LONGHORN ARMY AMMUNITION PLANT KARNACK, TEXAS

ADMINISTRATIVE RECORD

Volume 19

2019

Bate Stamp Numbers
00939026 – 00940880

Prepared for

Department of the Army
Longhorn Army Ammunition Plant

1976–2019

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

VOLUME 19

2019

A. Title: Report (cont'd) – Quarterly Evaluation Report, 2nd Quarter (April–June) 2019 Groundwater Treatment Plant, Longhorn Army Ammunition Plant, Karnack, Texas
Author(s): Bhate Environmental Associates, Inc.
Recipient: U.S. Army Corps of Engineers, Tulsa District
Date: November 4, 2019
Bate Stamp: 00939026 – 00940880

Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD17.D Sample Name: 653685 CCV@25

Injection Date:	5/21/2019 11:23:56	Seq Line:	17
Sample Name:	653685 CCV@25	Location:	Vial 71
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.628	PBA	1938377.4	23.3659	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.647	PBA	593941.4	24.0719	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.650	PBA	253387.5	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 : 3/19/2019 2:35:19 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
8.744	1	1	1.00000	7.76074e4	1.28854e-5		1	Perchlorate
		2	2.00000	1.35273e5	1.47849e-5			
		3	5.00000	3.37764e5	1.48033e-5			
		4	10.00000	6.83454e5	1.46316e-5			
		5	25.00000	2.08433e6	1.19943e-5			
		6	50.00000	4.13334e6	1.20968e-5			
		7	75.00000	5.99313e6	1.25143e-5			
8.755	2	1	1.00000	2.36780e4	4.22333e-5		1	CLO4-85
		2	2.00000	4.69486e4	4.25998e-5			
		3	5.00000	1.06124e5	4.71147e-5			
		4	10.00000	2.13523e5	4.68335e-5			
		5	25.00000	6.14295e5	4.06971e-5			
		6	50.00000	1.19814e6	4.17315e-5			
		7	75.00000	1.78355e6	4.20509e-5			
8.766	3	1	5.00000	2.73208e5	1.83011e-5	+I1		CLO4-89-ISTD
		2	5.00000	2.24886e5	2.22335e-5			
		3	5.00000	2.33196e5	2.14412e-5			
		4	5.00000	2.34454e5	2.13262e-5			
		5	5.00000	2.50568e5	1.99547e-5			
		6	5.00000	2.30977e5	2.16472e-5			

Method C:\HPCHEM\1\METHODS\CLO4-DP2.M

RetTime [min]	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
	7	5.00000	2.21504e5	2.25729e-5			

More compound-specific settings:

Compound: Perchlorate
- Time Window : From 6.654 min To 12.544 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 0.5
  - Level 3 : 0.2
  - Level 4 : 0.1
  - Level 5 : 0.04
  - Level 6 : 0.02
  - Level 7 : 0.013333

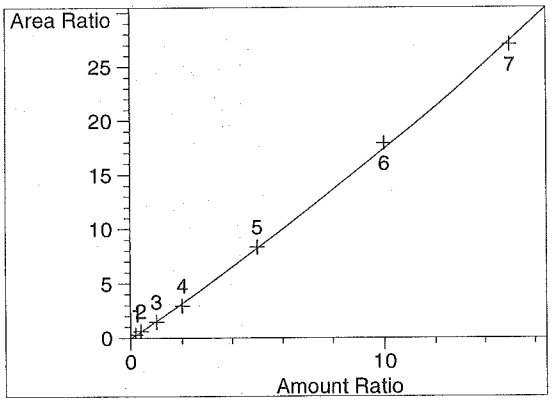
Compound: CLO4-85
- Time Window : From 6.650 min To 12.505 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 0.5
  - Level 3 : 0.2
  - Level 4 : 0.1
  - Level 5 : 0.04
  - Level 6 : 0.02
  - Level 7 : 0.013333

Compound: CLO4-89-ISTD
- Time Window : From 6.659 min To 12.466 min
- Curve Type : Linear
- Origin : Included
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 1
  - Level 3 : 1
  - Level 4 : 1
  - Level 5 : 1
  - Level 6 : 1
  - Level 7 : 1

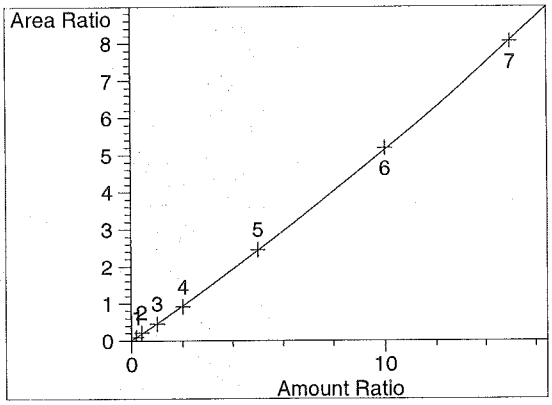
Peak Sum Table

No Entries in table

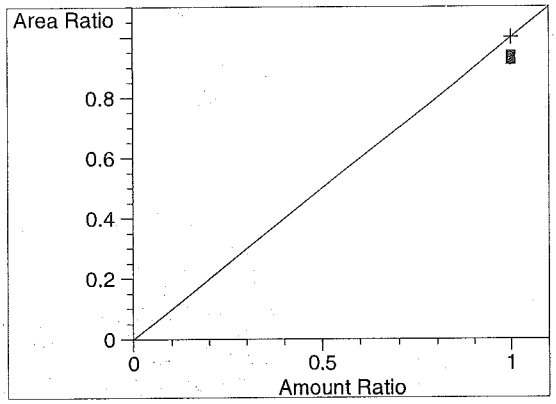
Calibration Curves



Perchlorate at exp. RT: 8.744
MSD1 83, EIC=82.7:83.7
Correlation: 0.99957
Residual Std. Dev.: 0.30744
Formula: $y = ax^2 + bx + c$
a: 1.76988e-2
b: 1.56480
c: -4.92430e-2
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.5
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.013333



CLO4-85 at exp. RT: 8.755
MSD1 85, EIC=84.7:85.7
Correlation: 0.99983
Residual Std. Dev.: 0.03473
Formula: $y = ax^2 + bx + c$
a: 5.13396e-3
b: 4.62055e-1
c: 4.97209e-4
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.5
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.013333



CLO4-89-ISTD at exp. RT: 8.766
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 1 : 1
Level 2 : 1
Level 3 : 1
Level 4 : 1
Level 5 : 1
Level 6 : 1
Level 7 : 1

Batch Report: C:\HPCHEM\1\DATA\19MAR19I\19MAR19D.B

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP2.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	7.76074e4	8.744	1.06245
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	1.35273e5	8.992	2.06969
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	3.37764e5	8.586	4.73474
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	6.83454e5	8.698	9.27727
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.08433e6	8.451	25.29036
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	4.13334e6	8.810	51.36844
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	5.99313e6	8.586	74.16754
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	7.34719e5	8.702	9.25940

#	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.36780e4	8.755	9.30535e-1
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	4.69486e4	9.012	2.24255
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	1.06124e5	8.602	4.86656
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.13523e5	8.713	9.64312
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	6.14295e5	8.468	25.12159
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	1.19814e6	8.825	50.46721
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	1.78355e6	8.603	74.72019
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.27495e5	8.721	9.54024

#	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	2.73208e5	8.766	5.00000
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	2.24886e5	9.012	5.00000
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	2.33196e5	8.609	5.00000
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.34454e5	8.716	5.00000
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.50568e5	8.472	5.00000
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	2.30977e5	8.825	5.00000
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	2.21504e5	8.610	5.00000
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.52544e5	8.725	5.00000

*** End of Report ***

Sequence: C:\HPCHEM\1\SEQUENCE\CLO4\2019\MAR\19MAR19I.S

Sequence Table:

Method and Injection Info Part:

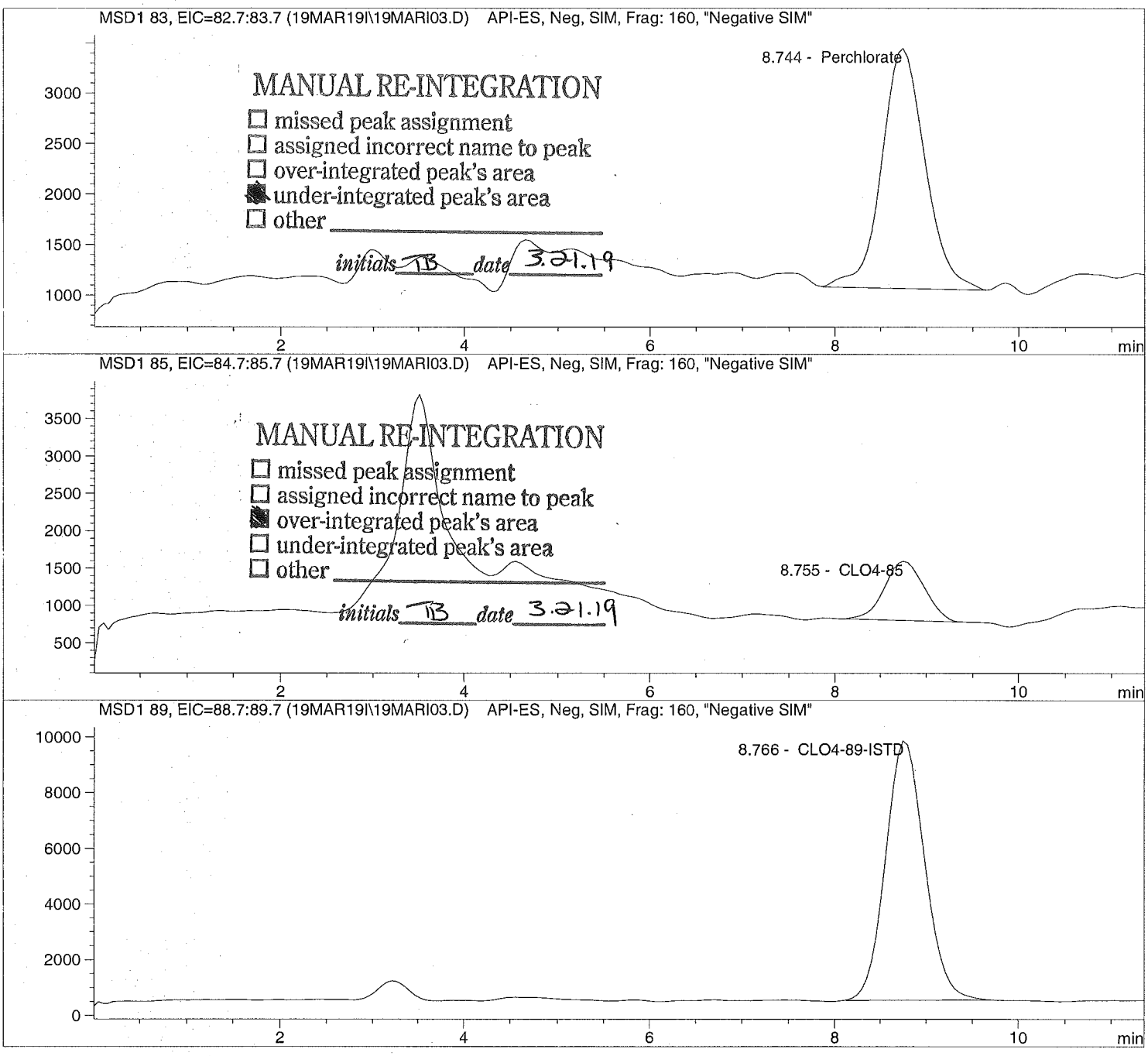
Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	CLO4@ 0.2ug/L	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	CLO4@ 0.5ug/L	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	CLO4@ 1.0ug/L	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	CLO4@ 2.0ug/L	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	CLO4@ 5.0ug/L	CLO4-AQN	1	Ctrl Samp		
6	Vial 76	CLO4@ 10.ug/L	CLO4-AQN	1	Ctrl Samp		
7	Vial 77	CLO4@ 25.ug/L	CLO4-AQN	1	Ctrl Samp		
8	Vial 78	CLO4@ 50.ug/L	CLO4-AQN	1	Ctrl Samp		
9	Vial 79	CLO4@ 75.ug/L	CLO4-AQN	1	Ctrl Samp		
10	Vial 80	ICAL Verf@10ug/L	CLO4-AQN	1	Ctrl Samp		

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 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
8.744	MM	77607.4	1.0625	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	MM	23678.0	0.9305	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

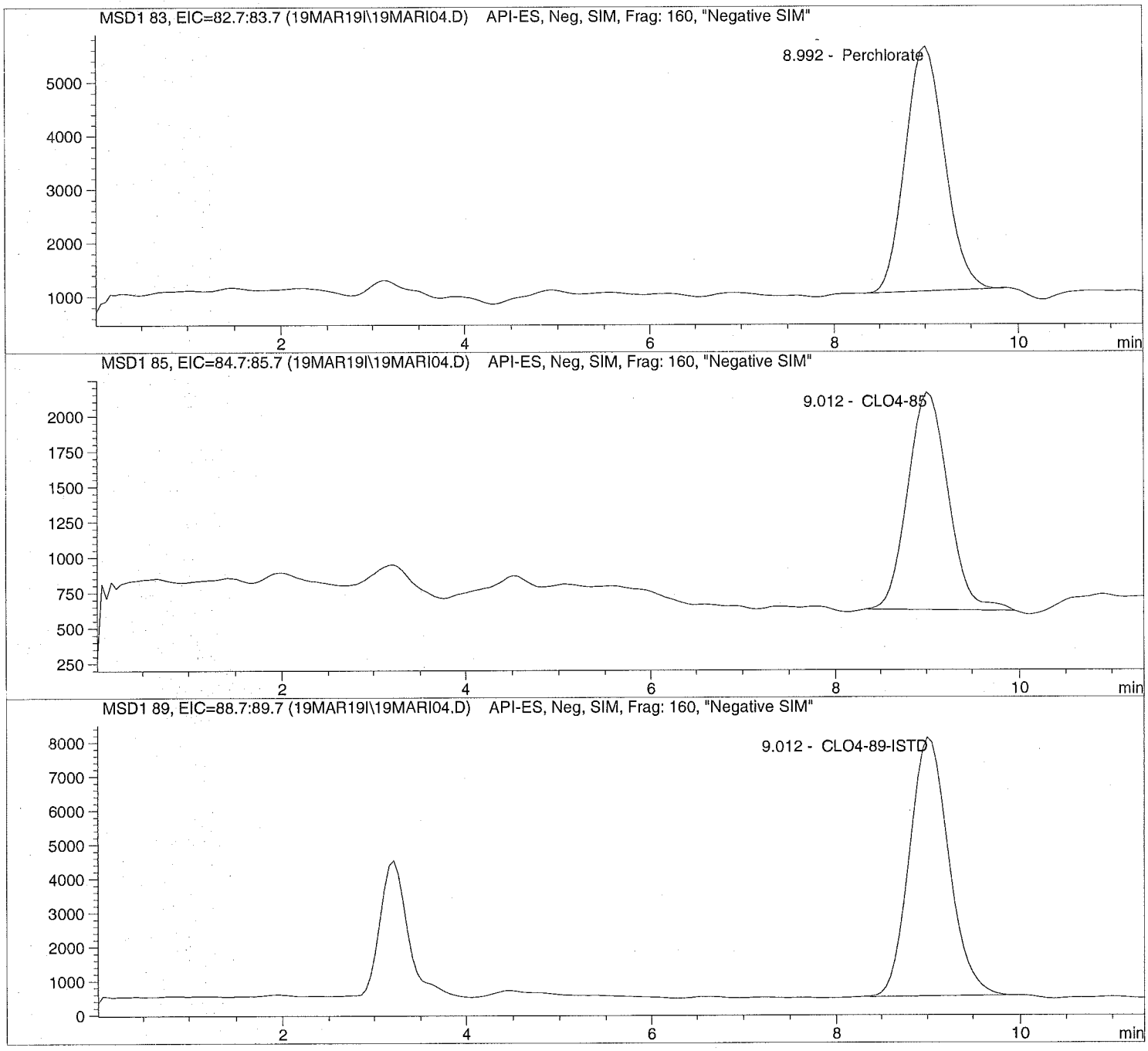
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	3/19/2019 09:53:00	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	3/19/2019 09:53:00	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 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
8.992	BBA	135272.8	2.0697	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	46948.6	2.2425	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	224885.9	5.0000	CLO4-89-ISTD

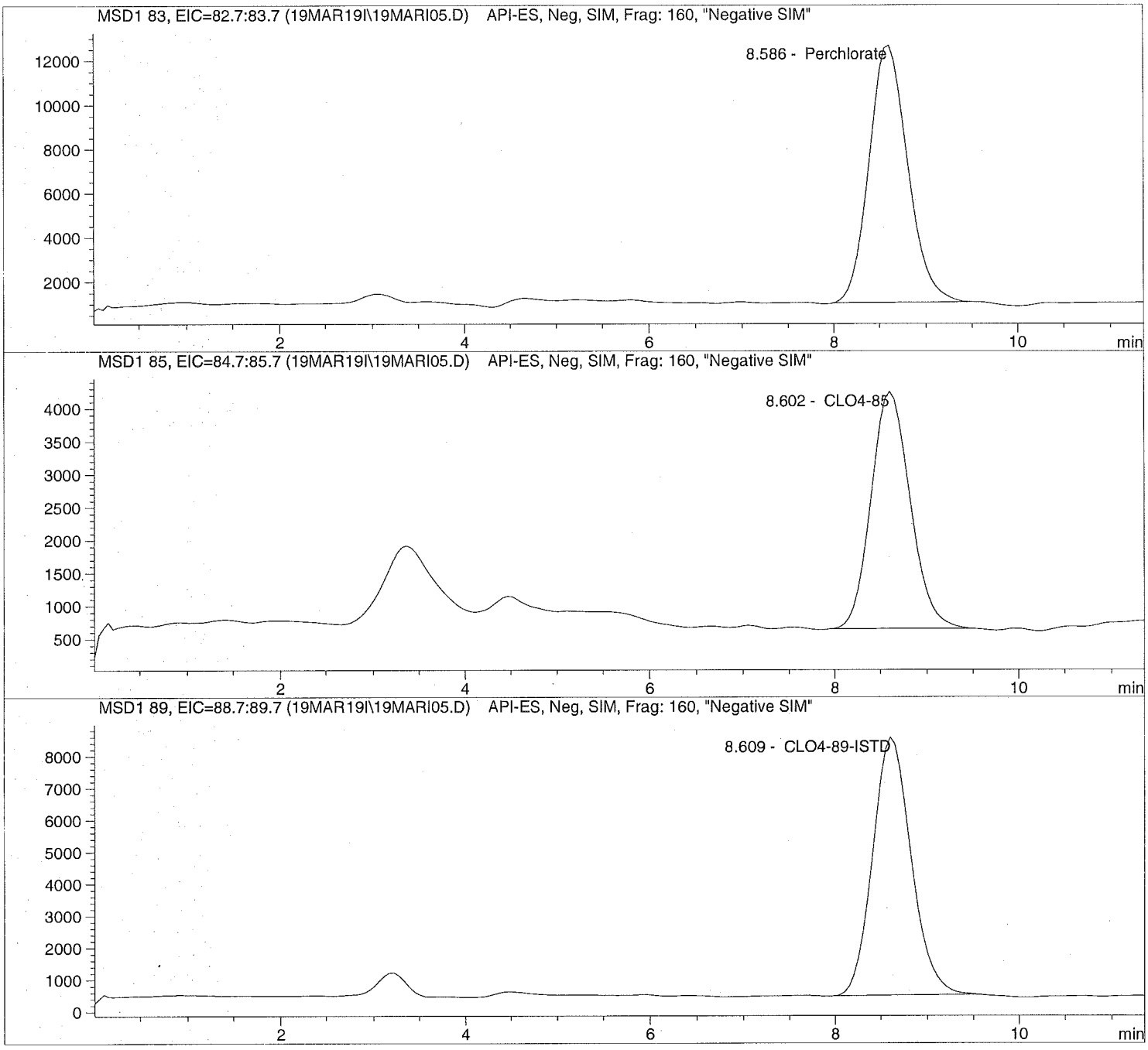
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	3/19/2019 10:06:16	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	3/19/2019 10:06:16	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 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
8.586	PBA	337763.6	4.7347	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.602	PBA	106124.0	4.8666	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.609	PBA	233196.3	5.0000	CLO4-89-ISTD

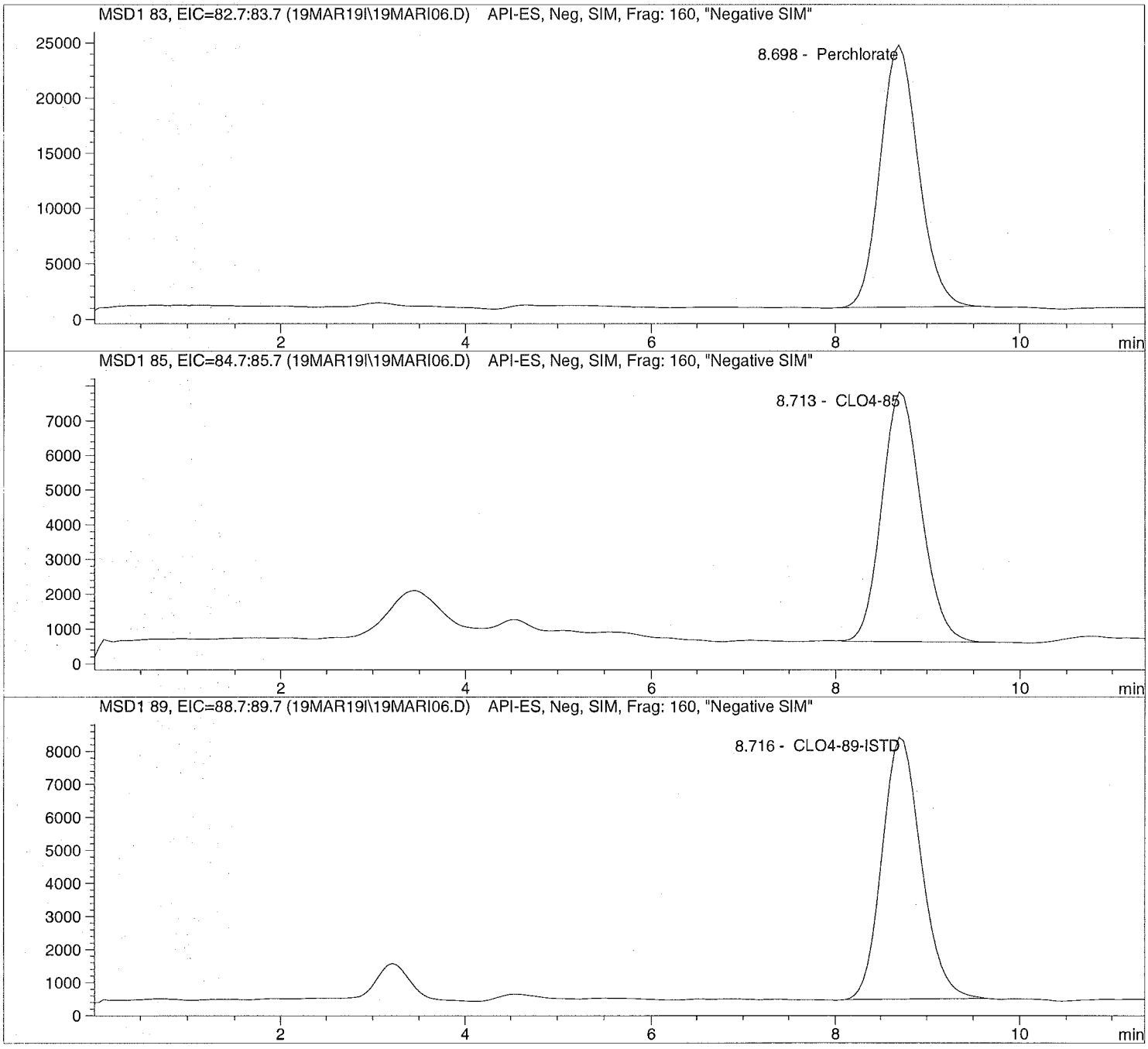
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	3/19/2019 10:19:32	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	3/19/2019 10:19:32	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 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
8.698	PBA	683454.4	9.2773	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.713	BBA	213522.6	9.6431	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.716	PBA	234453.6	5.0000	CLO4-89-ISTD

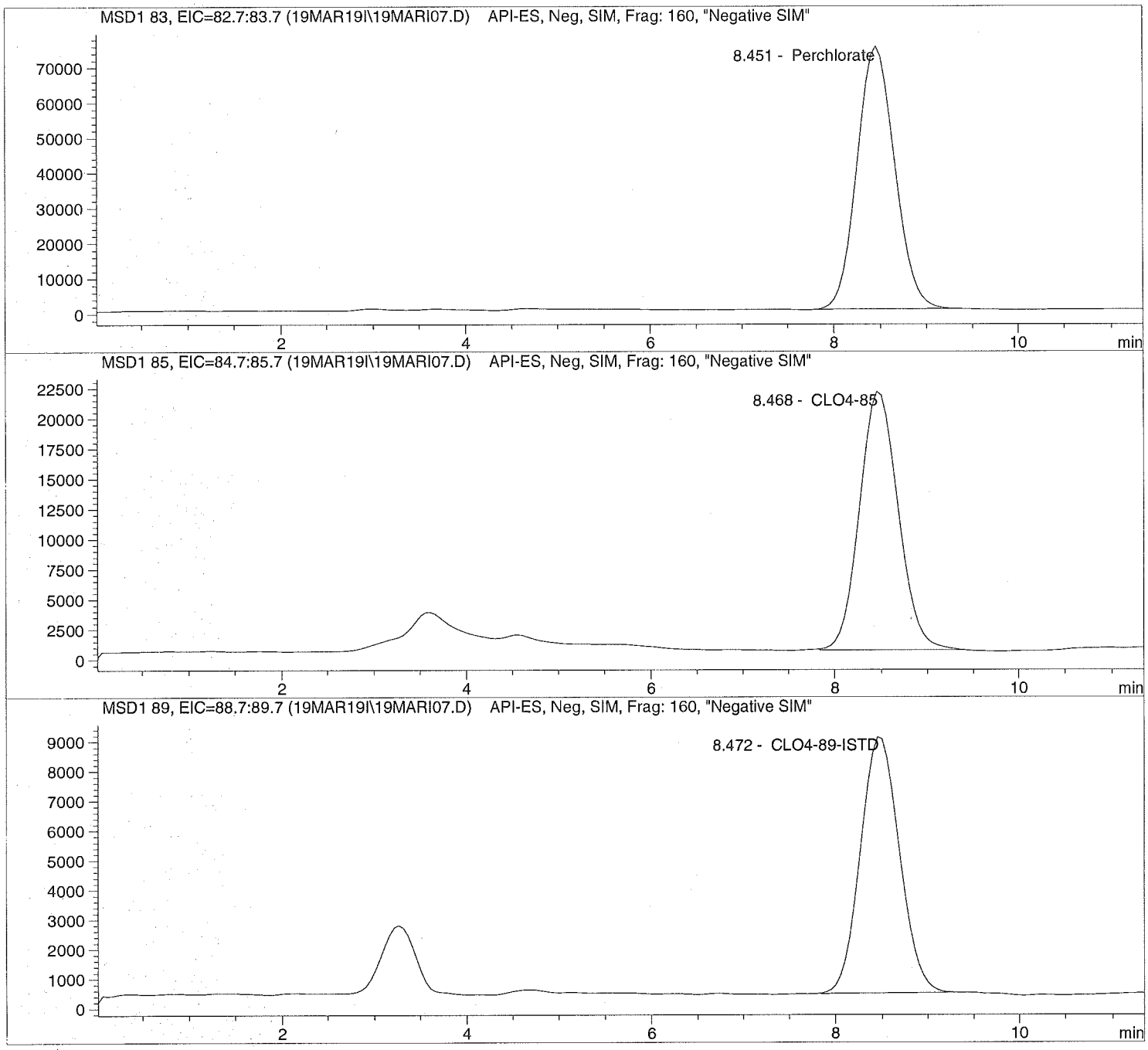
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	3/19/2019 10:32:49	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	3/19/2019 10:32:49	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 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
8.451	PBA	2084327.4	25.2904	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.468	BBA	614294.8	25.1216	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.472	BBA	250568.0	5.0000	CLO4-89-ISTD

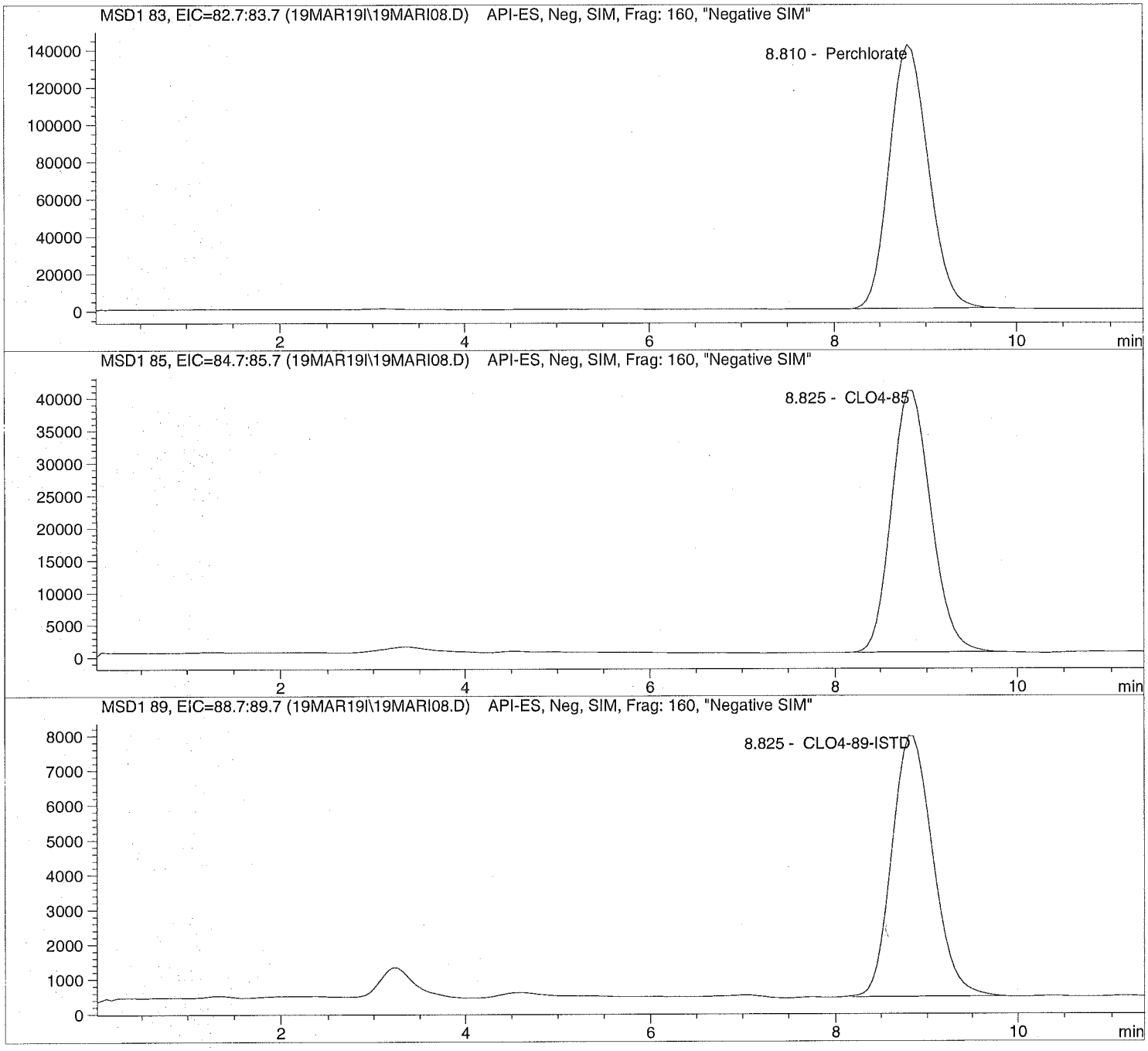
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	3/19/2019 10:46:05	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	3/19/2019 10:46:05	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 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
8.810	PBA	4133340.5	51.3684	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	1198135.6	50.4672	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	230976.7	5.0000	CLO4-89-ISTD

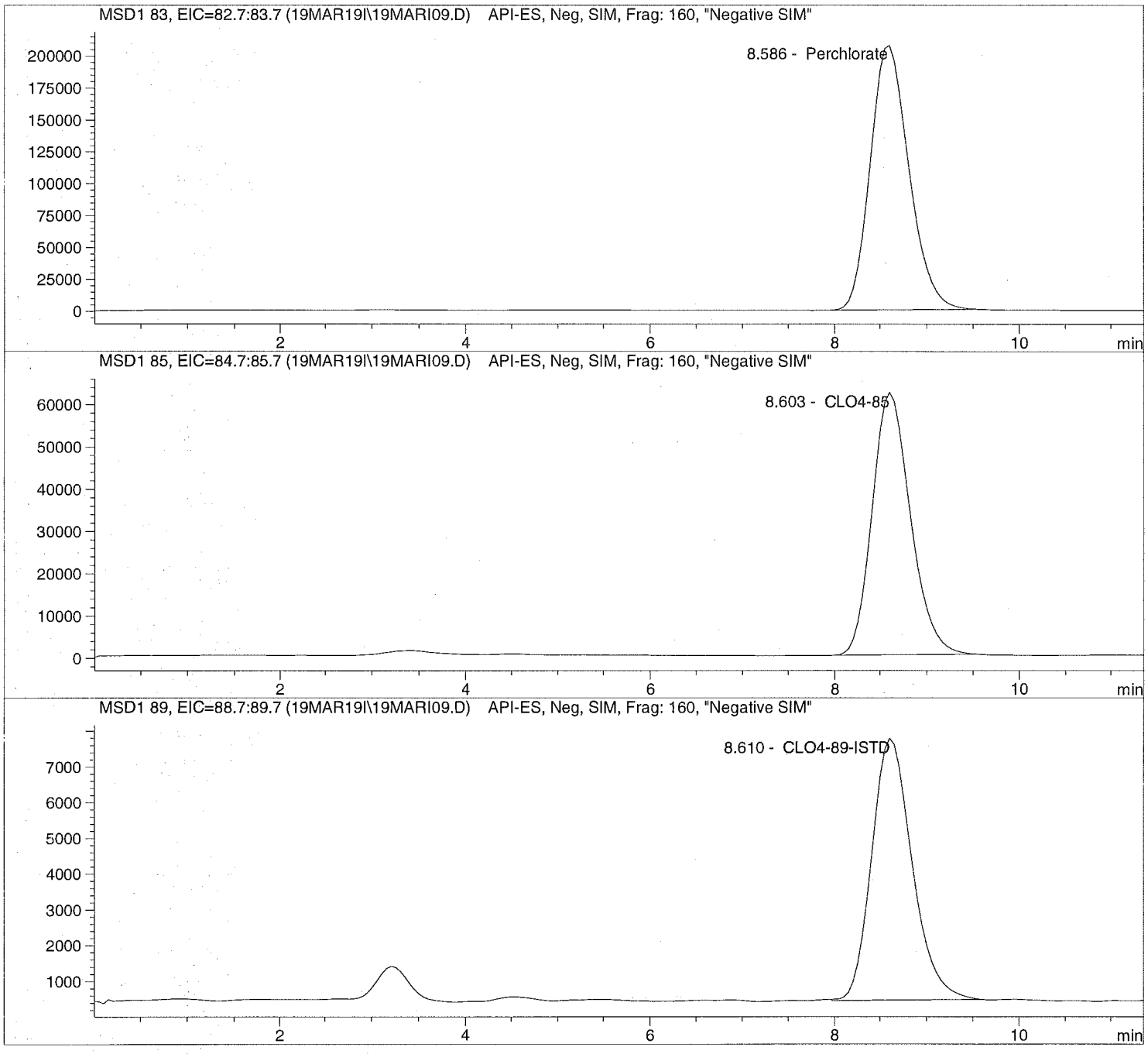
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	3/19/2019 10:59:22	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	3/19/2019 10:59:22	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 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
8.586	PBA	5993128.0	74.1675	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.603	PBA	1783554.4	74.7202	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.610	BBA	221504.5	5.0000	CLO4-89-ISTD

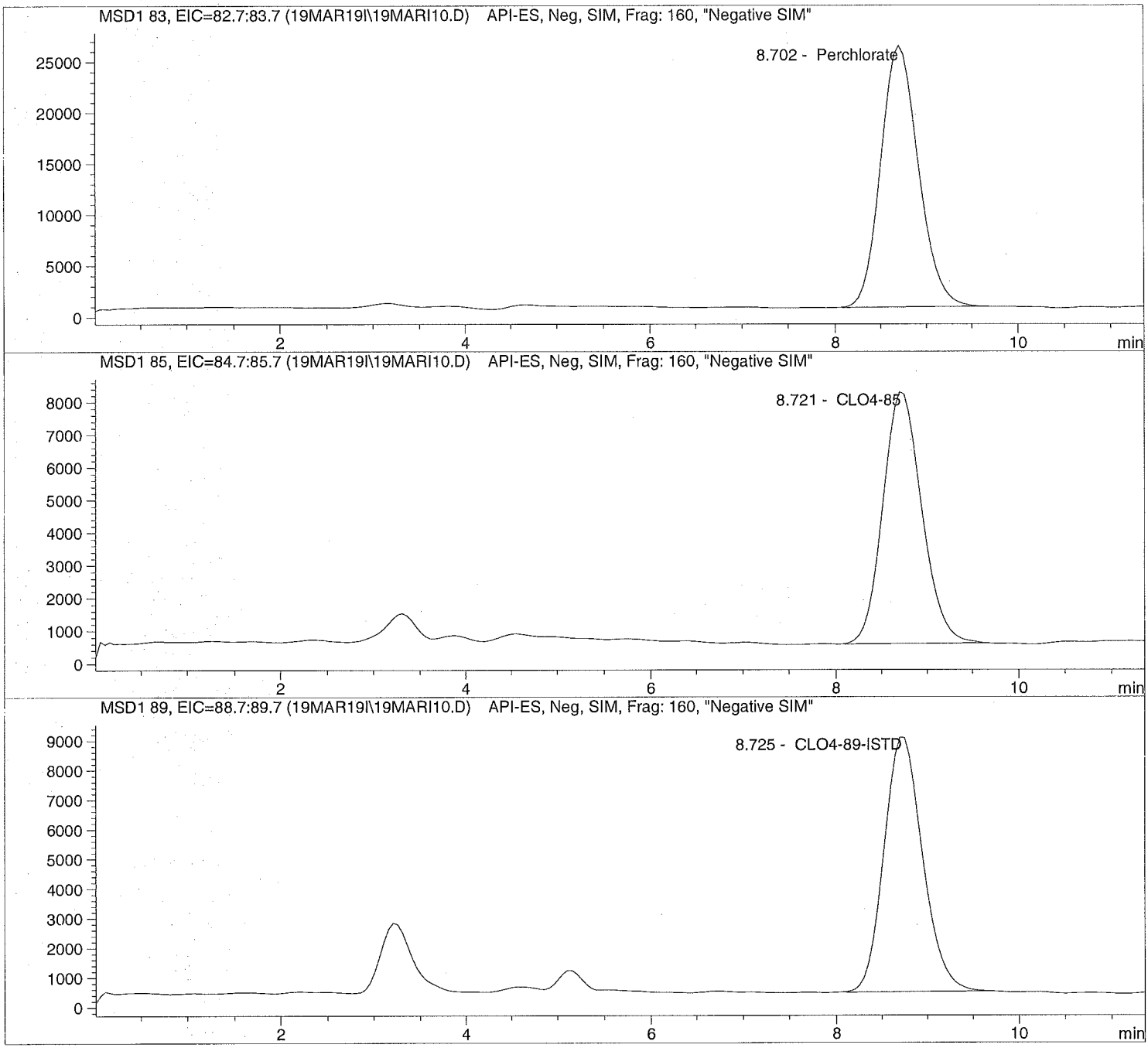
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L

Injection Date:	3/19/2019 11:12:42	Seq Line:	10
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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L

Injection Date:	3/19/2019 11:12:42	Seq Line:	10
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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 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
8.702	PBA	734718.7	9.2594	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.721	PBA	227494.7	9.5402	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.725	BBA	252544.4	5.0000	CLO4-89-ISTD

*** End of Report ***

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

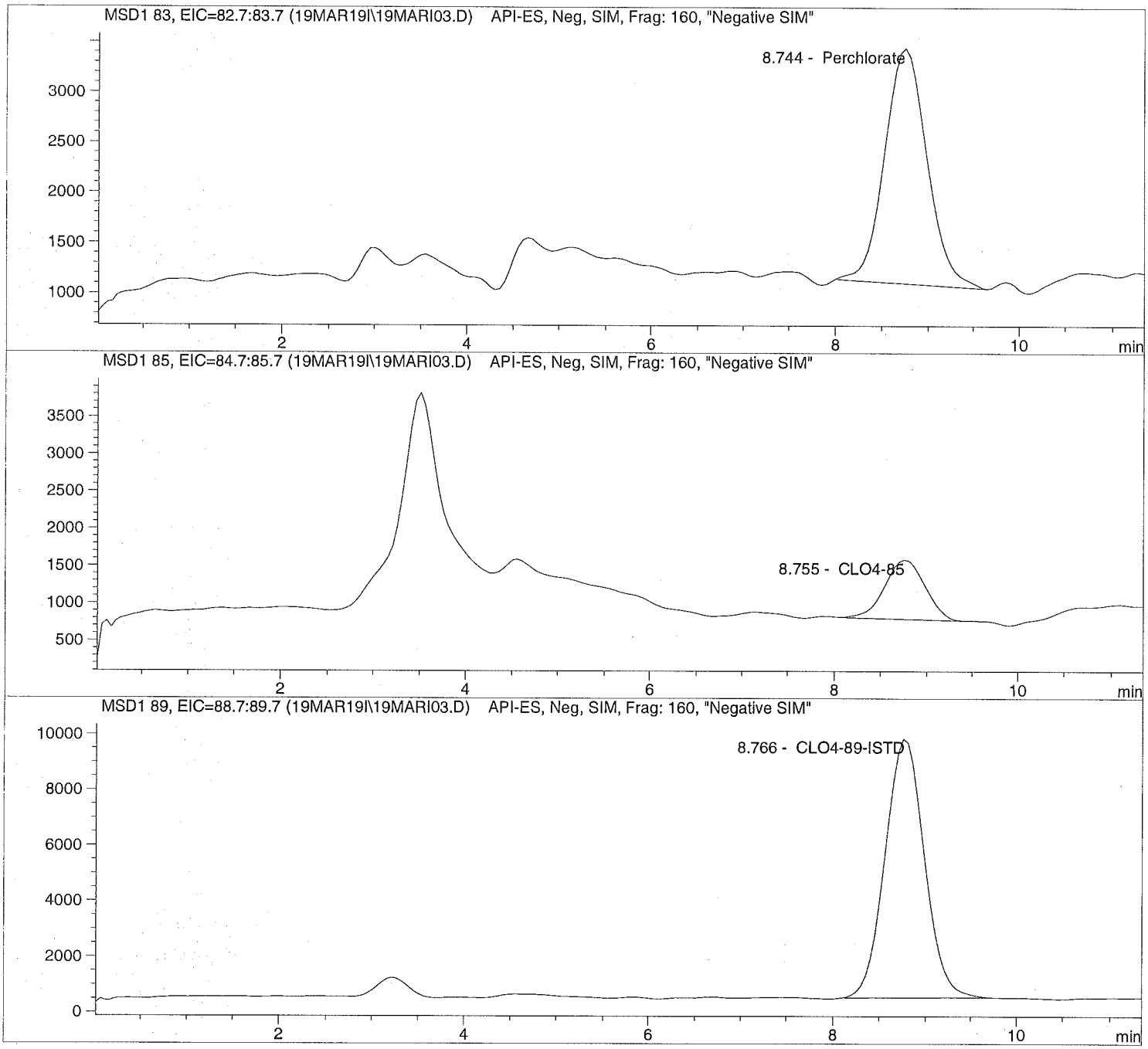
Unmodified

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	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-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	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-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 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
8.744	BBA	74166.3	1.0224	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	BBA	24138.1	0.9487	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

*** End of Report ***

ALS Houston, US Date: 15-May-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
Work Order: HS19050138

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19050138-01	LH18/24-SP650_050119	Water		01-May-2019 14:00	02-May-2019 12:50	☐
HS19050138-02	Trip Blank	Water	CG 040119 -194	01-May-2019 00:00	02-May-2019 12:50	☐

ALS Houston, US Date: 15-May-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
Work Order: HS19050138

CASE NARRATIVE

GCMS Volatiles by Method SW8260

Batch ID: R338430

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

WetChemistry by Method SW9056

Batch ID: R337814

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

ALS Houston, US Date: 15-May-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: Longhorn GW Treatment Plant Bi-Weekly Samples WorkOrder:HS19050138
Sample ID: LH18/24-SP650_050119 Lab ID:HS19050138-01
Collection Date: 01-May-2019 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	14-May-2019 12:49
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 12:49
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	14-May-2019 12:49
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 12:49
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 12:49
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 12:49
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 12:49
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	14-May-2019 12:49
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	14-May-2019 12:49
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	14-May-2019 12:49
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 12:49
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 12:49
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 12:49
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	14-May-2019 12:49
1,2-Dichloroethane	**0.51**	J	**0.20**	**0.50**	**1.0**	**UG/L**	1	14-May-2019 12:49
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	14-May-2019 12:49
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 12:49
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	14-May-2019 12:49
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 12:49
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	14-May-2019 12:49
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 12:49
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	14-May-2019 12:49
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 12:49
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	14-May-2019 12:49
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	14-May-2019 12:49
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 12:49
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	14-May-2019 12:49
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	14-May-2019 12:49
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 12:49
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	14-May-2019 12:49
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 12:49
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 12:49
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	14-May-2019 12:49
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	14-May-2019 12:49
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	14-May-2019 12:49
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	14-May-2019 12:49
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 12:49
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 12:49
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 12:49

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

ALS Houston, US Date: 15-May-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: Longhorn GW Treatment Plant Bi-Weekly Samples WorkOrder:HS19050138
Sample ID: LH18/24-SP650_050119 Lab ID:HS19050138-01
Collection Date: 01-May-2019 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	14-May-2019 12:49
cis-1,2-Dichloroethene	**2.0**		**0.20**	**0.50**	**1.0**	**UG/L**	1	14-May-2019 12:49
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	14-May-2019 12:49
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 12:49
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 12:49
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 12:49
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 12:49
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	14-May-2019 12:49
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 12:49
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	14-May-2019 12:49
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	14-May-2019 12:49
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	14-May-2019 12:49
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 12:49
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 12:49
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 12:49
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 12:49
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 12:49
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 12:49
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 12:49
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 12:49
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 12:49
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 12:49
Trichloroethene	**0.65**	J	**0.20**	**0.50**	**1.0**	**UG/L**	1	14-May-2019 12:49
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 12:49
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 12:49
Surr: 1,2-Dichloroethane-d4	*87.6*			**0**	*81-118*	*%REC*	*1*	*14-May-2019 12:49*
Surr: 4-Bromofluorobenzene	*98.7*			**0**	*85-114*	*%REC*	*1*	*14-May-2019 12:49*
Surr: Dibromofluoromethane	*90.3*			**0**	*80-119*	*%REC*	*1*	*14-May-2019 12:49*
Surr: Toluene-d8	*104*			**0**	*89-112*	*%REC*	*1*	*14-May-2019 12:49*
ANIONS BY SW9056A		**Method:SW9056**						Analyst: AJH
Chloride	**302**		**2.00**	**5.00**	**5.00**	**mg/L**	10	03-May-2019 06:28
Sulfate	**15.0**		**2.00**	**5.00**	**5.00**	**mg/L**	10	03-May-2019 06:28

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

ALS Houston, US Date: 15-May-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: Longhorn GW Treatment Plant Bi-Weekly Samples WorkOrder:HS19050138
Sample ID: Trip Blank Lab ID:HS19050138-02
Collection Date: 01-May-2019 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	14-May-2019 12:01
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 12:01
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	14-May-2019 12:01
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 12:01
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 12:01
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 12:01
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 12:01
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	14-May-2019 12:01
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	14-May-2019 12:01
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	14-May-2019 12:01
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 12:01
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 12:01
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 12:01
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	14-May-2019 12:01
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 12:01
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	14-May-2019 12:01
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 12:01
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	14-May-2019 12:01
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 12:01
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	14-May-2019 12:01
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 12:01
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	14-May-2019 12:01
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 12:01
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	14-May-2019 12:01
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	14-May-2019 12:01
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 12:01
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	14-May-2019 12:01
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	14-May-2019 12:01
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 12:01
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	14-May-2019 12:01
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 12:01
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 12:01
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	14-May-2019 12:01
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	14-May-2019 12:01
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	14-May-2019 12:01
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	14-May-2019 12:01
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 12:01
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 12:01
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 12:01

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

ALS Houston, US Date: 15-May-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**

Project: Longhorn GW Treatment Plant Bi-Weekly Samples WorkOrder:HS19050138

Sample ID: Trip Blank Lab ID:HS19050138-02

Collection Date: 01-May-2019 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	14-May-2019 12:01
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 12:01
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	14-May-2019 12:01
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 12:01
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 12:01
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 12:01
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 12:01
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	14-May-2019 12:01
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 12:01
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	14-May-2019 12:01
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	14-May-2019 12:01
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	14-May-2019 12:01
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 12:01
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 12:01
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 12:01
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 12:01
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 12:01
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 12:01
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 12:01
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 12:01
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 12:01
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 12:01
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 12:01
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 12:01
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 12:01
Surr: 1,2-Dichloroethane-d4	*86.7*			**0**	*81-118*	*%REC*	*1*	*14-May-2019 12:01*
Surr: 4-Bromofluorobenzene	*97.2*			**0**	*85-114*	*%REC*	*1*	*14-May-2019 12:01*
Surr: Dibromofluoromethane	*88.8*			**0**	*80-119*	*%REC*	*1*	*14-May-2019 12:01*
Surr: Toluene-d8	*104*			**0**	*89-112*	*%REC*	*1*	*14-May-2019 12:01*

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

ALS Houston, US Date: 15-May-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: HS19050138

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID R337814	**Test Name :** ANIONS BY SW9056A			**Matrix:** Water		
HS19050138-01	LH18/24-SP650_050119	01 May 2019 14:00			03 May 2019 06:28	10
Batch ID R338430	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C			**Matrix:** Water		
HS19050138-01	LH18/24-SP650_050119	01 May 2019 14:00			14 May 2019 12:49	1
HS19050138-02	Trip Blank	01 May 2019 00:00			14 May 2019 12:01	1

ALS Houston, US Date: 15-May-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: HS19050138

QC BATCH REPORT

Batch ID: R338430 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-190514** Units: **UG/L** Analysis Date: **14-May-2019 11:37**
Client ID: Run ID: **VOA6_338430** SeqNo: **5075195** 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: 15-May-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: HS19050138

QC BATCH REPORT

Batch ID: R338430 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-190514** Units: **UG/L** Analysis Date: **14-May-2019 11:37**
Client ID: Run ID: **VOA6_338430** SeqNo: **5075195** 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	*42.59*	*1.0*	*50*	*0*	*85.2*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*48.97*	*1.0*	*50*	*0*	*97.9*	*85 - 114*				
Surr: Dibromofluoromethane	*43.89*	*1.0*	*50*	*0*	*87.8*	*80 - 119*				
Surr: Toluene-d8	*52.89*	*1.0*	*50*	*0*	*106*	*89 - 112*				

ALS Houston, US Date: 15-May-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: HS19050138

QC BATCH REPORT

Batch ID: R338430 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-190514** Units: **UG/L** Analysis Date: **14-May-2019 10:49**
Client ID: Run ID: **VOA6_338430** SeqNo: **5075194** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	19.65	1.0	20	0	98.3	78 - 124				
1,1,1-Trichloroethane	19.21	1.0	20	0	96.0	74 - 131				
1,1,2,2-Tetrachloroethane	19.94	1.0	20	0	99.7	71 - 121				
1,1,2-Trichloroethane	19.79	1.0	20	0	98.9	80 - 119				
1,1-Dichloroethane	19.1	1.0	20	0	95.5	77 - 125				
1,1-Dichloroethene	19.64	1.0	20	0	98.2	71 - 131				
1,1-Dichloropropene	19.1	1.0	20	0	95.5	78 - 125				
1,2,3-Trichlorobenzene	22.8	1.0	20	0	114	69 - 129				
1,2,3-Trichloropropane	19.99	1.0	20	0	99.9	73 - 122				
1,2,4-Trichlorobenzene	20.95	1.0	20	0	105	69 - 130				
1,2,4-Trimethylbenzene	19.27	1.0	20	0	96.3	76 - 124				
1,2-Dibromo-3-chloropropane	20.82	1.0	20	0	104	62 - 128				
1,2-Dibromoethane	19.76	1.0	20	0	98.8	77 - 121				
1,2-Dichlorobenzene	19.39	1.0	20	0	96.9	80 - 119				
1,2-Dichloroethane	19.2	1.0	20	0	96.0	73 - 128				
1,2-Dichloropropane	20.1	1.0	20	0	100	78 - 122				
1,3,5-Trimethylbenzene	19.23	1.0	20	0	96.2	75 - 124				
1,3-Dichlorobenzene	19.33	1.0	20	0	96.7	80 - 119				
1,3-Dichloropropane	19.66	1.0	20	0	98.3	80 - 119				
1,4-Dichlorobenzene	19.64	1.0	20	0	98.2	79 - 118				
2,2-Dichloropropane	19.71	1.0	20	0	98.6	60 - 139				
2-Butanone	41.52	2.0	40	0	104	56 - 143				
2-Chlorotoluene	18.51	1.0	20	0	92.5	79 - 122				
2-Hexanone	40.58	2.0	40	0	101	57 - 139				
4-Chlorotoluene	18.69	1.0	20	0	93.4	78 - 122				
4-Isopropyltoluene	18.93	1.0	20	0	94.6	77 - 127				
4-Methyl-2-pentanone	39.72	2.0	40	0	99.3	67 - 130				
Acetone	44.55	2.0	40	0	111	39 - 160				
Benzene	19.69	1.0	20	0	98.4	79 - 120				
Bromobenzene	19.68	1.0	20	0	98.4	80 - 120				
Bromochloromethane	19.96	1.0	20	0	99.8	78 - 123				
Bromodichloromethane	20.01	1.0	20	0	100	79 - 125				
Bromoform	21	1.0	20	0	105	66 - 130				
Bromomethane	22.76	1.0	20	0	114	53 - 141				

ALS Houston, US Date: 15-May-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: HS19050138

QC BATCH REPORT

Batch ID: R338430 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-190514** Units: **UG/L** Analysis Date: **14-May-2019 10:49**
Client ID: Run ID: **VOA6_338430** SeqNo: **5075194** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	39.51	2.0	40	0	98.8	64 - 133				
Carbon tetrachloride	18.82	1.0	20	0	94.1	72 - 136				
Chlorobenzene	19.91	1.0	20	0	99.5	82 - 118				
Chloroethane	18.27	1.0	20	0	91.3	60 - 138				
Chloroform	19.45	1.0	20	0	97.2	79 - 124				
Chloromethane	18.59	1.0	20	0	93.0	50 - 139				
cis-1,2-Dichloroethene	19.06	1.0	20	0	95.3	78 - 123				
cis-1,3-Dichloropropene	20.18	1.0	20	0	101	75 - 124				
Dibromochloromethane	19.83	1.0	20	0	99.2	74 - 126				
Dibromomethane	20.15	1.0	20	0	101	79 - 123				
Dichlorodifluoromethane	21.17	1.0	20	0	106	32 - 152				
Ethylbenzene	19.47	1.0	20	0	97.3	79 - 121				
Hexachlorobutadiene	20.77	1.0	20	0	104	66 - 134				
Isopropylbenzene	19.15	1.0	20	0	95.7	72 - 131				
m,p-Xylene	38.81	2.0	40	0	97.0	80 - 121				
Methylene chloride	20.12	2.0	20	0	101	74 - 124				
Naphthalene	20.78	1.0	20	0	104	61 - 128				
n-Butylbenzene	19.23	1.0	20	0	96.1	75 - 128				
n-Propylbenzene	18.85	1.0	20	0	94.2	76 - 126				
o-Xylene	19.46	1.0	20	0	97.3	78 - 122				
sec-Butylbenzene	18.62	1.0	20	0	93.1	77 - 126				
Styrene	20.18	1.0	20	0	101	78 - 123				
tert-Butylbenzene	18.7	1.0	20	0	93.5	78 - 124				
Tetrachloroethene	19.22	1.0	20	0	96.1	74 - 129				
Toluene	19.42	1.0	20	0	97.1	80 - 121				
trans-1,2-Dichloroethene	19.89	1.0	20	0	99.5	75 - 124				
trans-1,3-Dichloropropene	20.67	1.0	20	0	103	73 - 127				
Trichloroethene	19.92	1.0	20	0	99.6	79 - 123				
Trichlorofluoromethane	19.39	1.0	20	0	96.9	65 - 141				
Vinyl chloride	19.64	1.0	20	0	98.2	58 - 137				
Surr: 1,2-Dichloroethane-d4	*49.83*	*1.0*	*50*	*0*	*99.7*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.82*	*1.0*	*50*	*0*	*102*	*85 - 114*				
Surr: Dibromofluoromethane	*48.75*	*1.0*	*50*	*0*	*97.5*	*80 - 119*				
Surr: Toluene-d8	*48.69*	*1.0*	*50*	*0*	*97.4*	*89 - 112*				

ALS Houston, US Date: 15-May-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: HS19050138

QC BATCH REPORT

Batch ID: R338430 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS19050304-05MS** Units: **UG/L** Analysis Date: **14-May-2019 14:26**
Client ID: Run ID: **VOA6_338430** SeqNo: **5075202** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	17.96	1.0	20	0	89.8	78 - 124				
1,1,1-Trichloroethane	17.27	1.0	20	0	86.4	74 - 131				
1,1,2,2-Tetrachloroethane	19.07	1.0	20	0	95.4	71 - 121				
1,1,2-Trichloroethane	18.35	1.0	20	0	91.8	80 - 119				
1,1-Dichloroethane	16.46	1.0	20	0	82.3	77 - 125				
1,1-Dichloroethene	17.19	1.0	20	0	86.0	71 - 131				
1,1-Dichloropropene	18.19	1.0	20	0	91.0	78 - 125				
1,2,3-Trichlorobenzene	21.91	1.0	20	0	110	69 - 129				
1,2,3-Trichloropropane	18.51	1.0	20	0	92.6	73 - 122				
1,2,4-Trichlorobenzene	20.05	1.0	20	0	100	69 - 130				
1,2,4-Trimethylbenzene	17.85	1.0	20	0	89.3	76 - 124				
1,2-Dibromo-3-chloropropane	20.62	1.0	20	0	103	62 - 128				
1,2-Dibromoethane	18.37	1.0	20	0	91.9	77 - 121				
1,2-Dichlorobenzene	18.43	1.0	20	0	92.2	80 - 119				
1,2-Dichloroethane	16.81	1.0	20	0	84.1	73 - 128				
1,2-Dichloropropane	17.63	1.0	20	0	88.2	78 - 122				
1,3,5-Trimethylbenzene	18.57	1.0	20	0	92.8	75 - 124				
1,3-Dichlorobenzene	18.44	1.0	20	0	92.2	80 - 119				
1,3-Dichloropropane	18.25	1.0	20	0	91.3	80 - 119				
1,4-Dichlorobenzene	18.41	1.0	20	0	92.1	79 - 118				
2,2-Dichloropropane	17.18	1.0	20	0	85.9	60 - 139				
2-Butanone	36.74	2.0	40	0	91.9	56 - 143				
2-Chlorotoluene	18.14	1.0	20	0	90.7	79 - 122				
2-Hexanone	36.41	2.0	40	0	91.0	57 - 139				
4-Chlorotoluene	18.02	1.0	20	0	90.1	78 - 122				
4-Isopropyltoluene	19.4	1.0	20	0	97.0	77 - 127				
4-Methyl-2-pentanone	37.53	2.0	40	0	93.8	67 - 130				
Acetone	41.3	2.0	40	5.033	90.7	39 - 160				
Benzene	17.22	1.0	20	0	86.1	79 - 120				
Bromobenzene	17.54	1.0	20	0	87.7	80 - 120				
Bromochloromethane	16.53	1.0	20	0	82.6	78 - 123				
Bromodichloromethane	17.16	1.0	20	0	85.8	79 - 125				
Bromoform	18.69	1.0	20	0	93.5	66 - 130				
Bromomethane	14.83	1.0	20	0	74.1	53 - 141				

ALS Houston, US Date: 15-May-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: HS19050138

QC BATCH REPORT

Batch ID: R338430 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS19050304-05MS** Units: **UG/L** Analysis Date: **14-May-2019 14:26**
Client ID: Run ID: **VOA6_338430** SeqNo: **5075202** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	34.64	2.0	40	0	86.6	64 - 133				
Carbon tetrachloride	17.45	1.0	20	0	87.2	72 - 136				
Chlorobenzene	18.68	1.0	20	0	93.4	82 - 118				
Chloroethane	16.04	1.0	20	0	80.2	60 - 138				
Chloroform	16.36	1.0	20	0	81.8	79 - 124				
Chloromethane	14.06	1.0	20	0	70.3	50 - 139				
cis-1,2-Dichloroethene	16.27	1.0	20	0	81.4	78 - 123				
cis-1,3-Dichloropropene	18.73	1.0	20	0	93.7	75 - 124				
Dibromochloromethane	18.41	1.0	20	0	92.0	74 - 126				
Dibromomethane	17.7	1.0	20	0	88.5	79 - 123				
Dichlorodifluoromethane	15.98	1.0	20	0	79.9	32 - 152				
Ethylbenzene	18.41	1.0	20	0	92.1	79 - 121				
Hexachlorobutadiene	21.25	1.0	20	0	106	66 - 134				
Isopropylbenzene	18.73	1.0	20	0	93.7	72 - 131				
m,p-Xylene	37.34	2.0	40	0	93.4	80 - 121				
Methylene chloride	16.74	2.0	20	0	83.7	74 - 124				
Naphthalene	20.25	1.0	20	0	101	61 - 128				
n-Butylbenzene	19.47	1.0	20	0	97.4	75 - 128				
n-Propylbenzene	19.15	1.0	20	0	95.8	76 - 126				
o-Xylene	19.15	1.0	20	0	95.7	78 - 122				
sec-Butylbenzene	19.76	1.0	20	0	98.8	77 - 126				
Styrene	18.13	1.0	20	0	90.7	78 - 123				
tert-Butylbenzene	19.35	1.0	20	0	96.8	78 - 124				
Tetrachloroethene	18.9	1.0	20	0	94.5	74 - 129				
Toluene	18.38	1.0	20	0	91.9	80 - 121				
trans-1,2-Dichloroethene	17.28	1.0	20	0	86.4	75 - 124				
trans-1,3-Dichloropropene	17.81	1.0	20	0	89.1	73 - 127				
Trichloroethene	18.37	1.0	20	0	91.9	79 - 123				
Trichlorofluoromethane	16.85	1.0	20	0	84.3	65 - 141				
Vinyl chloride	17.11	1.0	20	0	85.5	58 - 137				
Surr: 1,2-Dichloroethane-d4	*43.63*	*1.0*	*50*	*0*	*87.3*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.27*	*1.0*	*50*	*0*	*101*	*85 - 114*				
Surr: Dibromofluoromethane	*45.19*	*1.0*	*50*	*0*	*90.4*	*80 - 119*				
Surr: Toluene-d8	*52*	*1.0*	*50*	*0*	*104*	*89 - 112*				

ALS Houston, US Date: 15-May-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: HS19050138

QC BATCH REPORT

Batch ID: R338430 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS19050304-05MSD** Units: **UG/L** Analysis Date: **14-May-2019 14:50**
Client ID: Run ID: **VOA6_338430** SeqNo: **5075203** 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	18.05	1.0	20	0	90.3	78 - 124	17.96	0.499	20	
1,1,1-Trichloroethane	16.75	1.0	20	0	83.7	74 - 131	17.27	3.11	20	
1,1,2,2-Tetrachloroethane	20.62	1.0	20	0	103	71 - 121	19.07	7.82	20	
1,1,2-Trichloroethane	18.77	1.0	20	0	93.9	80 - 119	18.35	2.27	20	
1,1-Dichloroethane	15.96	1.0	20	0	79.8	77 - 125	16.46	3.1	20	
1,1-Dichloroethene	16.38	1.0	20	0	81.9	71 - 131	17.19	4.84	20	
1,1-Dichloropropene	17.86	1.0	20	0	89.3	78 - 125	18.19	1.86	20	
1,2,3-Trichlorobenzene	24.61	1.0	20	0	123	69 - 129	21.91	11.6	20	
1,2,3-Trichloropropane	20.12	1.0	20	0	101	73 - 122	18.51	8.29	20	
1,2,4-Trichlorobenzene	21.58	1.0	20	0	108	69 - 130	20.05	7.37	20	
1,2,4-Trimethylbenzene	19.04	1.0	20	0	95.2	76 - 124	17.85	6.43	20	
1,2-Dibromo-3-chloropropane	23.37	1.0	20	0	117	62 - 128	20.62	12.5	20	
1,2-Dibromoethane	18.7	1.0	20	0	93.5	77 - 121	18.37	1.8	20	
1,2-Dichlorobenzene	20.02	1.0	20	0	100	80 - 119	18.43	8.27	20	
1,2-Dichloroethane	16.81	1.0	20	0	84.1	73 - 128	16.81	0.00614	20	
1,2-Dichloropropane	17.42	1.0	20	0	87.1	78 - 122	17.63	1.19	20	
1,3,5-Trimethylbenzene	19.67	1.0	20	0	98.3	75 - 124	18.57	5.76	20	
1,3-Dichlorobenzene	19.64	1.0	20	0	98.2	80 - 119	18.44	6.33	20	
1,3-Dichloropropane	18.61	1.0	20	0	93.0	80 - 119	18.25	1.94	20	
1,4-Dichlorobenzene	19.37	1.0	20	0	96.8	79 - 118	18.41	5.05	20	
2,2-Dichloropropane	16.54	1.0	20	0	82.7	60 - 139	17.18	3.8	20	
2-Butanone	36.99	2.0	40	0	92.5	56 - 143	36.74	0.672	20	
2-Chlorotoluene	19.27	1.0	20	0	96.3	79 - 122	18.14	6	20	
2-Hexanone	38.67	2.0	40	0	96.7	57 - 139	36.41	6.02	20	
4-Chlorotoluene	19.19	1.0	20	0	96.0	78 - 122	18.02	6.3	20	
4-Isopropyltoluene	20.54	1.0	20	0	103	77 - 127	19.4	5.71	20	
4-Methyl-2-pentanone	38.72	2.0	40	0	96.8	67 - 130	37.53	3.12	20	
Acetone	42.23	2.0	40	5.033	93.0	39 - 160	41.3	2.22	20	
Benzene	17.15	1.0	20	0	85.7	79 - 120	17.22	0.446	20	
Bromobenzene	18.86	1.0	20	0	94.3	80 - 120	17.54	7.22	20	
Bromochloromethane	15.89	1.0	20	0	79.5	78 - 123	16.53	3.91	20	
Bromodichloromethane	16.76	1.0	20	0	83.8	79 - 125	17.16	2.31	20	
Bromoform	19.5	1.0	20	0	97.5	66 - 130	18.69	4.22	20	
Bromomethane	14.44	1.0	20	0	72.2	53 - 141	14.83	2.67	20	

ALS Houston, US Date: 15-May-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: HS19050138

QC BATCH REPORT

Batch ID: R338430 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS19050304-05MSD** Units: **UG/L** Analysis Date: **14-May-2019 14:50**
Client ID: Run ID: **VOA6_338430** SeqNo: **5075203** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Carbon disulfide	33.71	2.0	40	0	84.3	64 - 133	34.64	2.72	20	
Carbon tetrachloride	17.32	1.0	20	0	86.6	72 - 136	17.45	0.729	20	
Chlorobenzene	18.86	1.0	20	0	94.3	82 - 118	18.68	0.95	20	
Chloroethane	15.18	1.0	20	0	75.9	60 - 138	16.04	5.54	20	
Chloroform	15.86	1.0	20	0	79.3	79 - 124	16.36	3.15	20	
Chloromethane	13.31	1.0	20	0	66.6	50 - 139	14.06	5.44	20	
cis-1,2-Dichloroethene	15.91	1.0	20	0	79.6	78 - 123	16.27	2.26	20	
cis-1,3-Dichloropropene	18.59	1.0	20	0	92.9	75 - 124	18.73	0.759	20	
Dibromochloromethane	18.51	1.0	20	0	92.5	74 - 126	18.41	0.558	20	
Dibromomethane	17.47	1.0	20	0	87.4	79 - 123	17.7	1.28	20	
Dichlorodifluoromethane	15.52	1.0	20	0	77.6	32 - 152	15.98	2.93	20	
Ethylbenzene	18.16	1.0	20	0	90.8	79 - 121	18.41	1.34	20	
Hexachlorobutadiene	21.15	1.0	20	0	106	66 - 134	21.25	0.477	20	
Isopropylbenzene	19.08	1.0	20	0	95.4	72 - 131	18.73	1.81	20	
m,p-Xylene	37.75	2.0	40	0	94.4	80 - 121	37.34	1.1	20	
Methylene chloride	16.03	2.0	20	0	80.1	74 - 124	16.74	4.31	20	
Naphthalene	22.61	1.0	20	0	113	61 - 128	20.25	11	20	
n-Butylbenzene	20.47	1.0	20	0	102	75 - 128	19.47	5.02	20	
n-Propylbenzene	20.31	1.0	20	0	102	76 - 126	19.15	5.87	20	
o-Xylene	19.03	1.0	20	0	95.1	78 - 122	19.15	0.637	20	
sec-Butylbenzene	20.71	1.0	20	0	104	77 - 126	19.76	4.7	20	
Styrene	17.96	1.0	20	0	89.8	78 - 123	18.13	0.935	20	
tert-Butylbenzene	20.46	1.0	20	0	102	78 - 124	19.35	5.56	20	
Tetrachloroethene	19.07	1.0	20	0	95.4	74 - 129	18.9	0.914	20	
Toluene	18.07	1.0	20	0	90.4	80 - 121	18.38	1.68	20	
trans-1,2-Dichloroethene	17.11	1.0	20	0	85.5	75 - 124	17.28	0.993	20	
trans-1,3-Dichloropropene	17.87	1.0	20	0	89.3	73 - 127	17.81	0.302	20	
Trichloroethene	17.81	1.0	20	0	89.1	79 - 123	18.37	3.1	20	
Trichlorofluoromethane	16.6	1.0	20	0	83.0	65 - 141	16.85	1.52	20	
Vinyl chloride	16.44	1.0	20	0	82.2	58 - 137	17.11	3.99	20	
Surr: 1,2-Dichloroethane-d4	*43.69*	*1.0*	*50*	*0*	*87.4*	*81 - 118*	*43.63*	*0.13*	*20*	
Surr: 4-Bromofluorobenzene	*49.42*	*1.0*	*50*	*0*	*98.8*	*85 - 114*	*50.27*	*1.71*	*20*	
Surr: Dibromofluoromethane	*44.57*	*1.0*	*50*	*0*	*89.1*	*80 - 119*	*45.19*	*1.39*	*20*	
Surr: Toluene-d8	*52.58*	*1.0*	*50*	*0*	*105*	*89 - 112*	*52*	*1.12*	*20*	

ALS Houston, US Date: 15-May-19

Client:	Bhate Environmental Associates, Inc.
Project:	Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder:	HS19050138

QC BATCH REPORT

Batch ID:	**R338430 (0)**	**Instrument:**	**VOA6**	**Method:**	**VOLATILES ORGANICS BY METHOD 8260C**

The following samples were analyzed in this batch: HS19050138-01 HS19050138-02

ALS Houston, US Date: 15-May-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: HS19050138

QC BATCH REPORT

Batch ID: R337814 (0) **Instrument: ICS2100** **Method: ANIONS BY SW9056A**

MBLK Sample ID: **WBLKW2-050219** Units: **mg/L** Analysis Date: **02-May-2019 21:41**
Client ID: Run ID: **ICS2100_337814** SeqNo: **5061734** 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: **WLCSW2-050219** Units: **mg/L** Analysis Date: **02-May-2019 21:55**
Client ID: Run ID: **ICS2100_337814** SeqNo: **5061735** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	20.13	0.500	20	0	101	80 - 120				
Sulfate	20.05	0.500	20	0	100	80 - 120				

LCSD Sample ID: **WLCSDW2-050219** Units: **mg/L** Analysis Date: **02-May-2019 22:10**
Client ID: Run ID: **ICS2100_337814** SeqNo: **5061736** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	19.37	0.500	20	0	96.8	80 - 120	20.13	3.87	20	
Sulfate	19.23	0.500	20	0	96.2	80 - 120	20.05	4.17	20	

MS Sample ID: **HS19041545-10MS** Units: **mg/L** Analysis Date: **03-May-2019 03:32**
Client ID: Run ID: **ICS2100_337814** SeqNo: **5061745** PrepDate: DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	65.95	2.50	50	15.1	102	80 - 120				
Sulfate	133.5	2.50	50	78.44	110	80 - 120				

MS Sample ID: **HS19041537-01MS** Units: **mg/L** Analysis Date: **02-May-2019 23:08**
Client ID: Run ID: **ICS2100_337814** SeqNo: **5061738** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	27.68	0.500	10	16.95	107	80 - 120				
Sulfate	86.19	0.500	10	75.01	112	80 - 120				O

ALS Houston, US Date: 15-May-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: HS19050138

QC BATCH REPORT

Batch ID: R337814 (0) **Instrument: ICS2100** **Method: ANIONS BY SW9056A**

MSD Sample ID: **HS19041545-10MSD** Units: **mg/L** Analysis Date: **03-May-2019 03:47**
Client ID: Run ID: **ICS2100_337814** SeqNo: **5061746** PrepDate: DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	65.05	2.50	50	15.1	99.9	80 - 120	65.95	1.37	20	
Sulfate	129.9	2.50	50	78.44	103	80 - 120	133.5	2.69	20	

MSD Sample ID: **HS19041537-01MSD** Units: **mg/L** Analysis Date: **02-May-2019 23:23**
Client ID: Run ID: **ICS2100_337814** SeqNo: **5061739** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	26.91	0.500	10	16.95	99.6	80 - 120	27.68	2.81	20	
Sulfate	0.5000	0.500	10	75.01	0	80 - 120	86.19	0	20	U

The following samples were analyzed in this batch: HS19050138-01

ALS Houston, US Date: 15-May-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: **HS19050138**

QUALIFIERS, ACRONYMS, UNITS

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

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

Unit Reported	Description
mg/L	Milligrams per Liter

ALS Houston, US Date: 15-May-19

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Dept of Defense	ANAB L2231	20-Dec-2021
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019
North Carolina	624-2019	31-Dec-2019
Maryland	343, 2018-2019	30-Jun-2019
Arkansas	19-028-0	27-Mar-2020
Texas	TX104704231-19-23	30-Apr-2020

ALS Houston, US Date: 15-May-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
Work Order: HS19050138

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19050138-01	LH18/24-SP650_050119	Login	5/2/2019 5:17:11 PM	JRM	WET158
HS19050138-01	LH18/24-SP650_050119	Login	5/2/2019 5:17:11 PM	JRM	VOA216
HS19050138-02	Trip Blank	Login	5/2/2019 5:17:11 PM	JRM	VOA216

00939073

ALS Houston, US Date: 15-May-19

Sample Receipt Checklist

Client Name: Bhate Environmental
Work Order: HS19050138
Date/Time Received: **02-May-2019 12:50**
Received by: **JRM**

Checklist completed by: *Jared R. Makan* eSignature 2-May-2019 Date
Reviewed by: *RJ Modashia* eSignature 2-May-2019 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:N/A
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	1.8c/1.8c UC/C	IR11	
Cooler(s)/Kit(s):	43551		
Date/Time sample(s) sent to storage:	05/02/2019 17:20		
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:

00939074

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_050119	Water	05/01/19 / 14:00		3	3		HCL	
LH18/24-SP650_050119	Water	05/01/19 / 14:00		1		1	NONE	
Trip Blank	Water	05/01/19		2	2		HCL	

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	05/01/19	14:30	J. Mannion	5/2/19	12:30						

9For Lab Use Only

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

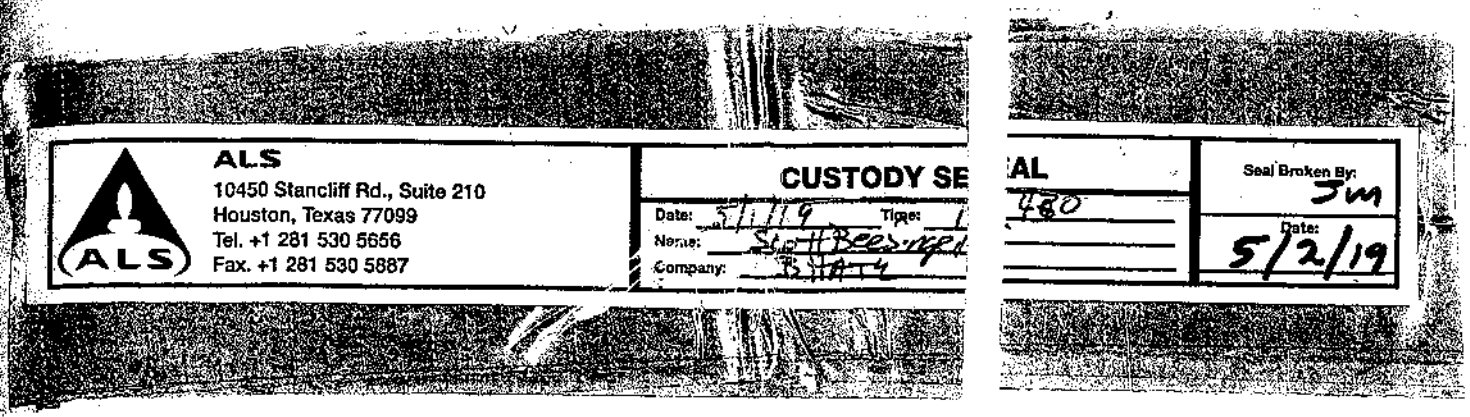
Remarks
Cooler ~~45~~ IR 43551 IR11
Temp 1.8 CF0.0

HS19050138

Bhate Environmental Associates, Inc.
Longhorn GW Treatment Plant Bi-Weekly Samples



00939075



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

CUSTODY SE
Date: 5/1/19 Time:
Name: Scott Beesinger
Company: SHAW

AL
480

Seal Broken By:
JM
Date:
5/2/19

RMA:

FedEx Express

RETURNS MON-SAT
PRIORITY OVERNIGHT
THU - 02 MAY 10:30
PRIORITY OVERNIGH

TRK# 4380 0535 4231

FedEx
TRK# 4380 9535 4231
0221

AB SGRA

77099
TX-US
IAH

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

June 17, 2019

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

Work Order: **HS19051856**

Laboratory Results for: **LH18/24 Longhorn GW Treatment Plant Weekly Samples**

Dear Marcia,

ALS Environmental received 2 sample(s) on May 31, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
RJ Modashia
Project Manager

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
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June 17, 2019

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

Work Order: **HS19051859**

Laboratory Results for: **LHAAP 18/24 GWTP Quaterly Effluent**

Dear Marcia,

ALS Environmental received 3 sample(s) on May 31, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,



Generated By: JUMOKE.LAWAL
RJ Modashia
Project Manager

ALS Houston, US Date: 17-jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Effluent
Work Order: HS19051859

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19051859-01	LH18/24-SP650_052919	Groundwater		29-May-2019 14:00	31-May-2019 08:37	☐
HS19051859-02	LH18/24-SP650_052919_BIX	Groundwater		29-May-2019 14:00	31-May-2019 08:37	☐
HS19051859-03	Trip Blank	Water	C&G-040119-199	29-May-2019 14:00	31-May-2019 08:37	☐

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc. **CASE NARRATIVE**
Project: LHAAP 18/24 GWTP Quaterly Effluent
Work Order:

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: 141538

Sample ID: LCSD-141538

- LCS/LCSD RPD exceeded the laboratory acceptance limit for surrogate Nitrobenzene-d5. The individual recoveries met acceptance criteria.

GCMS Volatiles by Method SW8260

Batch ID: R339874

Sample ID: HS19051779-01MS

- MS and MSD are for an unrelated sample

Metals by Method SW7470

Batch ID: 141540

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

Metals by Method SW6020

Batch ID: 141478

Sample ID: HS19051850-03MS

- MS and MSD are for an unrelated sample

WetChemistry by Method SW9056

Batch ID: R340350

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

WetChemistry by Method E1664A

Batch ID: R340065

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

WetChemistry by Method E410.4

Batch ID: R339595

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

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Effluent
Sample ID: LH18/24-SP650_052919
Collection Date: 29-May-2019 14:00

ANALYTICAL REPORT
WorkOrder:HS19051859
Lab ID:HS19051859-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 19:51
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 19:51
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	04-Jun-2019 19:51
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 19:51
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 19:51
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 19:51
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 19:51
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jun-2019 19:51
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	04-Jun-2019 19:51
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	04-Jun-2019 19:51
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 19:51
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 19:51
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 19:51
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	04-Jun-2019 19:51
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 19:51
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	04-Jun-2019 19:51
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 19:51
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jun-2019 19:51
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 19:51
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jun-2019 19:51
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 19:51
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	04-Jun-2019 19:51
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 19:51
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	04-Jun-2019 19:51
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jun-2019 19:51
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 19:51
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	04-Jun-2019 19:51
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	04-Jun-2019 19:51
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 19:51
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jun-2019 19:51
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 19:51
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 19:51
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jun-2019 19:51
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jun-2019 19:51
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	04-Jun-2019 19:51
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	04-Jun-2019 19:51
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 19:51
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 19:51
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 19:51

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

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Effluent
Sample ID: LH18/24-SP650_052919
Collection Date: 29-May-2019 14:00

ANALYTICAL REPORT
WorkOrder:HS19051859
Lab ID:HS19051859-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 19:51
cis-1,2-Dichloroethene	**2.6**		**0.20**	**0.50**	**1.0**	**UG/L**	1	04-Jun-2019 19:51
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	04-Jun-2019 19:51
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 19:51
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 19:51
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 19:51
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 19:51
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	04-Jun-2019 19:51
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 19:51
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	04-Jun-2019 19:51
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	04-Jun-2019 19:51
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jun-2019 19:51
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 19:51
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 19:51
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 19:51
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 19:51
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 19:51
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 19:51
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 19:51
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 19:51
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 19:51
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 19:51
Trichloroethene	**0.92**	J	**0.20**	**0.50**	**1.0**	**UG/L**	1	04-Jun-2019 19:51
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 19:51
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 19:51
Surr: 1,2-Dichloroethane-d4	*89.7*			**0**	*81-118*	*%REC*	*1*	*04-Jun-2019 19:51*
Surr: 4-Bromofluorobenzene	*104*			**0**	*85-114*	*%REC*	*1*	*04-Jun-2019 19:51*
Surr: Dibromofluoromethane	*94.4*			**0**	*80-119*	*%REC*	*1*	*04-Jun-2019 19:51*
Surr: Toluene-d8	*106*			**0**	*89-112*	*%REC*	*1*	*04-Jun-2019 19:51*
SEMIVOLATILES SIM		**Method:SW8270SIM**				Prep:SW3510 / 03-Jun-2019		Analyst: LG
1,4-Dioxane	**5.1**		**0.20**	**0.20**	**0.20**	**ug/L**	20	05-Jun-2019 10:38
Surr: 2-Fluorobiphenyl	*96.3*			**0**	*40-140*	*%REC*	*20*	*05-Jun-2019 10:38*
Surr: 4-Terphenyl-d14	*75.5*			**0**	*40-140*	*%REC*	*20*	*05-Jun-2019 10:38*
Surr: Nitrobenzene-d5	*71.3*			**0**	*40-140*	*%REC*	*20*	*05-Jun-2019 10:38*

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

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Effluent
Sample ID: LH18/24-SP650_052919
Collection Date: 29-May-2019 14:00

ANALYTICAL REPORT
WorkOrder:HS19051859
Lab ID:HS19051859-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 31-May-2019		Analyst: JHD
Aluminum	**0.0422**		**0.00180**	**0.00500**	**0.0100**	**mg/L**	1	04-Jun-2019 16:32
Antimony	0.000500	U	0.000400	0.000500	0.00200	mg/L	1	04-Jun-2019 16:32
Arsenic	**0.000699**	J	**0.000400**	**0.000500**	**0.00200**	**mg/L**	1	04-Jun-2019 16:32
Barium	**0.114**		**0.00190**	**0.00250**	**0.00400**	**mg/L**	1	04-Jun-2019 16:32
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	04-Jun-2019 16:32
Cadmium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	04-Jun-2019 16:32
Calcium	**8.42**		**0.0340**	**0.0500**	**0.500**	**mg/L**	1	04-Jun-2019 16:32
Chromium	**0.00105**	J	**0.000400**	**0.000500**	**0.00400**	**mg/L**	1	04-Jun-2019 16:32
Cobalt	**0.00105**	J	**0.000200**	**0.000500**	**0.00500**	**mg/L**	1	04-Jun-2019 16:32
Iron	**0.195**	J	**0.0120**	**0.0500**	**0.200**	**mg/L**	1	04-Jun-2019 16:32
Lead	0.00100	U	0.000600	0.00100	0.00200	mg/L	1	04-Jun-2019 16:32
Magnesium	**10.7**		**0.0500**	**0.250**	**1.00**	**mg/L**	5	01-Jun-2019 00:28
Manganese	**0.0833**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	04-Jun-2019 16:32
Nickel	**0.00257**		**0.000600**	**0.00100**	**0.00200**	**mg/L**	1	04-Jun-2019 16:32
Potassium	**1.46**		**0.0180**	**0.0500**	**0.200**	**mg/L**	1	04-Jun-2019 16:32
Selenium	0.00250	U	0.00110	0.00250	0.00200	mg/L	1	04-Jun-2019 16:32
Silver	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	04-Jun-2019 16:32
Sodium	**280**		**0.0700**	**0.250**	**1.00**	**mg/L**	5	01-Jun-2019 00:28
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	04-Jun-2019 16:32
Vanadium	**0.000969**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	04-Jun-2019 16:32
Zinc	**0.0228**		**0.00200**	**0.00200**	**0.00400**	**mg/L**	1	04-Jun-2019 16:32
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 03-Jun-2019		Analyst: FO
Mercury	**0.0000900**	J	**0.0000300**	**0.000100**	**0.000200**	**mg/L**	1	03-Jun-2019 13:55
OIL & GREASE (HEM) BY E1664A		**Method:E1664A**						Analyst: KAH
Oil and Grease	**1.46**	J	**0.610**	**1.00**	**2.00**	**mg/L**	1	07-Jun-2019 14:45
CHEMICAL OXYGEN DEMAND BY E410.4		**Method:E410.4**						Analyst: AJA
Chemical Oxygen Demand	**16.0**		**5.00**	**15.0**	**15.0**	**mg/L**	1	31-May-2019 17:30
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Chloride	**253**		**2.00**	**5.00**	**5.00**	**mg/L**	10	11-Jun-2019 22:28
Sulfate	**33.0**		**2.00**	**5.00**	**5.00**	**mg/L**	10	11-Jun-2019 22:28

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

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Effluent
Sample ID: LH18/24-SP650_052919_BIX
Collection Date: 29-May-2019 14:00

ANALYTICAL REPORT
WorkOrder:HS19051859
Lab ID:HS19051859-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	17-Jun-2019 18:06

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

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Effluent
Sample ID: Trip Blank
Collection Date: 29-May-2019 14:00

ANALYTICAL REPORT
WorkOrder:HS19051859
Lab ID:HS19051859-03
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 17:50
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 17:50
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	04-Jun-2019 17:50
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 17:50
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 17:50
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 17:50
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 17:50
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jun-2019 17:50
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	04-Jun-2019 17:50
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	04-Jun-2019 17:50
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 17:50
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 17:50
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 17:50
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	04-Jun-2019 17:50
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 17:50
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	04-Jun-2019 17:50
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 17:50
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jun-2019 17:50
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 17:50
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jun-2019 17:50
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 17:50
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	04-Jun-2019 17:50
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 17:50
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	04-Jun-2019 17:50
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jun-2019 17:50
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 17:50
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	04-Jun-2019 17:50
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	04-Jun-2019 17:50
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 17:50
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jun-2019 17:50
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 17:50
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 17:50
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jun-2019 17:50
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jun-2019 17:50
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	04-Jun-2019 17:50
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	04-Jun-2019 17:50
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 17:50
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 17:50
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 17:50

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

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Effluent
Sample ID: Trip Blank
Collection Date: 29-May-2019 14:00

ANALYTICAL REPORT
WorkOrder:HS19051859
Lab ID:HS19051859-03
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	04-Jun-2019 17:50
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 17:50
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	04-Jun-2019 17:50
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 17:50
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 17:50
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 17:50
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 17:50
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	04-Jun-2019 17:50
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 17:50
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	04-Jun-2019 17:50
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	04-Jun-2019 17:50
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jun-2019 17:50
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 17:50
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 17:50
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 17:50
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 17:50
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 17:50
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 17:50
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 17:50
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 17:50
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 17:50
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 17:50
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 17:50
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 17:50
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 17:50
Surr: 1,2-Dichloroethane-d4	*91.1*			**0**	*81-118*	*%REC*	*1*	*04-Jun-2019 17:50*
Surr: 4-Bromofluorobenzene	*102*			**0**	*85-114*	*%REC*	*1*	*04-Jun-2019 17:50*
Surr: Dibromofluoromethane	*94.9*			**0**	*80-119*	*%REC*	*1*	*04-Jun-2019 17:50*
Surr: Toluene-d8	*109*			**0**	*89-112*	*%REC*	*1*	*04-Jun-2019 17:50*

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

WEIGHT LOG

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Effluent
WorkOrder: HS19051859

Batch ID: 141478 **Method:** ICP-MS METALS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19051859-01	1	10	10 (mL)	1

Batch ID: 141538 **Method:** SEMIVOLATILES SIM **Prep:** 3510_B_SIM

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19051859-01	1	1000	1 (mL)	0.001

Batch ID: 141540 **Method:** MERCURY BY SW7470A **Prep:** HG_WPR

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19051859-01	1	10 (mL)	10 (mL)	1

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Effluent
WorkOrder: HS19051859

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 141478	**Test Name :** ICP-MS METALS BY SW6020A			**Matrix:** Groundwater		
HS19051859-01	LH18/24-SP650_052919	29 May 2019 14:00		31 May 2019 11:00	04 Jun 2019 16:32	1
HS19051859-01	LH18/24-SP650_052919	29 May 2019 14:00		31 May 2019 11:00	01 Jun 2019 00:28	5
Batch ID 141538	**Test Name :** SEMIVOLATILES SIM			**Matrix:** Groundwater		
HS19051859-01	LH18/24-SP650_052919	29 May 2019 14:00		03 Jun 2019 13:22	05 Jun 2019 10:38	20
Batch ID 141540	**Test Name :** MERCURY BY SW7470A			**Matrix:** Groundwater		
HS19051859-01	LH18/24-SP650_052919	29 May 2019 14:00		03 Jun 2019 10:00	03 Jun 2019 13:55	1
Batch ID R339595	**Test Name :** CHEMICAL OXYGEN DEMAND BY E410.4			**Matrix:** Groundwater		
HS19051859-01	LH18/24-SP650_052919	29 May 2019 14:00			31 May 2019 17:30	1
Batch ID R339874	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C			**Matrix:** Water		
HS19051859-03	Trip Blank	29 May 2019 14:00			04 Jun 2019 17:50	1
Batch ID R339874	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C			**Matrix:** Groundwater		
HS19051859-01	LH18/24-SP650_052919	29 May 2019 14:00			04 Jun 2019 19:51	1
Batch ID R340065	**Test Name :** OIL & GREASE (HEM) BY E1664A			**Matrix:** Groundwater		
HS19051859-01	LH18/24-SP650_052919	29 May 2019 14:00			07 Jun 2019 14:45	1
Batch ID R340350	**Test Name :** ANIONS BY SW9056A			**Matrix:** Groundwater		
HS19051859-01	LH18/24-SP650_052919	29 May 2019 14:00			11 Jun 2019 22:28	10
Batch ID R340666	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			**Matrix:** Groundwater		
HS19051859-02	LH18/24-SP650_052919_BIX	29 May 2019 14:00			17 Jun 2019 18:06	1

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Effluent
WorkOrder: HS19051859

QC BATCH REPORT

Batch ID: 141478 (0) **Instrument: ICPMS06** **Method: ICP-MS METALS BY SW6020A**

MBLK Sample ID: **MBLKF1-141478** Units: **mg/L** Analysis Date: **31-May-2019 23:28**
Client ID: Run ID: **ICPMS06_339538** SeqNo: **5102626** PrepDate: **31-May-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.007575	0.0100								J
Antimony	0.000500	0.00200								U
Arsenic	0.000500	0.00200								U
Barium	0.00315	0.00400								J
Beryllium	0.000500	0.00200								U
Cadmium	0.000500	0.00200								U
Calcium	0.04241	0.500								J
Chromium	0.000500	0.00400								U
Cobalt	0.000500	0.00500								U
Iron	0.0500	0.200								U
Lead	0.00100	0.00200								U
Magnesium	0.01861	0.200								J
Manganese	0.000746	0.00500								J
Nickel	0.00100	0.00200								U
Potassium	0.0500	0.200								U
Selenium	0.00250	0.00200								U
Silver	0.000500	0.00200								U
Sodium	0.1198	0.200								J
Thallium	0.000500	0.00200								U
Vanadium	0.00100	0.00500								U
Zinc	0.02232	0.00400								

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Effluent
WorkOrder: HS19051859

QC BATCH REPORT

Batch ID: 141478 (0) **Instrument: ICPMS06** **Method: ICP-MS METALS BY SW6020A**

MBLK Sample ID: **MBLK-141478** Units: **mg/L** Analysis Date: **31-May-2019 23:26**
Client ID: Run ID: **ICPMS06_339538** SeqNo: **5102625** PrepDate: **31-May-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.003227	0.0100								J
Antimony	0.000500	0.00200								U
Arsenic	0.000500	0.00200								U
Barium	0.00250	0.00400								U
Beryllium	0.000500	0.00200								U
Cadmium	0.000500	0.00200								U
Calcium	0.0500	0.500								U
Chromium	0.000500	0.00400								U
Cobalt	0.000500	0.00500								U
Iron	0.0500	0.200								U
Lead	0.00100	0.00200								U
Magnesium	0.0500	0.200								U
Manganese	0.00100	0.00500								U
Nickel	0.00100	0.00200								U
Potassium	0.0500	0.200								U
Selenium	0.00250	0.00200								U
Silver	0.000500	0.00200								U
Sodium	0.0500	0.200								U
Thallium	0.000500	0.00200								U
Vanadium	0.00100	0.00500								U
Zinc	0.00200	0.00400								U

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Effluent
WorkOrder: HS19051859

QC BATCH REPORT

Batch ID: 141478 (0) **Instrument: ICPMS06** **Method: ICP-MS METALS BY SW6020A**

LCS Sample ID: **LCS-141478** Units: **mg/L** Analysis Date: **31-May-2019 23:30**
Client ID: Run ID: **ICPMS06_339538** SeqNo: **5102627** PrepDate: **31-May-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.09159	0.0100	0.1	0	91.6	80 - 120				
Antimony	0.04956	0.00200	0.05	0	99.1	80 - 120				
Arsenic	0.04876	0.00200	0.05	0	97.5	80 - 120				
Barium	0.04854	0.00400	0.05	0	97.1	80 - 120				
Beryllium	0.04803	0.00200	0.05	0	96.1	80 - 120				
Cadmium	0.04938	0.00200	0.05	0	98.8	80 - 120				
Calcium	4.702	0.500	5	0	94.0	80 - 120				
Chromium	0.04808	0.00400	0.05	0	96.2	80 - 120				
Cobalt	0.04631	0.00500	0.05	0	92.6	80 - 120				
Iron	4.869	0.200	5	0	97.4	80 - 120				
Lead	0.0475	0.00200	0.05	0	95.0	80 - 120				
Magnesium	4.706	0.200	5	0	94.1	80 - 120				
Manganese	0.04804	0.00500	0.05	0	96.1	80 - 120				
Nickel	0.04942	0.00200	0.05	0	98.8	80 - 120				
Potassium	4.811	0.200	5	0	96.2	80 - 120				
Selenium	0.0515	0.00200	0.05	0	103	80 - 120				
Silver	0.0546	0.00200	0.05	0	109	80 - 120				
Sodium	4.751	0.200	5	0	95.0	80 - 120				
Thallium	0.04748	0.00200	0.05	0	95.0	80 - 120				
Vanadium	0.04702	0.00500	0.05	0	94.0	80 - 120				
Zinc	0.05157	0.00400	0.05	0	103	80 - 120				

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Effluent
WorkOrder: HS19051859

QC BATCH REPORT

Batch ID: 141478 (0) **Instrument: ICPMS06** **Method: ICP-MS METALS BY SW6020A**

MS Sample ID: **HS19051850-03MS** Units: **mg/L** Analysis Date: **31-May-2019 23:39**
Client ID: Run ID: **ICPMS06_339538** SeqNo: **5102632** PrepDate: **31-May-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.143	0.0100	0.1	0.03095	112	80 - 120				
Antimony	0.04944	0.00200	0.05	-0.000554	100.0	80 - 120				
Arsenic	0.05055	0.00200	0.05	0.000794	99.5	80 - 120				
Barium	0.44	0.00400	0.05	0.3664	147	80 - 120				SO
Beryllium	0.04816	0.00200	0.05	0.000011	96.3	80 - 120				
Cadmium	0.05034	0.00200	0.05	0.000018	101	80 - 120				
Calcium	80.68	0.500	5	73.3	147	80 - 120				SO
Chromium	0.1352	0.00400	0.05	0.0279	215	80 - 120				S
Cobalt	0.05522	0.00500	0.05	0.006927	96.6	80 - 120				
Iron	5.781	0.200	5	0.6969	102	80 - 120				
Lead	0.05114	0.00200	0.05	0.000147	102	80 - 120				
Magnesium	25.76	0.200	5	20.51	105	80 - 120				O
Manganese	0.1893	0.00500	0.05	0.1059	167	80 - 120				S
Nickel	0.2741	0.00200	0.05	0.206	136	80 - 120				SO
Potassium	5.961	0.200	5	1.107	97.1	80 - 120				
Selenium	0.05099	0.00200	0.05	0.000467	101	80 - 120				
Silver	0.05342	0.00200	0.05	-0.000008	107	80 - 120				
Sodium	59.66	0.200	5	53.73	119	80 - 120				O
Thallium	0.05062	0.00200	0.05	-0.000018	101	80 - 120				
Vanadium	0.05114	0.00500	0.05	0.002713	96.9	80 - 120				
Zinc	0.05361	0.00400	0.05	0.003698	99.8	80 - 120				

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Effluent
WorkOrder: HS19051859

QC BATCH REPORT

Batch ID: 141478 (0) **Instrument: ICPMS06** **Method: ICP-MS METALS BY SW6020A**

MSD Sample ID: **HS19051850-03MSD** Units: **mg/L** Analysis Date: **31-May-2019 23:41**
Client ID: Run ID: **ICPMS06_339538** SeqNo: **5102633** PrepDate: **31-May-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.151	0.0100	0.1	0.03095	120	80 - 120	0.143	5.46	20	S
Antimony	0.05253	0.00200	0.05	-0.000554	106	80 - 120	0.04944	6.06	20	
Arsenic	0.05277	0.00200	0.05	0.000794	104	80 - 120	0.05055	4.3	20	
Barium	0.4384	0.00400	0.05	0.3664	144	80 - 120	0.44	0.368	20	SO
Beryllium	0.04972	0.00200	0.05	0.000011	99.4	80 - 120	0.04816	3.2	20	
Cadmium	0.0514	0.00200	0.05	0.000018	103	80 - 120	0.05034	2.08	20	
Calcium	84.17	0.500	5	73.3	217	80 - 120	80.68	4.24	20	SO
Chromium	0.1197	0.00400	0.05	0.0279	184	80 - 120	0.1352	12.2	20	S
Cobalt	0.05791	0.00500	0.05	0.006927	102	80 - 120	0.05522	4.74	20	
Iron	6.089	0.200	5	0.6969	108	80 - 120	5.781	5.19	20	
Lead	0.05042	0.00200	0.05	0.000147	101	80 - 120	0.05114	1.41	20	
Magnesium	27.04	0.200	5	20.51	131	80 - 120	25.76	4.87	20	SO
Manganese	0.2094	0.00500	0.05	0.1059	207	80 - 120	0.1893	10.1	20	S
Nickel	0.2818	0.00200	0.05	0.206	152	80 - 120	0.2741	2.77	20	SO
Potassium	6.227	0.200	5	1.107	102	80 - 120	5.961	4.35	20	
Selenium	0.05276	0.00200	0.05	0.000467	105	80 - 120	0.05099	3.42	20	
Silver	0.05362	0.00200	0.05	-0.000008	107	80 - 120	0.05342	0.362	20	
Sodium	62.68	0.200	5	53.73	179	80 - 120	59.66	4.93	20	SO
Thallium	0.05011	0.00200	0.05	-0.000018	100	80 - 120	0.05062	1.01	20	
Vanadium	0.05404	0.00500	0.05	0.002713	103	80 - 120	0.05114	5.52	20	
Zinc	0.05674	0.00400	0.05	0.003698	106	80 - 120	0.05361	5.68	20	

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Effluent
WorkOrder: HS19051859

QC BATCH REPORT

Batch ID: 141478 (0) **Instrument: ICPMS06** **Method: ICP-MS METALS BY SW6020A**

PDS Sample ID: **HS19051850-03PDS** Units: **mg/L** Analysis Date: **31-May-2019 23:43**
Client ID: Run ID: **ICPMS06_339538** SeqNo: **5102634** PrepDate: **31-May-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.1521	0.0100	0.1	0.03095	121	75 - 125				
Arsenic	0.1244	0.00200	0.1	0.000794	124	75 - 125				
Cadmium	0.1243	0.00200	0.1	0.000018	124	75 - 125				
Calcium	83.17	0.500	10	73.3	98.6	75 - 125				O
Cobalt	0.1211	0.00500	0.1	0.006927	114	75 - 125				
Iron	12.94	0.200	10	0.6969	122	75 - 125				
Lead	0.1242	0.00200	0.1	0.000147	124	75 - 125				
Magnesium	32.3	0.200	10	20.51	118	75 - 125				
Nickel	0.3242	0.00200	0.1	0.206	118	75 - 125				
Potassium	12.94	0.200	10	1.107	118	75 - 125				
Silver	0.1237	0.00200	0.1	-0.000008	124	75 - 125				
Sodium	64.04	0.200	10	53.73	103	75 - 125				O
Thallium	0.1233	0.00200	0.1	-0.000018	123	75 - 125				
Vanadium	0.122	0.00500	0.1	0.002713	119	75 - 125				
Zinc	0.1272	0.00400	0.1	0.003698	123	75 - 125				

PDS Sample ID: **HS19051850-03PDS** Units: **mg/L** Analysis Date: **03-Jun-2019 12:04**
Client ID: Run ID: **ICPMS04_339653** SeqNo: **5103542** PrepDate: **31-May-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.09062	0.00200	0.1	0	90.6	75 - 125				
Barium	0.4529	0.00400	0.1	0.3664	86.4	75 - 125				
Beryllium	0.09399	0.00200	0.1	0	94.0	75 - 125				
Chromium	0.1265	0.00400	0.1	0.0279	98.6	75 - 125				
Manganese	0.2079	0.00500	0.1	0.1059	102	75 - 125				
Selenium	0.094	0.00200	0.1	0	94.0	75 - 125				

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Effluent
WorkOrder: HS19051859

QC BATCH REPORT

Batch ID: 141478 (0) **Instrument: ICPMS06** **Method: ICP-MS METALS BY SW6020A**

SD Sample ID: **HS19051850-03SD** Units: **mg/L** Analysis Date: **31-May-2019 23:38**
Client ID: Run ID: **ICPMS06_339538** SeqNo: **5102631** PrepDate: **31-May-2019** DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Aluminum	0.02554	0.0500					0.03095	0	10	J
Antimony	0.00250	0.0100					-0.000554	0	10	U
Arsenic	0.00250	0.0100					0.000794	0	10	U
Barium	0.3548	0.0200					0.3664	3.18	10	
Beryllium	0.00250	0.0100					0.000011	0	10	U
Cadmium	0.00250	0.0100					0.000018	0	10	U
Calcium	73.23	2.50					73.3	0.105	10	
Chromium	0.02755	0.0200					0.0279	1.26	10	
Cobalt	0.007246	0.0250					0.006927	0	10	J
Iron	0.6583	1.00					0.6969	0	10	J
Lead	0.00500	0.0100					0.000147	0	10	U
Magnesium	21.55	1.00					20.51	5.06	10	
Manganese	0.1139	0.0250					0.1059	7.61	10	
Nickel	0.2156	0.0100					0.206	4.67	10	
Potassium	1.116	1.00					1.107	0.792	10	
Selenium	0.0125	0.0100					0.000467	0	10	U
Silver	0.00250	0.0100					-0.000008	0	10	U
Sodium	55.55	1.00					53.73	3.38	10	
Thallium	0.00250	0.0100					-0.000018	0	10	U
Vanadium	0.008106	0.0250					0.002713	0	10	J
Zinc	0.0100	0.0200					0.003698	0	10	U

The following samples were analyzed in this batch: HS19051859-01

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Effluent
WorkOrder: HS19051859

QC BATCH REPORT

Batch ID: 141540 (0) **Instrument: HG03** **Method: MERCURY BY SW7470A**

MBLK Sample ID: **MBLK-141540** Units: **mg/L** Analysis Date: **03-Jun-2019 13:52**
Client ID: Run ID: **HG03_339690** SeqNo: **5104033** PrepDate: **03-Jun-2019** 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-141540** Units: **mg/L** Analysis Date: **03-Jun-2019 13:53**
Client ID: Run ID: **HG03_339690** SeqNo: **5104034** PrepDate: **03-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00503	0.000200	0.005	0	101	80 - 120				

MS Sample ID: **HS19051859-01MS** Units: **mg/L** Analysis Date: **03-Jun-2019 13:57**
Client ID: **LH18/24-SP650_052919** Run ID: **HG03_339690** SeqNo: **5104036** PrepDate: **03-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.005	0.000200	0.005	0.00009	98.2	75 - 125				

MSD Sample ID: **HS19051859-01MSD** Units: **mg/L** Analysis Date: **03-Jun-2019 13:58**
Client ID: **LH18/24-SP650_052919** Run ID: **HG03_339690** SeqNo: **5104037** PrepDate: **03-Jun-2019** 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	0.00009	98.6	75 - 125	0.005	0.399	20	

The following samples were analyzed in this batch: HS19051859-01

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Effluent
WorkOrder: HS19051859

QC BATCH REPORT

Batch ID: 141538 (0) **Instrument: SV-5** **Method: SEMIVOLATILES SIM**

MBLK Sample ID: **MBLK-141538** Units: **ug/L** Analysis Date: **05-Jun-2019 09:15**
Client ID: Run ID: **SV-5_339895** SeqNo: **5108847** PrepDate: **03-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.010	0.010								U
Surr: 2-Fluorobiphenyl	*0.07056*	*0*	*0.08*	*0*	*88.2*	*40 - 140*				
Surr: 4-Terphenyl-d14	*0.06728*	*0*	*0.08*	*0*	*84.1*	*40 - 140*				
Surr: Nitrobenzene-d5	*0.07988*	*0*	*0.08*	*0*	*99.9*	*40 - 140*				

LCS Sample ID: **LCS-141538** Units: **ug/L** Analysis Date: **05-Jun-2019 08:33**
Client ID: Run ID: **SV-5_339895** SeqNo: **5108833** PrepDate: **03-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.0845	0.010	0.08	0	106	40 - 140				
Surr: 2-Fluorobiphenyl	*0.08883*	*0*	*0.08*	*0*	*111*	*40 - 140*				
Surr: 4-Terphenyl-d14	*0.06752*	*0*	*0.08*	*0*	*84.4*	*40 - 140*				
Surr: Nitrobenzene-d5	*0.06431*	*0*	*0.08*	*0*	*80.4*	*40 - 140*				

LCSD Sample ID: **LCSD-141538** Units: **ug/L** Analysis Date: **05-Jun-2019 08:54**
Client ID: Run ID: **SV-5_339895** SeqNo: **5108846** PrepDate: **03-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.08994	0.010	0.08	0	112	40 - 140	0.0845	6.24	20	
Surr: 2-Fluorobiphenyl	*0.0828*	*0*	*0.08*	*0*	*104*	*40 - 140*	*0.08883*	*7.03*	*20*	
Surr: 4-Terphenyl-d14	*0.0602*	*0*	*0.08*	*0*	*75.2*	*40 - 140*	*0.06752*	*11.5*	*20*	
Surr: Nitrobenzene-d5	*0.08236*	*0*	*0.08*	*0*	*103*	*40 - 140*	*0.06431*	*24.6*	*20*	R

The following samples were analyzed in this batch: HS19051859-01

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Effluent
WorkOrder: HS19051859

QC BATCH REPORT

Batch ID: R339874 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-190604** Units: **UG/L** Analysis Date: **04-Jun-2019 17:26**
Client ID: Run ID: **VOA6_339874** SeqNo: **5108298** 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: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Effluent
WorkOrder: HS19051859

QC BATCH REPORT

Batch ID: R339874 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-190604** Units: **UG/L** Analysis Date: **04-Jun-2019 17:26**
Client ID: Run ID: **VOA6_339874** SeqNo: **5108298** 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	*44.91*	*1.0*	*50*	*0*	*89.8*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*49.35*	*1.0*	*50*	*0*	*98.7*	*85 - 114*				
Surr: Dibromofluoromethane	*46.74*	*1.0*	*50*	*0*	*93.5*	*80 - 119*				
Surr: Toluene-d8	*53.5*	*1.0*	*50*	*0*	*107*	*89 - 112*				

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Effluent
WorkOrder: HS19051859

QC BATCH REPORT

Batch ID: R339874 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-190604** Units: **UG/L** Analysis Date: **04-Jun-2019 16:38**
Client ID: Run ID: **VOA6_339874** SeqNo: **5108297** 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	19.65	1.0	20	0	98.2	78 - 124			
1,1,1-Trichloroethane	19.34	1.0	20	0	96.7	74 - 131			
1,1,2,2-Tetrachloroethane	20.2	1.0	20	0	101	71 - 121			
1,1,2-Trichloroethane	20.99	1.0	20	0	105	80 - 119			
1,1-Dichloroethane	19.06	1.0	20	0	95.3	77 - 125			
1,1-Dichloroethene	18.87	1.0	20	0	94.4	71 - 131			
1,1-Dichloropropene	18.09	1.0	20	0	90.4	78 - 125			
1,2,3-Trichlorobenzene	24.79	1.0	20	0	124	69 - 129			
1,2,3-Trichloropropane	19.34	1.0	20	0	96.7	73 - 122			
1,2,4-Trichlorobenzene	23.55	1.0	20	0	118	69 - 130			
1,2,4-Trimethylbenzene	18.31	1.0	20	0	91.6	76 - 124			
1,2-Dibromo-3-chloropropane	20.72	1.0	20	0	104	62 - 128			
1,2-Dibromoethane	20.66	1.0	20	0	103	77 - 121			
1,2-Dichlorobenzene	19.72	1.0	20	0	98.6	80 - 119			
1,2-Dichloroethane	19.85	1.0	20	0	99.2	73 - 128			
1,2-Dichloropropane	20.15	1.0	20	0	101	78 - 122			
1,3,5-Trimethylbenzene	17.9	1.0	20	0	89.5	75 - 124			
1,3-Dichlorobenzene	18.94	1.0	20	0	94.7	80 - 119			
1,3-Dichloropropane	20.87	1.0	20	0	104	80 - 119			
1,4-Dichlorobenzene	18.66	1.0	20	0	93.3	79 - 118			
2,2-Dichloropropane	19.73	1.0	20	0	98.7	60 - 139			
2-Butanone	47.14	2.0	40	0	118	56 - 143			
2-Chlorotoluene	17.89	1.0	20	0	89.5	79 - 122			
2-Hexanone	44.83	2.0	40	0	112	57 - 139			
4-Chlorotoluene	18.29	1.0	20	0	91.4	78 - 122			
4-Isopropyltoluene	17.3	1.0	20	0	86.5	77 - 127			
4-Methyl-2-pentanone	41.57	2.0	40	0	104	67 - 130			
Acetone	49.02	2.0	40	0	123	39 - 160			
Benzene	19.02	1.0	20	0	95.1	79 - 120			
Bromobenzene	19.17	1.0	20	0	95.9	80 - 120			
Bromochloromethane	20.93	1.0	20	0	105	78 - 123			
Bromodichloromethane	19.64	1.0	20	0	98.2	79 - 125			
Bromoform	20.82	1.0	20	0	104	66 - 130			
Bromomethane	23.09	1.0	20	0	115	53 - 141			

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Effluent
WorkOrder: HS19051859

QC BATCH REPORT

Batch ID: R339874 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-190604** Units: **UG/L** Analysis Date: **04-Jun-2019 16:38**
Client ID: Run ID: **VOA6_339874** SeqNo: **5108297** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Carbon disulfide	38.69	2.0	40	0	96.7	64 - 133				
Carbon tetrachloride	17.69	1.0	20	0	88.5	72 - 136				
Chlorobenzene	19.45	1.0	20	0	97.3	82 - 118				
Chloroethane	19.14	1.0	20	0	95.7	60 - 138				
Chloroform	20.04	1.0	20	0	100	79 - 124				
Chloromethane	15.66	1.0	20	0	78.3	50 - 139				
cis-1,2-Dichloroethene	19.81	1.0	20	0	99.1	78 - 123				
cis-1,3-Dichloropropene	20.05	1.0	20	0	100	75 - 124				
Dibromochloromethane	20.63	1.0	20	0	103	74 - 126				
Dibromomethane	20.31	1.0	20	0	102	79 - 123				
Dichlorodifluoromethane	18.37	1.0	20	0	91.8	32 - 152				
Ethylbenzene	18.95	1.0	20	0	94.8	79 - 121				
Hexachlorobutadiene	22.08	1.0	20	0	110	66 - 134				
Isopropylbenzene	17.97	1.0	20	0	89.9	72 - 131				
m,p-Xylene	37.67	2.0	40	0	94.2	80 - 121				
Methylene chloride	20.5	2.0	20	0	102	74 - 124				
Naphthalene	24.54	1.0	20	0	123	61 - 128				
n-Butylbenzene	17.48	1.0	20	0	87.4	75 - 128				
n-Propylbenzene	17.36	1.0	20	0	86.8	76 - 126				
o-Xylene	19.08	1.0	20	0	95.4	78 - 122				
sec-Butylbenzene	16.66	1.0	20	0	83.3	77 - 126				
Styrene	19.95	1.0	20	0	99.7	78 - 123				
tert-Butylbenzene	17.22	1.0	20	0	86.1	78 - 124				
Tetrachloroethene	18.71	1.0	20	0	93.5	74 - 129				
Toluene	19.64	1.0	20	0	98.2	80 - 121				
trans-1,2-Dichloroethene	19.19	1.0	20	0	96.0	75 - 124				
trans-1,3-Dichloropropene	20.51	1.0	20	0	103	73 - 127				
Trichloroethene	19.2	1.0	20	0	96.0	79 - 123				
Trichlorofluoromethane	18.09	1.0	20	0	90.5	65 - 141				
Vinyl chloride	18.75	1.0	20	0	93.8	58 - 137				
Surr: 1,2-Dichloroethane-d4	*53.33*	*1.0*	*50*	*0*	*107*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*52.97*	*1.0*	*50*	*0*	*106*	*85 - 114*				
Surr: Dibromofluoromethane	*53.7*	*1.0*	*50*	*0*	*107*	*80 - 119*				
Surr: Toluene-d8	*50.12*	*1.0*	*50*	*0*	*100*	*89 - 112*				

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Effluent
WorkOrder: HS19051859

QC BATCH REPORT

Batch ID: R339874 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS19051779-01MS** Units: **UG/L** Analysis Date: **04-Jun-2019 21:05**
Client ID: Run ID: **VOA6_339874** SeqNo: **5108306** PrepDate: DF: **20**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	379.7	20	400	0	94.9	78 - 124				
1,1,1-Trichloroethane	352	20	400	0	88.0	74 - 131				
1,1,2,2-Tetrachloroethane	366.7	20	400	0	91.7	71 - 121				
1,1,2-Trichloroethane	380.6	20	400	0	95.2	80 - 119				
1,1-Dichloroethane	341.8	20	400	0	85.4	77 - 125				
1,1-Dichloroethene	356.6	20	400	0	89.2	71 - 131				
1,1-Dichloropropene	358.1	20	400	0	89.5	78 - 125				
1,2,3-Trichlorobenzene	347.8	20	400	0	86.9	69 - 129				
1,2,3-Trichloropropane	349.4	20	400	0	87.4	73 - 122				
1,2,4-Trichlorobenzene	373.2	20	400	0	93.3	69 - 130				
1,2,4-Trimethylbenzene	389.8	20	400	0	97.5	76 - 124				
1,2-Dibromo-3-chloropropane	336.5	20	400	0	84.1	62 - 128				
1,2-Dibromoethane	368.3	20	400	0	92.1	77 - 121				
1,2-Dichlorobenzene	382.4	20	400	0	95.6	80 - 119				
1,2-Dichloroethane	354.8	20	400	0	88.7	73 - 128				
1,2-Dichloropropane	375.8	20	400	0	94.0	78 - 122				
1,3,5-Trimethylbenzene	401.3	20	400	0	100	75 - 124				
1,3-Dichlorobenzene	384	20	400	0	96.0	80 - 119				
1,3-Dichloropropane	382.9	20	400	0	95.7	80 - 119				
1,4-Dichlorobenzene	373.9	20	400	0	93.5	79 - 118				
2,2-Dichloropropane	324.6	20	400	0	81.1	60 - 139				
2-Butanone	413.2	40	800	0	51.7	56 - 143				S
2-Chlorotoluene	378.8	20	400	0	94.7	79 - 122				
2-Hexanone	492.1	40	800	0	61.5	57 - 139				
4-Chlorotoluene	380.5	20	400	0	95.1	78 - 122				
4-Isopropyltoluene	397.3	20	400	0	99.3	77 - 127				
4-Methyl-2-pentanone	457.2	40	800	0	57.1	67 - 130				S
Acetone	465.2	40	800	0	58.2	39 - 160				
Benzene	361.9	20	400	0	90.5	79 - 120				
Bromobenzene	387.6	20	400	0	96.9	80 - 120				
Bromochloromethane	345.5	20	400	0	86.4	78 - 123				
Bromodichloromethane	354.6	20	400	0	88.7	79 - 125				
Bromoform	362.7	20	400	0	90.7	66 - 130				
Bromomethane	290.5	20	400	0	72.6	53 - 141				

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Effluent
WorkOrder: HS19051859

QC BATCH REPORT

Batch ID: R339874 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MS Sample ID: **HS19051779-01MS** Units: **UG/L** Analysis Date: **04-Jun-2019 21:05**
Client ID: Run ID: **VOA6_339874** SeqNo: **5108306** PrepDate: DF: **20**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	549.2	40	800	0	68.6	64 - 133				
Carbon tetrachloride	364.1	20	400	0	91.0	72 - 136				
Chlorobenzene	376.7	20	400	0	94.2	82 - 118				
Chloroethane	332.8	20	400	0	83.2	60 - 138				
Chloroform	346.2	20	400	0	86.6	79 - 124				
Chloromethane	358	20	400	0	89.5	50 - 139				
cis-1,2-Dichloroethene	345.9	20	400	0	86.5	78 - 123				
cis-1,3-Dichloropropene	355	20	400	0	88.7	75 - 124				
Dibromochloromethane	377.7	20	400	0	94.4	74 - 126				
Dibromomethane	351.1	20	400	0	87.8	79 - 123				
Dichlorodifluoromethane	349.2	20	400	0	87.3	32 - 152				
Ethylbenzene	381.7	20	400	0	95.4	79 - 121				
Hexachlorobutadiene	413.2	20	400	0	103	66 - 134				
Isopropylbenzene	394.8	20	400	0	98.7	72 - 131				
m,p-Xylene	749.4	40	800	0	93.7	80 - 121				
Methylene chloride	414.4	40	400	0	104	74 - 124				
Naphthalene	328.1	20	400	0	82.0	61 - 128				
n-Butylbenzene	392.4	20	400	0	98.1	75 - 128				
n-Propylbenzene	390.4	20	400	0	97.6	76 - 126				
o-Xylene	376.8	20	400	0	94.2	78 - 122				
sec-Butylbenzene	395.7	20	400	0	98.9	77 - 126				
Styrene	377.9	20	400	0	94.5	78 - 123				
tert-Butylbenzene	398.9	20	400	0	99.7	78 - 124				
Tetrachloroethene	407.5	20	400	0	102	74 - 129				
Toluene	393.5	20	400	0	98.4	80 - 121				
trans-1,2-Dichloroethene	346.7	20	400	0	86.7	75 - 124				
trans-1,3-Dichloropropene	347.8	20	400	0	87.0	73 - 127				
Trichloroethene	367.7	20	400	0	91.9	79 - 123				
Trichlorofluoromethane	355.1	20	400	0	88.8	65 - 141				
Vinyl chloride	398.1	20	400	0	99.5	58 - 137				
Surr: 1,2-Dichloroethane-d4	*887.4*	*20*	*1000*	*0*	*88.7*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*1056*	*20*	*1000*	*0*	*106*	*85 - 114*				
Surr: Dibromofluoromethane	*955.1*	*20*	*1000*	*0*	*95.5*	*80 - 119*				
Surr: Toluene-d8	*1063*	*20*	*1000*	*0*	*106*	*89 - 112*				

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Effluent
WorkOrder: HS19051859

QC BATCH REPORT

Batch ID: R339874 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MSD Sample ID: **HS19051779-01MSD** Units: **UG/L** Analysis Date: **04-Jun-2019 21:29**
Client ID: Run ID: **VOA6_339874** SeqNo: **5108307** PrepDate: DF: **20**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	367.2	20	400	0	91.8	78 - 124	379.7	3.34	20	
1,1,1-Trichloroethane	332.3	20	400	0	83.1	74 - 131	352	5.78	20	
1,1,2,2-Tetrachloroethane	360.3	20	400	0	90.1	71 - 121	366.7	1.76	20	
1,1,2-Trichloroethane	369.5	20	400	0	92.4	80 - 119	380.6	2.96	20	
1,1-Dichloroethane	325.1	20	400	0	81.3	77 - 125	341.8	5	20	
1,1-Dichloroethene	329.1	20	400	0	82.3	71 - 131	356.6	8.03	20	
1,1-Dichloropropene	337.5	20	400	0	84.4	78 - 125	358.1	5.92	20	
1,2,3-Trichlorobenzene	331.8	20	400	0	83.0	69 - 129	347.8	4.69	20	
1,2,3-Trichloropropane	343.3	20	400	0	85.8	73 - 122	349.4	1.76	20	
1,2,4-Trichlorobenzene	357.2	20	400	0	89.3	69 - 130	373.2	4.39	20	
1,2,4-Trimethylbenzene	377.3	20	400	0	94.3	76 - 124	389.8	3.28	20	
1,2-Dibromo-3-chloropropane	318.8	20	400	0	79.7	62 - 128	336.5	5.41	20	
1,2-Dibromoethane	362.9	20	400	0	90.7	77 - 121	368.3	1.47	20	
1,2-Dichlorobenzene	372.2	20	400	0	93.0	80 - 119	382.4	2.71	20	
1,2-Dichloroethane	338.6	20	400	0	84.6	73 - 128	354.8	4.68	20	
1,2-Dichloropropane	361	20	400	0	90.2	78 - 122	375.8	4.03	20	
1,3,5-Trimethylbenzene	383.3	20	400	0	95.8	75 - 124	401.3	4.61	20	
1,3-Dichlorobenzene	375	20	400	0	93.7	80 - 119	384	2.38	20	
1,3-Dichloropropane	377.7	20	400	0	94.4	80 - 119	382.9	1.36	20	
1,4-Dichlorobenzene	364	20	400	0	91.0	79 - 118	373.9	2.69	20	
2,2-Dichloropropane	300.4	20	400	0	75.1	60 - 139	324.6	7.75	20	
2-Butanone	406.9	40	800	0	50.9	56 - 143	413.2	1.53	20	S
2-Chlorotoluene	361.9	20	400	0	90.5	79 - 122	378.8	4.55	20	
2-Hexanone	486.1	40	800	0	60.8	57 - 139	492.1	1.24	20	
4-Chlorotoluene	368.9	20	400	0	92.2	78 - 122	380.5	3.1	20	
4-Isopropyltoluene	386.4	20	400	0	96.6	77 - 127	397.3	2.78	20	
4-Methyl-2-pentanone	457.6	40	800	0	57.2	67 - 130	457.2	0.0924	20	S
Acetone	450.9	40	800	0	56.4	39 - 160	465.2	3.12	20	
Benzene	344.2	20	400	0	86.0	79 - 120	361.9	5.03	20	
Bromobenzene	376.4	20	400	0	94.1	80 - 120	387.6	2.91	20	
Bromochloromethane	322.4	20	400	0	80.6	78 - 123	345.5	6.9	20	
Bromodichloromethane	345	20	400	0	86.2	79 - 125	354.6	2.76	20	
Bromoform	361.1	20	400	0	90.3	66 - 130	362.7	0.454	20	
Bromomethane	292.3	20	400	0	73.1	53 - 141	290.5	0.628	20	

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Effluent
WorkOrder: HS19051859

QC BATCH REPORT

Batch ID: R339874 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MSD Sample ID: **HS19051779-01MSD** Units: **UG/L** Analysis Date: **04-Jun-2019 21:29**
Client ID: Run ID: **VOA6_339874** SeqNo: **5108307** PrepDate: DF: **20**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Carbon disulfide	437.5	40	800	0	54.7	64 - 133	549.2	22.6	20	SR
Carbon tetrachloride	345.2	20	400	0	86.3	72 - 136	364.1	5.33	20	
Chlorobenzene	359.3	20	400	0	89.8	82 - 118	376.7	4.73	20	
Chloroethane	298.2	20	400	0	74.5	60 - 138	332.8	11	20	
Chloroform	327.7	20	400	0	81.9	79 - 124	346.2	5.49	20	
Chloromethane	257.4	20	400	0	64.3	50 - 139	358	32.7	20	R
cis-1,2-Dichloroethene	330	20	400	0	82.5	78 - 123	345.9	4.71	20	
cis-1,3-Dichloropropene	340	20	400	0	85.0	75 - 124	355	4.3	20	
Dibromochloromethane	364.1	20	400	0	91.0	74 - 126	377.7	3.67	20	
Dibromomethane	343.3	20	400	0	85.8	79 - 123	351.1	2.23	20	
Dichlorodifluoromethane	290.4	20	400	0	72.6	32 - 152	349.2	18.4	20	
Ethylbenzene	367.9	20	400	0	92.0	79 - 121	381.7	3.7	20	
Hexachlorobutadiene	395.8	20	400	0	99.0	66 - 134	413.2	4.29	20	
Isopropylbenzene	382.6	20	400	0	95.6	72 - 131	394.8	3.14	20	
m,p-Xylene	717.3	40	800	0	89.7	80 - 121	749.4	4.39	20	
Methylene chloride	347.1	40	400	0	86.8	74 - 124	414.4	17.7	20	
Naphthalene	318.6	20	400	0	79.7	61 - 128	328.1	2.93	20	
n-Butylbenzene	379.9	20	400	0	95.0	75 - 128	392.4	3.24	20	
n-Propylbenzene	376.1	20	400	0	94.0	76 - 126	390.4	3.73	20	
o-Xylene	360.5	20	400	0	90.1	78 - 122	376.8	4.44	20	
sec-Butylbenzene	383.6	20	400	0	95.9	77 - 126	395.7	3.12	20	
Styrene	362.3	20	400	0	90.6	78 - 123	377.9	4.22	20	
tert-Butylbenzene	388.5	20	400	0	97.1	78 - 124	398.9	2.65	20	
Tetrachloroethene	385.4	20	400	0	96.4	74 - 129	407.5	5.57	20	
Toluene	373.9	20	400	0	93.5	80 - 121	393.5	5.13	20	
trans-1,2-Dichloroethene	326.7	20	400	0	81.7	75 - 124	346.7	5.92	20	
trans-1,3-Dichloropropene	332	20	400	0	83.0	73 - 127	347.8	4.67	20	
Trichloroethene	350	20	400	0	87.5	79 - 123	367.7	4.94	20	
Trichlorofluoromethane	333	20	400	0	83.2	65 - 141	355.1	6.44	20	
Vinyl chloride	325.9	20	400	0	81.5	58 - 137	398.1	20	20	
Surr: 1,2-Dichloroethane-d4	*879.9*	*20*	*1000*	*0*	*88.0*	*81 - 118*	*887.4*	*0.843*	*20*	
Surr: 4-Bromofluorobenzene	*1059*	*20*	*1000*	*0*	*106*	*85 - 114*	*1056*	*0.269*	*20*	
Surr: Dibromofluoromethane	*947.2*	*20*	*1000*	*0*	*94.7*	*80 - 119*	*955.1*	*0.821*	*20*	
Surr: Toluene-d8	*1055*	*20*	*1000*	*0*	*105*	*89 - 112*	*1063*	*0.745*	*20*	

ALS Houston, US Date: 17-Jun-19

Client:	Bhate Environmental Associates, Inc.
Project:	LHAAP 18/24 GWTP Quaterly Effluent
WorkOrder:	HS19051859

QC BATCH REPORT

Batch ID:	**R339874 (0)**	**Instrument:**	**VOA6**	**Method:**	**VOLATILES ORGANICS BY METHOD 8260C**

The following samples were analyzed in this batch: HS19051859-01 HS19051859-03

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Effluent
WorkOrder: HS19051859

QC BATCH REPORT

Batch ID: R339595 (0) **Instrument: WetChem_HS** **Method: CHEMICAL OXYGEN DEMAND BY E410.4**

MBLK Sample ID: **MBLK-R339595** Units: **mg/L** Analysis Date: **31-May-2019 17:30**
Client ID: Run ID: **WetChem_HS_339595** SeqNo: **5101809** 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-R339595** Units: **mg/L** Analysis Date: **31-May-2019 17:30**
Client ID: Run ID: **WetChem_HS_339595** SeqNo: **5101808** 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				

MS Sample ID: **HS19051880-02MS** Units: **mg/L** Analysis Date: **31-May-2019 17:30**
Client ID: Run ID: **WetChem_HS_339595** SeqNo: **5101810** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chemical Oxygen Demand	88	15.0	50	34	108	80 - 120				

DUP Sample ID: **HS19051880-02DUP** Units: **mg/L** Analysis Date: **31-May-2019 17:30**
Client ID: Run ID: **WetChem_HS_339595** SeqNo: **5101811** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chemical Oxygen Demand	32	15.0					34	6.06	20	

The following samples were analyzed in this batch: HS19051859-01

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Effluent
WorkOrder: HS19051859

QC BATCH REPORT

Batch ID: R340065 (0) **Instrument: Balance1** **Method: OIL & GREASE (HEM) BY E1664A**

MBLK Sample ID: **WBLKW-060719** Units: **mg/L** Analysis Date: **07-Jun-2019 14:45**
Client ID: Run ID: **Balance1_340065** SeqNo: **5112440** 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-060719** Units: **mg/L** Analysis Date: **07-Jun-2019 14:45**
Client ID: Run ID: **Balance1_340065** SeqNo: **5112442** 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-060719** Units: **mg/L** Analysis Date: **07-Jun-2019 14:45**
Client ID: Run ID: **Balance1_340065** SeqNo: **5112441** 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	2.00	40	0	95.0	78 - 114	38.4	1.05	18	

MS Sample ID: **HS19060196-01MS** Units: **mg/L** Analysis Date: **07-Jun-2019 14:45**
Client ID: Run ID: **Balance1_340065** SeqNo: **5112436** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Oil and Grease	40.83	2.00	40	1.667	97.9	78 - 114				

The following samples were analyzed in this batch: HS19051859-01

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Effluent
WorkOrder: HS19051859

QC BATCH REPORT

Batch ID: R340350 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY SW9056A**

MBLK Sample ID: **WBLKW1-061119** Units: **mg/L** Analysis Date: **11-Jun-2019 13:36**
Client ID: Run ID: **ICS-Integrion_340350** SeqNo: **5118828** 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: **WLCSW1-061119** Units: **mg/L** Analysis Date: **11-Jun-2019 13:54**
Client ID: Run ID: **ICS-Integrion_340350** SeqNo: **5118829** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	19.46	0.500	20	0	97.3	80 - 120				
Sulfate	19.67	0.500	20	0	98.4	80 - 120				

LCSD Sample ID: **WLCSDW1-061119** Units: **mg/L** Analysis Date: **11-Jun-2019 14:12**
Client ID: Run ID: **ICS-Integrion_340350** SeqNo: **5118830** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	19.46	0.500	20	0	97.3	80 - 120	19.46	0.0308	20	
Sulfate	19.63	0.500	20	0	98.2	80 - 120	19.67	0.189	20	

MS Sample ID: **HS19060226-01MS** Units: **mg/L** Analysis Date: **11-Jun-2019 16:35**
Client ID: Run ID: **ICS-Integrion_340350** SeqNo: **5118835** PrepDate: DF: **50**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	490.6	25.0	500	13.25	95.5	80 - 120				
Sulfate	1634	25.0	500	1163	94.1	80 - 120				

MS Sample ID: **HS19060224-03MS** Units: **mg/L** Analysis Date: **11-Jun-2019 15:43**
Client ID: Run ID: **ICS-Integrion_340350** SeqNo: **5118832** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	108.2	5.00	100	12.57	95.6	80 - 120				
Sulfate	337.8	5.00	100	245	92.8	80 - 120				

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Effluent
WorkOrder: HS19051859

QC BATCH REPORT

Batch ID: R340350 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY SW9056A**

MSD Sample ID: **HS19060226-01MSD** Units: **mg/L** Analysis Date: **11-Jun-2019 17:28**
Client ID: Run ID: **ICS-Integrion_340350** SeqNo: **5118838** PrepDate: DF: **50**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	489.3	25.0	500	13.25	95.2	80 - 120	490.6	0.255	20	
Sulfate	1631	25.0	500	1163	93.7	80 - 120	1634	0.13	20	

MSD Sample ID: **HS19060224-03MSD** Units: **mg/L** Analysis Date: **11-Jun-2019 16:00**
Client ID: Run ID: **ICS-Integrion_340350** SeqNo: **5118833** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	108.4	5.00	100	12.57	95.8	80 - 120	108.2	0.157	20	
Sulfate	338.1	5.00	100	245	93.1	80 - 120	337.8	0.0846	20	

The following samples were analyzed in this batch: HS19051859-01

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Effluent
WorkOrder: **HS19051859**

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
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Dept of Defense	ANAB L2231	20-Dec-2021
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019
North Carolina	624-2019	31-Dec-2019
Maryland	343, 2018-2019	30-Jun-2019
Arkansas	19-028-0	27-Mar-2020
Texas	TX104704231-19-23	30-Apr-2020

ALS Houston, US Date: 17-jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Effluent
Work Order: HS19051859

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19051859-01	LH18/24-SP650_052919	Login	31/05/2019 11:30:39	PMG	Disposed
HS19051859-01	LH18/24-SP650_052919	Login	31/05/2019 11:30:39	PMG	Disposed
HS19051859-01	LH18/24-SP650_052919	Login	31/05/2019 11:30:39	PMG	Disposed
HS19051859-01	LH18/24-SP650_052919	Login	31/05/2019 11:30:39	PMG	Disposed
HS19051859-01	LH18/24-SP650_052919	Login	31/05/2019 11:30:39	PMG	Disposed
HS19051859-01	LH18/24-SP650_052919	Login	31/05/2019 11:30:39	PMG	Disposed
HS19051859-02	LH18/24-SP650_052919_BIX	Login	31/05/2019 11:30:39	PMG	Sub
HS19051859-03	Trip Blank	Login	31/05/2019 11:30:39	PMG	Disposed

ALS Houston, US Date: 17-Jun-19

Sample Receipt Checklist

Client Name: Bhate Environmental
Work Order: HS19051859
Date/Time Received: **31-May-2019 08:37**
Received by: **JRM**

Checklist completed by: *Paresh M. Giga* eSignature 31-May-2019 Date
Reviewed by: *RJ Modashia* eSignature 31-May-2019 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):	2.3c U/c	IR11	
Cooler(s)/Kit(s):	44407		
Date/Time sample(s) sent to storage:	5/31/19 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 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_052919	Water	05/29/19 / 14:00		4	3		1								HCL	
LH18/24-SP650_052919	Water	05/29/19 / 14:00		1		1									HNO3	
LH18/24-SP650_052919	Water	05/29/19 / 14:00		2					1	1					NONE	
LH18/24-SP650_052919	Water	05/29/19 / 14:00		1				1							H2SO4	
LH18/24-SP650_052919_BIX	Water	05/29/19 / 14:00		1							1				NONE	
Trip Blank	Water	05/29/19		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	05/29/19	14:30									

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date
J. Mercury	5/31/19	08:37			

Remarks: Cooler 44407
Temp 2.3
Intl CF 0.0

HS19051859

Bhate Environmental Associates, Inc.
LHAAP 18/24 GWTP Quaterly Effluent

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

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

44407

CUSTODY SEAL

Date: 5/29/19 Time: 1500
Name: Scott Beesinger
Company: BHATE

Seal Broken By:
Date: 05/31/19

44407 MAY 31 2019

Must Deliver Next Business Day
Time and Tempature Sensitive!

44407

917 B03 1 10:30 A 8290 05.31

ORIGIN ID: 930-6193
SCOTT BEESI
BHATE ENVIRO ASSOCIATES
1203-B EAST GR AVE. PMB202

MARSHALL, TX 75670
UNITED STATES US

SHIP DATE: 21SEP18
ACTWGT: 1.00 LB MAN
CAD: 3001307CAFE3211

TO CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099
(281) 530-5656
REF: LHAAP 58 - RJ

RMA:

FedEx Express

RETURNS MON-SAT
PRIORITY OVERNIGHT

TRK# 0221 4380 9532 8290

77099

FedEx TRK# 0221 4380 9532 8290
FRI - 31 MAY 10:30A
PRIORITY OVERNIGHT

77099
TX-US
IAH

AB SGRA

Case Narrative

Method: 6850
Analysis: Perchlorate
Analysis SOP: LC-MS-CLO4
ALS WO ID(s): 1915802, 1915803, 1915852, 1916229; 1916231; 1916232

Client: ALS Laboratories (Houston, TX)
Matrix: Water
ELMS Batch (HBN): 2261 (241120)

General Set Information: There were six 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 samples 1915852001 and 1916229001 were analyzed and reported from 1:1,000 dilutions. The reporting limits have been adjusted accordingly.

Method QC data: The method blank (LMB 657797) was less than 1/2 the CRDL. The recovery for the LCS (657798) was within acceptable parameters.

MS/MSD Analysis: MS/MSD was performed on sample 1915802001 (Client ID: LH18/24-SP650_052919_BIX). 4.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. The spike target was 4.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 – 657795) is reported from the analysis of the Laboratory Control Sample (LCS – 657798) at a level of 4.0µg/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: 19MARI03).

Thomas Bosch June 12, 2019
Analyst Date

ANALYTICAL REPORT

Report Date: June 13, 2019

RJ Modashia
ALS Environmental (Houston)
10450 Stancliff Road
Suite 210
Houston, TX 77099

Phone: 281 530-5656

E-mail: RJ.Modashia@ALSGlobal.com

Workorder: **34-1915803**
Project ID: HS19051859
Purchase Order: HS19051859
Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
LH18/24-SP650_052919_BIX	1915803001	05/29/19	06/01/19	

ANALYTICAL REPORT

Workorder: 34-1915803
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID:	**LH18/24-SP650_052919_BIX**	Sampling Site:	NA	Collected:	05/29/2019
Lab ID:	1915803001	Media:	125 mL Nalgene	Received:	06/01/2019
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/2261 (HBN: 241120)	**Percent Solid:**	NA
	Analyzed: 06/11/2019 10:25	**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 06/12/2019 12:46	/S/ Stephen Brose 06/13/2019 10:59

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: 34-1915803
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
	Nevada (TNI)	UT00953201-1	https://ndep.nv.gov/water/lab-certification
	Iowa (TNI)	IA# 376	http://www.shl.uiowa.edu/labcert/idnr/
	Kansas	E-10416	http://www.kdheks.gov/envlab/disclaimer.html
	Oklahoma (TNI)	IJ# 9980	http://www.deq.state.ok.us/CSDnew/labcert.htm
	Texas (TNI)	T104704456-18-9	https://www.tceq.texas.gov/assets/public/compliance/compliance_support/qa/txnelap_lab_list.pdf
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: 1915803

Limits:	Client SOW/Contract Specified	**Preparation:**	NA	**Analysis:**	EPA 6850, DoD QSM
Basis:	DoD QSM	**Batch:**	NA	**Batch:**	ELMS/2261 (HBN: 241120)
		Prepared By:	NA	**Analyzed By:**	Thomas Bosch

Blank

LMB: 657797
Analyzed: 06/11/2019 09:31
Units: ug/L

Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 657798
Analyzed: 06/11/2019 09:04
Dilution: 1
Units: ug/L

Analyte	Result	Target	% Rec	QC Limits	
Perchlorate	4.34	4.00	109	78.8	123.8

Matrix Spike - Matrix Spike Duplicate

Sample:	1915802001	**MS:**	657799
Analyzed:	06/11/2019 09:45	**Analyzed:**	06/11/2019 09:58
Dilution:	1	**Dilution:**	1
Units:	ug/L	**Units:**	ug/L

	MSD:	657800
	Analyzed:	06/11/2019 10:12
	Dilution:	1
	Units:	ug/L

Analyte	Result	Result	Target	% Rec	QC Limits		Result	% Rec	RPD	QC Limits	
Perchlorate	ND	4.57	4	114	78.8	123.8	4.78	120	4.65	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 06/12/2019 12:47	/S/ Stephen Brose 06/13/2019 10:59

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 1915803

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

1915803

SAMPLING STATE: **Colorado**

COC ID: **11498**

18698/#2

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:	HS19051859
TSR:	Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS19051859-02**	**LH18/24-SP650_052919_BIX**	**Groundwater**	**29 May 2019 14:00**
	SUB_Perch-6850			14 Jun 2019

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

QC Level: DOD IV (DoD Data Package)

Relinquished By: _____ Date/Time: 5/31/19 1800

Received By: _____ Date/Time: 6/1/19 852

Cooler ID(s): 9459 Temperature(s): 2

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Environmental

CHAIN-OF-CUSTODY

Project / Job / Task: HS19051859	***Split:***	**Workorder ID:** 1915803	**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	COOL	Requested Analysis: EPA 6850, DoD QSM
1	05/29/2019 14:00	LH18/24-SP650_052919_BIX	1915803001		Water	A	1		A
2									
3									
4									
5									
6									
7									
8									
9									
10									

47 of 121

ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location
Coates, Gayleen	06/01/2019 08:52	ALS Sample Receiving	Sample Login
R.33.1	6-3-19 10:18	BB	STORAGE
	6.11.19 0800	T. Bush	6850

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

00939123

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: 6/1/19 852

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:	Cooler/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	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.
1	C19 9459	2 °C	4	C19	°C	7	C19	°C
2	C19	°C	5	C19	°C	8	C19	°C
3	C19	°C	6	C19	°C	9	C19	°C

Taken By: _____ (Signature) Meredith Delong (Printed Name) 6/1/19 (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: _____

Must Deliver Next Business Day
Time and Tempature Sensitive!

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

SHIP DATE: 31MAY19
ACTWGT: 8.90 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: HS19051856/1859/1863-RJ

FedEx Express

SATURDAY 12:00P
PRIORITY OVERNIGHT

TRK# 0201 **4809 7834 6651**

XO BTFA

84123
UT-US **SLC**

Batch Worklist

Batch: ELMS/ 2261 **Created:** 6/11/2019 07:45 **Instrument:** **HBN:** 241120

Rule: EPA 6850, DoD QSM Water **Analyst:** T. Bosch **Status:** WP

Workorder: 1915802 [ENV_LVL4]
Workorder: 1915803 [ENV_LVL4]
Workorder: 1915852 [ENV_LVL4]
Workorder: 1916229 [ENV_LVL4]
Workorder: 1916231 [ENV_LVL4]
Workorder: 1916232 [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	657794	CCV for HBN 241120 [ELMS/2261]				CCV	3		E685041C3Q	5311		6/13/2019	
2	657795	RLVS for HBN 241120 [ELMS/2261				RLVS	3		E685041C3Q	5311		6/13/2019	
3	657796	ICS for HBN 241120 [ELMS/2261]				ICS	3		E6850..D3Q	5311		6/13/2019	
4	657797	LMB for HBN 241120 [ELMS/2261]				LMB	3		E6850Q413Q	5311		6/13/2019	
5	657798	LCS for HBN 241120 [ELMS/2261]				LCS	3		E6850Q413Q	5311		6/13/2019	
6	1915802001	LH18/24-SP650_052919_BIX				SAMPLE	3	1915802001-A	E6850Q41.3	5480	6/26/2019	6/13/2019	
7	657799	LH18/24-SP650...(1915802001MS)				MS	3		E6850Q413Q	5311		6/13/2019	
8	657800	LH18/24-SP65...(1915802001MSD)				MSD	3		E6850Q413Q	5311		6/13/2019	
9	1915803001	LH18/24-SP650_052919_BIX				SAMPLE	3	1915803001-A	E6850Q41.3	5480	6/26/2019	6/13/2019	
10	1915852001	LH18/24-SP140_052919				SAMPLE	3	1915852001-A	E6850Q41.3	5480	6/26/2019	6/13/2019	
11	1916229001	LH18/24-SP140_060419				SAMPLE	3	1916229001-A	E6850Q41.3	5480	7/2/2019	6/19/2019	
12	1916231001	LH18/24-SP650_060419_BIX				SAMPLE	3	1916231001-A	E6850Q41.3	5480	7/2/2019	6/19/2019	
13	1916232001	LH18/24-SP650_060419_BIX				SAMPLE	3	1916232001-A	E6850Q41.3	5480	7/2/2019	6/19/2019	
14	657801	CCV for HBN 241120 [ELMS/2261]				CCV	3		E685041C3Q	5311		6/13/2019	

00939126



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

ALS Work Order #'s & Sample #( )'s: 1915802 (001), 1915803 (001), 1915852 (001), 1916229 (001); 1916231 (001); 1916232 (001) ELMS Batch/HBN ID: 2261 (241120)
Prep Date: 06/11/2019 Analysis Date: 06/11/2019 Analyst: T. Bosch
Analyte: **Perchlorate** Matrix: **Water** Method: **6850**
Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2019\JUN\11JUN19D.s
Reported DL: **1.0µg/L** Reported LOD: **2.0µg/L** Reported LOQ: **4.0µg/L**

SAMPLE PREPARATION/ANALYSIS:

Water: Samples were prepared by Thomas 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 AH015-4)/0.1% glacial acetic acid (JT-Baker Lot 04802).
Eluent B1: 95% ACN (B&J Lot AH015-4)/ 5% ASTM Type II water (ALS)/0.1% glacial acetic acid (JT-Baker Lot 04802).

STANDARDS: Internal Standard Spiking Solution Horizon# 43730. Dilutions of Working Standard Solution ID 43702 used for CCV's, LODV's, RLVS and IPC.

CALIBRATION CURVE: Used curve from 03/19/2019, sequence 19MAR19D.s Offline Quantitation Method: CLO4-DP2.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: 7 Injection Volume: 35µL
Column: KP-RPPX C8 separator, 250mm Mobile Phase: 70% Eluent A1; 30% Eluent B1

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: 4.0µL of QC Solution Horizon ID 47516 was used for LCS 657798; Target = 4.0µg/L. ASTM type II water was used for LMB 657797.

MS/MSD: The Matrix Spike and duplicate (MS/MSD) were performed on sample 1915802001 (Client ID: LH18/24-SP650_052919_BIX). 4.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. Spike target = 4.0µg/L.

COMMENTS:

1) Results reported in µg/L. Field samples 1915852001 and 1916229001 were analyzed and reported from 1:1,000 dilutions. The reporting limits have been adjusted accordingly.
2) All QC, Blank, CCV, and MS/MSD results were within method parameters.
3) Sample data can be viewed at two directories within the ALS system: \\ALSLTWS013\LCMS\LCMS04\2019\JUN\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
4) Notebook: \\alsltws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2019\241120-DoD-ALS-Hstn LCMS4 or through \\ALSLTWS013\DATAREVIEW\HBN#
5) The Reporting Limit Verification Standard (RLVS – 657795) is reported from the analysis of the Laboratory Control Sample (LCS – 657798) at a level of 4.0µg/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: 19MARI03).

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: 2261 HBN: 241120 Sample Set IDs if Applicable: 191580 2/191580 3/191585 2 191623 9/191623 1/191623 2	Analyst Initials	Reviewer Initials
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
Method Blanks 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 flags applied on QC reports; LCSs analyzed and meet acceptance criteria when performed	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 checked	TB	SB
Preparation and analysis calculations checked	TB	SB
NCRs are completed as necessary NC/CAR#		
Report forms are complete and accurate	TB	SB
Manual integrations checked	TB	SB

STANDARD REPORT

Working Standard - CLO4 WRK

CLO4 WRK — Description - 6850 WKG Std 100.ug/L

Standard: 43702
MFG: ALS/SLC
MFG Lot: TNB: 09/18/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/18/2018 02:09PM

Amount: 10 mL
Expires: 09/18/2019
Usable: Yes
Lab Lot: CLO4 WRK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	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
43701	CLO4 INT	6850 Intermdt AccStd 10.ug/mL	CLO4 INT	0.1 mL	09/18/2019

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: No
Lab Lot: CLO4 STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	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: 43701
MFG: ALS/SLC
MFG Lot: TNB: 09/18/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/18/2018 02:09PM

Amount: 10 mL
Expires: 09/18/2019
Usable: Yes
Lab Lot: CLO4 INT

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
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
MFG: Ultra Scientific
MFG Lot: CP-0860
Part ID: ICC-013

Created By: Thomas Bosch
Create Date: 05/11/2017 01:05PM

Amount: 100 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL

STANDARD REPORT

Constituent

Working Standard - CLO4 QC INT

CLO4 QC INT — Description - 6850 QC Intrmdt Std-QC 10ug/mL

Standard: 47515
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

STANDARD REPORT

Working Standard - CLO4ISTDWRK

CLO4ISTDWRK — Description - Perchlorate ISTD Wrk 1,000ug/L

Standard: 43730
MFG: ALS/SLC
MFG Lot: TNB: 05/09/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/20/2018 09:09AM
Verified By: Thomas Bosch
Verify Date:

Amount: 25 mL
Expires: 09/20/2019
Usable: Yes
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
43729	CLO4ISTDSTK	Perchlorate ISTD Stock	CLO4ISTDSTK	0.25 mL	04/28/2026

STANDARD REPORT

Constituent

Stock Standard - CLO4ISTDSTK

CLO4ISTDSTK — Description - Perchlorate ISTD Stock

Standard: 43729
MFG: Cambridge Isotope
MFG Lot: SDFF-012A
Part ID: OLM-7310-S

Created By: Thomas Bosch
Create Date: 09/20/2018 09:09AM
Verified By: Thomas Bosch
Verify Date:

Amount: 1 mL
Expires: 04/28/2026
Usable: Yes
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

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

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 REFERENCE MATERIAL PRODUCER
ANAB ACCREDITED TESTING LABORATORY

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: JCC-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

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*

Date Certified: Jun 25, 2018
Expiration: Jul 25, 2020
Sample Size: 100 mL
Components: 1
Storage Condition: Ambient (>5 °C)
Included on ISO/IEC 17025 Scope of Accreditation: Yes
Included on ISO 17034 Scope of Accreditation: Yes

Signal Word: None

Component		SRM #	Prepared Concentration (µg/mL)
ClO_4	Perchlorate	Ind. Std.	1000

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.

Cambridge Isotope Laboratories, Inc.

Certificate of Analysis

Quality Standards:
ISO Guide 34 • ISO/IEC 17025 • ISO 13485 • cGMP

23118

Product Name: (Isotopic Label & Enrichment Specification)	PERCHLORIC ACID, SODIUM SALT (18O4, 90%+) 100 UG/ML IN WATER
Lot Number:	SDDG-013
Catalog Number:	OLM-7310-S

Product Information

Chemical Purity Specification:	≥98%
Labeled CAS Number:	NA
Unlabeled CAS Number:	7601-89-0
MW*:	130.4
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.

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.

* *For isotopically labeled compounds, MW listed is for the fully enriched product.*

Approved by: T. J. Eckersley

Timothy I. Eckersley, Ph.D., Quality Assurance

Quality Control Tests and Results

QC Release Date	2/27/2014
Expiration Date	2/27/2024
Concentration Based on Gravimetry	102 µg/mL
Chemical Purity of Neat Material(s)	98%
LC/MS for Concentration	109.4 ± 2.8 µg/mL (k=2)



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP2.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
*	657794 CCV@25	Vial 71	1	Control	1	1.90258e6	8.986	26.94929
*	657798 QC@4.0	Vial 72	1	Control	2	3.85542e5	8.884	4.34115
*	657796 ICS@4.0	Vial 73	1	Control	3	2.32261e5	8.623	3.98229
*	657797 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	1915802001	Vial 75	1	Sample	5	0.00000	0.000	0.00000
*	657799 158021S	Vial 76	1	Sample	6	1.46622e5	8.522	4.56740
*	657800 158021D	Vial 77	1	Sample	7	1.54646e5	8.528	4.78474
*	1915803001	Vial 78	1	Sample	8	0.00000	0.000	0.00000
*	1915852001 1K	Vial 79	1	Sample	9	3.32187e5	9.077	4885.02369
*	1916229001 1K	Vial 80	1	Sample	10	4.13979e5	9.091	6820.05588
*	1916231001	Vial 81	1	Sample	11	0.00000	0.000	0.00000
*	1916232001	Vial 82	1	Sample	12	0.00000	0.000	0.00000
*	657801 CCV@25	Vial 71	1	Control	13	1.42334e6	9.028	25.98075

#	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
*	657794 CCV@25	Vial 71	1	Control	1	5.56917e5	9.003	26.60911
*	657798 QC@4.0	Vial 72	1	Control	2	1.22598e5	8.893	4.50107
*	657796 ICS@4.0	Vial 73	1	Control	3	7.62920e4	8.637	4.24932
*	657797 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	1915802001	Vial 75	1	Sample	5	0.00000	0.000	0.00000
*	657799 158021S	Vial 76	1	Sample	6	5.01097e4	8.545	5.09575
*	657800 158021D	Vial 77	1	Sample	7	5.24358e4	8.548	5.30516
*	1915803001	Vial 78	1	Sample	8	0.00000	0.000	0.00000
*	1915852001 1K	Vial 79	1	Sample	9	1.07205e5	9.093	5161.49233
*	1916229001 1K	Vial 80	1	Sample	10	1.30297e5	9.110	7096.69575
*	1916231001	Vial 81	1	Sample	11	0.00000	0.000	0.00000
*	1916232001	Vial 82	1	Sample	12	0.00000	0.000	0.00000
*	657801 CCV@25	Vial 71	1	Control	13	4.26237e5	9.042	26.20612

#	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
*	657794 CCV@25	Vial 71	1	Control	1	2.13798e5	9.004	5.00000
*	657798 QC@4.0	Vial 72	1	Control	2	2.91481e5	8.904	5.00000
*	657796 ICS@4.0	Vial 73	1	Control	3	1.92225e5	8.645	5.00000
*	657797 LMB	Vial 74	1	Control	4	3.01884e5	9.082	5.00000
*	1915802001	Vial 75	1	Sample	5	1.12941e5	8.589	5.00000
*	657799 158021S	Vial 76	1	Sample	6	1.05110e5	8.545	5.00000
*	657800 158021D	Vial 77	1	Sample	7	1.05604e5	8.552	5.00000
*	1915803001	Vial 78	1	Sample	8	1.14182e5	8.546	5.00000
*	1915852001 1K	Vial 79	1	Sample	9	2.21981e5	9.097	5000.00000
*	1916229001 1K	Vial 80	1	Sample	10	1.95450e5	9.116	5000.00000
*	1916231001	Vial 81	1	Sample	11	1.33828e5	8.518	5.00000
*	1916232001	Vial 82	1	Sample	12	1.27034e5	8.502	5.00000
*	657801 CCV@25	Vial 71	1	Control	13	1.66287e5	9.054	5.00000

*** End of Report ***

Sequence Table:

Method and Injection Info Part:

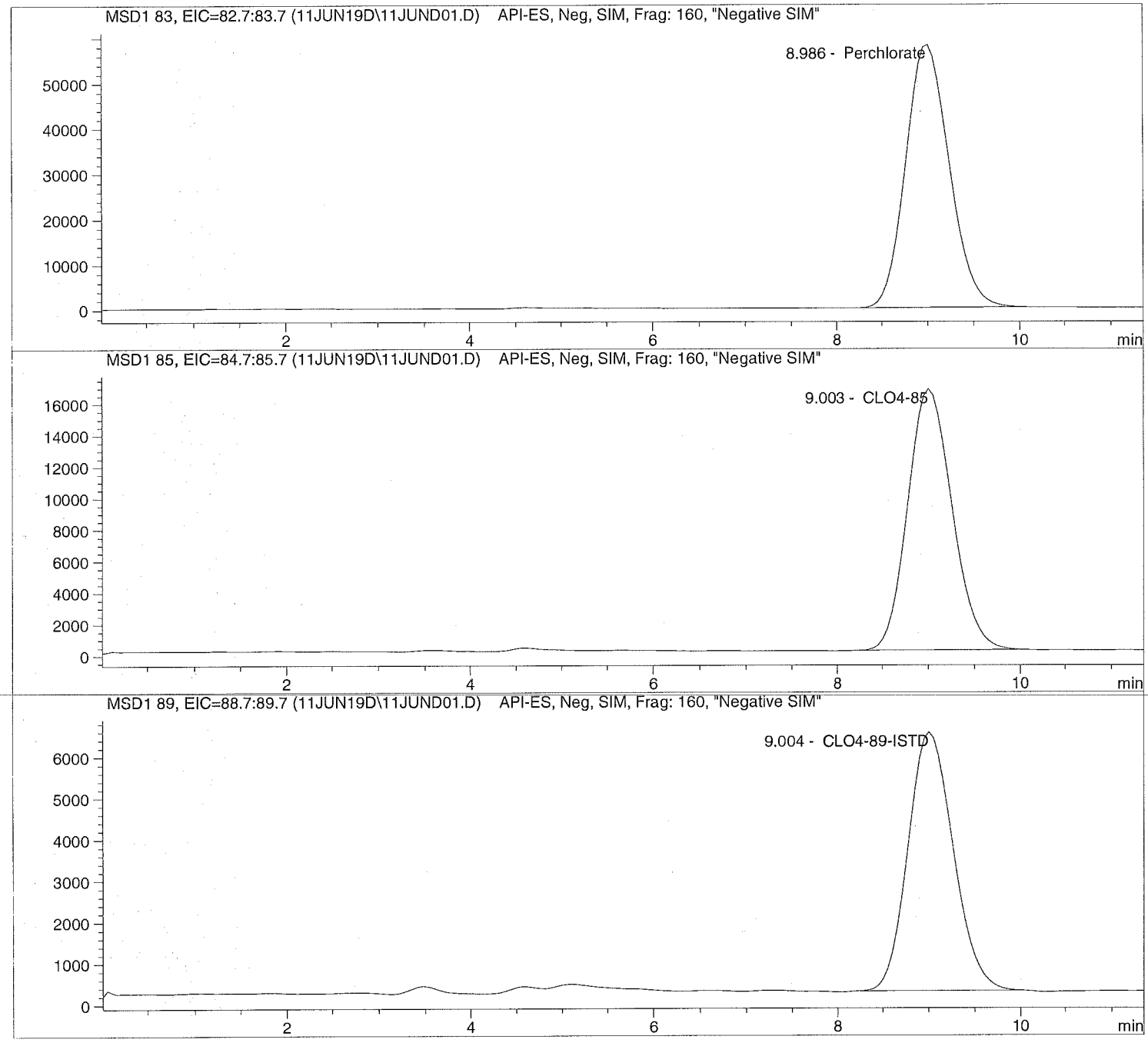
Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	657794 CCV@25	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	657798 QC@4.0	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	657796 ICS@4.0	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	657797 LMB	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	1915802001	CLO4-AQN	1	Sample		
6	Vial 76	657799 158021S	CLO4-AQN	1	Sample		
7	Vial 77	657800 158021D	CLO4-AQN	1	Sample		
8	Vial 78	1915803001	CLO4-AQN	1	Sample		
9	Vial 79	1915852001 1K	CLO4-AQN	1	Sample		
10	Vial 80	1916229001 1K	CLO4-AQN	1	Sample		
11	Vial 81	1916231001	CLO4-AQN	1	Sample		
12	Vial 82	1916232001	CLO4-AQN	1	Sample		
13	Vial 71	657801 CCV@25	CLO4-AQN	1	Ctrl Samp		

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND01.D Sample Name: 657794 CCV@25

Injection Date:	6/11/2019 08:44:35	Seq Line:	1
Sample Name:	657794 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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND01.D Sample Name: 657794 CCV@25

Injection Date:	6/11/2019 08:44:35	Seq Line:	1
Sample Name:	657794 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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.986	PBA	1902575.4	26.9493	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.003	PBA	556916.8	26.6091	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.004	PBA	213798.0	5.0000	CLO4-89-ISTD

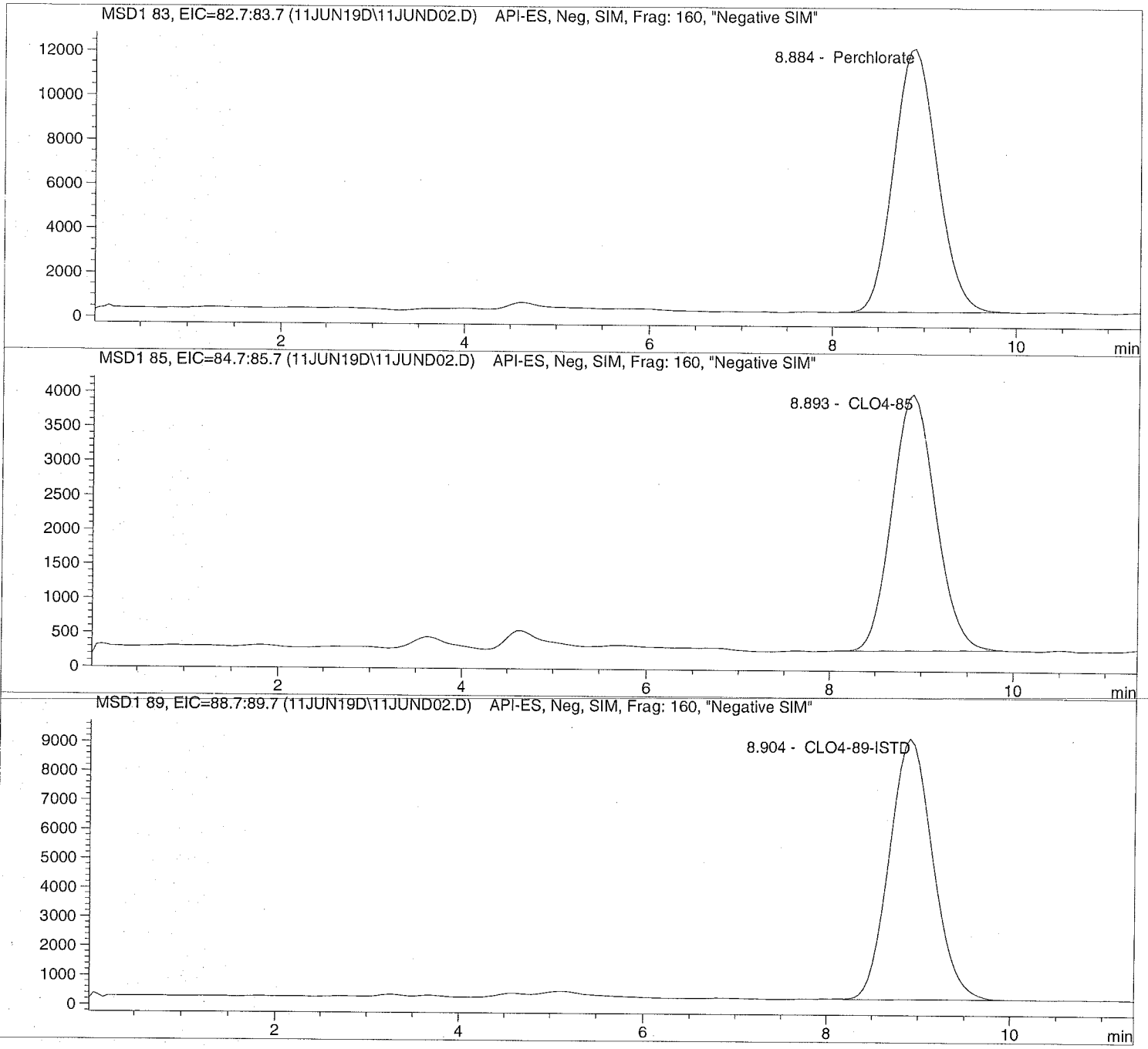
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND02.D Sample Name: 657798 QC@4.0

Injection Date:	6/11/2019 09:04:55	Seq Line:	2
Sample Name:	657798 QC@4.0	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND02.D Sample Name: 657798 QC@4.0

Injection Date:	6/11/2019 09:04:55	Seq Line:	2
Sample Name:	657798 QC@4.0	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.884	PBA	385541.7	4.3412	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.893	BBA	122598.4	4.5011	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.904	BBA	291480.6	5.0000	CLO4-89-ISTD

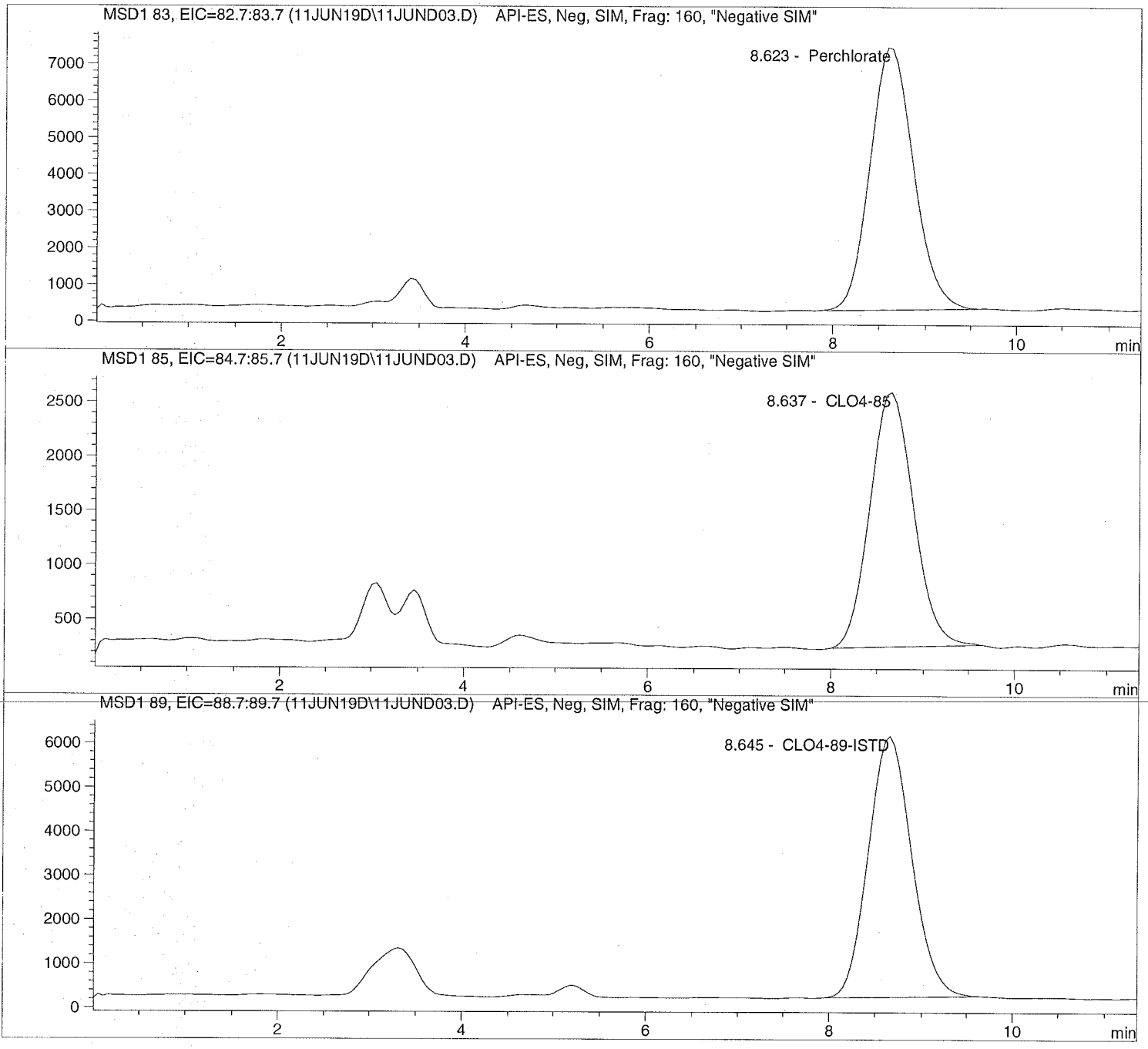
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND03.D Sample Name: 657796 ICS@4.0

Injection Date:	6/11/2019 09:18:21	Seq Line:	3
Sample Name:	657796 ICS@4.0	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND03.D Sample Name: 657796 ICS@4.0

Injection Date:	6/11/2019 09:18:21	Seq Line:	3
Sample Name:	657796 ICS@4.0	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.623	PBA	232261.2	3.9823	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.637	PBA	76292.0	4.2493	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.645	PBA	192224.9	5.0000	CLO4-89-ISTD

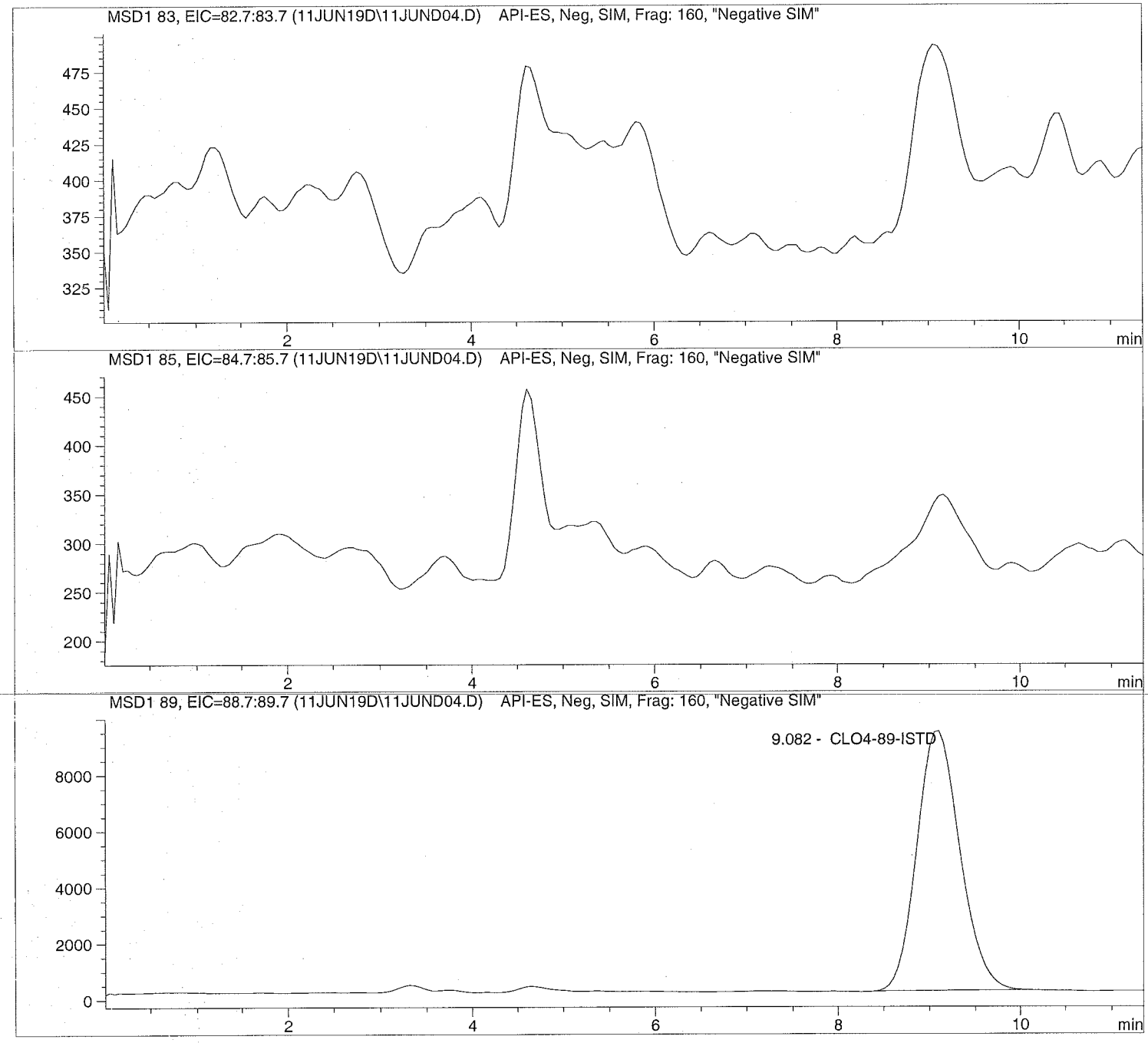
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND04.D Sample Name: 657797 LMB

Injection Date:	6/11/2019 09:31:47	Seq Line:	4
Sample Name:	657797 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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND04.D Sample Name: 657797 LMB

Injection Date:	6/11/2019 09:31:47	Seq Line:	4
Sample Name:	657797 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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
9.082	PBA	301883.5	5.0000	CLO4-89-ISTD

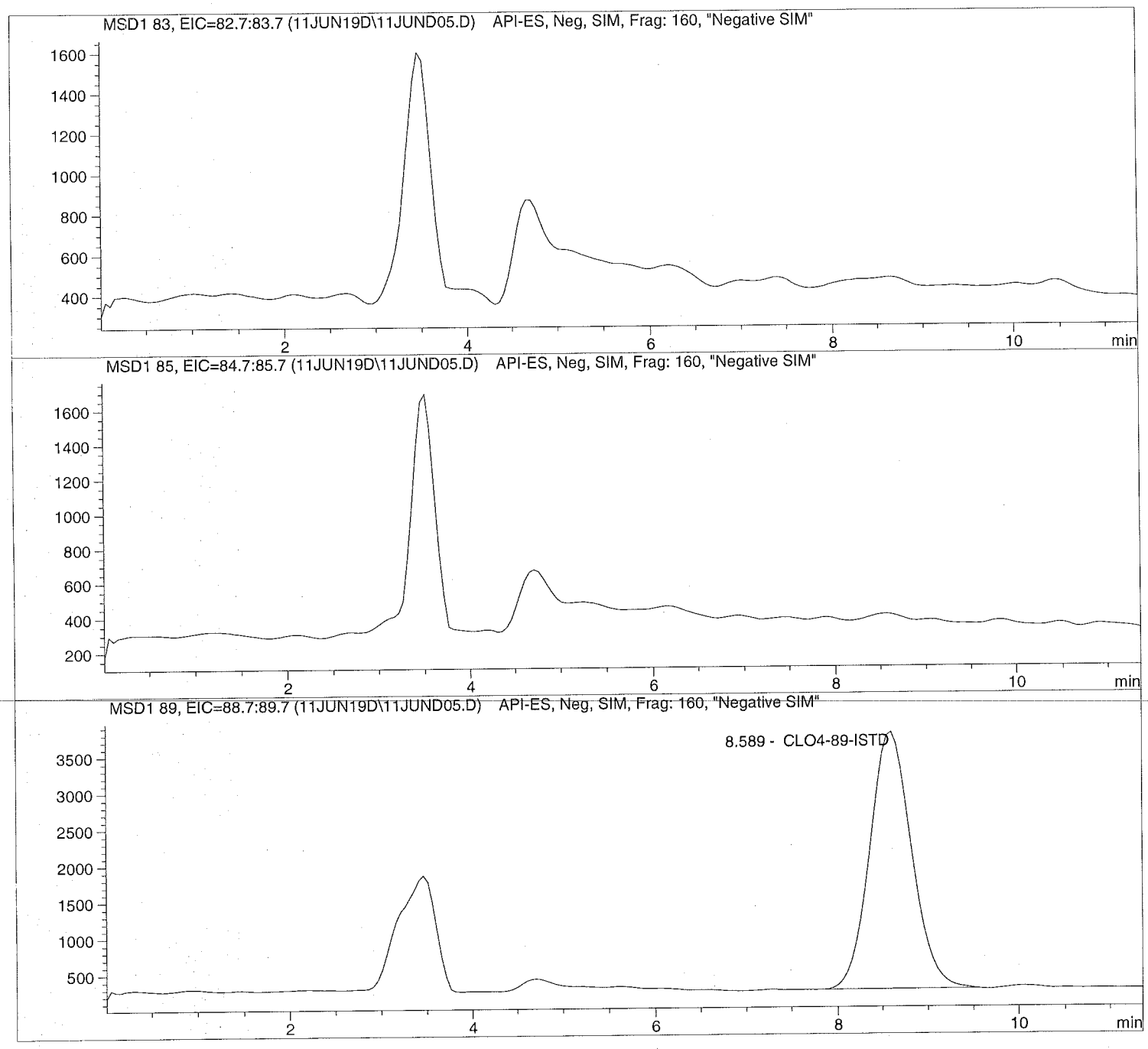
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND05.D Sample Name: 1915802001

Injection Date:	6/11/2019 09:45:13	Seq Line:	5
Sample Name:	1915802001	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND05.D Sample Name: 1915802001

Injection Date:	6/11/2019 09:45:13	Seq Line:	5
Sample Name:	1915802001	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.589	PBA	112941.5	5.0000	CLO4-89-ISTD

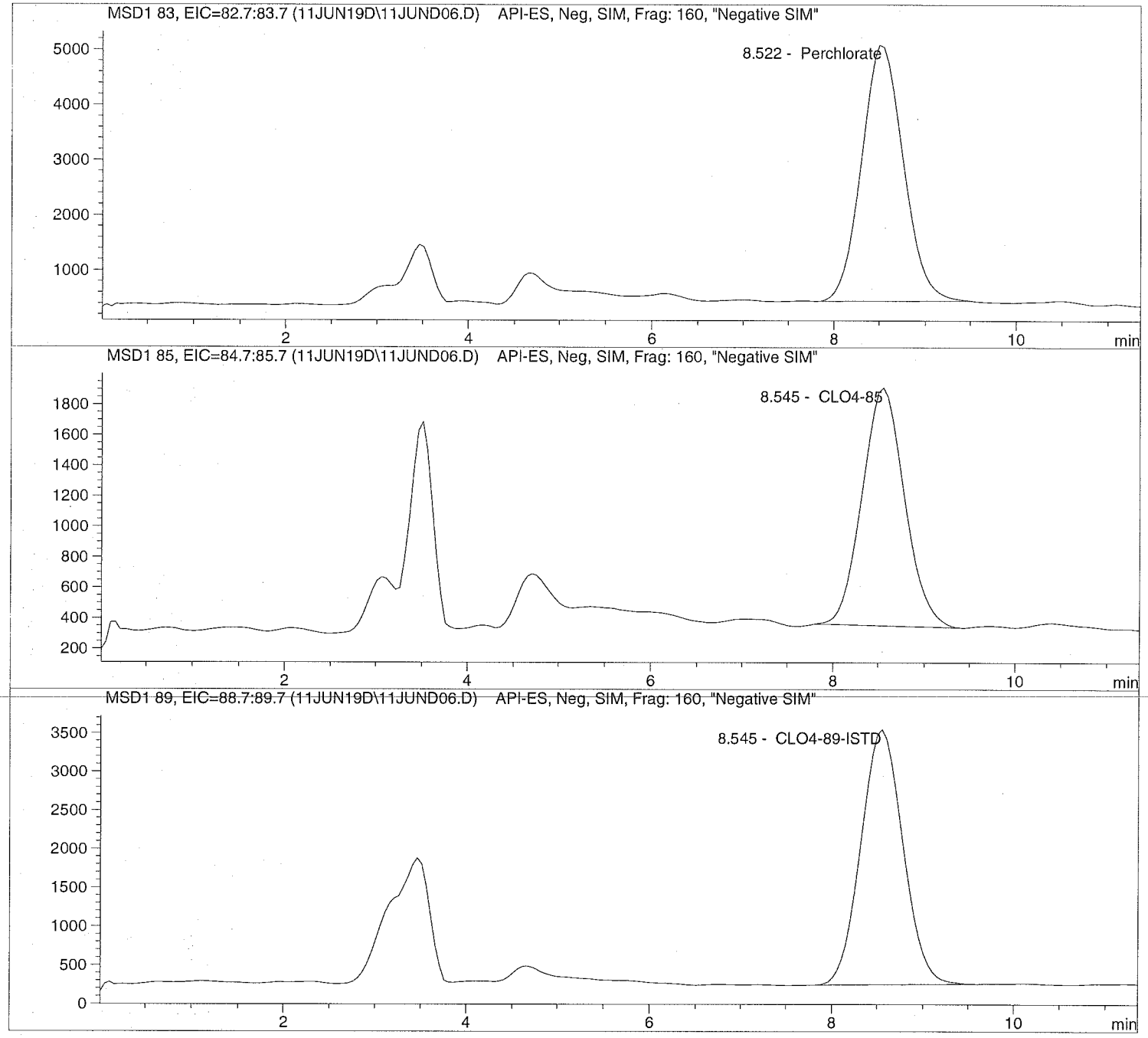
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND06.D Sample Name: 657799 158021S

Injection Date:	6/11/2019 09:58:38	Seq Line:	6
Sample Name:	657799 158021S	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Injection Date:	6/11/2019 09:58:38	Seq Line:	6
Sample Name:	657799 158021S	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-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.522	BBA	146622.1	4.5674	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.545	PBA	50109.7	5.0958	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.545	PBA	105110.4	5.0000	CLO4-89-ISTD

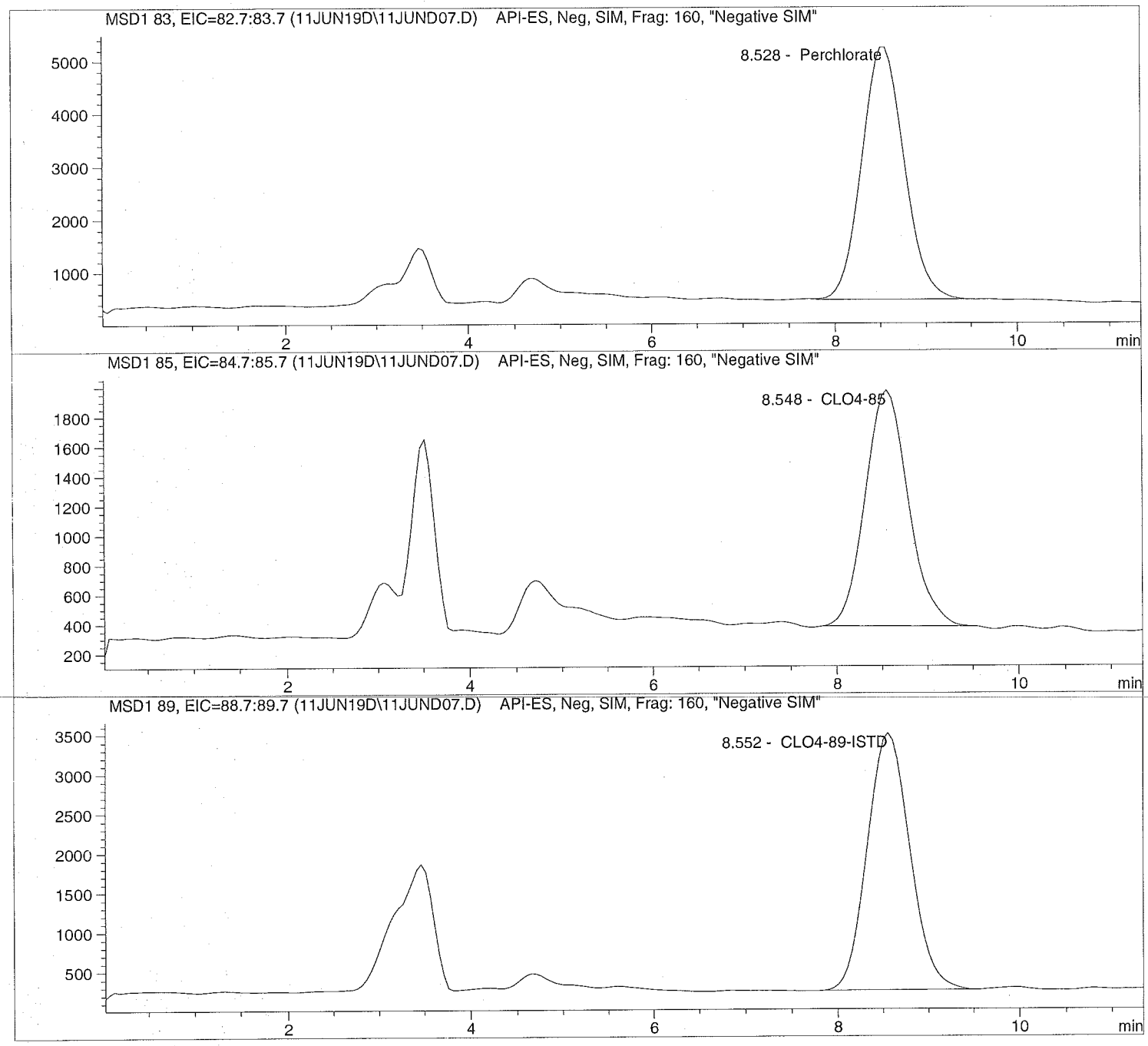
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND07.D Sample Name: 657800 158021D

Injection Date:	6/11/2019 10:12:09	Seq Line:	7
Sample Name:	657800 158021D	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Injection Date: 6/11/2019 10:12:09 Seq Line: 7
Sample Name: 657800 158021D 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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Fri, 12. Apr. 2019,07:52:58 am
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
8.528	BBA	154645.8	4.7847	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.548	PBA	52435.8	5.3052	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.552	PBA	105604.1	5.0000	CLO4-89-ISTD

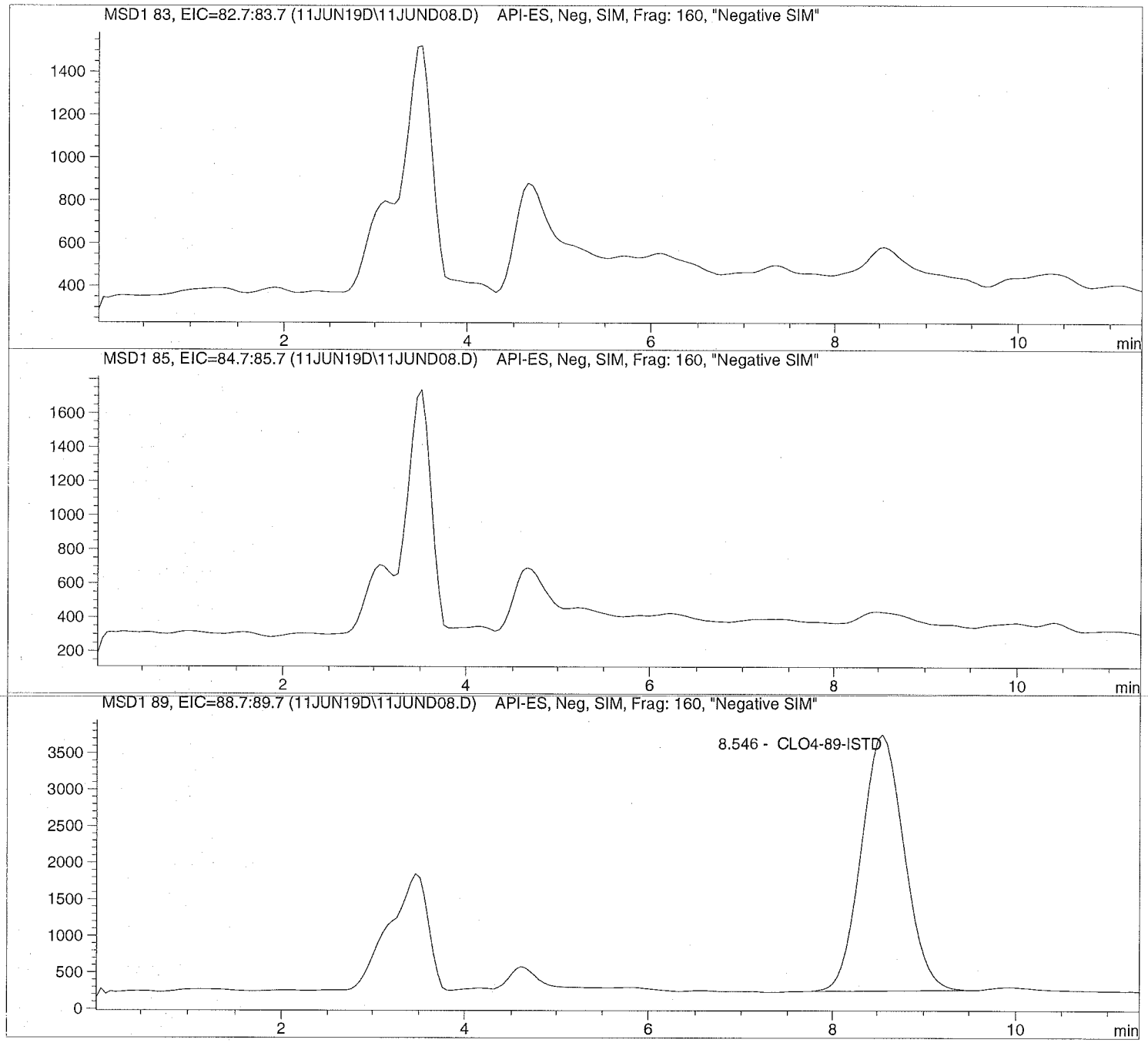
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND08.D Sample Name: 1915803001

Injection Date:	6/11/2019 10:25:32	Seq Line:	8
Sample Name:	1915803001	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND08.D Sample Name: 1915803001

Injection Date:	6/11/2019 10:25:32	Seq Line:	8
Sample Name:	1915803001	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-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.546	BBA	114182.4	5.0000	CLO4-89-ISTD

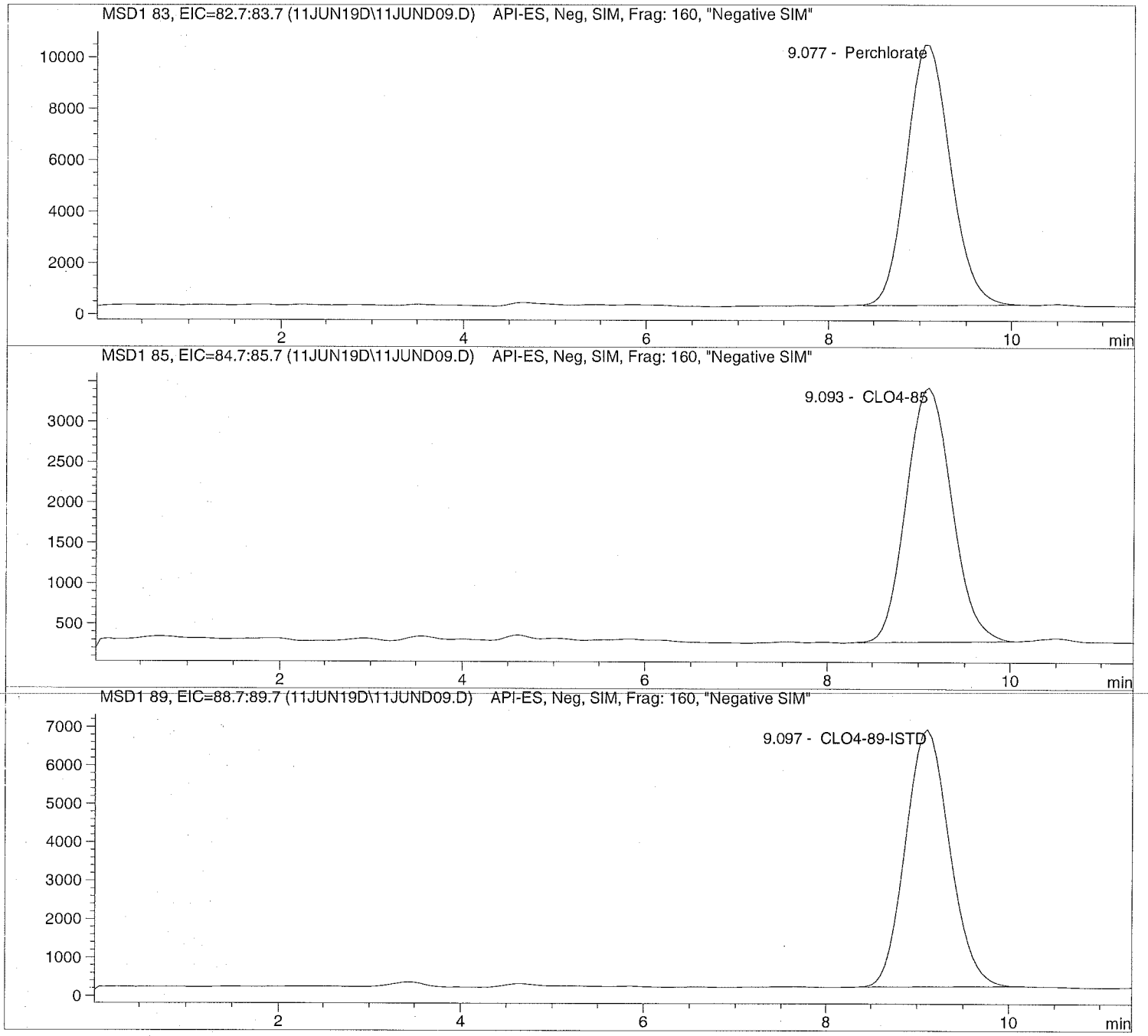
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND09.D Sample Name: 1915852001 1K

Injection Date:	6/11/2019 10:38:54	Seq Line:	9
Sample Name:	1915852001 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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND09.D Sample Name: 1915852001 1K

Injection Date:	6/11/2019 10:38:54	Seq Line:	9
Sample Name:	1915852001 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-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
9.077	BBA	332187.1	4885.0237	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.093	PBA	107205.2	5161.4923	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.097	PBA	221981.4	5000.0000	CLO4-89-ISTD

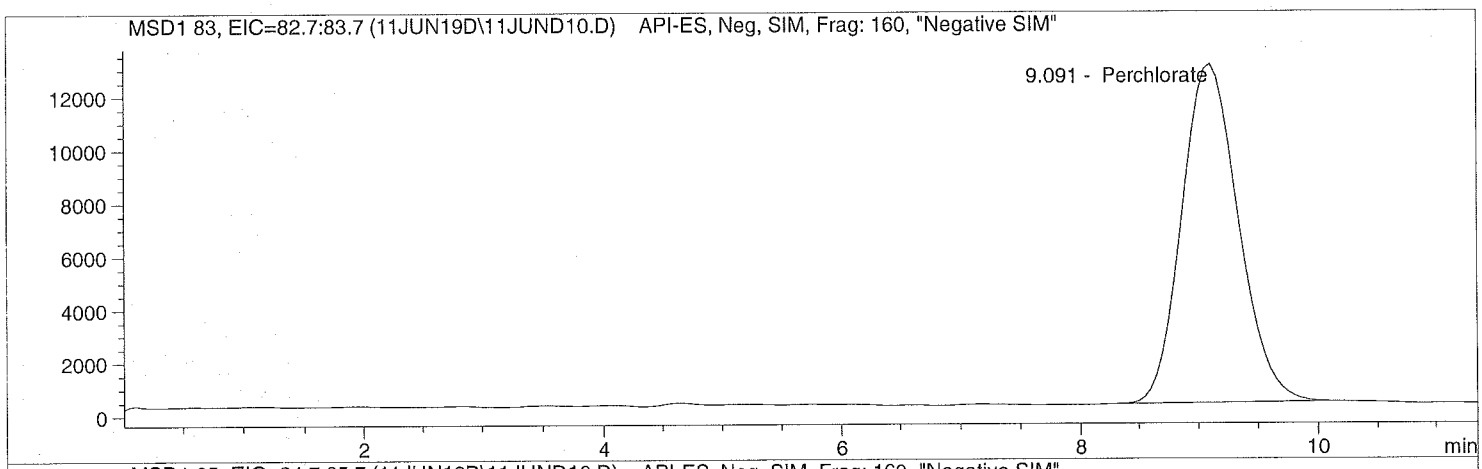
*** End of Report ***

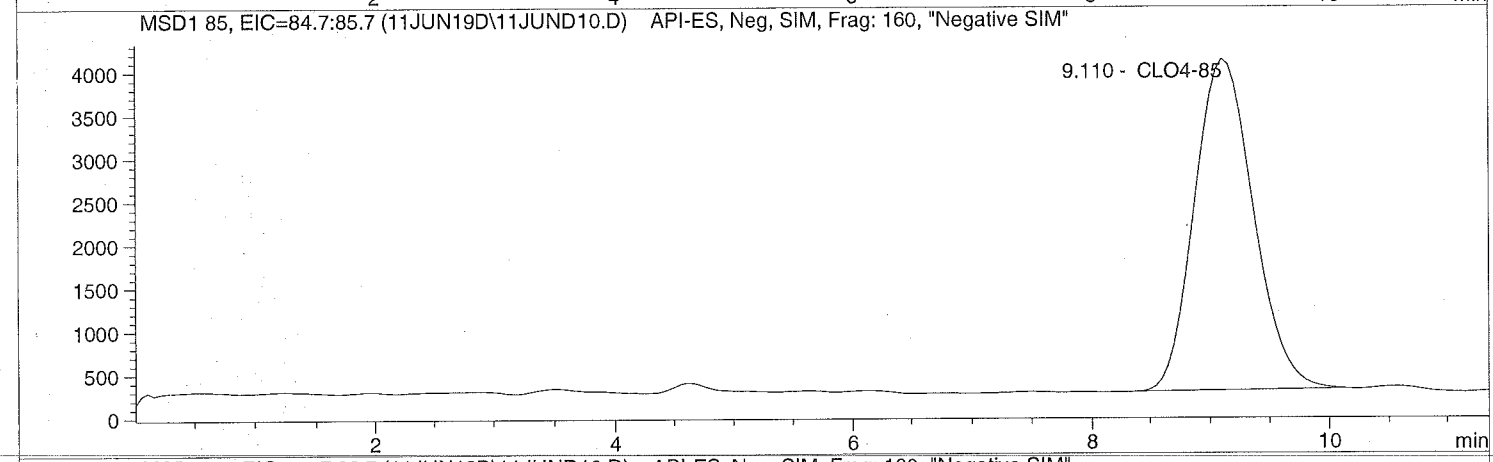
Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND10.D Sample Name: 1916229001 1K

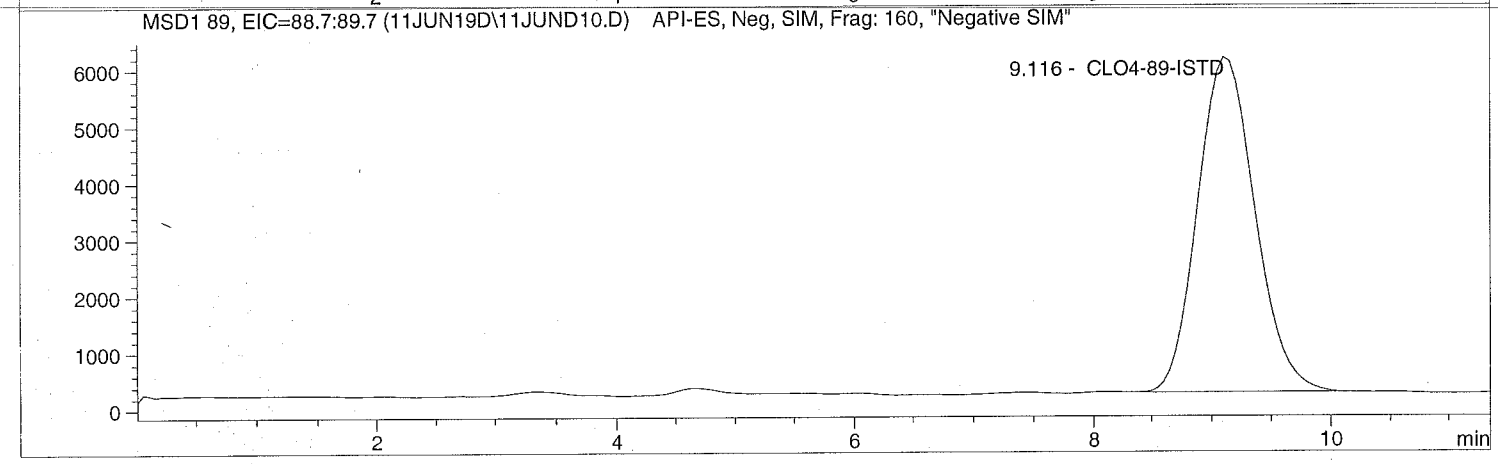
Injection Date:	6/11/2019 10:52:22	Seq Line:	10
Sample Name:	1916229001 1K	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND10.D Sample Name: 1916229001 1K

Injection Date:	6/11/2019 10:52:22	Seq Line:	10
Sample Name:	1916229001 1K	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
9.091	BBA	413978.8	6820.0559	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.110	PBA	130297.0	7096.6957	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.116	BBA	195449.6	5000.0000	CLO4-89-ISTD

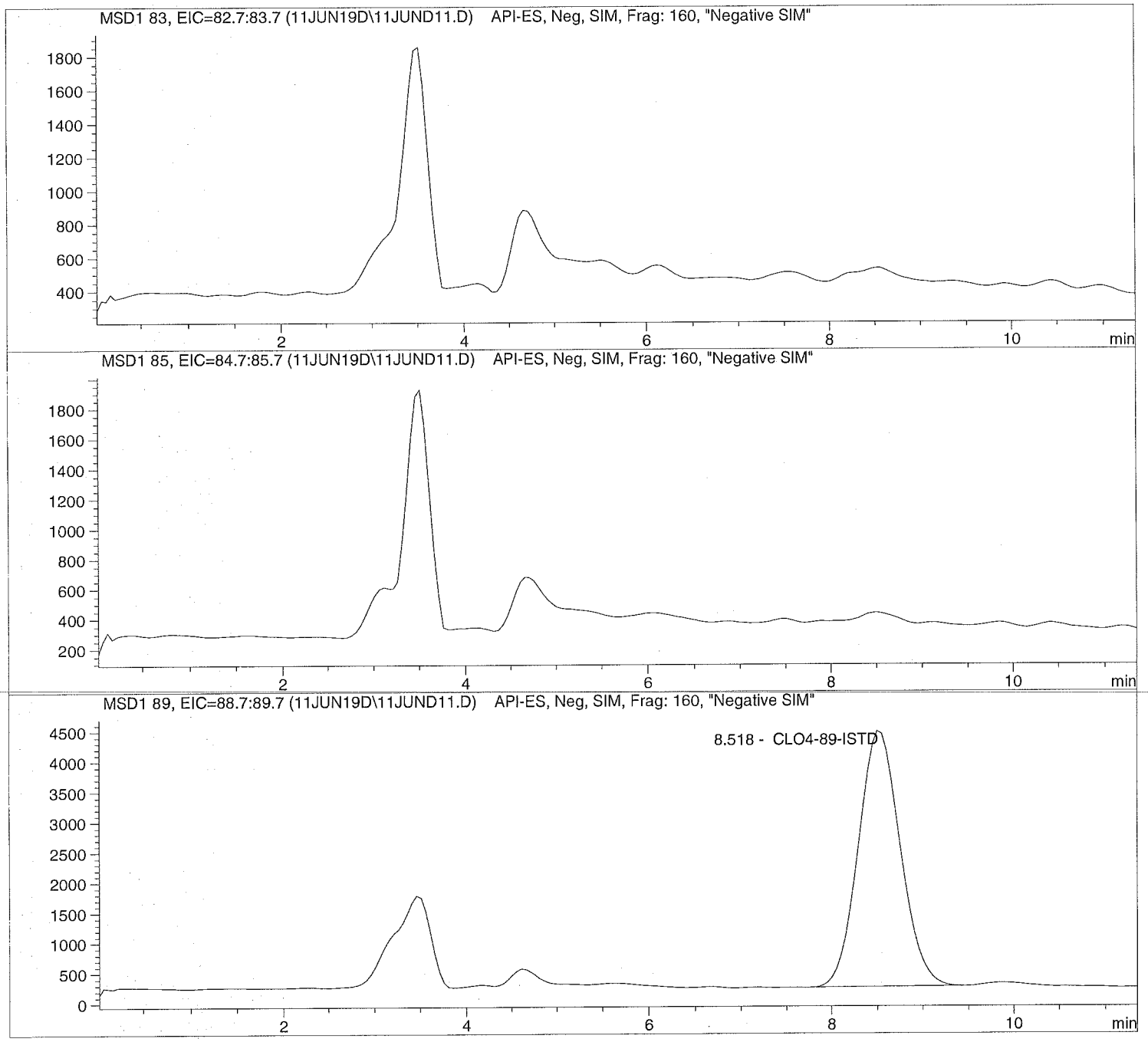
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND11.D Sample Name: 1916231001

Injection Date:	6/11/2019 11:05:44	Seq Line:	11
Sample Name:	1916231001	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND11.D Sample Name: 1916231001

Injection Date:	6/11/2019 11:05:44	Seq Line:	11
Sample Name:	1916231001	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.518	PBA	133827.9	5.0000	CLO4-89-ISTD

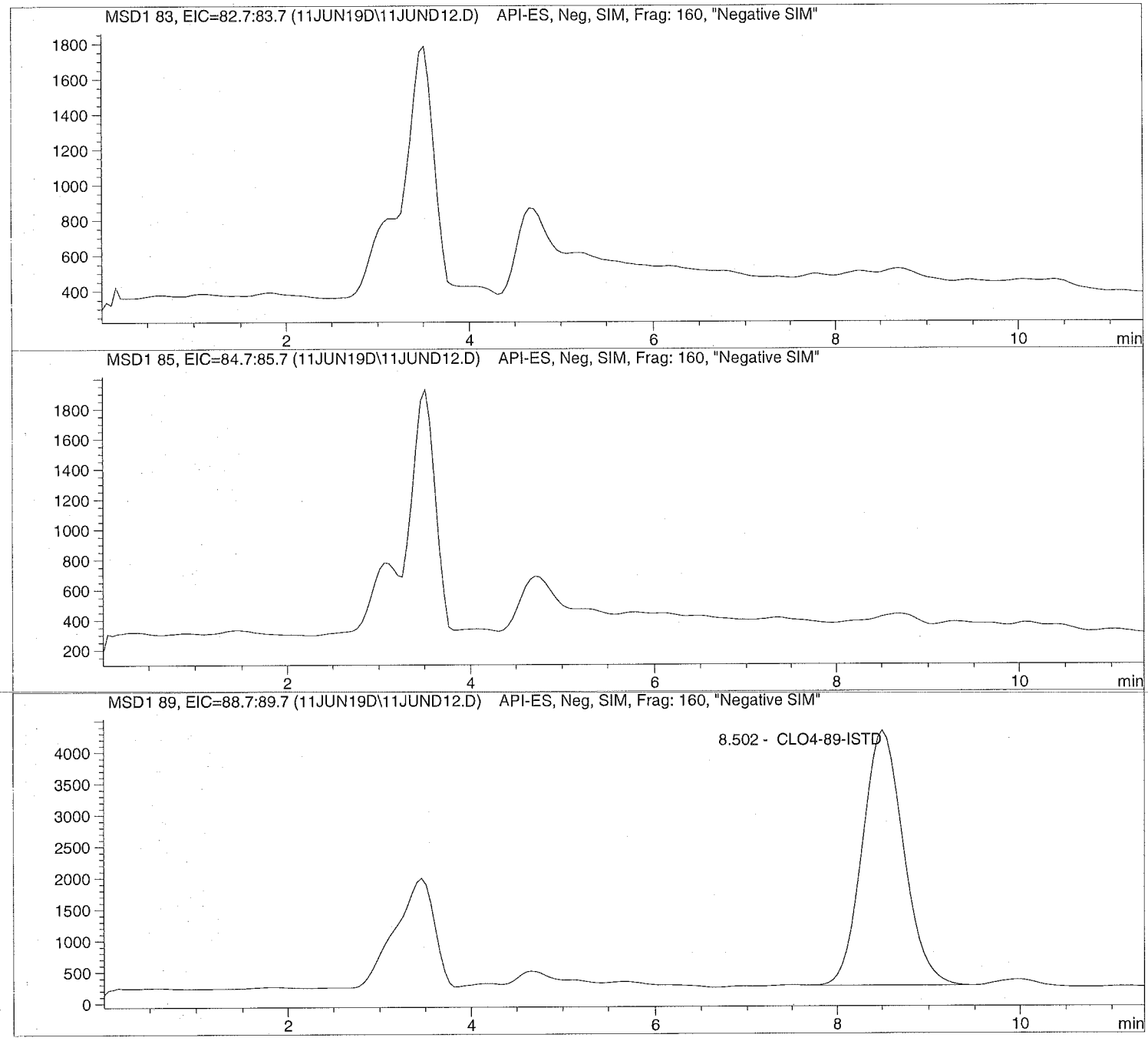
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND12.D Sample Name: 1916232001

Injection Date:	6/11/2019 11:19:06	Seq Line:	12
Sample Name:	1916232001	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND12.D Sample Name: 1916232001

Injection Date:	6/11/2019 11:19:06	Seq Line:	12
Sample Name:	1916232001	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-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.502	BBA	127033.7	5.0000	CLO4-89-ISTD

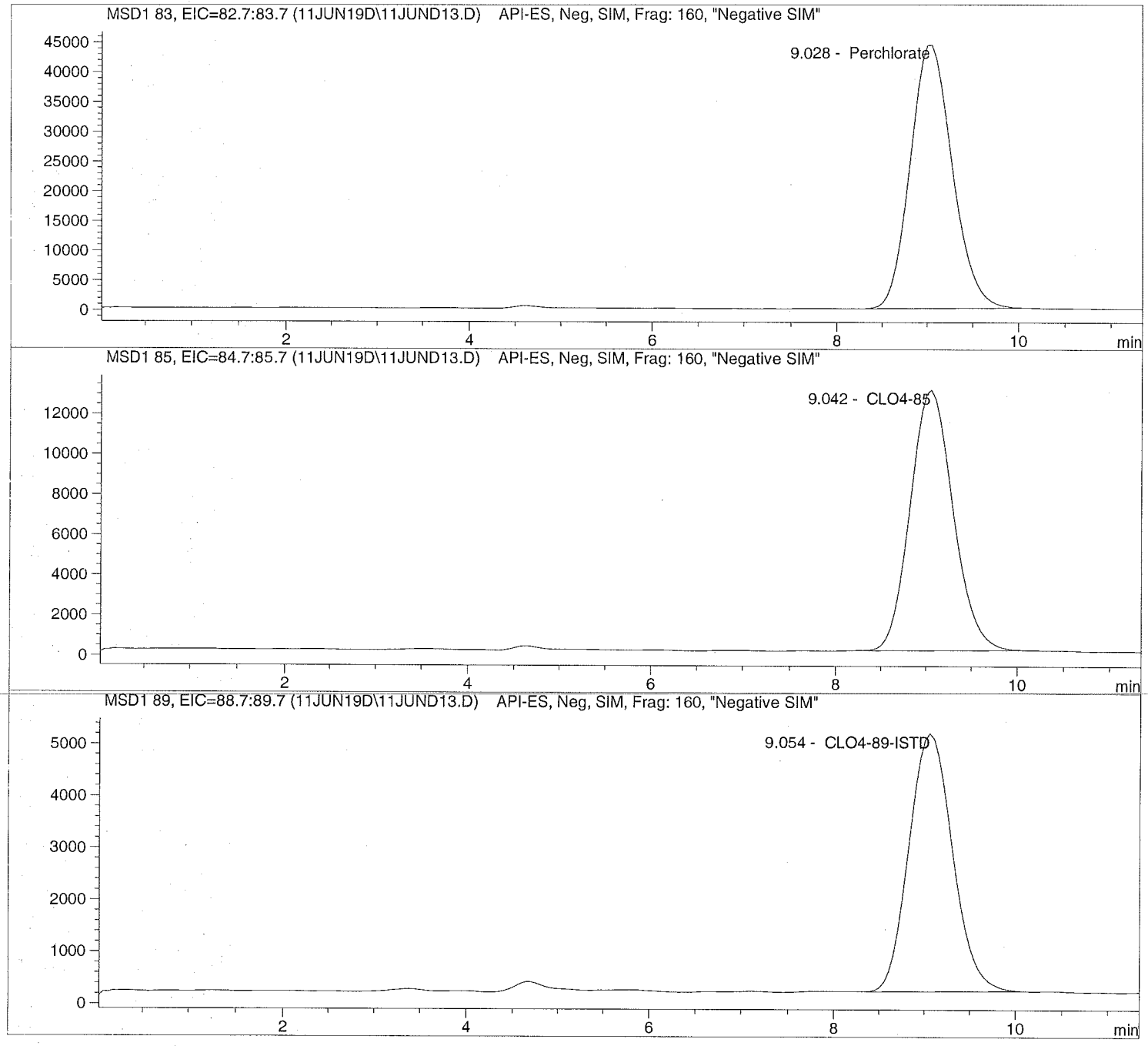
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND13.D Sample Name: 657801 CCV@25

Injection Date:	6/11/2019 11:34:17	Seq Line:	13
Sample Name:	657801 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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND13.D Sample Name: 657801 CCV@25

Injection Date:	6/11/2019 11:34:17	Seq Line:	13
Sample Name:	657801 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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
9.028	PBA	1423337.3	25.9807	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.042	BBA	426236.8	26.2061	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.054	BBA	166286.8	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 : 3/19/2019 2:35:19 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
8.744	1	1	1.00000	7.76074e4	1.28854e-5		1	Perchlorate
		2	2.00000	1.35273e5	1.47849e-5			
		3	5.00000	3.37764e5	1.48033e-5			
		4	10.00000	6.83454e5	1.46316e-5			
		5	25.00000	2.08433e6	1.19943e-5			
		6	50.00000	4.13334e6	1.20968e-5			
		7	75.00000	5.99313e6	1.25143e-5			
8.755	2	1	1.00000	2.36780e4	4.22333e-5		1	CLO4-85
		2	2.00000	4.69486e4	4.25998e-5			
		3	5.00000	1.06124e5	4.71147e-5			
		4	10.00000	2.13523e5	4.68335e-5			
		5	25.00000	6.14295e5	4.06971e-5			
		6	50.00000	1.19814e6	4.17315e-5			
		7	75.00000	1.78355e6	4.20509e-5			
8.766	3	1	5.00000	2.73208e5	1.83011e-5	+I1		CLO4-89-ISTD
		2	5.00000	2.24886e5	2.22335e-5			
		3	5.00000	2.33196e5	2.14412e-5			
		4	5.00000	2.34454e5	2.13262e-5			
		5	5.00000	2.50568e5	1.99547e-5			
		6	5.00000	2.30977e5	2.16472e-5			

RetTime [min]	Sig	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
		7	5.00000	2.21504e5	2.25729e-5			

More compound-specific settings:

Compound: Perchlorate
- Time Window : From 6.654 min To 12.544 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 0.5
  - Level 3 : 0.2
  - Level 4 : 0.1
  - Level 5 : 0.04
  - Level 6 : 0.02
  - Level 7 : 0.013333

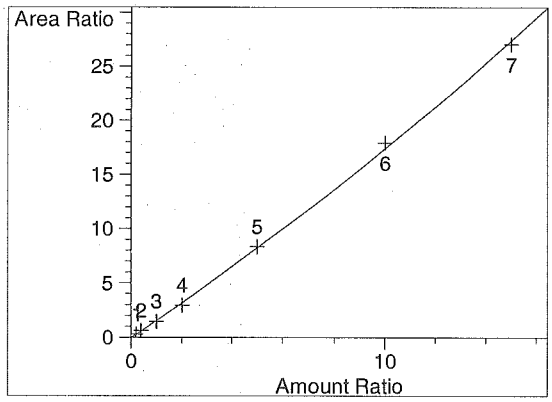
Compound: CLO4-85
- Time Window : From 6.650 min To 12.505 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 0.5
  - Level 3 : 0.2
  - Level 4 : 0.1
  - Level 5 : 0.04
  - Level 6 : 0.02
  - Level 7 : 0.013333

Compound: CLO4-89-ISTD
- Time Window : From 6.659 min To 12.466 min
- Curve Type : Linear
- Origin : Included
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 1
  - Level 3 : 1
  - Level 4 : 1
  - Level 5 : 1
  - Level 6 : 1
  - Level 7 : 1

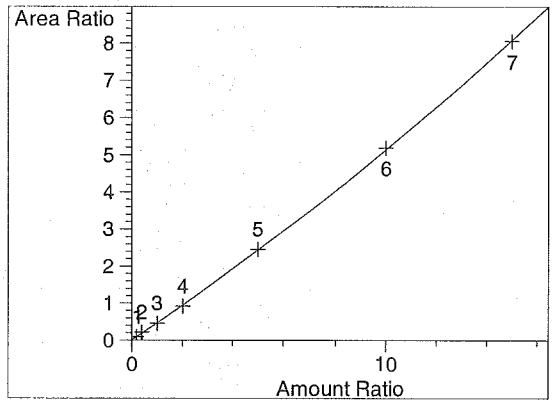
Peak Sum Table

No Entries in table

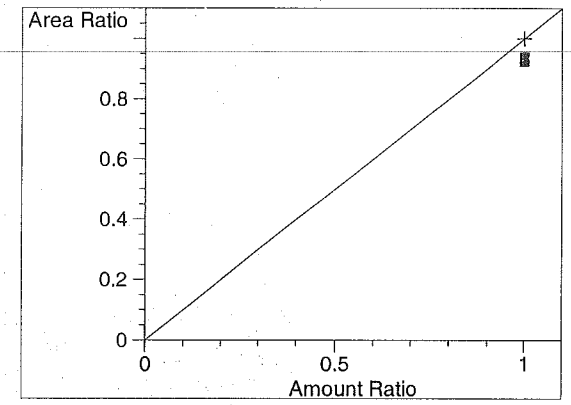
Calibration Curves



Perchlorate at exp. RT: 8.744
MSD1 83, EIC=82.7:83.7
Correlation: 0.99957
Residual Std. Dev.: 0.30744
Formula: $y = ax^2 + bx + c$
a: 1.76988e-2
b: 1.56480
c: -4.92430e-2
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.5
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.013333



CLO4-85 at exp. RT: 8.755
MSD1 85, EIC=84.7:85.7
Correlation: 0.99983
Residual Std. Dev.: 0.03473
Formula: $y = ax^2 + bx + c$
a: 5.13396e-3
b: 4.62055e-1
c: 4.97209e-4
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.5
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.013333



CLO4-89-ISTD at exp. RT: 8.766
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 1 : 1
Level 2 : 1
Level 3 : 1
Level 4 : 1
Level 5 : 1
Level 6 : 1
Level 7 : 1

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP2.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	7.76074e4	8.744	1.06245
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	1.35273e5	8.992	2.06969
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	3.37764e5	8.586	4.73474
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	6.83454e5	8.698	9.27727
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.08433e6	8.451	25.29036
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	4.13334e6	8.810	51.36844
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	5.99313e6	8.586	74.16754
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	7.34719e5	8.702	9.25940

#	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.36780e4	8.755	9.30535e-1
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	4.69486e4	9.012	2.24255
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	1.06124e5	8.602	4.86656
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.13523e5	8.713	9.64312
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	6.14295e5	8.468	25.12159
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	1.19814e6	8.825	50.46721
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	1.78355e6	8.603	74.72019
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.27495e5	8.721	9.54024

#	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	2.73208e5	8.766	5.00000
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	2.24886e5	9.012	5.00000
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	2.33196e5	8.609	5.00000
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.34454e5	8.716	5.00000
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.50568e5	8.472	5.00000
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	2.30977e5	8.825	5.00000
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	2.21504e5	8.610	5.00000
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.52544e5	8.725	5.00000

*** End of Report ***

Sequence Table:

Method and Injection Info Part:

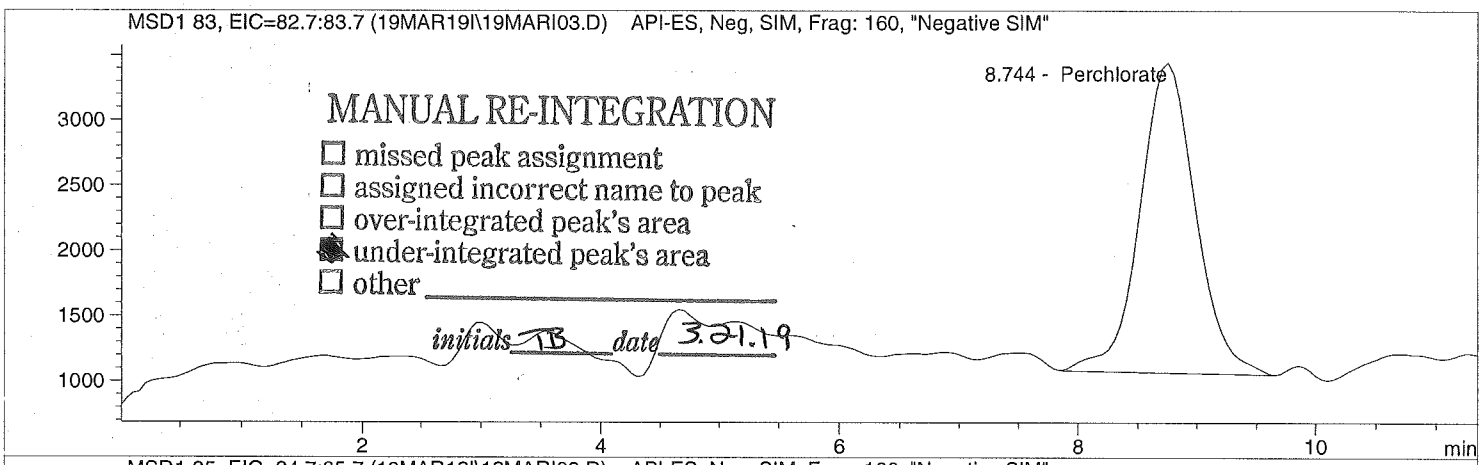
Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	CLO4@ 0.2ug/L	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	CLO4@ 0.5ug/L	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	CLO4@ 1.0ug/L	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	CLO4@ 2.0ug/L	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	CLO4@ 5.0ug/L	CLO4-AQN	1	Ctrl Samp		
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 80	ICAL Verf@10ug/L	CLO4-AQN	1	Ctrl Samp		

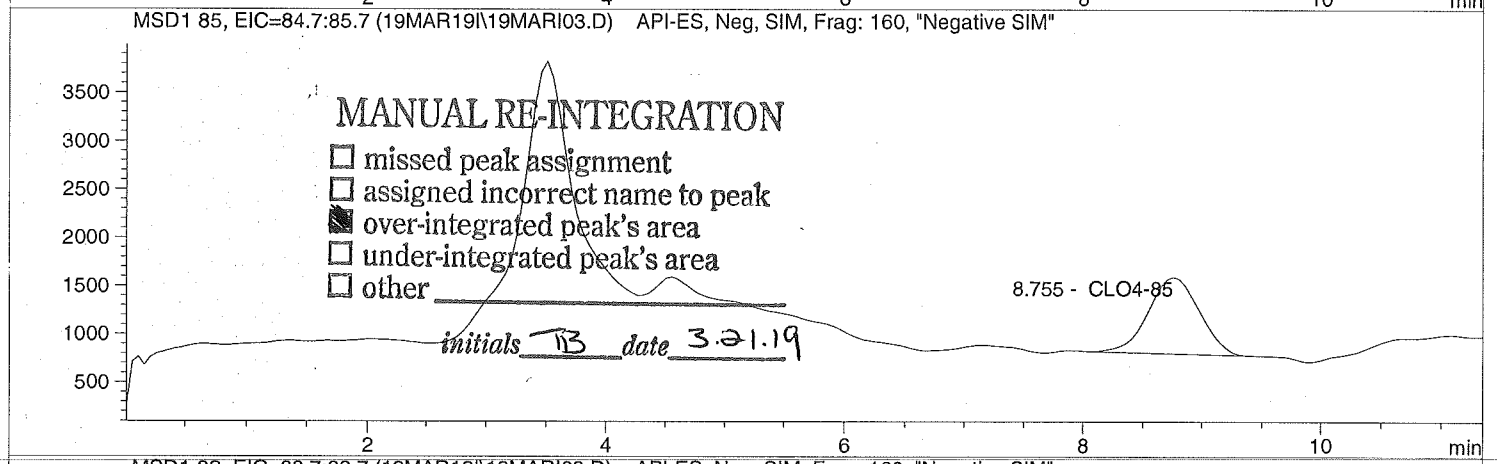
Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

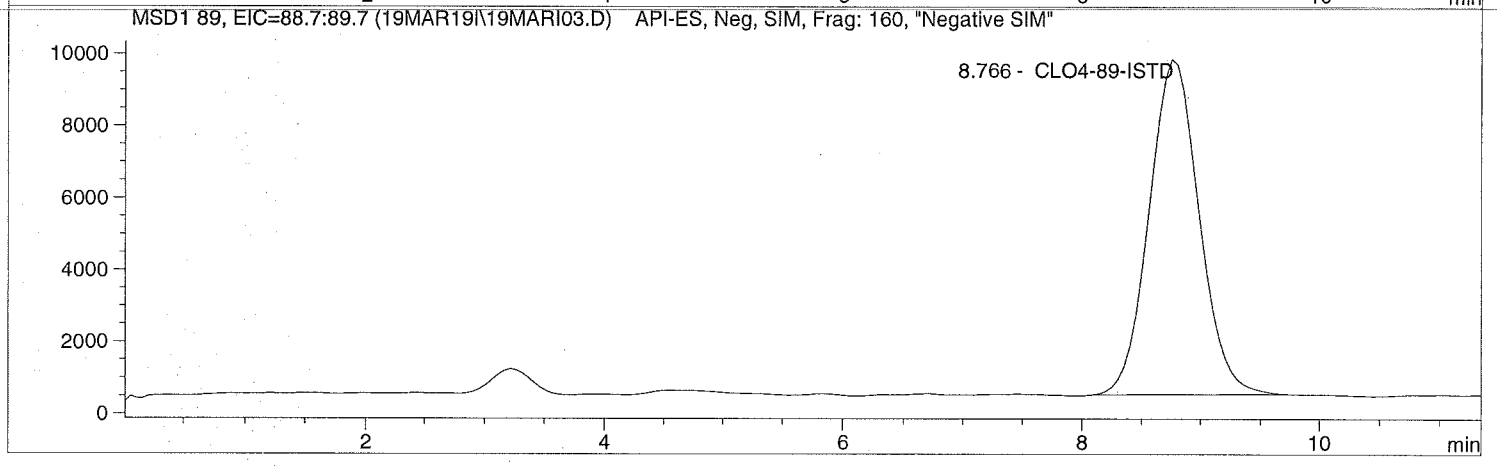
Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 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
8.744	MM	77607.4	1.0625	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	MM	23678.0	0.9305	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

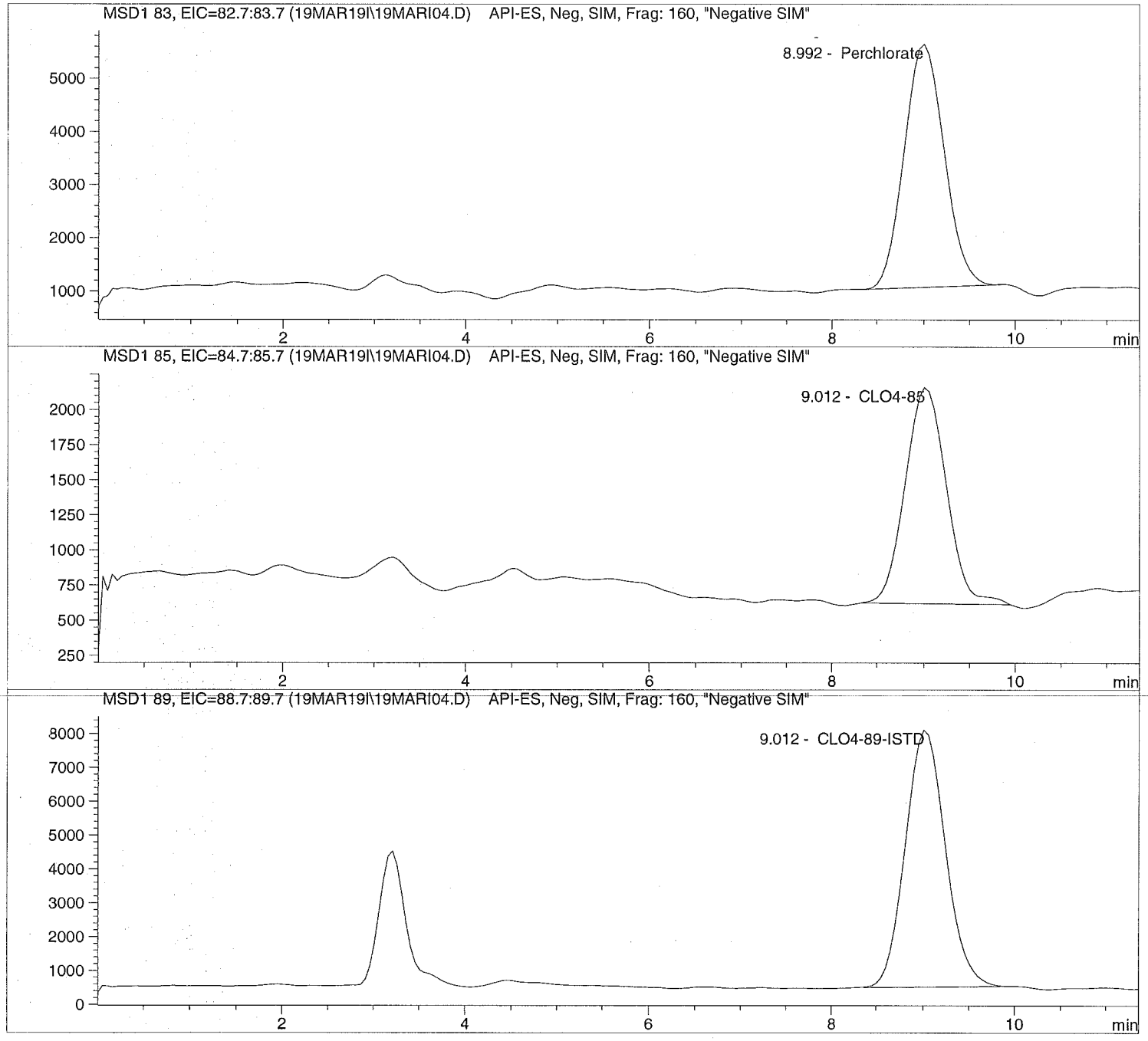
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	3/19/2019 09:53:00	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	3/19/2019 09:53:00	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 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
8.992	BBA	135272.8	2.0697	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	46948.6	2.2425	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	224885.9	5.0000	CLO4-89-ISTD

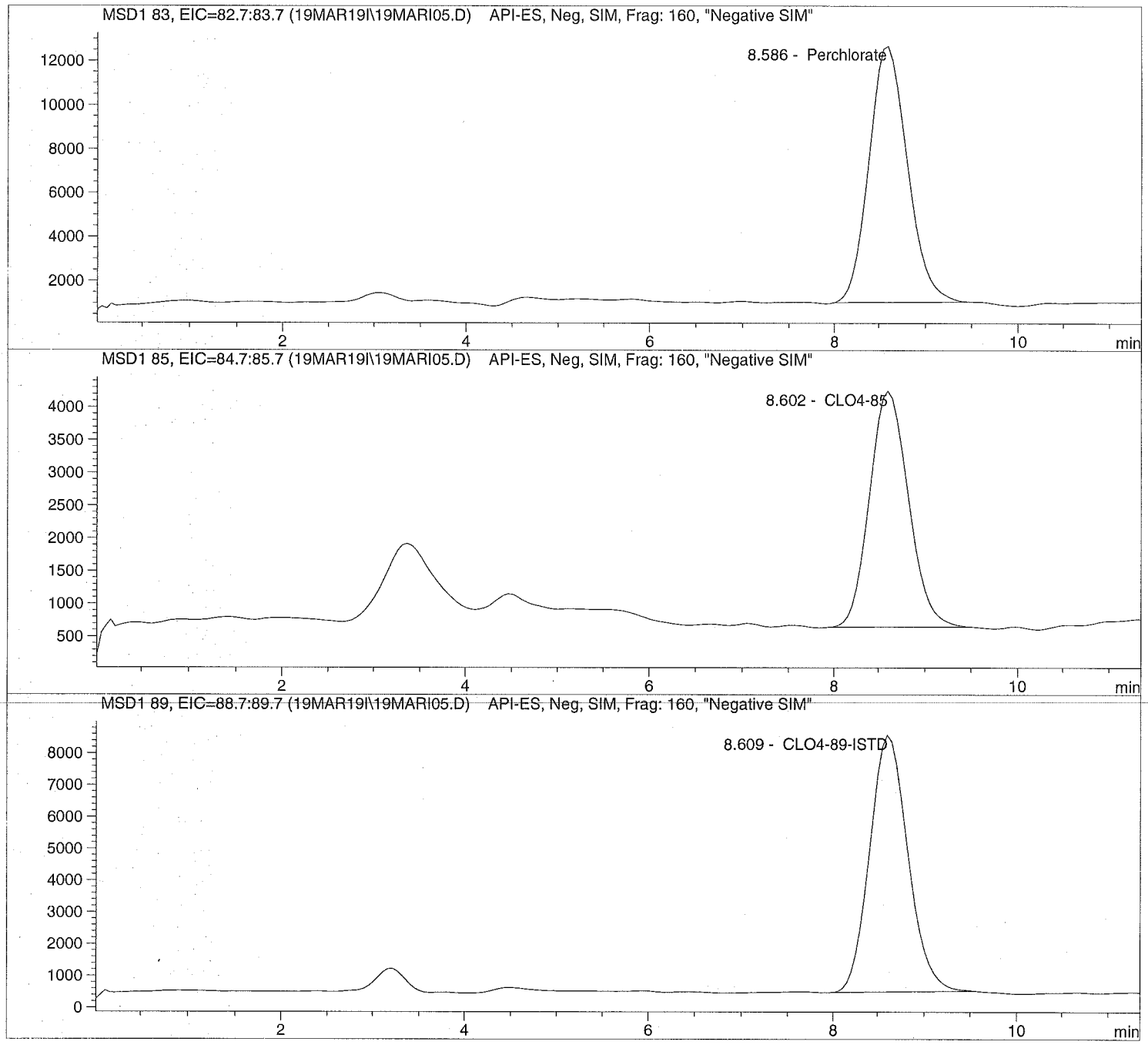
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	3/19/2019 10:06:16	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	3/19/2019 10:06:16	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 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
8.586	PBA	337763.6	4.7347	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.602	PBA	106124.0	4.8666	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.609	PBA	233196.3	5.0000	CLO4-89-ISTD

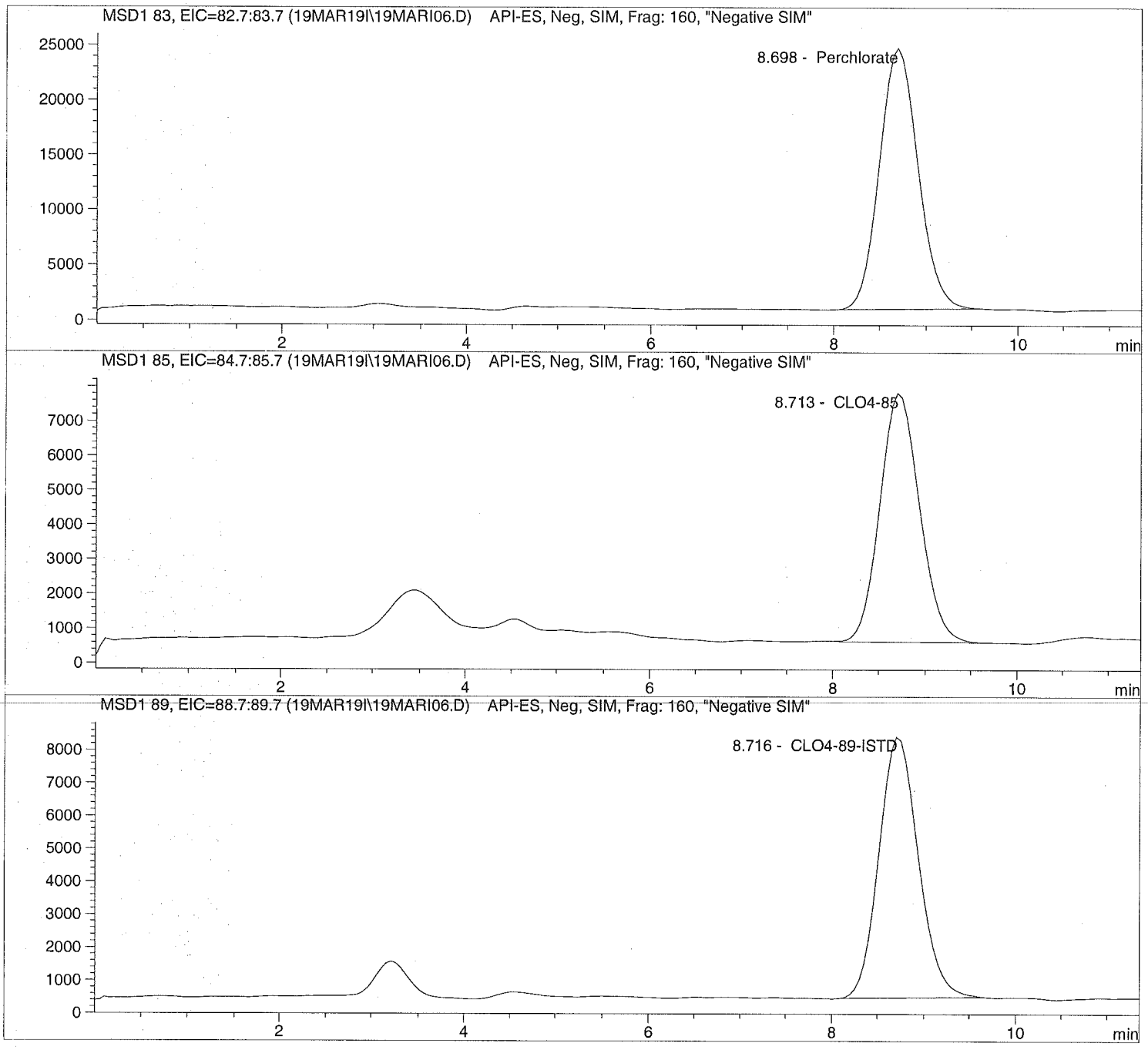
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	3/19/2019 10:19:32	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	3/19/2019 10:19:32	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 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
8.698	PBA	683454.4	9.2773	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.713	BBA	213522.6	9.6431	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.716	PBA	234453.6	5.0000	CLO4-89-ISTD

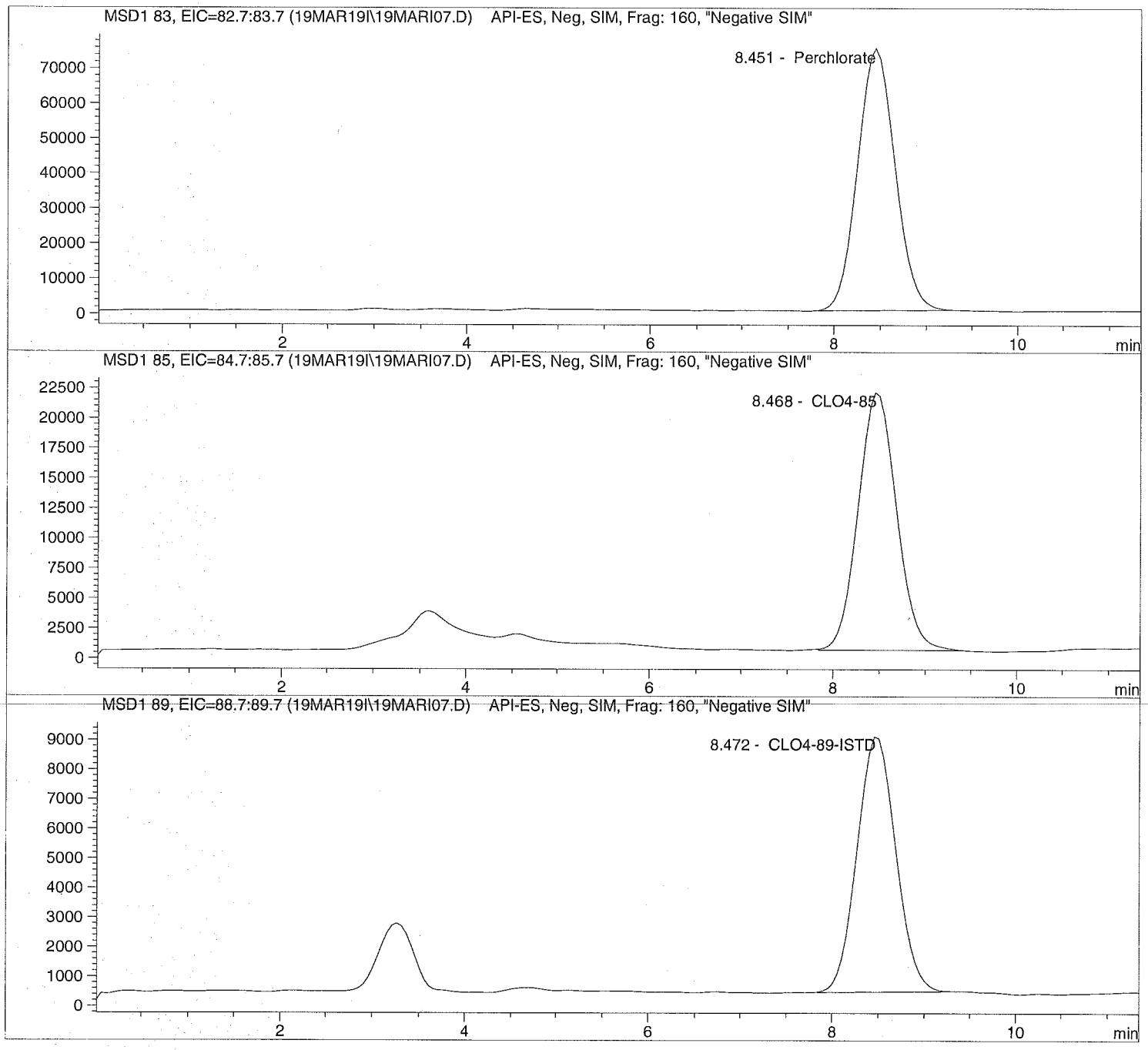
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	3/19/2019 10:32:49	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	3/19/2019 10:32:49	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 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
8.451	PBA	2084327.4	25.2904	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.468	BBA	614294.8	25.1216	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.472	BBA	250568.0	5.0000	CLO4-89-ISTD

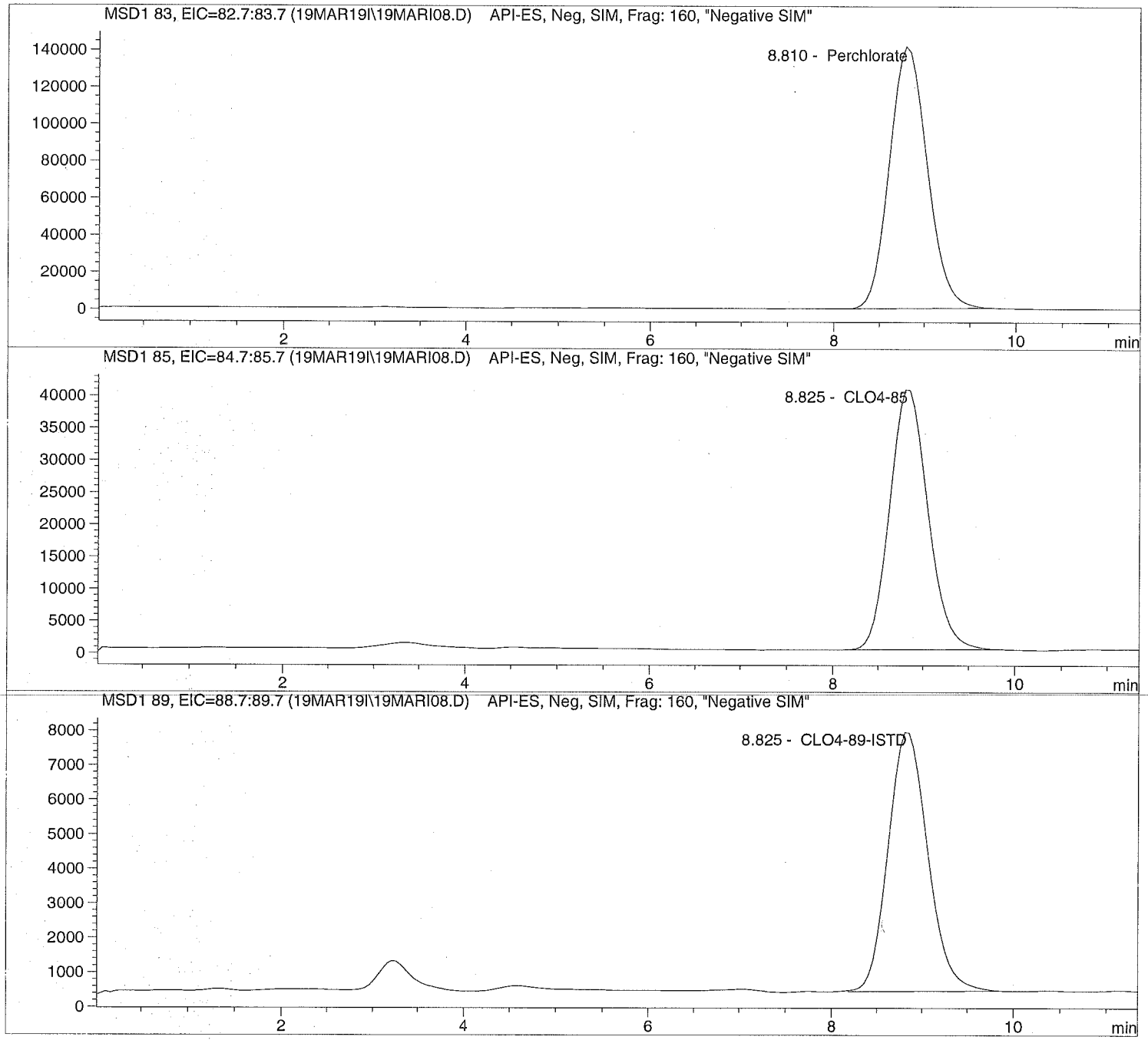
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	3/19/2019 10:46:05	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	3/19/2019 10:46:05	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 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
8.810	PBA	4133340.5	51.3684	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	1198135.6	50.4672	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	230976.7	5.0000	CLO4-89-ISTD

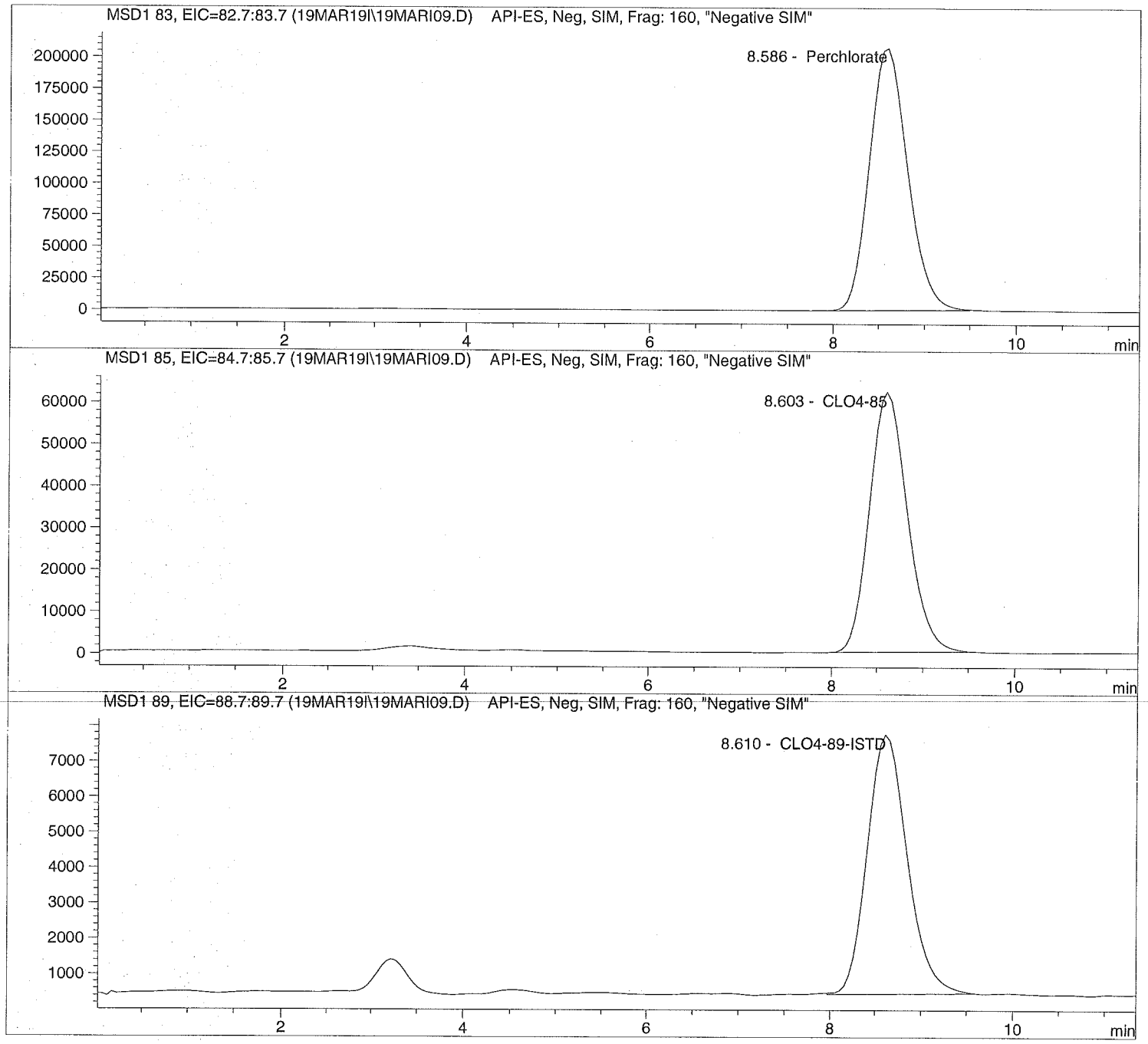
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	3/19/2019 10:59:22	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	3/19/2019 10:59:22	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 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
8.586	PBA	5993128.0	74.1675	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.603	PBA	1783554.4	74.7202	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.610	BBA	221504.5	5.0000	CLO4-89-ISTD

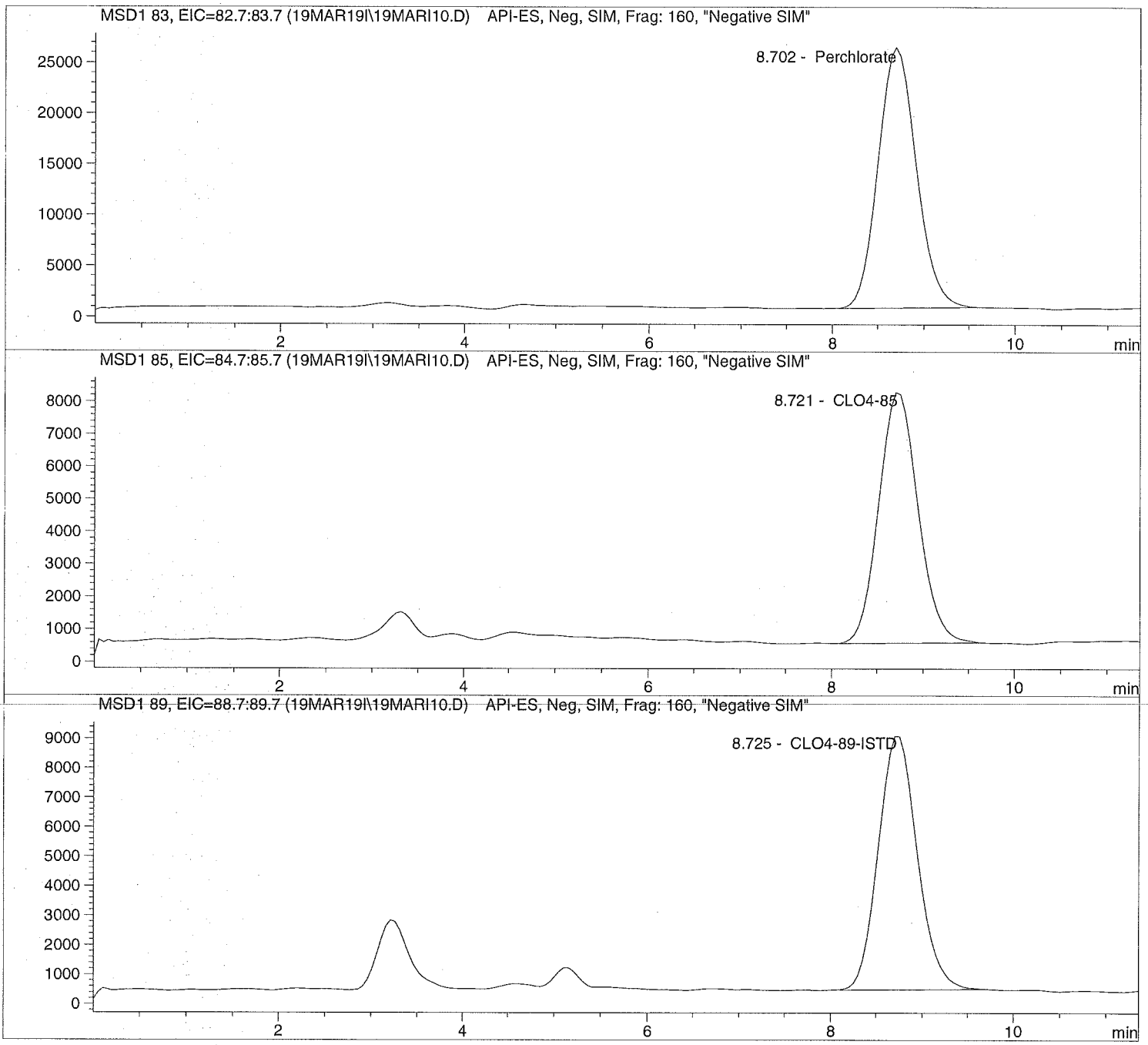
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L

Injection Date:	3/19/2019 11:12:42	Seq Line:	10
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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L

Injection Date:	3/19/2019 11:12:42	Seq Line:	10
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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 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
8.702	PBA	734718.7	9.2594	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.721	PBA	227494.7	9.5402	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.725	BBA	252544.4	5.0000	CLO4-89-ISTD

*** End of Report ***



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

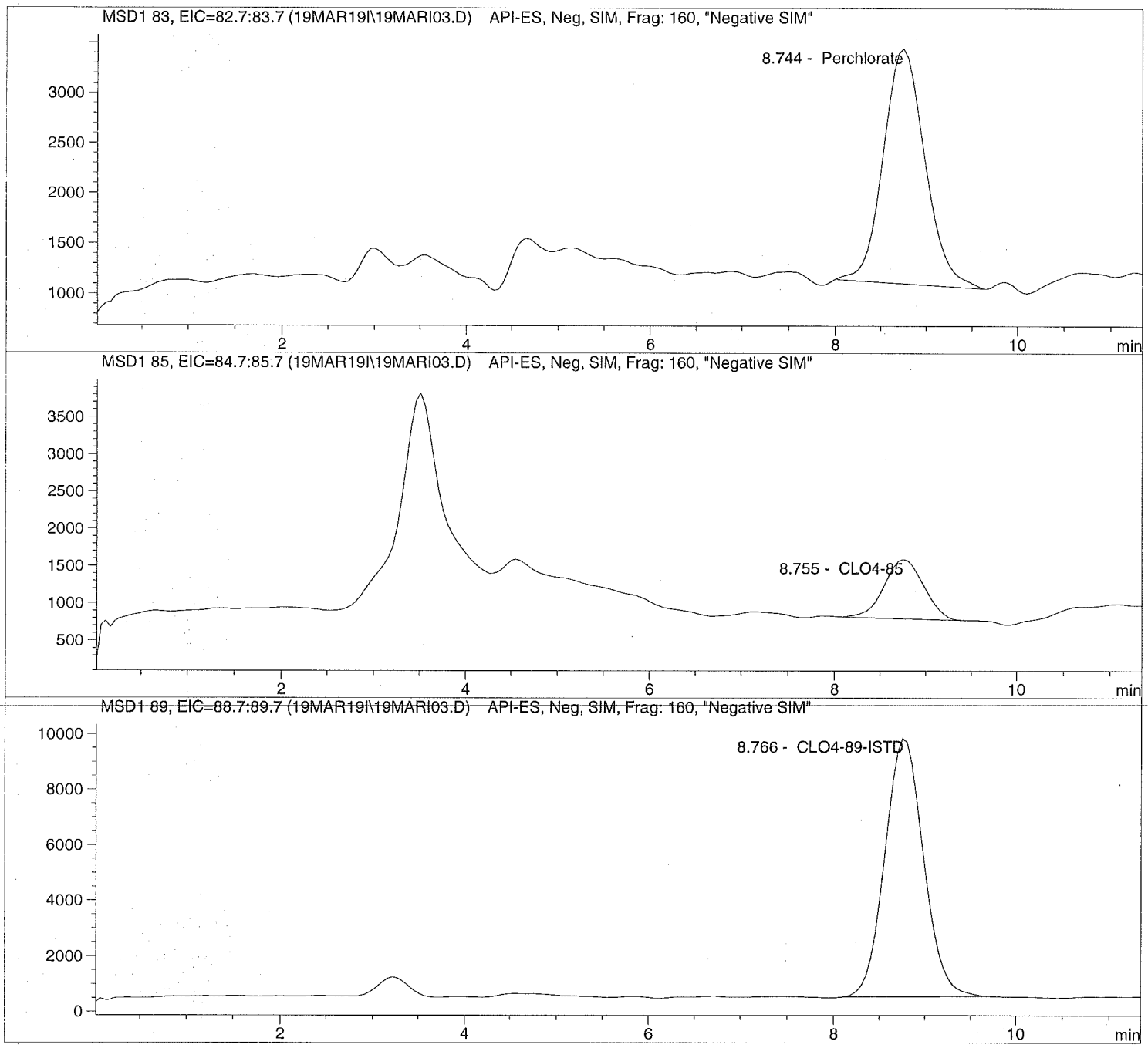
Unmodified

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	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-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	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-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 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
8.744	BBA	74166.3	1.0224	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	BBA	24138.1	0.9487	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

*** End of Report ***

ALS Houston, US Date: 17-jun-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples
Work Order: HS19051856

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19051856-01	LH18/24-SP650_052919	Water		29-May-2019 14:00	31-May-2019 08:37	☐
HS19051856-02	LH18/24-SP650_052919_BIX	Water		29-May-2019 14:00	31-May-2019 08:37	☐

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc. **CASE NARRATIVE**
Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples
Work Order:

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 Kelso,WA. Final report attached.

Wet Chemistry by Method E350.3

Batch ID: R340032

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

Wet Chemistry by Method E365.3

Batch ID: R339834

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

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**

Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples WorkOrder:HS19051856

Sample ID: LH18/24-SP650_052919 Lab ID:HS19051856-01

Collection Date: 29-May-2019 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)	**10.0**		**0.20**	**0.10**	**0.20**	**mg/L**	1	07-Jun-2019 10:45
ORTHO PHOSPHATE (PO4) AS P BY E365.3		**Method:E365.3**						Analyst: KVL
Phosphorus, Total Orthophosphate (As P)	**2.21**		**0.100**	**0.200**	**0.250**	**mg/L**	10	31-May-2019 12:43
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	11-Jun-2019 09:29

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

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**

Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples WorkOrder:HS19051856

Sample ID: LH18/24-SP650_052919_BIX Lab ID:HS19051856-02

Collection Date: 29-May-2019 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 Atttached**		**0**	**0**	**0**	**NA**	1	17-Jun-2019 18:06

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

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples
WorkOrder: HS19051856

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID R339834	**Test Name :** ORTHO PHOSPHATE (PO4) AS P BY E365.3			**Matrix:** Water		
HS19051856-01	LH18/24-SP650_052919	29 May 2019 14:00			31 May 2019 12:43	10
Batch ID R340032	**Test Name :** AMMONIA AS N BY E350.3(ISE)			**Matrix:** Water		
HS19051856-01	LH18/24-SP650_052919	29 May 2019 14:00			07 Jun 2019 10:45	1
Batch ID R340200	**Test Name :** SUBCONTRACT ANALYSIS - TOC ANALYSIS			**Matrix:** Water		
HS19051856-01	LH18/24-SP650_052919	29 May 2019 14:00			11 Jun 2019 09:29	1
Batch ID R340666	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			**Matrix:** Water		
HS19051856-02	LH18/24-SP650_052919_BIX	29 May 2019 14:00			17 Jun 2019 18:06	1

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples
WorkOrder: HS19051856

QC BATCH REPORT

Batch ID: R339834 (0) **Instrument:** UV-2450 **Method:** ORTHO PHOSPHATE (PO4) AS P BY E365.3

MBLK Sample ID: **MBLK-339834** Units: **mg/L** Analysis Date: **31-May-2019 12:43**
Client ID: Run ID: **UV-2450_339834** SeqNo: **5107837** 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)	0.0200	0.0250								U

LCS Sample ID: **LCS-339834** Units: **mg/L** Analysis Date: **31-May-2019 12:43**
Client ID: Run ID: **UV-2450_339834** SeqNo: **5107838** 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)	0.247	0.0250	0.25	0	98.8	85 - 115				

MS Sample ID: **HS19051856-01MS** Units: **mg/L** Analysis Date: **31-May-2019 12:43**
Client ID: **LH18/24-SP650_052919** Run ID: **UV-2450_339834** SeqNo: **5107840** 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)	4.8	0.250	2.5	2.21	104	80 - 120				

MSD Sample ID: **HS19051856-01MSD** Units: **mg/L** Analysis Date: **31-May-2019 12:43**
Client ID: **LH18/24-SP650_052919** Run ID: **UV-2450_339834** SeqNo: **5107841** 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)	4.71	0.250	2.5	2.21	100	80 - 120	4.8	1.89	20	

The following samples were analyzed in this batch: HS19051856-01

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples
WorkOrder: HS19051856

QC BATCH REPORT

Batch ID: R340032 (0) **Instrument: WetChem_HS** **Method: AMMONIA AS N BY E350.3(ISE)**

MBLK Sample ID: **MBLK-R340032** Units: **mg/L** Analysis Date: **07-Jun-2019 10:45**
Client ID: Run ID: **WetChem_HS_340032** SeqNo: **5111522** 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-R340032** Units: **mg/L** Analysis Date: **07-Jun-2019 10:45**
Client ID: Run ID: **WetChem_HS_340032** SeqNo: **5111521** 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)	10.54	0.20	10	0	105	80 - 120				

MS Sample ID: **HS19051885-01MS** Units: **mg/L** Analysis Date: **07-Jun-2019 10:45**
Client ID: Run ID: **WetChem_HS_340032** SeqNo: **5111524** 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	0.2668	104	80 - 120				

MSD Sample ID: **HS19051885-01MSD** Units: **mg/L** Analysis Date: **07-Jun-2019 10:45**
Client ID: Run ID: **WetChem_HS_340032** SeqNo: **5111523** 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)	10.64	0.20	10	0.2668	104	80 - 120	10.69	0.469	20	

The following samples were analyzed in this batch: HS19051856-01

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples
WorkOrder: **HS19051856**

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
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Dept of Defense	ANAB L2231	20-Dec-2021
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019
North Carolina	624-2019	31-Dec-2019
Maryland	343, 2018-2019	30-Jun-2019
Arkansas	19-028-0	27-Mar-2020
Texas	TX104704231-19-23	30-Apr-2020

ALS Houston, US Date: 17-jun-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples
Work Order: HS19051856

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19051856-01	LH18/24-SP650_052919	Login	31/05/2019 11:02:42	PMG	WET161
HS19051856-01	LH18/24-SP650_052919	Login	31/05/2019 11:02:42	PMG	WET161
HS19051856-01	LH18/24-SP650_052919	Login	31/05/2019 11:02:42	PMG	Sub
HS19051856-02	LH18/24-SP650_052919_BIX	Login	31/05/2019 11:02:42	PMG	Sub

ALS Houston, US Date: 17-Jun-19

Sample Receipt Checklist

Client Name: Bhate Environmental
Work Order: HS19051856
Date/Time Received: **31-May-2019 08:37**
Received by: **JRM**

Checklist completed by: *Paresh M. Giga* eSignature 31-May-2019 Date
Reviewed by: *RJ Modashia* eSignature 31-May-2019 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):	2.3c U/C	IR11
Cooler(s)/Kit(s):	44407	
Date/Time sample(s) sent to storage:	5/31/19 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 Modshia

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	Analyses: AMMONIA-N	TOTAL ORGANIC CARBON	ORTHO-PHOSPHATE	PERCHLORATE	Remarks (Preservatives, etc.)	Lab I.D.#
LH18/24-SP650_052919	Water	05/29/19 / 14:00		2	X	X			H2SO4	
LH18/24-SP650_052919	Water	05/29/19 / 14:00		1			X		NONE	
LH18/24-SP650_052919_BIX	Water	05/29/19 / 14:00		1					NONE	

HS19051856

Bhate Environmental Associates, Inc.
18/24 Longhorn GW Treatment Plant Weekly Sampl

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	05/29/19	14:30									

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition
J. Hubbard	5/31/19	08:37							

Remarks: Cooler 44407
Temp 2.3
1211 CFO.0

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

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

44407

CUSTODY SEAL

Date: 5/29/19 Time: 1400
Name: Scott Beesinger
Company: Bhate

Seal Broken By:
Date: 05/31/19

44407 MAY 31 2019

Must Deliver Next Business Day
Time and Tempature Sensitive!

44407

917 B03 1 10:30 A

8290 05:31

ORIGIN ID SCOTT BEESI BHATE ENVIRON 1203-B EAST GR AVE. PMB202 930-6193
MARSHALL, TX 75670
UNITED STATES US

SHIP DATE: 21SEP18
ACTWGT: 1.00 LB MAN
CAD: 3001307CAFE3211

TO CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099
(281) 530--5656
REF: LHAAP 58 - RJ
RMA:

FedEx Express

TRK# 4380 9532 8290

RETURNS MON-SAT
PRIORITY OVERNIGHT

77099

FedEx
TRK# 4380 9532 8290

FRI 31 MAY 10:30A
PRIORITY OVERNIGHT

AB SGRA

77099
TX-US
IAH

ALS Environmental
ALS Group USA, Corp
1317 South 13th Avenue
Kelso, WA 98626
T : +1 360 577 7222
F : +1 360 636 1068
www.alsglobal.com

June 10, 2019

Analytical Report for Service Request No: K1905066

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

RE: HS19051856

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory June 01, 2019
For your reference, these analyses have been assigned our service request number **K1905066.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please contact me if you have any questions. My extension is 3350. You may also contact me via email at Kelley.Lovejoy@alsglobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Kelley Lovejoy

Kelley Lovejoy
Project Manager

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Environmental
ALS Group USA, Corp
1317 South 13th Avenue
Kelso, WA 98626
T : +1 360 577 7222
F : +1 360 636 1068
www.alsglobal.com

Table of Contents

Acronyms
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State Certifications, Accreditations, And Licenses
Case Narrative
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Raw Data
    General Chemistry

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated value.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.
H	The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

Metals Data Qualifiers

#	The control limit criteria is not applicable. See case narrative.
J	The result is an estimated value.
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
M	The duplicate injection precision was not met.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
S	The reported value was determined by the Method of Standard Additions (MSA).
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
+	The correlation coefficient for the MSA is less than 0.995.
Q	See case narrative. One or more quality control criteria was outside the limits.

Organic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
A	A tentatively identified compound, a suspected aldol-condensation product.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
C	The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
D	The reported result is from a dilution.
E	The result is an estimated value.
J	The result is an estimated value.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
P	The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.

Additional Petroleum Hydrocarbon Specific Qualifiers

F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
Y	The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
Z	The chromatographic fingerprint does not resemble a petroleum product.

ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso
State Certifications, Accreditations, and Licenses

Agency	Web Site	Number
Alaska DEH	http://dec.alaska.gov/eh/lab/cs/csapproval.htm	UST-040
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0339
Arkansas - DEQ	http://www.adeq.state.ar.us/techsvs/labcert.htm	88-0637
California DHS (ELAP)	http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx	2795
DOD ELAP	http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm	L16-58-R4
Florida DOH	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E87412
Hawaii DOH	http://health.hawaii.gov/	-
ISO 17025	http://www.pjlabs.com/	L16-57
Louisiana DEQ	http://www.deq.louisiana.gov/page/la-lab-accreditation	03016
Maine DHS	http://www.maine.gov/dhhs/	WA01276
Minnesota DOH	http://www.health.state.mn.us/accreditation	053-999-457
Nevada DEP	http://ndep.nv.gov/bsdw/labservice.htm	WA01276
New Jersey DEP	http://www.nj.gov/dep/enforcement/oqa.html	WA005
New York - DOH	https://www.wadsworth.org/regulatory/elap	12060
North Carolina DEQ	https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification	605
Oklahoma DEQ	http://www.deq.state.ok.us/CSDnew/labcert.htm	9801
Oregon – DEQ (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	WA100010
South Carolina DHEC	http://www.scdhec.gov/environment/EnvironmentalLabCertification/	61002
Texas CEQ	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704427
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C544
Wyoming (EPA Region 8)	https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water-	-
Kelso Laboratory Website	www.alsglobal.com	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at www.ALSGlobal.com or at the accreditation bodies web site.
Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/anlayte is offered by that state.

Case Narrative

ALS Environmental—Kelso Laboratory
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ALS Environmental

Client: ALS Environmental - US
Project: HS19051856
Sample Matrix: Water

Service Request: K1905066
Date Received: 06/01/2019

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples for the Tier level IV requested by the client.

Sample Receipt:

One water sample was received for analysis at ALS Environmental on 06/01/2019. 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 06/10/2019

Chain of Custody

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F: +1 281 530 5887
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Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID:** **11496**

SUBCONTRACT TO:

ALS Environmental Kelso
1317 S. 13th Avenue
Kelso, WA 98626

Phone: +1 360 501 3312

KL90506b

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:	HS19051856
TSR:	Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS19051856-01**	**LH18/24-SP650_052919**	**Water**	**29 May 2019 14:00**
	TOC Analysis for DOD Level IV			10 Jun 2019

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

QC Level: DOD IV (DoD Data Package)

Relinquished By: _____ Date/Time: 5/31/19 1800

Received By: _____ Date/Time: 6/1/19 1010

Cooler ID(s): _____ Temperature(s): _____

00939220

PC KV

Cooler Receipt and Preservation Form

Client ALS / Houston Service Request *K19* 050660

Received: 6/1/19 Opened: 6/1/19 By: [signature] Unloaded: 6/1/19 By: [signature]

1. Samples were received via? *USPS* (*Fed Ex*) *UPS* *DHL* *PDX* *Courier* *Hand Delivered*
2. Samples were received in: (circle) (*Cooler*) *Box* *Envelope* *Other* _____ *NA*
3. Were custody seals on coolers? NA (Y) N If yes, how many and where? 2, front
   If present, were custody seals intact? (Y) N If present, were they signed and dated? (Y) N

Raw Cooler Temp	Corrected Cooler Temp	Raw Temp Blank	Corrected Temp Blank	Corr. Factor	Thermometer ID	Cooler/COC ID NA	Tracking Number NA	Filed
-0.5	-0.4	1.2	1.3	+0.1	360	11496	4809 7834 6662	

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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ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	K1905066
Project:	HS19051856	**Date Collected:**	05/29/19
Sample Matrix:	Water	**Date Received:**	06/1/19
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_052919	K1905066-001	**2.12**	0.50	0.20	0.07	1	06/04/19 18:18	
Method Blank	K1905066-MB	ND U	0.50	0.20	0.07	1	06/04/19 13:46	

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K1905066
Project	HS19051856	**Date Collected:**	05/29/19
Sample Matrix:	Water	**Date Received:**	06/01/19
		Date Analyzed:	06/04/19

Replicate Sample Summary
General Chemistry Parameters

Sample Name:	LH18/24-SP650_052919	**Units:**	mg/L
Lab Code:	K1905066-001	**Basis:**	NA

Analyte Name	Analysis Method	LOQ	LOD	MDL	Sample Result	Duplicate Sample K1905066-001DUP Result	Average	RPD	RPD Limit
Carbon, Total Organic	SM 5310 C	0.50	0.20	0.07	2.12	2.14	2.13	<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:**	K1905066
Project:	HS19051856	**Date Analyzed:**	06/04/19
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:	638040

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K1905066-LCS	25.2	25.0	101	83-117

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US **Service Request:** K1905066
Project: HS19051856

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	638040	KQ1907639-01	06/04/19 13:17	25.0	24.6	98	90-110
CCV2	638040	KQ1907639-02	06/04/19 17:20	25.0	24.6	99	90-110
CCV3	638040	KQ1907639-03	06/04/19 22:30	25.0	24.2	97	90-110
CCV4	638040	KQ1907639-04	06/05/19 03:14	25.0	24.4	98	90-110

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US **Service Request:**K1905066
Project: HS19051856

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	638040	KQ1907639-05	06/04/19 13:32	0.50	0.20	0.07	ND	U
CCB2	638040	KQ1907639-06	06/04/19 17:34	0.50	0.20	0.07	ND	U
CCB3	638040	KQ1907639-07	06/04/19 22:45	0.50	0.20	0.07	ND	U
CCB4	638040	KQ1907639-08	06/05/19 03:28	0.50	0.20	0.07	ND	U

Raw Data

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General Chemistry

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Work Request # Original (K190) 5047, 5066, 4849, 4850, 4848, 4853, 4986, 5084, 5062, 5063, 5032, II

Tier: II IV I I IV IV I II III IV 5029, I

Date Analyzed: 6/4/19 TOC: 638040, 638042, 638044

Analyst: HLM Run # DOC: 638047

Analysis: TOC/DOC 5050 I

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:
K1904853-1/1dup present a high RPD of 24%. however, sample concentration is less than 5x MRL.

Final Approved by: _____ Date: 06/07/19

DQREPORT

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** HMIRENTA **Analysis Lot:** 638040 **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
K1904848-001	Carbon, Total Organic	N/A		Surface Water	1.29 mg/L	10 mL	1.29 mg/L	1	0.07	0.50			6/5/19 00:53:00	N	IV
K1904848-002	Carbon, Total Organic	N/A		Surface Water	0.63 mg/L	10 mL	0.63 mg/L	1	0.07	0.50			6/5/19 01:22:00	N	IV
K1904849-001	Carbon, Total Organic	N/A		Water	2.22 mg/L	10 mL	2.22 mg/L	1	0.07	0.50			6/4/19 18:46:00	N	I
K1904849-002	Carbon, Total Organic	N/A		Water	2.76 mg/L	10 mL	2.76 mg/L	1	0.07	0.50			6/4/19 19:14:00	N	I
K1904849-003	Carbon, Total Organic	N/A		Water	4.33 mg/L	10 mL	4.33 mg/L	1	0.07	0.50			6/4/19 19:42:00	N	I
K1904849-004	Carbon, Total Organic	N/A		Water	8.74 mg/L	10 mL	34.9 mg/L	4	0.3	2.0			6/4/19 20:10:00	N	I
K1904849-005	Carbon, Total Organic	N/A		Water	0.74 mg/L	10 mL	0.74 mg/L	1	0.07	0.50			6/4/19 20:38:00	N	I
K1904849-006	Carbon, Total Organic	N/A		Water	9.01 mg/L	10 mL	9.01 mg/L	1	0.07	0.50			6/4/19 21:06:00	N	I
K1904850-001	Carbon, Total Organic	N/A		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/4/19 21:34:00	N	I
K1904850-002	Carbon, Total Organic	N/A		Water	0.20 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/4/19 22:02:00	N	I
K1904850-003	Carbon, Total Organic	N/A		Water	0.30 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/4/19 23:29:00	N	I
K1904850-004	Carbon, Total Organic	N/A		Water	3.09 mg/L	10 mL	3.09 mg/L	1	0.07	0.50			6/4/19 23:57:00	N	I
K1904850-005	Carbon, Total Organic	N/A		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/5/19 00:25:00	N	I
K1905047-001	Carbon, Total Organic	N/A		Water	1.54 mg/L	10 mL	1.54 mg/L	1	0.07	0.50			6/4/19 14:30:00	N	II
K1905047-002	Carbon, Total Organic	N/A		Water	2.64 mg/L	10 mL	2.64 mg/L	1	0.07	0.50			6/4/19 15:28:00	N	II
K1905047-003	Carbon, Total Organic	N/A		Water	1.92 mg/L	10 mL	1.92 mg/L	1	0.07	0.50			6/4/19 15:56:00	N	II
K1905047-004	Carbon, Total Organic	N/A		Water	2.23 mg/L	10 mL	2.23 mg/L	1	0.07	0.50			6/4/19 16:24:00	N	II
K1905047-005	Carbon, Total Organic	N/A		Water	1.36 mg/L	10 mL	1.36 mg/L	1	0.07	0.50			6/4/19 16:52:00	N	II
K1905047-006	Carbon, Total Organic	N/A		Water	1.63 mg/L	10 mL	1.63 mg/L	1	0.07	0.50			6/4/19 17:49:00	N	II
K1905066-001	Carbon, Total Organic	N/A		Water	2.12 mg/L	10 mL	2.12 mg/L	1	0.07	0.50			6/4/19 18:18:00	N	IV
KQ1907639-01	Carbon, Total Organic	CCV		Water	24.56 mg/L	10 mL	24.6 mg/L	1					6/4/19 13:17:00	N	II
KQ1907639-02	Carbon, Total Organic	CCV		Water	24.65 mg/L	10 mL	24.6 mg/L	1					6/4/19 17:20:00	N	II
KQ1907639-03	Carbon, Total Organic	CCV		Water	24.21 mg/L	10 mL	24.2 mg/L	1					6/4/19 22:30:00	N	II
KQ1907639-04	Carbon, Total Organic	CCV		Water	24.43 mg/L	10 mL	24.4 mg/L	1					6/5/19 03:14:00	N	II
KQ1907639-05	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/4/19 13:32:00	N	II
KQ1907639-06	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/4/19 17:34:00	N	II
KQ1907639-07	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/4/19 22:45:00	N	II
KQ1907639-08	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/5/19 03:28:00	N	II
KQ1907639-09	Carbon, Total Organic	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/4/19 13:46:00	N	II
KQ1907639-10	Carbon, Total Organic	LCS		Water	25.20 mg/L	10 mL	25.2 mg/L	1	0.07	0.50	101		6/4/19 14:01:00	N	II
KQ1907639-11	Carbon, Total Organic	MS	K1905047-001	Water	26.56 mg/L	10 mL	26.6 mg/L	1	0.07	0.50	100		6/4/19 14:59:00	N	II
KQ1907639-12	Carbon, Total Organic	DUP	K1905047-001	Water	1.53 mg/L	10 mL	1.53 mg/L	1	0.07	0.50		1	6/4/19 14:30:00	N	II
KQ1907639-13	Carbon, Total Organic	DUP	K1905047-002	Water	2.71 mg/L	10 mL	2.71 mg/L	1	0.07	0.50		3	6/4/19 15:28:00	N	II
KQ1907639-14	Carbon, Total Organic	DUP	K1905047-003	Water	1.89 mg/L	10 mL	1.89 mg/L	1	0.07	0.50		1	6/4/19 15:56:00	N	II
KQ1907639-15	Carbon, Total Organic	DUP	K1905047-004	Water	2.28 mg/L	10 mL	2.28 mg/L	1	0.07	0.50		2	6/4/19 16:24:00	N	II

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

06/07/19

HLM 6/7/19

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** HMIRENTA **Analysis Lot:** 638040 **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
KQ1907639-16	Carbon, Total Organic	DUP	K1905047-005	Water	1.37 mg/L	10 mL	1.37 mg/L	1	0.07	0.50		1	6/4/19 16:52:00	N	II
KQ1907639-17	Carbon, Total Organic	DUP	K1905047-006	Water	1.60 mg/L	10 mL	1.60 mg/L	1	0.07	0.50		1	6/4/19 17:49:00	N	II
KQ1907639-18	Carbon, Total Organic	DUP	K1905066-001	Water	2.14 mg/L	10 mL	2.14 mg/L	1	0.07	0.50		<1	6/4/19 18:18:00	N	IV
KQ1907639-19	Carbon, Total Organic	DUP	K1904849-001	Water	2.17 mg/L	10 mL	2.17 mg/L	1	0.07	0.50		2	6/4/19 18:46:00	N	I
KQ1907639-20	Carbon, Total Organic	DUP	K1904849-002	Water	2.88 mg/L	10 mL	2.88 mg/L	1	0.07	0.50		4	6/4/19 19:14:00	N	I
KQ1907639-21	Carbon, Total Organic	DUP	K1904849-003	Water	4.31 mg/L	10 mL	4.31 mg/L	1	0.07	0.50		<1	6/4/19 19:42:00	N	I
KQ1907639-22	Carbon, Total Organic	DUP	K1904849-004	Water	8.90 mg/L	10 mL	35.6 mg/L	4	0.3	2.0		2	6/4/19 20:10:00	N	I
KQ1907639-23	Carbon, Total Organic	DUP	K1904849-005	Water	0.69 mg/L	10 mL	0.69 mg/L	1	0.07	0.50		7	6/4/19 20:38:00	N	I
KQ1907639-24	Carbon, Total Organic	DUP	K1904849-006	Water	8.93 mg/L	10 mL	8.93 mg/L	1	0.07	0.50		<1	6/4/19 21:06:00	N	I
KQ1907639-25	Carbon, Total Organic	DUP	K1904850-001	Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	6/4/19 21:34:00	N	I
KQ1907639-26	Carbon, Total Organic	DUP	K1904850-002	Water	0.22 mg/L	10 mL	0.22 mg/L J	1	0.07	0.50		NC	6/4/19 22:02:00	N	I
KQ1907639-27	Carbon, Total Organic	DUP	K1904850-003	Water	0.19 mg/L	10 mL	0.19 mg/L J	1	0.07	0.50		NC	6/4/19 23:29:00	N	I
KQ1907639-28	Carbon, Total Organic	DUP	K1904850-004	Water	3.12 mg/L	10 mL	3.12 mg/L	1	0.07	0.50		1	6/4/19 23:57:00	N	I
KQ1907639-29	Carbon, Total Organic	DUP	K1904850-005	Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	6/5/19 00:25:00	N	I
KQ1907639-30	Carbon, Total Organic	DUP	K1904848-001	Surface Water	1.31 mg/L	10 mL	1.31 mg/L	1	0.07	0.50		2	6/5/19 00:53:00	N	IV
KQ1907639-31	Carbon, Total Organic	DUP	K1904848-002	Surface Water	0.60 mg/L	10 mL	0.60 mg/L	1	0.07	0.50		6	6/5/19 01:22:00	N	IV

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

HLM 6/7/19

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** HMIRENTA **Analysis Lot:** 638042 **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
K1904848-003	Carbon, Total Organic	N/A		Surface Water	3.55 mg/L	10 mL	3.55 mg/L	1	0.07	0.50			6/5/19 01:50:00	N	IV
K1904848-004	Carbon, Total Organic	N/A		Surface Water	10.98 mg/L	10 mL	11.0 mg/L	1	0.07	0.50			6/5/19 02:18:00	N	IV
K1904848-005	Carbon, Total Organic	N/A		Surface Water	4.90 mg/L	10 mL	9.8 mg/L	2	0.2	1.0			6/5/19 02:46:00	N	IV
K1904848-006	Carbon, Total Organic	N/A		Surface Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/5/19 03:43:00	N	IV
K1904848-007	Carbon, Total Organic	N/A		Surface Water	4.37 mg/L	10 mL	8.7 mg/L	2	0.2	1.0			6/5/19 04:40:00	N	IV
K1904848-008	Carbon, Total Organic	N/A		Surface Water	9.38 mg/L	10 mL	9.38 mg/L	1	0.07	0.50			6/5/19 05:09:00	N	IV
K1904853-001	Carbon, Total Organic	N/A		Water	0.17 mg/L	10 mL	0.17 mg/L J	1	0.07	0.50			6/5/19 05:37:00	N	IV
K1904986-001	Carbon, Total Organic	N/A		Ground Water	8.80 mg/L	10 mL	8.80 mg/L	1	0.07	0.50			6/5/19 06:05:00	N	I
K1904986-002	Carbon, Total Organic	N/A		Ground Water	15.46 mg/L	10 mL	15.5 mg/L	1	0.07	0.50			6/5/19 06:33:00	N	I
K1904986-003	Carbon, Total Organic	N/A		Ground Water	18.27 mg/L	10 mL	18.3 mg/L	1	0.07	0.50			6/5/19 07:01:00	N	I
K1904986-004	Carbon, Total Organic	N/A		Ground Water	21.12 mg/L	10 mL	21.1 mg/L	1	0.07	0.50			6/5/19 07:29:00	N	I
K1904986-005	Carbon, Total Organic	N/A		Ground Water	11.46 mg/L	10 mL	45.8 mg/L	4	0.3	2.0			6/5/19 08:56:00	N	I
K1905062-001	Carbon, Total Organic	N/A		Surface Water	2.91 mg/L	10 mL	2.91 mg/L	1	0.07	0.50			6/5/19 09:52:00	N	III
K1905062-002	Carbon, Total Organic	N/A		Surface Water	2.71 mg/L	10 mL	2.71 mg/L	1	0.07	0.50			6/5/19 10:20:00	N	III
K1905062-003	Carbon, Total Organic	N/A		Surface Water	2.76 mg/L	10 mL	2.76 mg/L	1	0.07	0.50			6/5/19 10:48:00	N	III
K1905062-004	Carbon, Total Organic	N/A		Surface Water	2.61 mg/L	10 mL	2.61 mg/L	1	0.07	0.50			6/5/19 11:16:00	N	III
K1905062-005	Carbon, Total Organic	N/A		Surface Water	2.86 mg/L	10 mL	2.86 mg/L	1	0.07	0.50			6/5/19 11:44:00	N	III
K1905062-006	Carbon, Total Organic	N/A		Surface Water	0.54 mg/L	10 mL	0.54 mg/L	1	0.07	0.50			6/5/19 12:12:00	N	III
K1905062-007	Carbon, Total Organic	N/A		Surface Water	0.53 mg/L	10 mL	0.53 mg/L	1	0.07	0.50			6/5/19 13:10:00	N	III
K1905084-001	Carbon, Total Organic	N/A		Water	6.13 mg/L	10 mL	613 mg/L	100	7	50			6/5/19 09:24:00	N	II
KQ1907640-01	Carbon, Total Organic	CCV		Surface Water	24.21 mg/L	10 mL	24.2 mg/L	1					6/4/19 22:30:00	N	IV
KQ1907640-02	Carbon, Total Organic	CCV		Surface Water	24.43 mg/L	10 mL	24.4 mg/L	1					6/5/19 03:14:00	N	IV
KQ1907640-03	Carbon, Total Organic	CCV		Surface Water	24.47 mg/L	10 mL	24.5 mg/L	1					6/5/19 07:57:00	N	IV
KQ1907640-04	Carbon, Total Organic	CCV		Surface Water	24.37 mg/L	10 mL	24.4 mg/L	1					6/5/19 12:40:00	N	IV

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

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** HMIRENTA **Analysis Lot:** 638042 **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
KQ1907640-05	Carbon, Total Organic	CCV		Surface Water	24.97 mg/L	10 mL	25.0 mg/L	1					6/5/19 17:37:00	N	IV
KQ1907640-06	Carbon, Total Organic	CCB		Surface Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/4/19 22:45:00	N	IV
KQ1907640-07	Carbon, Total Organic	CCB		Surface Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/5/19 03:28:00	N	IV
KQ1907640-08	Carbon, Total Organic	CCB		Surface Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/5/19 08:12:00	N	IV
KQ1907640-09	Carbon, Total Organic	CCB		Surface Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/5/19 12:55:00	N	IV
KQ1907640-10	Carbon, Total Organic	CCB		Surface Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/5/19 17:52:00	N	IV
KQ1907640-11	Carbon, Total Organic	MB		Surface Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/4/19 23:00:00	N	IV
KQ1907640-12	Carbon, Total Organic	LCS		Surface Water	25.09 mg/L	10 mL	25.1 mg/L	1	0.07	0.50	100		6/4/19 23:14:00	N	IV
KQ1907640-14	Carbon, Total Organic	DUP	K1904848-003	Surface Water	3.51 mg/L	10 mL	3.51 mg/L	1	0.07	0.50		1	6/5/19 01:50:00	N	IV
KQ1907640-15	Carbon, Total Organic	DUP	K1904848-004	Surface Water	11.05 mg/L	10 mL	11.1 mg/L	1	0.07	0.50		<1	6/5/19 02:18:00	N	IV
KQ1907640-16	Carbon, Total Organic	DUP	K1904848-005	Surface Water	4.74 mg/L	10 mL	9.5 mg/L	2	0.2	1.0		3	6/5/19 02:46:00	N	IV
KQ1907640-17	Carbon, Total Organic	DUP	K1904848-006	Surface Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	6/5/19 03:43:00	N	IV
KQ1907640-18	Carbon, Total Organic	DUP	K1904848-007	Surface Water	4.27 mg/L	10 mL	8.5 mg/L	2	0.2	1.0		2	6/5/19 04:40:00	N	IV
KQ1907640-19	Carbon, Total Organic	DUP	K1904848-008	Surface Water	9.41 mg/L	10 mL	9.41 mg/L	1	0.07	0.50		<1	6/5/19 05:09:00	N	IV
KQ1907640-20	Carbon, Total Organic	DUP	K1904853-001	Water	0.14 mg/L	10 mL	0.14 mg/L J	1	0.07	0.50		24*	6/5/19 05:37:00	N	IV
KQ1907640-21	Carbon, Total Organic	DUP	K1904986-001	Ground Water	8.70 mg/L	10 mL	8.70 mg/L	1	0.07	0.50		1	6/5/19 06:05:00	N	I
KQ1907640-22	Carbon, Total Organic	DUP	K1904986-002	Ground Water	15.58 mg/L	10 mL	15.6 mg/L	1	0.07	0.50		<1	6/5/19 06:33:00	N	I
KQ1907640-23	Carbon, Total Organic	DUP	K1904986-003	Ground Water	18.12 mg/L	10 mL	18.1 mg/L	1	0.07	0.50		<1	6/5/19 07:01:00	N	I
KQ1907640-24	Carbon, Total Organic	DUP	K1904986-004	Ground Water	20.83 mg/L	10 mL	20.8 mg/L	1	0.07	0.50		1	6/5/19 07:29:00	N	I
KQ1907640-25	Carbon, Total Organic	DUP	K1904986-005	Ground Water	11.34 mg/L	10 mL	45.4 mg/L	4	0.3	2.0		1	6/5/19 08:56:00	N	I
KQ1907640-26	Carbon, Total Organic	DUP	K1905084-001	Water	6.26 mg/L	10 mL	626 mg/L	100	7	50		2	6/5/19 09:24:00	N	II
KQ1907640-27	Carbon, Total Organic	DUP	K1905062-001	Water	2.83 mg/L	10 mL	2.83 mg/L	1	0.07	0.50		3	6/5/19 09:52:00	N	III
KQ1907640-28	Carbon, Total Organic	DUP	K1905062-002	Water	2.74 mg/L	10 mL	2.74 mg/L	1	0.07	0.50		<1	6/5/19 10:20:00	N	III
KQ1907640-29	Carbon, Total Organic	DUP	K1905062-003	Water	2.71 mg/L	10 mL	2.71 mg/L	1	0.07	0.50		2	6/5/19 10:48:00	N	III
KQ1907640-30	Carbon, Total Organic	DUP	K1905062-004	Water	2.70 mg/L	10 mL	2.70 mg/L	1	0.07	0.50		3	6/5/19 11:16:00	N	III
KQ1907640-31	Carbon, Total Organic	DUP	K1905062-005	Water	2.84 mg/L	10 mL	2.84 mg/L	1	0.07	0.50		<1	6/5/19 11:44:00	N	III

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

HLM 6/7/19

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** HMIRENTA **Analysis Lot:** 638042 **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
KQ1907640-32	Carbon, Total Organic	DUP	K1905062-006	Water	0.59 mg/L	10 mL	0.59 mg/L	1	0.07	0.50		9	6/5/19 12:12:00	N	III
KQ1907640-33	Carbon, Total Organic	DUP	K1905062-007	Water	0.49 mg/L	10 mL	0.49 mg/L J	1	0.07	0.50		8	6/5/19 13:10:00	N	III
KQ1907640-34	Carbon, Total Organic	MS	K1904848-006	Surface Water	25.05 mg/L	10 mL	25.1 mg/L	1	0.07	0.50	100		6/5/19 04:11:00	N	IV

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

HCM 6/7/19

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** HMIRENTA **Analysis Lot:** 638044 **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
K1905062-008	Carbon, Total Organic	N/A		Surface Water	0.61 mg/L	10 mL	0.61 mg/L	1	0.07	0.50			6/5/19 13:38:00	N	III
K1905062-009	Carbon, Total Organic	N/A		Surface Water	0.51 mg/L	10 mL	0.51 mg/L	1	0.07	0.50			6/5/19 14:06:00	N	III
K1905063-001	Carbon, Total Organic	N/A		Surface Water	0.44 mg/L	10 mL	0.44 mg/L J	1	0.07	0.50			6/5/19 14:34:00	N	IV
K1905063-002	Carbon, Total Organic	N/A		Surface Water	0.27 mg/L	10 mL	0.27 mg/L J	1	0.07	0.50			6/5/19 15:02:00	N	IV
KQ1907641-01	Carbon, Total Organic	CCV		Water	24.37 mg/L	10 mL	24.4 mg/L	1					6/5/19 12:40:00	N	III
KQ1907641-02	Carbon, Total Organic	CCV		Water	24.97 mg/L	10 mL	25.0 mg/L	1					6/5/19 17:37:00	N	III
KQ1907641-03	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/5/19 12:55:00	N	III
KQ1907641-04	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/5/19 17:52:00	N	III
KQ1907641-05	Carbon, Total Organic	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/5/19 08:26:00	N	III
KQ1907641-06	Carbon, Total Organic	LCS		Water	24.71 mg/L	10 mL	24.7 mg/L	1	0.07	0.50	99		6/5/19 08:41:00	N	III
KQ1907641-07	Carbon, Total Organic	DUP	K1905062-008	Water	0.55 mg/L	10 mL	0.55 mg/L	1	0.07	0.50		10	6/5/19 13:38:00	N	III
KQ1907641-08	Carbon, Total Organic	DUP	K1905062-009	Water	0.55 mg/L	10 mL	0.55 mg/L	1	0.07	0.50		7	6/5/19 14:06:00	N	III
KQ1907641-09	Carbon, Total Organic	DUP	K1905063-001	Water	0.42 mg/L	10 mL	0.42 mg/L J	1	0.07	0.50		3	6/5/19 14:34:00	N	III
KQ1907641-10	Carbon, Total Organic	MS	K1905063-002	Water	26.28 mg/L	10 mL	26.3 mg/L	1	0.07	0.50	104		6/5/19 15:30:00	N	III
KQ1907641-11	Carbon, Total Organic	DUP	K1905063-002	Water	0.25 mg/L	10 mL	0.25 mg/L J	1	0.07	0.50		7	6/5/19 15:02:00	N	III

06/07/19

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

HLM 6/7/19

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** HMIRENTA **Analysis Lot:** 638047 **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
K1905029-001	Carbon, Dissolved Organic (DOC)	N/A		Water	12.51 mg/L	10 mL	12.5 mg/L	1	0.07	0.50			6/5/19 19:34:00	N	I
K1905030-001	Carbon, Dissolved Organic (DOC)	N/A		Water	10.17 mg/L	10 mL	10.2 mg/L	1	0.07	0.50			6/5/19 20:02:00	N	I
K1905030-002	Carbon, Dissolved Organic (DOC)	N/A		Water	4.35 mg/L	10 mL	4.35 mg/L	1	0.07	0.50			6/5/19 20:30:00	N	I
K1905032-001	Carbon, Dissolved Organic (DOC)	N/A		Water	0.26 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/5/19 16:13:00	N	II
K1905032-002	Carbon, Dissolved Organic (DOC)	N/A		Water	2.07 mg/L	10 mL	2.07 mg/L	1	0.07	0.50			6/5/19 16:41:00	N	II
K1905032-003	Carbon, Dissolved Organic (DOC)	N/A		Water	2.42 mg/L	10 mL	2.42 mg/L	1	0.07	0.50			6/5/19 17:09:00	N	II
KQ1907643-01	Carbon, Dissolved Organic (DOC)	CCV		Water	24.37 mg/L	10 mL	24.4 mg/L	1					6/5/19 12:40:00	N	II
KQ1907643-02	Carbon, Dissolved Organic (DOC)	CCV		Water	24.97 mg/L	10 mL	25.0 mg/L	1					6/5/19 17:37:00	N	II
KQ1907643-03	Carbon, Dissolved Organic (DOC)	CCV		Water	24.16 mg/L	10 mL	24.2 mg/L	1					6/5/19 21:26:00	N	II
KQ1907643-04	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/5/19 12:55:00	N	II
KQ1907643-05	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/5/19 17:52:00	N	II
KQ1907643-06	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/5/19 21:41:00	N	II
KQ1907643-07	Carbon, Dissolved Organic (DOC)	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/5/19 18:07:00	N	II
KQ1907643-08	Carbon, Dissolved Organic (DOC)	LCS		Water	25.47 mg/L	10 mL	25.5 mg/L	1	0.07	0.50	102		6/5/19 18:21:00	N	II
KQ1907643-09	Carbon, Dissolved Organic (DOC)	DUP	K1905032-001	Water	0.43 mg/L	10 mL	0.43 mg/L J	1	0.07	0.50		NC	6/5/19 16:13:00	N	II
KQ1907643-10	Carbon, Dissolved Organic (DOC)	DUP	K1905032-002	Water	2.29 mg/L	10 mL	2.29 mg/L	1	0.07	0.50		10	6/5/19 16:41:00	N	II
KQ1907643-11	Carbon, Dissolved Organic (DOC)	DUP	K1905032-003	Water	2.37 mg/L	10 mL	2.37 mg/L	1	0.07	0.50		2	6/5/19 17:09:00	N	II
KQ1907643-12	Carbon, Dissolved Organic (DOC)	DUP	K1905029-001	Water	12.59 mg/L	10 mL	12.6 mg/L	1	0.07	0.50		<1	6/5/19 19:34:00	N	I
KQ1907643-13	Carbon, Dissolved Organic (DOC)	DUP	K1905030-001	Water	9.97 mg/L	10 mL	9.97 mg/L	1	0.07	0.50		2	6/5/19 20:02:00	N	I
KQ1907643-14	Carbon, Dissolved Organic (DOC)	DUP	K1905030-002	Water	4.33 mg/L	10 mL	4.33 mg/L	1	0.07	0.50		<1	6/5/19 20:30:00	N	I
KQ1907643-15	Carbon, Dissolved Organic (DOC)	MS	K1905032-003	Water	27.55 mg/L	10 mL	27.5 mg/L	1	0.07	0.50	101		6/5/19 18:36:00	N	II

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

06/07/19

HLM 6/7/19

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	C] CCV 25 ppm [25 p	1	24.558	0.0000	24.5583	24.5583	24.6	6/4/2019
3	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	6/4/2019
4	MB1	1	0.000	0.0000	0.0000	0	<0.5	6/4/2019
5	[TOC] LCS [24ppm]	1	25.202	0.0000	25.2021	25.2021	25.2	6/4/2019
6	K1905047-001	1	1.545	0.0000	1.5446	1.5446	1.54	6/4/2019
7	K1905047-001d	1	1.525	0.0000	1.5251	1.5251	1.5	6/4/2019
8	K1905047-001ms	1	26.559	0.0000	26.5592	26.5592	27	6/4/2019
9	K1905047-002	1	2.638	0.0000	2.6379	2.6379	2.64	6/4/2019
10	K1905047-002d	1	2.714	0.0000	2.7144	2.7144	2.71	6/4/2019
11	K1905047-003	1	1.918	0.0000	1.9180	1.918	1.9	6/4/2019
12	K1905047-003d	1	1.893	0.0000	1.8928	1.8928	1.89	6/4/2019
13	K1905047-004	1	2.227	0.0000	2.2269	2.2269	2.23	6/4/2019
14	K1905047-004d	1	2.282	0.0000	2.2817	2.2817	2.28	6/4/2019
15	K1905047-005	1	1.355	0.0000	1.3550	1.355	1.4	6/4/2019
16	K1905047-005d	1	1.374	0.0000	1.3739	1.3739	1.4	6/4/2019
17	C] CCV 25 ppm [25 p	1	24.645	0.0000	24.6454	24.6454	24.65	6/4/2019
18	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	6/4/2019
19	K1905047-006	1	1.626	0.0000	1.6263	1.6263	1.6	6/4/2019
20	K1905047-006d	1	1.603	0.0000	1.6025	1.6025	1.60	6/4/2019
21	K1905066-001	1	2.120	0.0000	2.1198	2.1198	2.12	6/4/2019
22	K1905066-001d	1	2.137	0.0000	2.1373	2.1373	2.1	6/4/2019
23	K1904849-001	1	2.218	0.0000	2.2180	2.218	2.2	6/4/2019
24	K1904849-001d	1	2.166	0.0000	2.1663	2.1663	2.17	6/4/2019
25	K1904849-002	1	2.760	0.0000	2.7600	2.76	2.76	6/4/2019

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: HLM	Date Analyzed	6/4/19
Reviewed By:	Date Reviewed	06/07/19

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	K1904849-002d	1	2.875	0.0000	2.8752	2.8752	2.88	6/4/2019
27	K1904849-003	1	4.328	0.0000	4.3284	4.3284	4.33	6/4/2019
28	K1904849-003d	1	4.312	0.0000	4.3119	4.3119	4.3	6/4/2019
29	K1904849-004	4	8.736	0.0000	8.7359	34.9436	34.9	6/4/2019
30	K1904849-004d	4	8.898	0.0000	8.8983	35.5932	35.6	6/4/2019
31	K1904849-005	1	0.737	0.0000	0.7369	0.7369	0.7	6/4/2019
32	K1904849-005d	1	0.689	0.0000	0.6890	0.689	0.7	6/4/2019
33	K1904849-006	1	9.007	0.0000	9.0067	9.0067	9.0	6/4/2019
34	K1904849-006d	1	8.933	0.0000	8.9330	8.933	8.9	6/4/2019
35	K1904850-001	1	0.000	0.0000	0.0000	0	<0.5	6/4/2019
36	K1904850-001d	1	0.000	0.0000	0.0000	0	<0.5	6/4/2019
37	K1904850-002	1	0.198	0.0000	0.1983	0.1983	<0.5	6/4/2019
38	K1904850-002d	1	0.220	0.0000	0.2202	0.2202	<0.5	6/4/2019
39	C] CCV 25 ppm [25 p	1	24.214	0.0000	24.2136	24.2136	24.2	6/4/2019
40	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	6/4/2019
41	K1904850-003	1	0.303	0.0000	0.3033	0.3033	<0.5	6/4/2019
42	K1904850-003d	1	0.191	0.0000	0.1914	0.1914	<0.5	6/4/2019
43	K1904850-004	1	3.089	0.0000	3.0889	3.0889	3.1	6/4/2019
44	K1904850-004d	1	3.124	0.0000	3.1235	3.1235	3.1	6/4/2019
45	K1904850-005	1	0.000	0.0000	0.0000	0	<0.5	6/5/2019
46	K1904850-005d	1	0.000	0.0000	0.0000	0	<0.5	6/5/2019
47	K1904848-001	1	1.286	0.0000	1.2857	1.2857	1.3	6/5/2019
48	K1904848-001d	1	1.307	0.0000	1.3073	1.3073	1.3	6/5/2019
49	K1904848-002	1	0.632	0.0000	0.6317	0.6317	0.6	6/5/2019
50	K1904848-002d	1	0.598	0.0000	0.5977	0.5977	0.6	6/5/2019

Analyzed By:	HLM	Date Analyzed	6/14/19
Reviewed By:		Date Reviewed	06/07/19

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	C] CCV 25 ppm [25 p	1	24.434	0.0000	24.4344	24.4344	24.43	6/5/2019
52	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	6/5/2019
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:	HLM	Date Analyzed	6/14/19
Reviewed By:		Date Reviewed	06/07/19

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	C] CCV 25 ppm [25 p	1	24.214	0.0000	24.2136	24.2136	24.2	6/4/2019
3	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	6/4/2019
4	MB2	1	0.000	0.0000	0.0000	0	<0.5	6/4/2019
5	[TOC] LCS [24ppm]	1	25.090	0.0000	25.0902	25.0902	25.1	6/4/2019
6	K1904848-003	1	3.545	0.0000	3.5453	3.5453	3.55	6/5/2019
7	K1904848-003d	1	3.507	0.0000	3.5071	3.5071	3.5	6/5/2019
8	K1904848-004	1	10.983	0.0000	10.9829	10.9829	11	6/5/2019
9	K1904848-004d	1	11.053	0.0000	11.0527	11.0527	11.05	6/5/2019
10	K1904848-005	2	4.898	0.0000	4.8977	9.7954	9.80	6/5/2019
11	K1904848-005d	2	4.737	0.0000	4.7369	9.4738	9.5	6/5/2019
12	C] CCV 25 ppm [25 p	1	24.434	0.0000	24.4344	24.4344	24.43	6/5/2019
13	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	6/5/2019
14	K1904848-006	1	0.000	0.0000	0.0000	0	<0.5	6/5/2019
15	K1904848-006d	1	0.000	0.0000	0.0000	0	<0.5	6/5/2019
16	K1904848-006ms	1	25.055	0.0000	25.0547	25.0547	25.1	6/5/2019
17	K1904848-007	2	4.372	0.0000	4.3723	8.7446	8.74	6/5/2019
18	K1904848-007d	2	4.266	0.0000	4.2664	8.5328	8.5	6/5/2019
19	K1904848-008	1	9.384	0.0000	9.3843	9.3843	9.4	6/5/2019
20	K1904848-008d	1	9.409	0.0000	9.4090	9.409	9.41	6/5/2019
21	K1904853-001	1	0.174	0.0000	0.1743	0.1743	<0.5	6/5/2019
22	K1904853-001d	1	0.138	0.0000	0.1376	0.1376	<0.5	6/5/2019
23	K1904986-001	1	8.801	0.0000	8.8006	8.8006	8.8	6/5/2019
24	K1904986-001d	1	8.704	0.0000	8.7041	8.7041	8.70	6/5/2019
25	K1904986-002	1	15.461	0.0000	15.4606	15.4606	15.46	6/5/2019

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: HLM	Date Analyzed	6/4/19	
Reviewed By: [signature]	Date Reviewed	06/07/19	

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	K1904986-002d	1	15.579	0.0000	15.5788	15.5788	15.58	6/5/2019
27	K1904986-003	1	18.269	0.0000	18.2689	18.2689	18.27	6/5/2019
28	K1904986-003d	1	18.123	0.0000	18.1227	18.1227	18.1	6/5/2019
29	K1904986-004	1	21.118	0.0000	21.1180	21.118	21.1	6/5/2019
30	K1904986-004d	1	20.827	0.0000	20.8272	20.8272	20.8	6/5/2019
31	C] CCV 25 ppm [25 p	1	24.466	0.0000	24.4664	24.4664	24.5	6/5/2019
32	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	6/5/2019
33	K1904986-005	4	11.462	0.0000	11.4621	45.8484	45.8	6/5/2019
34	K1904986-005d	4	11.338	0.0000	11.3376	45.3504	45.4	6/5/2019
35	K1905084-001	100	6.135	0.0000	6.1348	613.48	613.5	6/5/2019
36	K1905084-001d	100	6.261	0.0000	6.2611	626.11	626.1	6/5/2019
37	K1905062-001	1	2.907	0.0000	2.9065	2.9065	2.9	6/5/2019
38	K1905062-001d	1	2.830	0.0000	2.8297	2.8297	2.8	6/5/2019
39	K1905062-002	1	2.711	0.0000	2.7110	2.711	2.7	6/5/2019
40	K1905062-002d	1	2.737	0.0000	2.7369	2.7369	2.7	6/5/2019
41	K1905062-003	1	2.757	0.0000	2.7569	2.7569	2.8	6/5/2019
42	K1905062-003d	1	2.712	0.0000	2.7119	2.7119	2.7	6/5/2019
43	K1905062-004	1	2.612	0.0000	2.6123	2.6123	2.6	6/5/2019
44	K1905062-004d	1	2.697	0.0000	2.6973	2.6973	2.7	6/5/2019
45	K1905062-005	1	2.862	0.0000	2.8618	2.8618	2.9	6/5/2019
46	K1905062-005d	1	2.836	0.0000	2.8358	2.8358	2.8	6/5/2019
47	K1905062-006	1	0.545	0.0000	0.5445	0.5445	0.5	6/5/2019
48	K1905062-006d	1	0.595	0.0000	0.5946	0.5946	0.6	6/5/2019
49	C] CCV 25 ppm [25 p	1	24.369	0.0000	24.3689	24.3689	24.4	6/5/2019
50	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	6/5/2019

Analyzed By: HLu	Date Analyzed 6/4/19
Reviewed By:	Date Reviewed 06/07/19

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	K1905062-007	1	0.528	0.0000	0.5284	0.5284	0.53	6/5/2019
52	K1905062-007d	1	0.489	0.0000	0.4894	0.4894	<0.5	6/5/2019
53	C] CCV 25 ppm [25 p	1	24.965	0.0000	24.9651	24.9651	25.0	6/5/2019
54	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	6/5/2019
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: HLM	Date Analyzed 6/4/19
Reviewed By:	Date Reviewed 06/07/19

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	MB3	1	0.000	0.0000	0.0000	0	<0.5	6/5/2019
3	[TOC] LCS [25ppm]	1	24.707	0.0000	24.7068	24.7068	24.7	6/5/2019
4	C] CCV 25 ppm [25 p	1	24.369	0.0000	24.3689	24.3689	24.4	6/5/2019
5	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	6/5/2019
6	K1905062-008	1	0.613	0.0000	0.6134	0.6134	0.61	6/5/2019
7	K1905062-008d	1	0.552	0.0000	0.5523	0.5523	0.6	6/5/2019
8	K1905062-009	1	0.511	0.0000	0.5113	0.5113	1	6/5/2019
9	K1905062-009d	1	0.547	0.0000	0.5467	0.5467	0.55	6/5/2019
10	K1905063-001	1	0.437	0.0000	0.4372	0.4372	<0.5	6/5/2019
11	K1905063-001d	1	0.423	0.0000	0.4227	0.4227	<0.5	6/5/2019
12	K1905063-002	1	0.275	0.0000	0.2745	0.2745	<0.5	6/5/2019
13	K1905063-002d	1	0.255	0.0000	0.2547	0.2547	<0.5	6/5/2019
14	K1905063-002ms	1	26.279	0.0000	26.2787	26.2787	26.28	6/5/2019
15	C] CCV 25 ppm [25 p	1	24.965	0.0000	24.9651	24.9651	25.0	6/5/2019
16	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	6/5/2019
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: HLM	Date Analyzed	6/4/19	
Reviewed By:	Date Reviewed	06/07/19	

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	C] CCV 25 ppm [25 p	1	24.369	0.0000	24.3689	24.3689	24.4	6/5/2019
3	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	6/5/2019
4	K1905032-001	1	0.264	0.0000	0.2638	0.2638	<0.5	6/5/2019
5	K1905032-001d	1	0.428	0.0000	0.4275	0.4275	<0.5	6/5/2019
6	K1905032-002	1	2.072	0.0000	2.0719	2.0719	2.07	6/5/2019
7	K1905032-002d	1	2.290	0.0000	2.2902	2.2902	2.3	6/5/2019
8	K1905032-003	1	2.418	0.0000	2.4181	2.4181	2	6/5/2019
9	K1905032-003d	1	2.374	0.0000	2.3742	2.3742	2.37	6/5/2019
10	C] CCV 25 ppm [25 p	1	24.965	0.0000	24.9651	24.9651	24.97	6/5/2019
11	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	6/5/2019
12	MB4	1	0.000	0.0000	0.0000	0	<0.5	6/5/2019
13	[TOC] LCS [25ppm]	1	25.469	0.0000	25.4694	25.4694	25.47	6/5/2019
14	K1905032-003ms	1	27.545	0.0000	27.5452	27.5452	27.55	6/5/2019
15	K1905029-001	1	12.505	0.0000	12.5053	12.5053	12.5	6/5/2019
16	K1905029-001d	1	12.587	0.0000	12.5867	12.5867	12.6	6/5/2019
17	K1905030-001	1	10.167	0.0000	10.1666	10.1666	10.17	6/5/2019
18	K1905030-001d	1	9.966	0.0000	9.9661	9.9661	10.0	6/5/2019
19	K1905030-002	1	4.347	0.0000	4.3468	4.3468	4.3	6/5/2019
20	K1905030-002d	1	4.325	0.0000	4.3253	4.3253	4.33	6/5/2019
21	C] CCV 25 ppm [25 p	1	24.157	0.0000	24.1573	24.1573	24.16	6/5/2019
22	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	6/5/2019
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: HLM	Date Analyzed	6/4/19	
Reviewed By:	Date Reviewed	06/07/19	

Schedule: 06042019

Version: 8
Instrument: Fusion1
Last Saved by: Fusion1 (Fusion1)
Last Saved on: 2019/06/04 13:11 - 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	K1905047-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
4	Sample	K1905047-001.01 ms	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
5	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
6	Sample	K1905047-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
7	Sample	K1905047-003.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
8	Sample	K1905047-004.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
9	Sample	K1905047-005.01	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	K1905047-006.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
11	Sample	K1905066-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
12	Sample	K1904849-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
13	Sample	K1904849-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
14	Sample	K1904849-003.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
15	Sample	K1904849-004.01 4x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
16	Sample	K1904849-005.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
17	Sample	K1904849-006.17	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
18	Sample	K1904850-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
19	Sample	K1904850-002.01	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	K1904850-003.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
22	Sample	K1904850-004.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
23	Sample	K1904850-005.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
24	Sample	K1904848-001.08	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
25	Sample	K1904848-002.08	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
26	Sample	K1904848-003.08	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
27	Sample	K1904848-004.08	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
28	Sample	K1904848-005.08 2x	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	K1904848-006.08	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
30	Sample	K1904848-006.08 ms	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
31	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
32	Sample	K1904848-007.08 2x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
33	Sample	K1904848-008.08	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
34	Sample	K1904853-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
35	Sample	K1904986-001.03	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
36	Sample	K1904986-002.03	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
37	Sample	K1904986-003.03	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
38	Sample	K1904986-004.03	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

Schedule: 06042019

Position	Sample Type	Sample ID	Method ID (Calibration ID)	Reps	Use	State
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
39	Sample	MB3	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
C	Check Standard	[TOC] LCS [25.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
40	Sample	K1904986-005.03 4x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
41	Sample	K1905084-001.01 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
42	Sample	K1905062-001.03	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
43	Sample	K1905062-002.03	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
44	Sample	K1905062-003.03	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
45	Sample	K1905062-004.03	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
46	Sample	K1905062-005.03	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
47	Sample	K1905062-006.03	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	K1905062-007.03	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
49	Sample	K1905062-008.03	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
50	Sample	K1905062-009.03	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
51	Sample	K1905063-001.03	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
52	Sample	K1905063-002.03	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
53	Sample	K1905063-002.03 ms	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
54	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
55	Sample	K1905032-001.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
56	Sample	K1905032-002.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
57	Sample	K1905032-003.04 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
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	K1905032-003.04 ms doc	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
60	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
61	Sample	FB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
62	Sample	K1905029-001.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
63	Sample	K1905030-001.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
64	Sample	K1905030-002.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
65	Sample	RB	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 - 06042019
Tuesday, June 04, 2019 10:57 AM

(View - Reps, Unused Reps, Meta-Data, Signature, History)
Printed on 2019/06/06 10:17 - Thursday

Report Summary Information

Company Location:	Gen Chem Lab		
Schedule Name:	06042019	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) (v5) Fusion1 (Fusion1) (v6) Fusion1 (Fusion1) (v8)		
Comment:			

Report Results

06/07/19

Sample Type: Clean — From Schedule Version 2

	Pos	Analysis Type	Sample ID	Start Time
◆	(clean)		Clean	2019/06/04 10:57

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	12.97	17.20	4.23	49.37	05:21
2	TC Clean	11.40	14.53	3.13	50.25	04:04
3	TC Clean	2.83	5.96	3.13	50.43	03:54
4	TC Clean	1.74	4.85	3.11	50.18	03:55

Sample Type: Clean — From Schedule Version 3

	Pos	Analysis Type	Sample ID	Start Time
◆	(clean)		Clean	2019/06/04 11:19

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	11.52	14.72	3.20	49.80	05:23
2	TC Clean	4.01	7.19	3.18	50.27	04:05

3	TC Clean	1.63	4.83	3.20	50.33	03:49
4	TC Clean	1.19	4.25	3.06	50.42	03:52

Sample Type: Clean — From Schedule Version 4

	Pos	Analysis Type	Sample ID	Start Time
◈	(clean)		Clean	2019/06/04 11:42

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	11.19	14.27	3.08	49.76	05:22
2	TC Clean	3.43	6.63	3.20	50.41	04:02
3	TC Clean	1.53	4.62	3.09	50.25	03:46
4	TC Clean	1.18	4.42	3.24	50.27	03:53

Sample Type: Blank (Creating v1263) — From Schedule Version 5

	Pos	Analysis Type	Sample ID	Start Time
◈	(blank)		Reagent/Acid Blank	2019/06/04 12:10

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	11.16	14.15	2.99	49.43	05:17
2	TC Clean	3.42	6.64	3.22	50.21	04:04
3	TC Clean	1.60	4.60	3.01	50.39	03:55
4	TC Clean	1.02	4.13	3.11	50.16	03:51
5	Reagent Blank	3.90	7.02	3.12	50.32	05:05
6	Acid Blank	1.28	4.41	3.13	49.86	05:27

Sample Type: Sample — From Schedule Version 6

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	D	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/04 13:02

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.28	11.19	2.91	50.18	10:34

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

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)	24.5583 ppm (PASS)	0.0000 ppm	0%	2019/06/04 13:17

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.5583	245.5833	176.16	179.39	3.22	50.11	10:28

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

Sample Type: Check Standard --> CCB — From Schedule Version 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%	2019/06/04 13:32

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	7.14	10.26	3.13	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 (v30)	0 ppmC

Sample Type: Sample — From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	1	TOC	MB1	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/04 13:46

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.22	9.21	2.99	50.01	10:33

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

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 [24.0 ppm]	0 / infinity (NA / NA)	25.2021 ppm (PASS)	0.0000 ppm	0%	2019/06/04 14:01

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	25.2021	252.0212	180.53	183.65	3.11	50.01	10:31

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

Sample Type: Sample

From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	2	TOC	ICS	0.0821 ppm	0.0000 ppm	0.0000%	2019/06/04 14:16

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0821	0.8205	9.33	12.54	3.20	49.92	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	3	TOC	K1905047-001.01	1.5348 ppm	0.0139 ppm	0.9000%	2019/06/04 14:30

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.5446	15.4465	19.26	22.35	3.09	49.96	10:29
2	TOC	1.5251	15.2505	19.13	22.24	3.12	50.00	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	4	TOC	K1905047-001.01 ms	26.5592 ppm	0.0000 ppm	0.0000%	2019/06/04 14:59

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	26.5592	265.5915	189.06	191.97	2.92	49.88	10:33

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	5	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/04 15:13

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.13	10.05	2.91	49.96	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC)	CAS_salt_010711	CAS_salt_010711

(v1263) (v4) (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	6	TOC	K1905047-002.01	2.6761 ppm	0.0541 ppm	2.0200%	2019/06/04 15:28

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.6379	26.3791	26.68	29.81	3.12	49.84	10:27
2	TOC	2.7144	27.1437	27.20	30.12	2.92	49.91	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	7	TOC	K1905047-003.01	1.9054 ppm	0.0178 ppm	0.9300%	2019/06/04 15:56

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.9180	19.1795	21.80	24.87	3.08	49.96	10:27
2	TOC	1.8928	18.9276	21.62	24.80	3.18	49.99	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	8	TOC	K1905047-004.01	2.2543 ppm	0.0388 ppm	1.7200%	2019/06/04 16:24

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.2269	22.2688	23.89	26.98	3.09	49.97	10:24
2	TOC	2.2817	22.8169	24.26	27.45	3.18	49.96	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	9	TOC	K1905047-005.01	1.3645 ppm	0.0133 ppm	0.9800%	2019/06/04 16:52

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.3550	13.5504	17.97	21.08	3.11	49.99	10:27
2	TOC	1.3739	13.7390	18.10	21.21	3.11	50.02	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

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)	24.6454 ppm (PASS)	0.0000 ppm	0%	2019/06/04 17:20

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.6454	246.4540	176.75	179.95	3.20	49.98	10:32

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

Sample Type: Check Standard --> CCB

From Schedule Version 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%	2019/06/04 17:34

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	6.47	9.66	3.19	49.95	10:30

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

Sample Type: Sample

From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	10	TOC	K1905047-006.01	1.6144 ppm	0.0168 ppm	1.0400%	2019/06/04 17:49

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.6263	16.2626	19.82	22.97	3.15	49.96	10:30
2	TOC	1.6025	16.0254	19.65	22.73	3.07	49.91	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	11	TOC	K1905066-001.01	2.1285 ppm	0.0124 ppm	0.5800%	2019/06/04 18:18

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.1198	21.1978	23.16	26.39	3.22	49.89	10:27
2	TOC	2.1373	21.3731	23.28	26.25	2.97	49.99	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	12	TOC	K1904849-001.01	2.1922 ppm	0.0366 ppm	1.6700%	2019/06/04 18:46

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.2180	22.1805	23.83	26.92	3.09	49.95	10:26
2	TOC	2.1663	21.6634	23.48	26.68	3.20	50.12	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	13	TOC	K1904849-002.01	2.8176 ppm	0.0815 ppm	2.8900%	2019/06/04 19:14

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.7600	27.6004	27.51	30.66	3.15	50.01	10:27
2	TOC	2.8752	28.7524	28.29	31.38	3.08	50.15	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	14	TOC	K1904849-003.01	4.3202 ppm	0.0117 ppm	0.2700%	2019/06/04 19:42

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.3284	43.2841	38.16	41.27	3.11	50.14	10:28
2	TOC	4.3119	43.1191	38.04	41.30	3.25	50.09	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	15	TOC	K1904849-004.01 4x	8.8171 ppm	0.1148 ppm	1.3000%	2019/06/04 20:10

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	8.7359	87.3593	68.08	71.20	3.12	50.19	10:29
2	TOC	8.8983	88.9827	69.18	72.20	3.03	50.25	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	16	TOC	K1904849-005.01	0.7129 ppm	0.0339 ppm	4.7500%	2019/06/04 20:38

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.7369	7.3689	13.78	16.72	2.94	50.16	10:26

2	TOC	0.6890	6.8901	13.45	16.45	2.99	50.16	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	17	TOC	K1904849-006.17	8.9699 ppm	0.0521 ppm	0.5800%	2019/06/04 21:06

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	9.0067	90.0670	69.91	73.02	3.11	50.14	10:27
2	TOC	8.9330	89.3304	69.41	72.51	3.10	50.17	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	18	TOC	K1904850-001.01	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/04 21:34

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.66	10.52	2.87	50.11	10:26
2	TOC	0.0000	0.0000	7.19	10.20	3.01	50.10	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	19	TOC	K1904850-002.01	0.2093 ppm	0.0155 ppm	7.4200%	2019/06/04 22:02

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.1983	1.9829	10.12	13.21	3.09	50.02	10:29
2	TOC	0.2202	2.2024	10.27	13.29	3.02	50.07	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

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)	24.2136 ppm (PASS)	0.0000 ppm	0%	2019/06/04 22:30

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.2136	242.1360	173.82	176.96	3.14	50.03	10:32

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

Sample Type: Check Standard --> CCB

From Schedule Version 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%	2019/06/04 22:45

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.99	9.21	3.22	49.98	10:31

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

Sample Type: Sample

From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	20	TOC	MB2	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/04 23:00

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.39	8.56	3.17	49.97	10:33

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

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 [24.0 ppm]	0 / infinity (NA / NA)	25.0902 ppm (PASS)	0.0000 ppm	0%	2019/06/04 23:14

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	25.0902	250.9016	179.77	182.90	3.12	49.95	10:33

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

Sample Type: Sample

From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	21	TOC	K1904850-003.01	0.2473 ppm	0.0792 ppm	32.0100%	2019/06/04 23:29

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.3033	3.0333	10.84	13.98	3.15	50.03	10:30
2	TOC	0.1914	1.9136	10.07	13.29	3.21	49.97	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	22	TOC	K1904850-004.01	3.1062 ppm	0.0245 ppm	0.7900%	2019/06/04 23:57

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.0889	30.8885	29.74	32.89	3.15	49.97	10:27
2	TOC	3.1235	31.2347	29.98	33.20	3.22	49.97	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	23	TOC	K1904850-005.01	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/05 00:25

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.20	10.38	3.18	49.99	10:25
2	TOC	0.0000	0.0000	6.89	10.11	3.22	49.99	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	24	TOC	K1904848-001.08	1.2965 ppm	0.0153 ppm	1.1800%	2019/06/05 00:53

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.2857	12.8566	17.50	20.69	3.19	50.00	10:29
2	TOC	1.3073	13.0731	17.65	20.72	3.07	50.04	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	25	TOC	K1904848-002.08	0.6147 ppm	0.0241 ppm	3.9100%	2019/06/05 01:22

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.6317	6.3170	13.06	15.94	2.87	50.03	10:28

2	TOC	0.5977	5.9767	12.83	15.98	3.14	50.07	10:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	26	TOC	K1904848-003.08	3.5262 ppm	0.0270 ppm	0.7700%	2019/06/05 01:50

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.5453	35.4525	32.84	35.92	3.08	50.06	10:28
2	TOC	3.5071	35.0710	32.58	35.68	3.10	50.05	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	27	TOC	K1904848-004.08	11.0178 ppm	0.0494 ppm	0.4500%	2019/06/05 02:18

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	10.9829	109.8285	83.33	86.40	3.07	50.04	10:27
2	TOC	11.0527	110.5268	83.80	86.85	3.05	50.04	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	28	TOC	K1904848-005.08 2x	4.8173 ppm	0.1137 ppm	2.3600%	2019/06/05 02:46

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.8977	48.9765	42.02	45.07	3.05	50.05	10:27
2	TOC	4.7369	47.3692	40.93	44.10	3.17	50.06	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

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)	24.4344 ppm (PASS)	0.0000 ppm	0%	2019/06/05 03:14

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.4344	244.3444	175.32	178.45	3.13	50.07	10:33

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

Sample Type: Check Standard --> CCB — From Schedule Version 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%	2019/06/05 03:28

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	6.17	9.26	3.08	50.06	10:35

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

Sample Type: Sample — From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	29	TOC	K1904848-006.08	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/05 03:43

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.37	9.50	3.14	50.06	10:30
2	TOC	0.0000	0.0000	6.44	9.74	3.29	50.09	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	30	TOC	K1904848-006.08 ms	25.0547 ppm	0.0000 ppm	0.0000%	2019/06/05 04:11

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	25.0547	250.5472	178.85	182.00	3.15	50.08	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	31	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/05 04:26

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.83	8.99	3.17	50.09	10:31

Dilution	Blank Contribution	Method	Calibration

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	32	TOC	K1904848-007.08 2x	4.3193 ppm	0.0749 ppm	1.7300%	2019/06/05 04:40

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.3723	43.7231	38.46	41.52	3.07	50.08	10:28
2	TOC	4.2664	42.6638	37.74	40.75	3.02	50.08	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	33	TOC	K1904848-008.08	9.3967 ppm	0.0175 ppm	0.1900%	2019/06/05 05:09

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	9.3843	93.8428	72.48	75.50	3.02	50.10	10:29
2	TOC	9.4090	94.0903	72.64	75.65	3.01	50.09	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	34	TOC	K1904853-001.01	0.1559 ppm	0.0259 ppm	16.6300%	2019/06/05 05:37

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.1743	1.7427	9.96	12.99	3.03	50.11	10:26
2	TOC	0.1376	1.3759	9.71	12.67	2.96	50.15	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	35	TOC	K1904986-001.03	8.7524 ppm	0.0682 ppm	0.7800%	2019/06/05 06:05

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	8.8006	88.0060	68.51	71.54	3.03	50.10	10:29
2	TOC	8.7041	87.0411	67.86	70.92	3.07	50.12	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	36	TOC	K1904986-002.03	15.5197 ppm	0.0835 ppm	0.5400%	2019/06/05 06:33

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	15.4606	154.6065	113.72	116.87	3.15	50.15	10:26
2	TOC	15.5788	155.7880	114.52	117.66	3.13	50.13	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	37	TOC	K1904986-003.03	18.1958 ppm	0.1033 ppm	0.5700%	2019/06/05 07:01

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	18.2689	182.6886	132.78	135.76	2.98	50.13	10:26
2	TOC	18.1227	181.2272	131.79	134.78	2.99	50.12	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	38	TOC	K1904986-004.03	20.9726 ppm	0.2056 ppm	0.9800%	2019/06/05 07:29

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	21.1180	211.1803	152.12	155.04	2.92	50.10	10:30
2	TOC	20.8272	208.2722	150.15	153.26	3.11	50.12	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

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)	24.4664 ppm (PASS)	0.0000 ppm	0%	2019/06/05 07:57

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.4664	244.6641	175.54	178.75	3.21	50.12	10:30

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

Sample Type: Check Standard --> CCB — From Schedule Version 8

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

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◆	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/06/05 08:12

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	6.10	9.05	2.95	50.12	10:36

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

Sample Type: Sample — From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	39	TOC	MB3	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/05 08:26

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.78	8.68	2.90	50.08	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

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)	24.7068 ppm (PASS)	0.0000 ppm	0%	2019/06/05 08:41

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	24.7068	247.0683	177.17	180.37	3.19	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 (v30)	25 ppmC

Sample Type: Sample — From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	40	TOC	K1904986-005.03 4x	11.3998 ppm	0.0880 ppm	0.7700%	2019/06/05 08:56

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	11.4621	114.6209	86.58	89.75	3.17	50.06	10:25
2	TOC	11.3376	113.3760	85.74	88.85	3.12	50.11	10:27

Dilution	Blank Contribution	Method	Calibration

1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	41	TOC	K1905084-001.01 100x	6.1980 ppm	0.0893 ppm	1.4400%	2019/06/05 09:24

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	6.1348	61.3484	50.42	53.74	3.32	50.11	10:29
2	TOC	6.2611	62.6110	51.28	54.41	3.13	50.03	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	42	TOC	K1905062-001.03	2.8681 ppm	0.0543 ppm	1.8900%	2019/06/05 09:52

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.9065	29.0647	28.51	31.48	2.98	50.02	10:30
2	TOC	2.8297	28.2972	27.98	31.00	3.02	50.00	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	43	TOC	K1905062-002.03	2.7239 ppm	0.0183 ppm	0.6700%	2019/06/05 10:20

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.7110	27.1098	27.18	30.24	3.06	49.98	10:27
2	TOC	2.7369	27.3691	27.35	30.34	2.98	49.97	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	44	TOC	K1905062-003.03	2.7344 ppm	0.0319 ppm	1.1700%	2019/06/05 10:48

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.7569	27.5694	27.49	30.38	2.89	49.96	10:27
2	TOC	2.7119	27.1186	27.18	30.31	3.13	49.96	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	45	TOC	K1905062-004.03	2.6548 ppm	0.0601 ppm	2.2600%	2019/06/05 11:16

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Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.6123	26.1227	26.51	29.68	3.17	49.94	10:25
2	TOC	2.6973	26.9728	27.08	30.06	2.98	49.93	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	46	TOC	K1905062-005.03	2.8488 ppm	0.0184 ppm	0.6500%	2019/06/05 11:44

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.8618	28.6183	28.20	31.39	3.18	49.96	10:31
2	TOC	2.8358	28.3576	28.02	31.05	3.03	49.90	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	47	TOC	K1905062-006.03	0.5695 ppm	0.0354 ppm	6.2200%	2019/06/05 12:12

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5445	5.4449	12.47	15.55	3.08	49.85	10:26
2	TOC	0.5946	5.9458	12.81	15.71	2.90	49.83	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

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)	24.3689 ppm (PASS)	0.0000 ppm	0%	2019/06/05 12:40

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.3689	243.6888	174.88	177.91	3.03	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 (v30)	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%	2019/06/05 12:55

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.65	8.74	3.09	49.79	10:32

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

Sample Type: Sample From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	48	TOC	K1905062-007.03	0.5089 ppm	0.0276 ppm	5.4200%	2019/06/05 13:10

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5284	5.2843	12.36	15.37	3.01	49.79	10:28
2	TOC	0.4894	4.8939	12.10	15.10	3.00	49.77	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	49	TOC	K1905062-008.03	0.5829 ppm	0.0432 ppm	7.4200%	2019/06/05 13:38

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.6134	6.1343	12.94	15.89	2.95	49.83	10:26
2	TOC	0.5523	5.5230	12.52	15.53	3.01	49.85	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	50	TOC	K1905062-009.03	0.5290 ppm	0.0250 ppm	4.7300%	2019/06/05 14:06

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5113	5.1134	12.25	15.23	2.99	49.81	10:27
2	TOC	0.5467	5.4670	12.49	15.50	3.02	49.79	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	51	TOC	K1905063-001.03	0.4299 ppm	0.0103 ppm	2.4000%	2019/06/05 14:34

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Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.4372	4.3724	11.74	14.76	3.01	49.78	10:28
2	TOC	0.4227	4.2266	11.64	14.70	3.06	49.75	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	52	TOC	K1905063-002.03	0.2646 ppm	0.0140 ppm	5.2800%	2019/06/05 15:02

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.2745	2.7445	10.64	13.58	2.94	49.85	10:31
2	TOC	0.2547	2.5471	10.50	13.52	3.02	49.83	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	53	TOC	K1905063-002.03 ms	26.2787 ppm	0.0000 ppm	0.0000%	2019/06/05 15:30

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	26.2787	262.7866	187.15	190.02	2.87	49.78	10:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	54	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/05 15:45

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.77	9.85	3.07	49.78	10:30
2	TOC	0.0000	0.0000	6.31	9.42	3.11	49.77	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	55	TOC	K1905032-001.04 doc	0.3457 ppm	0.1157 ppm	33.4800%	2019/06/05 16:13

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.2638	2.6384	10.57	13.60	3.04	49.74	10:32
2	TOC	0.4275	4.2752	11.68	14.67	3.00	49.81	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

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	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	56	TOC	K1905032-002.04 doc	2.1811 ppm	0.1544 ppm	7.0800%	2019/06/05 16:41

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.0719	20.7190	22.84	26.00	3.16	49.79	10:29
2	TOC	2.2902	22.9023	24.32	27.19	2.87	49.79	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	57	TOC	K1905032-003.04 doc	2.3962 ppm	0.0310 ppm	1.3000%	2019/06/05 17:09

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.4181	24.1811	25.19	28.27	3.08	49.76	10:27
2	TOC	2.3742	23.7420	24.89	28.06	3.17	49.76	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

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)	24.9651 ppm (PASS)	0.0000 ppm	0%	2019/06/05 17:37

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.9651	249.6508	178.92	181.86	2.93	49.71	10:31

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

Sample Type: Check Standard --> CCB — From Schedule Version 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%	2019/06/05 17:52

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	10.40	3.06	49.77	10:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos D

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Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	0 ppmC

Sample Type: Sample — From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	58	TOC	MB4	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/05 18:07

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.10	9.15	3.05	49.77	10:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

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)	25.4694 ppm (PASS)	0.0000 ppm	0%	2019/06/05 18:21

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	25.4694	254.6936	182.35	185.59	3.24	49.77	10:32

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

Sample Type: Sample — From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	59	TOC	K1905032-003.04 ms doc	27.5452 ppm	0.0000 ppm	0.0000%	2019/06/05 18:36

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	27.5452	275.4517	195.75	198.82	3.07	49.81	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	60	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/05 18:51

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time

00939268

1	TOC	0.0000	0.0000	7.06	10.17	3.11	49.76	10:26
2	TOC	0.0000	0.0000	5.92	9.05	3.13	49.74	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	61	TOC	FB	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/05 19:19

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.03	8.95	2.92	49.73	10:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	62	TOC	K1905029-001.01 doc	12.5460 ppm	0.0576 ppm	0.4600%	2019/06/05 19:34

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	12.5053	125.0526	93.66	96.93	3.27	49.72	10:29
2	TOC	12.5867	125.8673	94.21	97.33	3.11	49.73	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	63	TOC	K1905030-001.01 doc	10.0663 ppm	0.1418 ppm	1.4100%	2019/06/05 20:02

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	10.1666	101.6655	77.79	80.75	2.96	49.75	10:32
2	TOC	9.9661	99.6605	76.42	79.64	3.21	49.77	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	64	TOC	K1905030-002.01 doc	4.3361 ppm	0.0152 ppm	0.3500%	2019/06/05 20:30

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.3468	43.4682	38.28	41.23	2.95	49.79	10:31
2	TOC	4.3253	43.2531	38.14	41.05	2.92	49.81	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time

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◆	65	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/05 20:58

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.53	8.51	2.98	49.83	10:31
2	TOC	0.0000	0.0000	5.66	8.71	3.05	49.84	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

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)	24.1573 ppm (PASS)	0.0000 ppm	0%	2019/06/05 21:26

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.1573	241.5733	173.44	176.35	2.90	49.90	10:33

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

Sample Type: Check Standard --> CCB From Schedule Version 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%	2019/06/05 21:41

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.59	8.73	3.14	49.91	10:31

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

Meta Data Used in this Report

Blanks

Version	Reagent (Abs)	Acid (Abs)	DI IC (Abs)	DI TC (Abs)	DI TOC (Abs)	Save Time	Operator

v1262	2.1970	2.1280	0.0000	0.0000	0.0000	2019/05/31 14:34	Fusion1 (Fusion1)
v1263	1.2990	1.2790	0.0000	0.0000	0.0000	2019/06/04 12:44	Fusion1 (Fusion1)

Calibrations

Name: CAS_salt_010711 (TOC)

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

Basic Analysis Type: TOC

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

Methods

Name: CAS_salt_010711 (TOC)

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

Parameter	Value
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

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SyringeSpeedUVAspirate	5
SyringeSpeedICDispense	5
SyringeSpeedICAspirate	5
NDIRPressureStabilize	1.75 min
SampleMixing	Off
SampleMixingCycles	1
SampleMixingVolume	10.0
LowLevelFilterNDIR	Off

Acceptance / Approval

Electronic Signatures

Report Version	User Name	Acceptance	Reason	Date

Report History

Report History

Report Version	User Name	System Reason	User Reason	Date
1	Fusion1 (Fusion1)	Schedule completed	Schedule completed	2019/06/05 21:58

ALS Environmental

StarLIMS Run: 638040, 638042, 638044, 638047

Analysis: TOC/DOC

Method: 415.1, SM 5310 C, 9060, 9060A

CCV: 11-GEN-05-77K 50 ppm LCS: 11-GEN-05-77D 25.0 ppm

ICAL Date: 3/6/19

ICAL ID: 11-GEN-05-76H

ICS ID: 11-GEN-05-74A

ICS TV: 25.0 ppm ICS % R = 2

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

Sodium Persulfate: 11-GEN-05-78E

21 % H3PO4: 11-GEN-05-78D

Equipment ID: K-TOC-03

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

FILTER ID: FE1165 5/31/19

Analyzed By: HLM	Date Analyzed: 6/14/19
Reviewed By:	Date Reviewed: 06/07/19

Case Narrative

Method: 6850
Analysis: Perchlorate
Analysis SOP: LC-MS-CLO4
ALS WO ID(s): 1915802, 1915803, 1915852, 1916229; 1916231; 1916232

Client: ALS Laboratories (Houston, TX)
Matrix: Water
ELMS Batch (HBN): 2261 (241120)

General Set Information: There were six 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 samples 1915852001 and 1916229001 were analyzed and reported from 1:1,000 dilutions. The reporting limits have been adjusted accordingly.

Method QC data: The method blank (LMB 657797) was less than 1/2 the CRDL. The recovery for the LCS (657798) was within acceptable parameters.

MS/MSD Analysis: MS/MSD was performed on sample 1915802001 (Client ID: LH18/24-SP650_052919_BIX). 4.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. The spike target was 4.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 – 657795) is reported from the analysis of the Laboratory Control Sample (LCS – 657798) at a level of 4.0µg/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: 19MARI03).

Thomas Bosch June 12, 2019
Analyst Date

ANALYTICAL REPORT

Report Date: June 13, 2019

RJ Modashia
ALS Environmental (Houston)
10450 Stancliff Road
Suite 210
Houston, TX 77099

Phone: 281 530-5656

E-mail: RJ.Modashia@ALSGlobal.com

Workorder: **34-1915802**
Project ID: HS19051856
Purchase Order: HS19051856
Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
LH18/24-SP650_052919_BIX	1915802001	05/29/19	06/01/19	

ANALYTICAL REPORT

Workorder: 34-1915802
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **LH18/24-SP650_052919_BIX** | Sampling Site: NA | Collected: 05/29/2019
Lab ID: 1915802001 | Media: 125 mL Nalgene | Received: 06/01/2019
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/2261 (HBN: 241120) | **Percent Solid:** NA
Analyzed: 06/11/2019 09:45 | **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 06/12/2019 12:46	/S/ Stephen Brose 06/13/2019 10:59

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: 34-1915802
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
	Nevada (TNI)	UT00953201-1	https://ndep.nv.gov/water/lab-certification
	Iowa (TNI)	IA# 376	http://www.shl.uiowa.edu/labcert/idnr/
	Kansas	E-10416	http://www.kdheks.gov/envlab/disclaimer.html
	Oklahoma (TNI)	IJ# 9980	http://www.deq.state.ok.us/CSDnew/labcert.htm
	Texas (TNI)	T104704456-18-9	https://www.tceq.texas.gov/assets/public/compliance/compliance_support/qa/txnelap_lab_list.pdf
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: 1915802

Limits:	Client SOW/Contract Specified	**Preparation:**	NA	**Analysis:**	EPA 6850, DoD QSM
Basis:	DoD QSM	**Batch:**	NA	**Batch:**	ELMS/2261 (HBN: 241120)
		Prepared By:	NA	**Analyzed By:**	Thomas Bosch

Blank

LMB: 657797
Analyzed: 06/11/2019 09:31
Units: ug/L

Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 657798
Analyzed: 06/11/2019 09:04
Dilution: 1
Units: ug/L

Analyte	Result	Target	% Rec	QC Limits	
Perchlorate	4.34	4.00	109	78.8	123.8

Matrix Spike - Matrix Spike Duplicate

Sample:	1915802001	**MS:**	657799	**MSD:**	657800
Analyzed:	06/11/2019 09:45	**Analyzed:**	06/11/2019 09:58	**Analyzed:**	06/11/2019 10:12
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	4.57	4	114	78.8	123.8	4.78	120	4.65	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 06/12/2019 12:47	/S/ Stephen Brose 06/13/2019 10:59

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
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www.alsglobal.com

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense**

COC ID: **11497**

18698/#3
1915802

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:	HS19051856
TSR:	Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS19051856-02**	**LH18/24-SP650_052919_BIX**	**Water**	**29 May 2019 14:00**
	SUB_Perch-6850			10 Jun 2019

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

QC Level: DOD IV (DoD Data Package)

Relinquished By: _____ Date/Time: 5/31/19 1800

Received By: _____ Date/Time: 6/1/19 0852

Cooler ID(s): 9459 Temperature(s): 2

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Environmental

CHAIN-OF-CUSTODY

Project / Job / Task: HS19051856	***Split:***	**Workorder ID:** 1915802	**Level:** ENV_LVL4	**Requested Analysis**	
Client: ALS Environmental (Houston)		**Account:** 8101	**Type:** 125Poly		
Comments:			**Preservatives**		
			COOL		
			Containers		

Item	Collect Date/Time	Sample ID	Lab ID	QC	Matrix	ID(s)	Count	EPA 6850, DoD QSM
1	05/29/2019 14:00	LH18/24-SP650_052919_BIX	1915802001		Water	A	1	A
2								
3								
4								
5								
6								
7								
8								
9								
10								

84 of 158

ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location
Coates, Gayleen	06/01/2019 08:52	ALS Sample Receiving	Sample Login
R.33.1	6.3.19 10:15	13B	Storage
	6.11.19 08:00	T. Bush	6850

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

00939280

ALS-Salt Lake City-Related Information Report (CRIR)

Cooler or Container Information Checklist (Fill In or Circle)

Client Name: ALS Hanson

Project/Task/Site: 191802

Date/Time of Receipt: 6/1/19 852

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:	Cntr/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	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.
1	C19 9459	2 °C	4	C19	°C	7	C19	°C
2	C19	°C	5	C19	°C	8	C19	°C
3	C19	°C	6	C19	°C	9	C19	°C

Taken By: [signature] (Signature) Meredith Adams (Printed Name) 6/1/19 (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: _____

Must Deliver Next Business Day
Time and Tempature Sensitive!

Part # 156072-0120 0120 **

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

SHIP DATE: 31MAY19
ACTWGT: 8.90 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: HS19051856/1859/1863 - RJ

551C1/D66C/104C

FedEx Express

J181118060501uv

SATURDAY 12:00P
PRIORITY OVERNIGHT

TRK# 0201 4809 7834 6651

XO BTFA

84123
UT-US SLC

Batch Worklist

Batch: ELMS/ 2261 **Created:** 6/11/2019 07:45 **Instrument:** **HBN:** 241120

Rule: EPA 6850, DoD QSM Water **Analyst:** T. Bosch **Status:** WP

Workorder: 1915802 [ENV_LVL4]
Workorder: 1915803 [ENV_LVL4]
Workorder: 1915852 [ENV_LVL4]
Workorder: 1916229 [ENV_LVL4]
Workorder: 1916231 [ENV_LVL4]
Workorder: 1916232 [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	657794	CCV for HBN 241120 [ELMS/2261]				CCV	3		E685041C3Q	5311		6/13/2019	
2	657795	RLVS for HBN 241120 [ELMS/2261				RLVS	3		E685041C3Q	5311		6/13/2019	
3	657796	ICS for HBN 241120 [ELMS/2261]				ICS	3		E6850..D3Q	5311		6/13/2019	
4	657797	LMB for HBN 241120 [ELMS/2261]				LMB	3		E6850Q413Q	5311		6/13/2019	
5	657798	LCS for HBN 241120 [ELMS/2261]				LCS	3		E6850Q413Q	5311		6/13/2019	
6	1915802001	LH18/24-SP650_052919_BIX				SAMPLE	3	1915802001-A	E6850Q41.3	5480	6/26/2019	6/13/2019	
7	657799	LH18/24-SP650...(1915802001MS)				MS	3		E6850Q413Q	5311		6/13/2019	
8	657800	LH18/24-SP65...(1915802001MSD)				MSD	3		E6850Q413Q	5311		6/13/2019	
9	1915803001	LH18/24-SP650_052919_BIX				SAMPLE	3	1915803001-A	E6850Q41.3	5480	6/26/2019	6/13/2019	
10	1915852001	LH18/24-SP140_052919				SAMPLE	3	1915852001-A	E6850Q41.3	5480	6/26/2019	6/13/2019	
11	1916229001	LH18/24-SP140_060419				SAMPLE	3	1916229001-A	E6850Q41.3	5480	7/2/2019	6/19/2019	
12	1916231001	LH18/24-SP650_060419_BIX				SAMPLE	3	1916231001-A	E6850Q41.3	5480	7/2/2019	6/19/2019	
13	1916232001	LH18/24-SP650_060419_BIX				SAMPLE	3	1916232001-A	E6850Q41.3	5480	7/2/2019	6/19/2019	
14	657801	CCV for HBN 241120 [ELMS/2261]				CCV	3		E685041C3Q	5311		6/13/2019	

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

ALS Work Order #'s & Sample #( )'s: 1915802 (001), 1915803 (001), 1915852 (001), 1916229 (001); 1916231 (001); 1916232 (001) ELMS Batch/HBN ID: 2261 (241120)
Prep Date: 06/11/2019 Analysis Date: 06/11/2019 Analyst: T. Bosch
Analyte: **Perchlorate** Matrix: **Water** Method: **6850**
Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2019\JUN\11JUN19D.s
Reported DL: **1.0µg/L** Reported LOD: **2.0µg/L** Reported LOQ: **4.0µg/L**

SAMPLE PREPARATION/ANALYSIS:

Water: Samples were prepared by Thomas 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 AH015-4)/0.1% glacial acetic acid (JT-Baker Lot 04802).
Eluent B1: 95% ACN (B&J Lot AH015-4)/ 5% ASTM Type II water (ALS)/0.1% glacial acetic acid (JT-Baker Lot 04802).

STANDARDS: Internal Standard Spiking Solution Horizon# 43730. Dilutions of Working Standard Solution ID 43702 used for CCV's, LODV's, RLVS and IPC.

CALIBRATION CURVE: Used curve from 03/19/2019, sequence 19MAR19D.s Offline Quantitation Method: CLO4-DP2.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: 7 Injection Volume: 35µL
Column: KP-RPPX C8 separator, 250mm Mobile Phase: 70% Eluent A1; 30% Eluent B1

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: 4.0µL of QC Solution Horizon ID 47516 was used for LCS 657798; Target = 4.0µg/L. ASTM type II water was used for LMB 657797.

MS/MSD: The Matrix Spike and duplicate (MS/MSD) were performed on sample 1915802001 (Client ID: LH18/24-SP650_052919_BIX). 4.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. Spike target = 4.0µg/L.

COMMENTS:

1) Results reported in µg/L. Field samples 1915852001 and 1916229001 were analyzed and reported from 1:1,000 dilutions. The reporting limits have been adjusted accordingly.
2) All QC, Blank, CCV, and MS/MSD results were within method parameters.
3) Sample data can be viewed at two directories within the ALS system: \\ALSLTWS013\LCMS\LCMS04\2019\JUN\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
4) Notebook: \\alsltws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2019\241120-DoD-ALS-Hstn LCMS4 or through \\ALSLTWS013\DATAREVIEW\HBN#
5) The Reporting Limit Verification Standard (RLVS – 657795) is reported from the analysis of the Laboratory Control Sample (LCS – 657798) at a level of 4.0µg/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: 19MARI03).

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: 2261 HBN: 241120 Sample Set IDs if Applicable: 191580 2/191580 3/191585 2 1916229/191623 1/ 1916232	Analyst Initials	Reviewer Initials
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
Method Blanks 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 flags applied on QC reports; LCSs analyzed and meet acceptance criteria when performed	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 checked	TB	SB
Preparation and analysis calculations checked	TB	SB
NCRs are completed as necessary NC/CAR#		
Report forms are complete and accurate	TB	SB
Manual integrations checked	TB	SB

STANDARD REPORT

Working Standard - CLO4 WRK

CLO4 WRK — Description - 6850 WKG Std 100.ug/L

Standard: 43702
MFG: ALS/SLC
MFG Lot: TNB: 09/18/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/18/2018 02:09PM

Amount: 10 mL
Expires: 09/18/2019
Usable: Yes
Lab Lot: CLO4 WRK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	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
43701	CLO4 INT	6850 Intermdt AccStd 10.ug/mL	CLO4 INT	0.1 mL	09/18/2019

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: No
Lab Lot: CLO4 STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	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: 43701
MFG: ALS/SLC
MFG Lot: TNB: 09/18/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/18/2018 02:09PM

Amount: 10 mL
Expires: 09/18/2019
Usable: Yes
Lab Lot: CLO4 INT

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
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			

ALS

STANDARD REPORT

Constituent

Stock Standard - CLO4 QCSTOCK

CLO4 QCSTOCK — **Description - 6850 QC Stock STD 1,000ug/mL**

Standard: 36748
MFG: Ultra Scientific
MFG Lot: CP-0860
Part ID: ICC-013

Created By: Thomas Bosch
Create Date: 05/11/2017 01:05PM

Amount: 100 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL

STANDARD REPORT

Constituent

Working Standard - CLO4 QC INT

CLO4 QC INT — Description - 6850 QC Intrmdt Std-QC 10ug/mL

Standard: 47515
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

STANDARD REPORT

Working Standard - CLO4ISTDWRK

CLO4ISTDWRK — Description - Perchlorate ISTD Wrk 1,000ug/L

Standard: 43730	**Created By:** Thomas Bosch	**Amount:** 25 mL
MFG: ALS/SLC	**Create Date:** 09/20/2018 09:09AM	**Expires:** 09/20/2019
MFG Lot: TNB: 05/09/2018	**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
43729	CLO4ISTDSTK	Perchlorate ISTD Stock	CLO4ISTDSTK	0.25 mL	04/28/2026

STANDARD REPORT

Constituent

Stock Standard - CLO4ISTDSTK

CLO4ISTDSTK — Description - Perchlorate ISTD Stock

Standard: 43729
MFG: Cambridge Isotope
MFG Lot: SDFF-012A
Part ID: OLM-7310-S

Created By: Thomas Bosch
Create Date: 09/20/2018 09:09AM
Verified By: Thomas Bosch
Verify Date:

Amount: 1 mL
Expires: 04/28/2026
Usable: Yes
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

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

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 ACCEPTANCE MATERIAL PRODUCER
ANAB ACCREDITED TESTING LABORATORY

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: JCC-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

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*

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

GHS

Signal Word: None

Component		SRM #	Prepared Concentration (µg/mL)
ClO_4	Perchlorate	Ind. Std.	1000

USstandard

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.

Cambridge Isotope Laboratories, Inc.

Certificate of Analysis

Quality Standards:
ISO Guide 34 • ISO/IEC 17025 • ISO 13485 • cGMP

23118

Product Name: (Isotopic Label & Enrichment Specification)	PERCHLORIC ACID, SODIUM SALT (18O4, 90%+) 100 UG/ML IN WATER
Lot Number:	SDDG-013
Catalog Number:	OLM-7310-S

Product Information

Chemical Purity Specification:	≥98%
Labeled CAS Number:	NA
Unlabeled CAS Number:	7601-89-0
MW*:	130.4
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.

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.

* *For isotopically labeled compounds, MW listed is for the fully enriched product.*

Approved by: T. J. Eckersley

Timothy I. Eckersley, Ph.D., Quality Assurance

Quality Control Tests and Results

QC Release Date	2/27/2014
Expiration Date	2/27/2024
Concentration Based on Gravimetry	102 µg/mL
Chemical Purity of Neat Material(s)	98%
LC/MS for Concentration	109.4 ± 2.8 µg/mL (k=2)



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP2.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
*	657794 CCV@25	Vial 71	1	Control	1	1.90258e6	8.986	26.94929
*	657798 QC@4.0	Vial 72	1	Control	2	3.85542e5	8.884	4.34115
*	657796 ICS@4.0	Vial 73	1	Control	3	2.32261e5	8.623	3.98229
*	657797 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	1915802001	Vial 75	1	Sample	5	0.00000	0.000	0.00000
*	657799 158021S	Vial 76	1	Sample	6	1.46622e5	8.522	4.56740
*	657800 158021D	Vial 77	1	Sample	7	1.54646e5	8.528	4.78474
*	1915803001	Vial 78	1	Sample	8	0.00000	0.000	0.00000
*	1915852001 1K	Vial 79	1	Sample	9	3.32187e5	9.077	4885.02369
*	1916229001 1K	Vial 80	1	Sample	10	4.13979e5	9.091	6820.05588
*	1916231001	Vial 81	1	Sample	11	0.00000	0.000	0.00000
*	1916232001	Vial 82	1	Sample	12	0.00000	0.000	0.00000
*	657801 CCV@25	Vial 71	1	Control	13	1.42334e6	9.028	25.98075

#	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
*	657794 CCV@25	Vial 71	1	Control	1	5.56917e5	9.003	26.60911
*	657798 QC@4.0	Vial 72	1	Control	2	1.22598e5	8.893	4.50107
*	657796 ICS@4.0	Vial 73	1	Control	3	7.62920e4	8.637	4.24932
*	657797 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	1915802001	Vial 75	1	Sample	5	0.00000	0.000	0.00000
*	657799 158021S	Vial 76	1	Sample	6	5.01097e4	8.545	5.09575
*	657800 158021D	Vial 77	1	Sample	7	5.24358e4	8.548	5.30516
*	1915803001	Vial 78	1	Sample	8	0.00000	0.000	0.00000
*	1915852001 1K	Vial 79	1	Sample	9	1.07205e5	9.093	5161.49233
*	1916229001 1K	Vial 80	1	Sample	10	1.30297e5	9.110	7096.69575
*	1916231001	Vial 81	1	Sample	11	0.00000	0.000	0.00000
*	1916232001	Vial 82	1	Sample	12	0.00000	0.000	0.00000
*	657801 CCV@25	Vial 71	1	Control	13	4.26237e5	9.042	26.20612

#	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
*	657794 CCV@25	Vial 71	1	Control	1	2.13798e5	9.004	5.00000
*	657798 QC@4.0	Vial 72	1	Control	2	2.91481e5	8.904	5.00000
*	657796 ICS@4.0	Vial 73	1	Control	3	1.92225e5	8.645	5.00000
*	657797 LMB	Vial 74	1	Control	4	3.01884e5	9.082	5.00000
*	1915802001	Vial 75	1	Sample	5	1.12941e5	8.589	5.00000
*	657799 158021S	Vial 76	1	Sample	6	1.05110e5	8.545	5.00000
*	657800 158021D	Vial 77	1	Sample	7	1.05604e5	8.552	5.00000
*	1915803001	Vial 78	1	Sample	8	1.14182e5	8.546	5.00000
*	1915852001 1K	Vial 79	1	Sample	9	2.21981e5	9.097	5000.00000
*	1916229001 1K	Vial 80	1	Sample	10	1.95450e5	9.116	5000.00000
*	1916231001	Vial 81	1	Sample	11	1.33828e5	8.518	5.00000
*	1916232001	Vial 82	1	Sample	12	1.27034e5	8.502	5.00000
*	657801 CCV@25	Vial 71	1	Control	13	1.66287e5	9.054	5.00000

*** End of Report ***

Sequence Table:

Method and Injection Info Part:

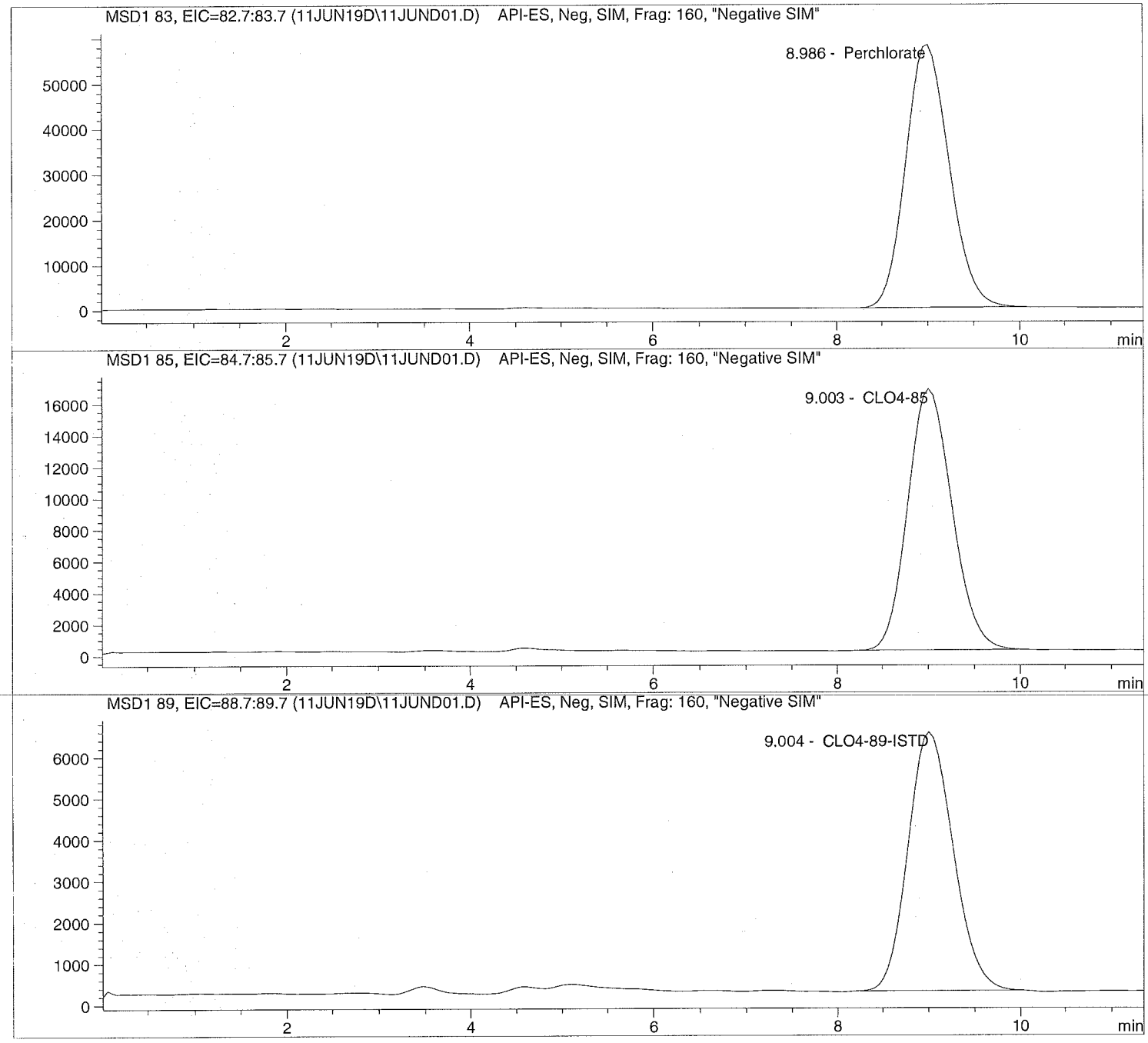
Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	657794 CCV@25	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	657798 QC@4.0	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	657796 ICS@4.0	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	657797 LMB	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	1915802001	CLO4-AQN	1	Sample		
6	Vial 76	657799 158021S	CLO4-AQN	1	Sample		
7	Vial 77	657800 158021D	CLO4-AQN	1	Sample		
8	Vial 78	1915803001	CLO4-AQN	1	Sample		
9	Vial 79	1915852001 1K	CLO4-AQN	1	Sample		
10	Vial 80	1916229001 1K	CLO4-AQN	1	Sample		
11	Vial 81	1916231001	CLO4-AQN	1	Sample		
12	Vial 82	1916232001	CLO4-AQN	1	Sample		
13	Vial 71	657801 CCV@25	CLO4-AQN	1	Ctrl Samp		

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND01.D Sample Name: 657794 CCV@25

Injection Date:	6/11/2019 08:44:35	Seq Line:	1
Sample Name:	657794 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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND01.D Sample Name: 657794 CCV@25

Injection Date:	6/11/2019 08:44:35	Seq Line:	1
Sample Name:	657794 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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.986	PBA	1902575.4	26.9493	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.003	PBA	556916.8	26.6091	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.004	PBA	213798.0	5.0000	CLO4-89-ISTD

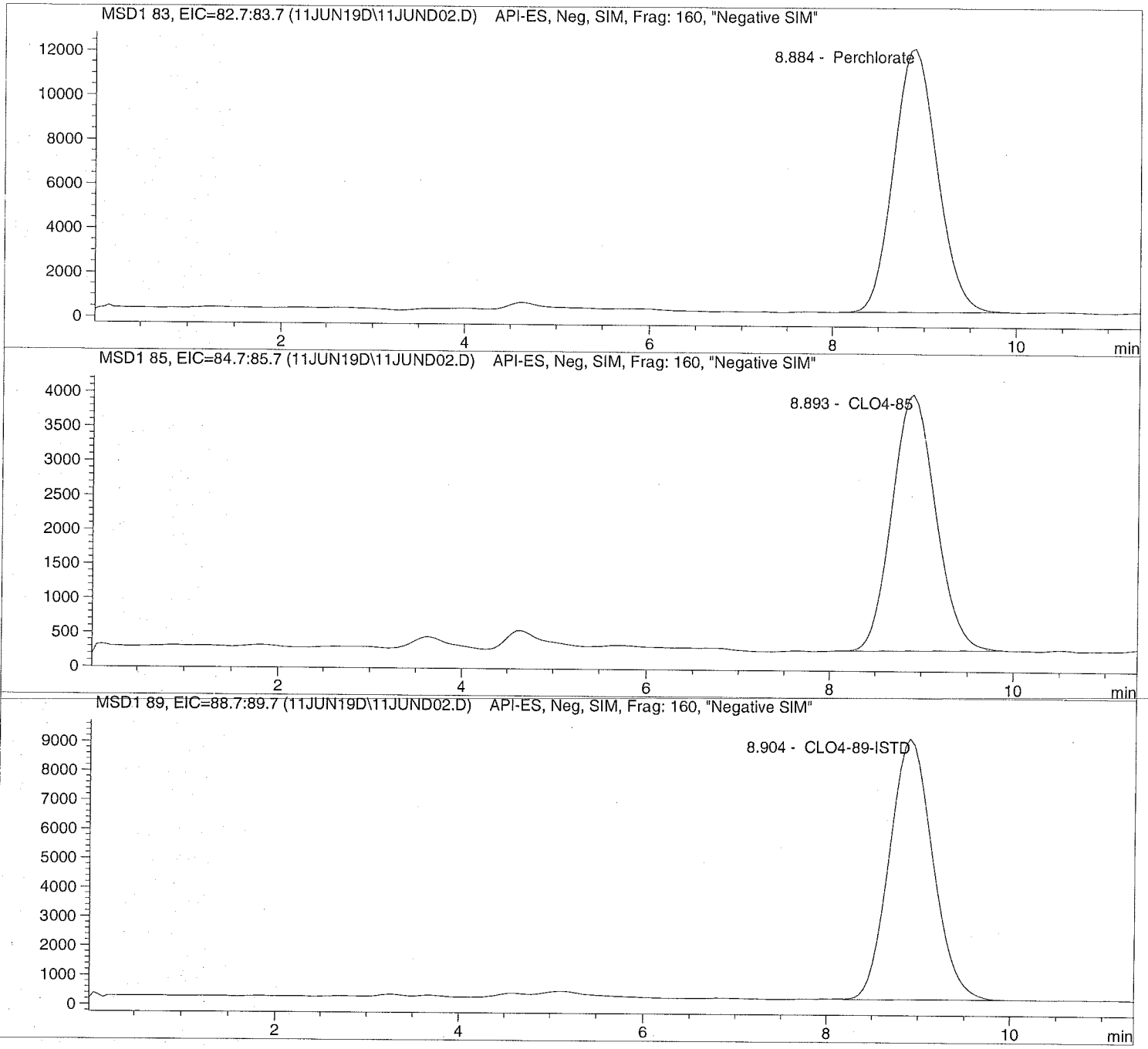
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND02.D Sample Name: 657798 QC@4.0

Injection Date:	6/11/2019 09:04:55	Seq Line:	2
Sample Name:	657798 QC@4.0	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND02.D Sample Name: 657798 QC@4.0

Injection Date:	6/11/2019 09:04:55	Seq Line:	2
Sample Name:	657798 QC@4.0	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.884	PBA	385541.7	4.3412	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.893	BBA	122598.4	4.5011	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.904	BBA	291480.6	5.0000	CLO4-89-ISTD

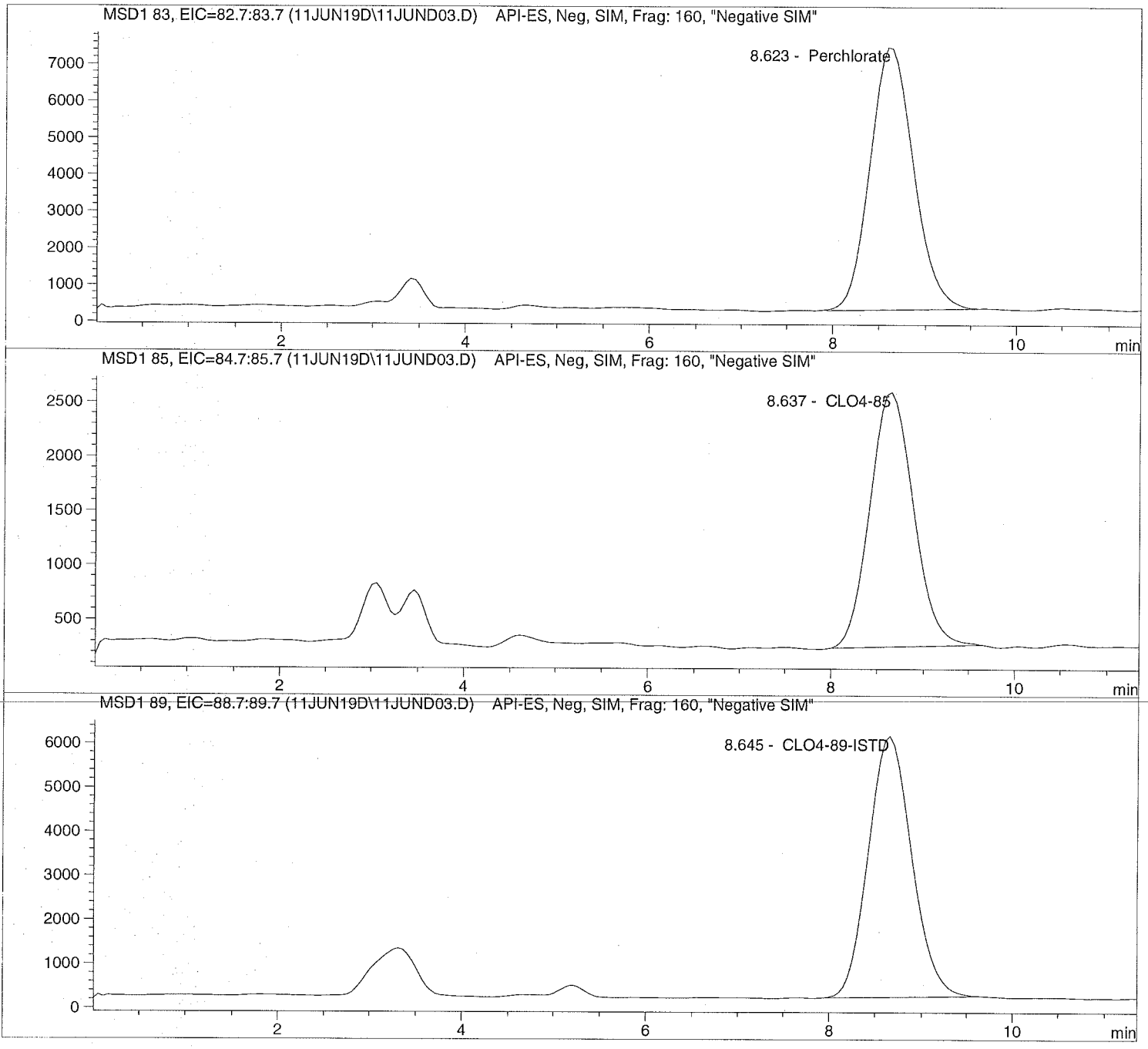
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND03.D Sample Name: 657796 ICS@4.0

Injection Date:	6/11/2019 09:18:21	Seq Line:	3
Sample Name:	657796 ICS@4.0	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND03.D Sample Name: 657796 ICS@4.0

Injection Date:	6/11/2019 09:18:21	Seq Line:	3
Sample Name:	657796 ICS@4.0	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.623	PBA	232261.2	3.9823	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.637	PBA	76292.0	4.2493	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.645	PBA	192224.9	5.0000	CLO4-89-ISTD

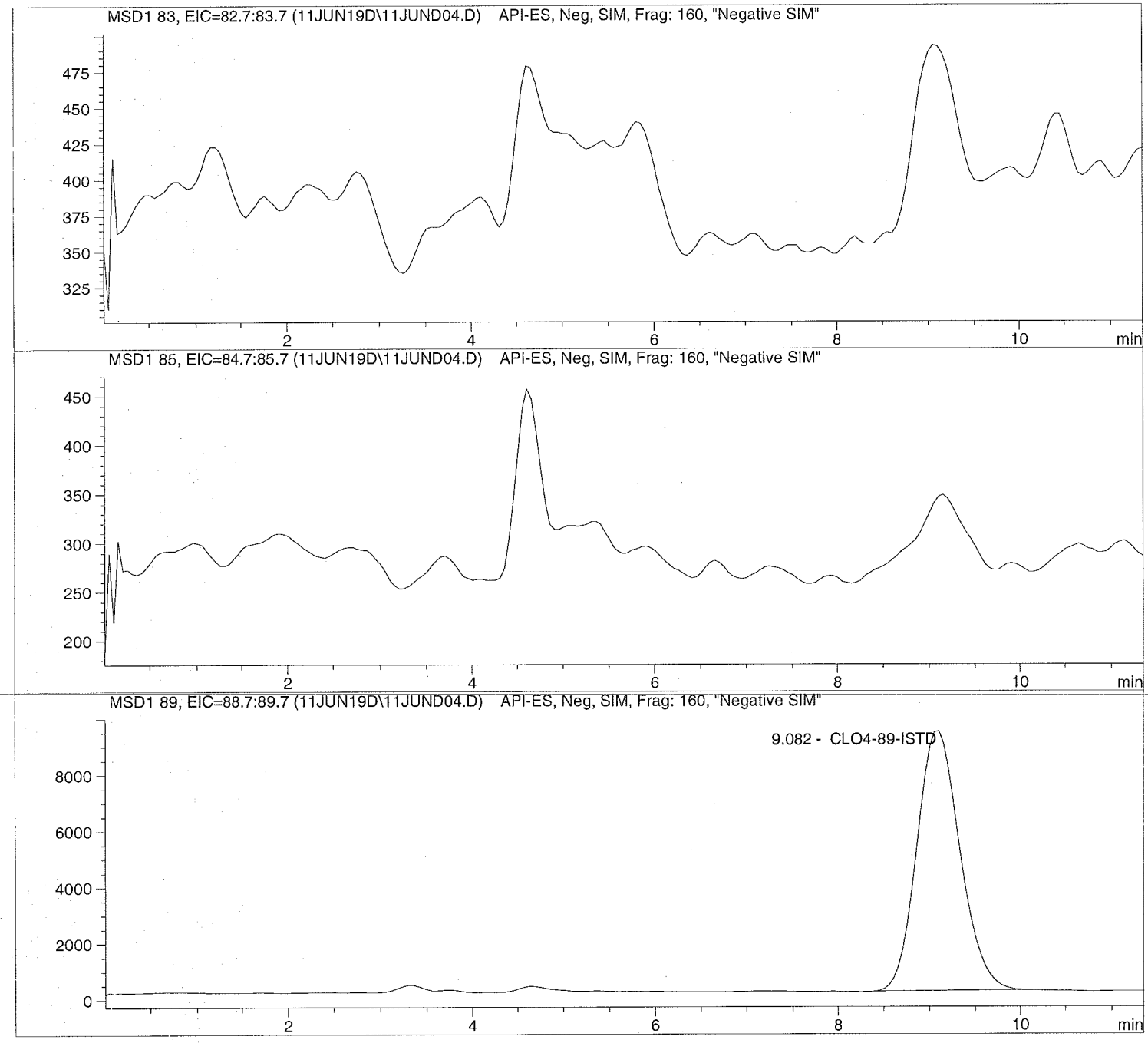
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND04.D Sample Name: 657797 LMB

Injection Date:	6/11/2019 09:31:47	Seq Line:	4
Sample Name:	657797 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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND04.D Sample Name: 657797 LMB

Injection Date:	6/11/2019 09:31:47	Seq Line:	4
Sample Name:	657797 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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
9.082	PBA	301883.5	5.0000	CLO4-89-ISTD

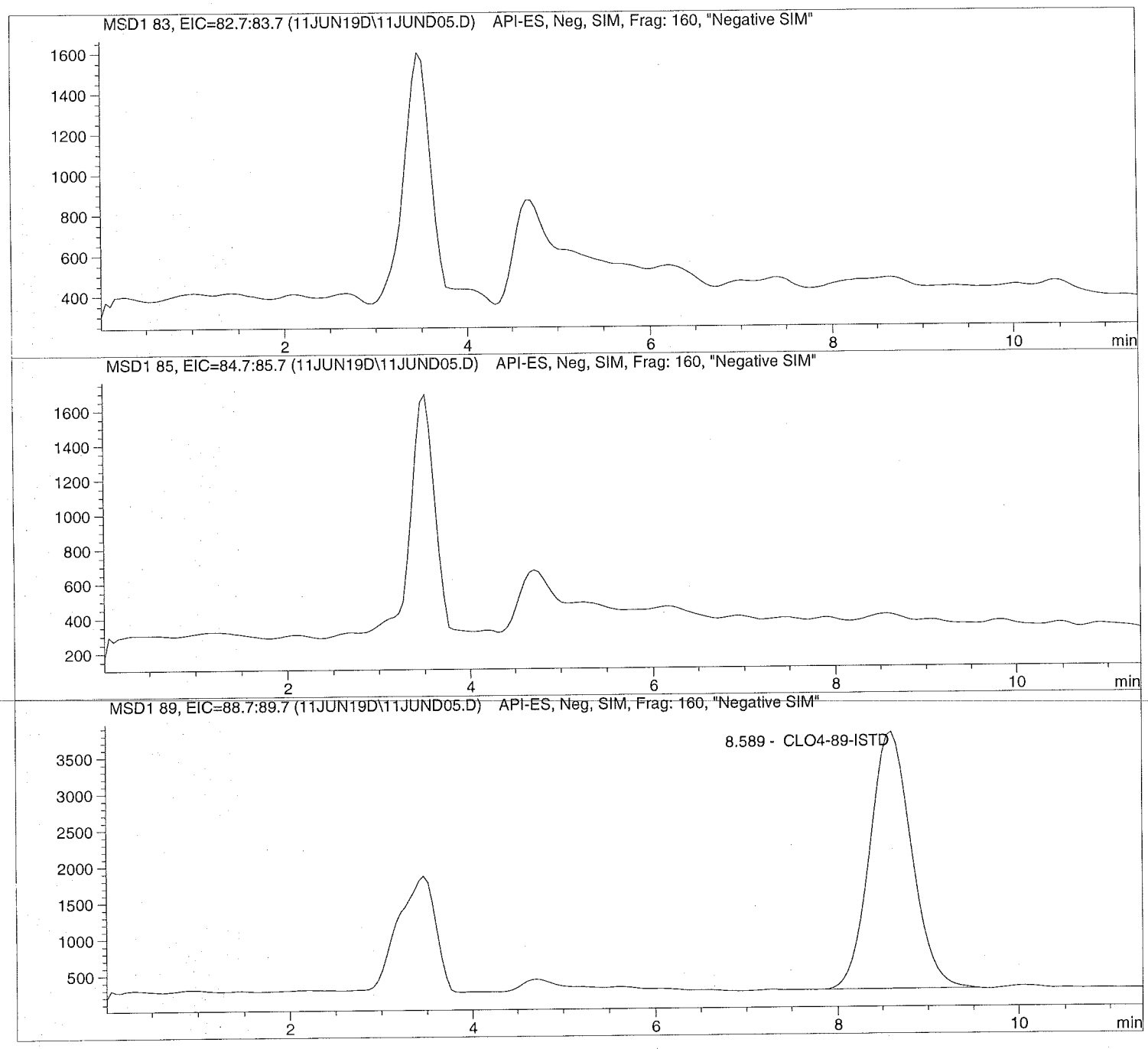
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND05.D Sample Name: 1915802001

Injection Date:	6/11/2019 09:45:13	Seq Line:	5
Sample Name:	1915802001	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND05.D Sample Name: 1915802001

Injection Date:	6/11/2019 09:45:13	Seq Line:	5
Sample Name:	1915802001	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.589	PBA	112941.5	5.0000	CLO4-89-ISTD

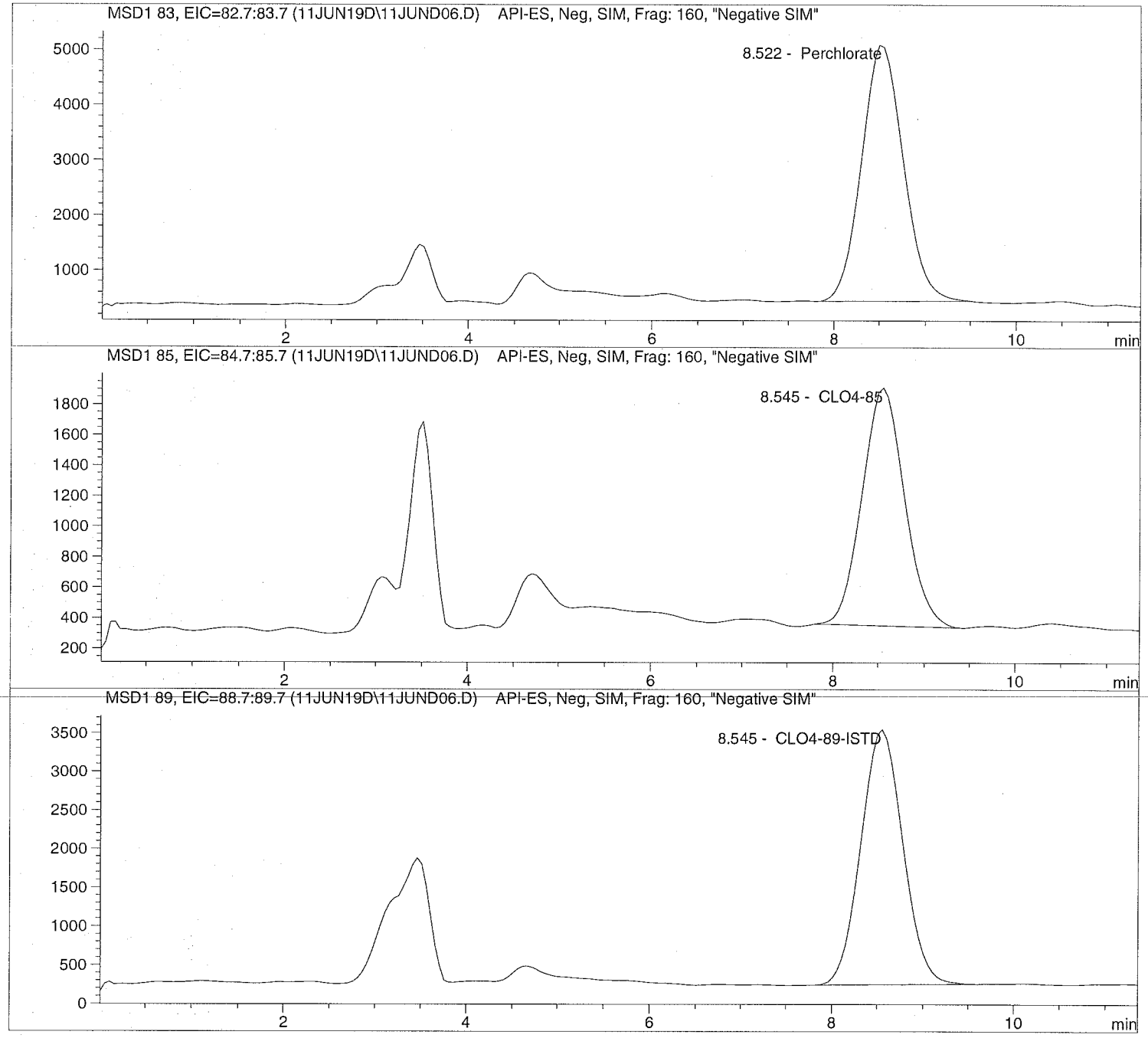
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND06.D Sample Name: 657799 158021S

Injection Date:	6/11/2019 09:58:38	Seq Line:	6
Sample Name:	657799 158021S	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND06.D Sample Name: 657799 158021S

Injection Date:	6/11/2019 09:58:38	Seq Line:	6
Sample Name:	657799 158021S	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-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.522	BBA	146622.1	4.5674	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.545	PBA	50109.7	5.0958	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.545	PBA	105110.4	5.0000	CLO4-89-ISTD

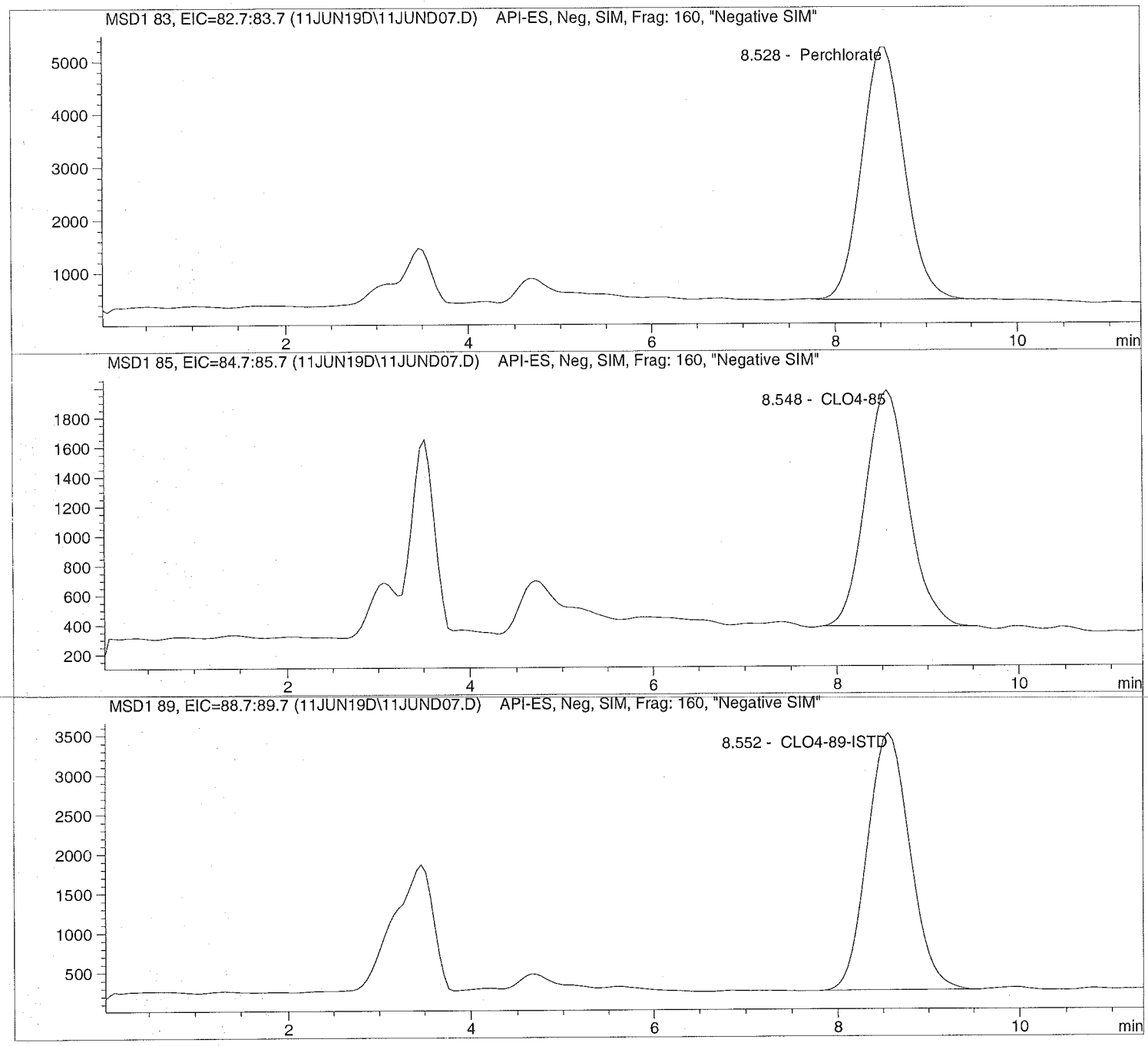
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND07.D Sample Name: 657800 158021D

Injection Date:	6/11/2019 10:12:09	Seq Line:	7
Sample Name:	657800 158021D	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND07.D Sample Name: 657800 158021D

Injection Date:	6/11/2019 10:12:09	Seq Line:	7
Sample Name:	657800 158021D	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.528	BBA	154645.8	4.7847	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.548	PBA	52435.8	5.3052	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.552	PBA	105604.1	5.0000	CLO4-89-ISTD

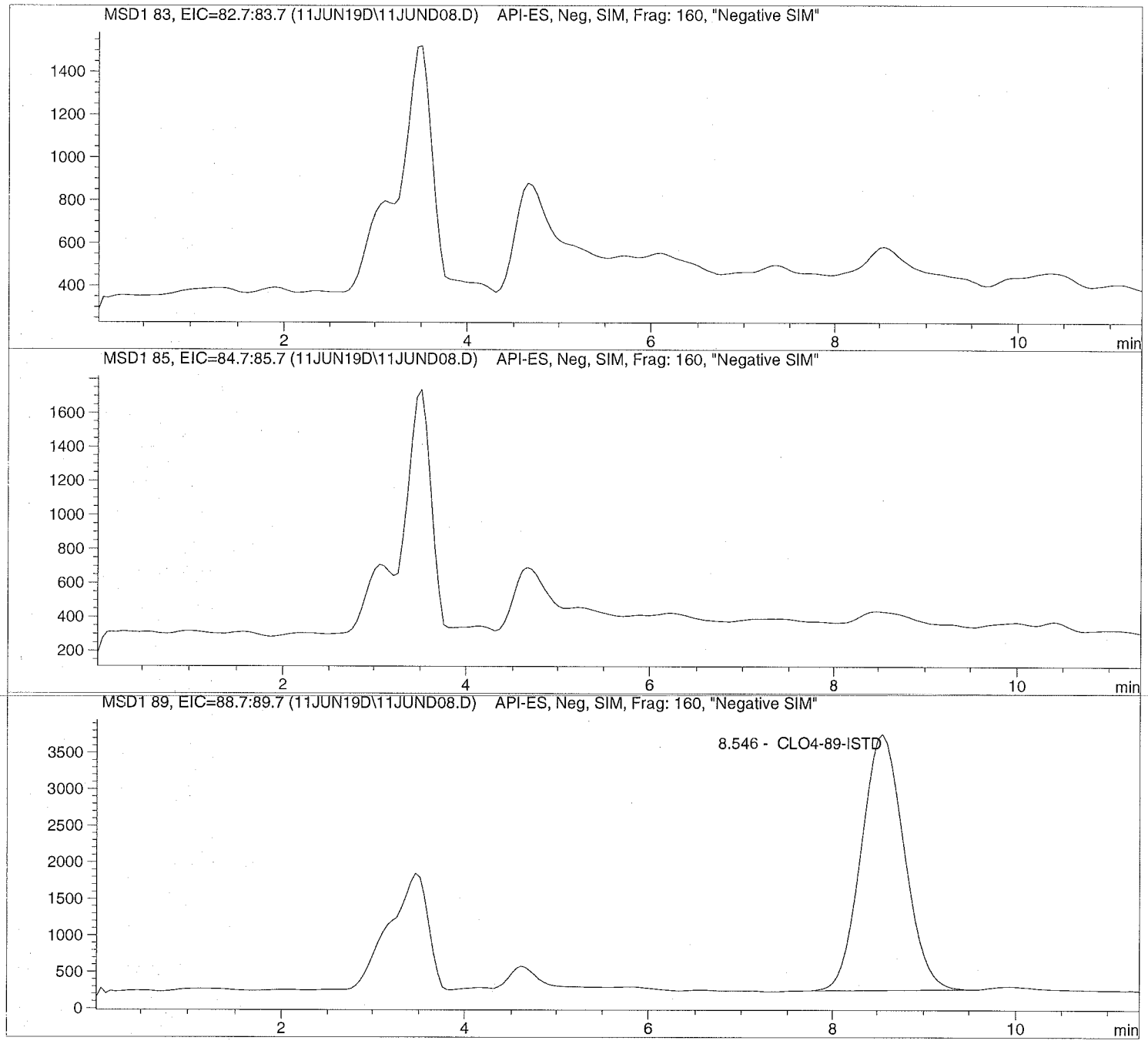
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND08.D Sample Name: 1915803001

Injection Date:	6/11/2019 10:25:32	Seq Line:	8
Sample Name:	1915803001	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND08.D Sample Name: 1915803001

Injection Date:	6/11/2019 10:25:32	Seq Line:	8
Sample Name:	1915803001	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.546	BBA	114182.4	5.0000	CLO4-89-ISTD

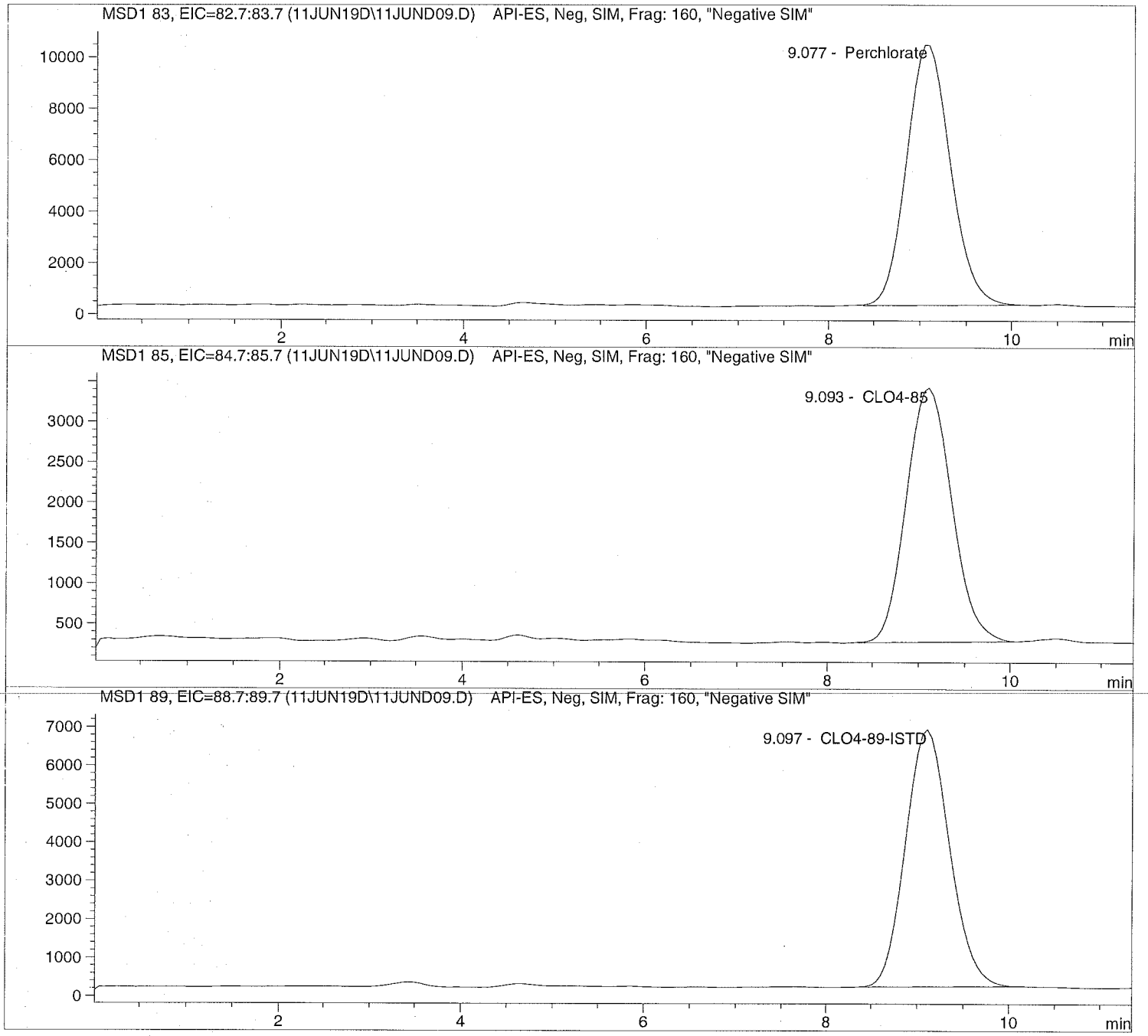
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND09.D Sample Name: 1915852001 1K

Injection Date:	6/11/2019 10:38:54	Seq Line:	9
Sample Name:	1915852001 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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND09.D Sample Name: 1915852001 1K

Injection Date:	6/11/2019 10:38:54	Seq Line:	9
Sample Name:	1915852001 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-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
9.077	BBA	332187.1	4885.0237	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.093	PBA	107205.2	5161.4923	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.097	PBA	221981.4	5000.0000	CLO4-89-ISTD

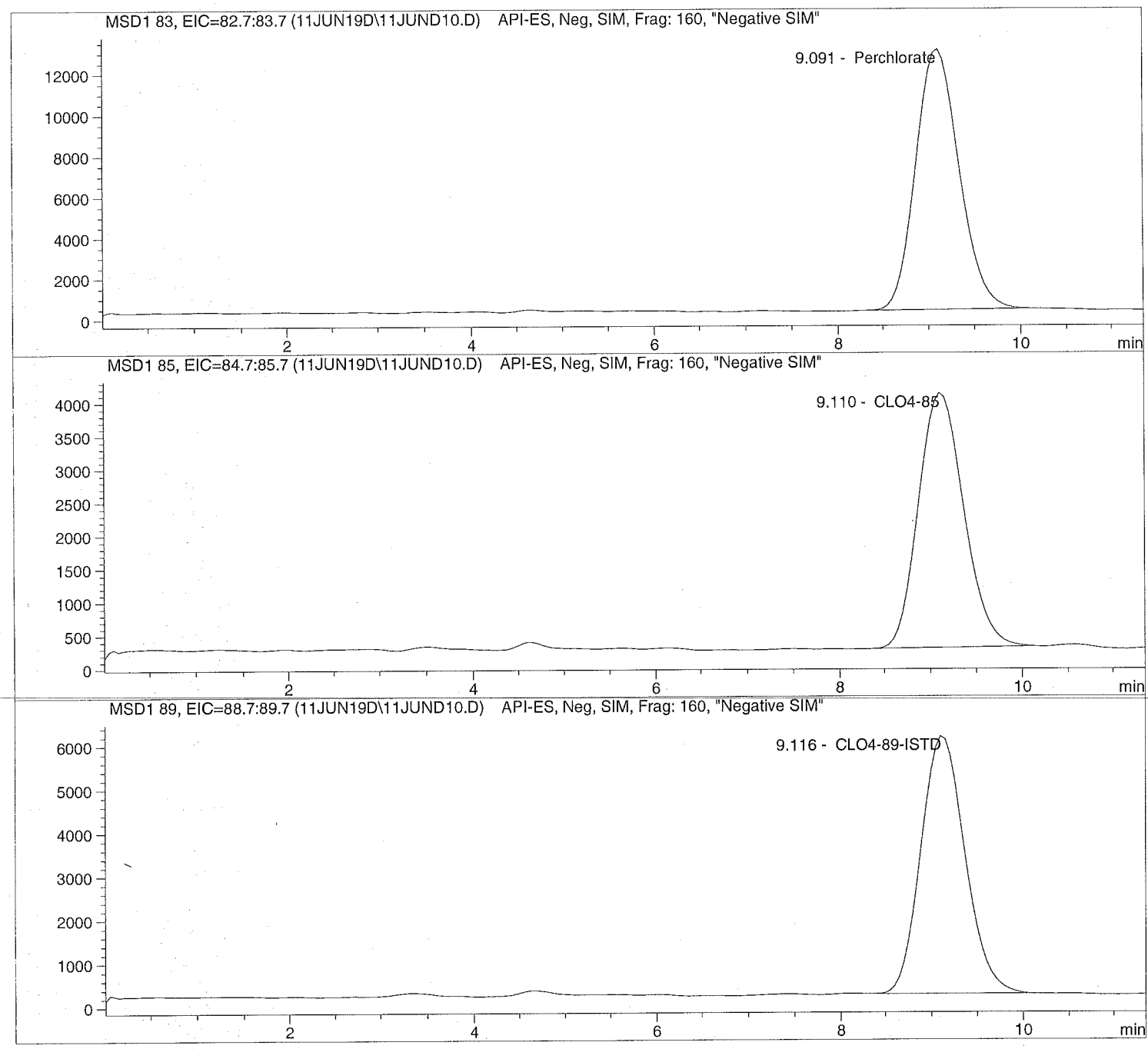
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND10.D Sample Name: 1916229001 1K

Injection Date:	6/11/2019 10:52:22	Seq Line:	10
Sample Name:	1916229001 1K	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND10.D Sample Name: 1916229001 1K

Injection Date:	6/11/2019 10:52:22	Seq Line:	10
Sample Name:	1916229001 1K	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
9.091	BBA	413978.8	6820.0559	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.110	PBA	130297.0	7096.6957	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.116	BBA	195449.6	5000.0000	CLO4-89-ISTD

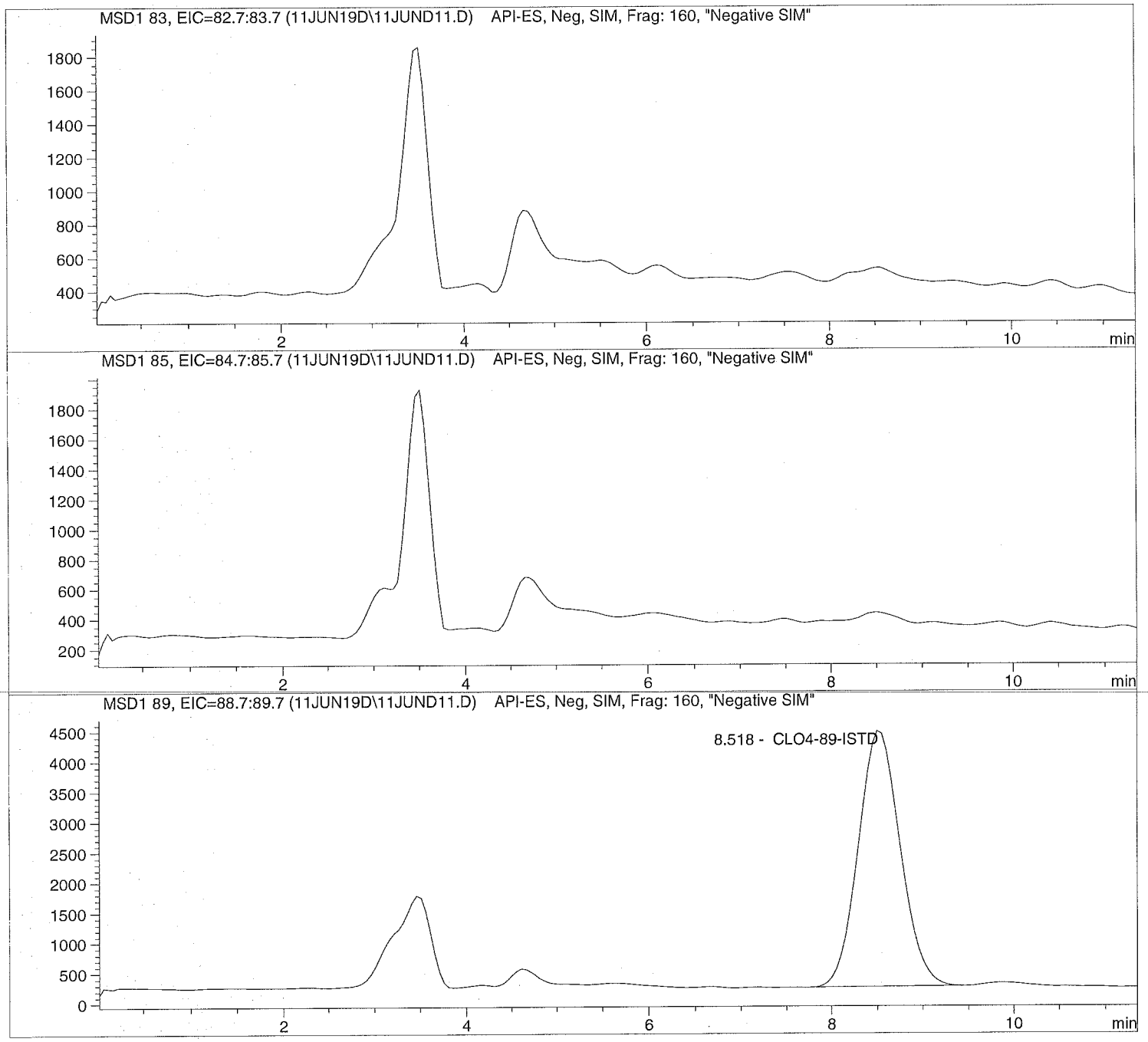
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND11.D Sample Name: 1916231001

Injection Date:	6/11/2019 11:05:44	Seq Line:	11
Sample Name:	1916231001	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND11.D Sample Name: 1916231001

Injection Date:	6/11/2019 11:05:44	Seq Line:	11
Sample Name:	1916231001	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.518	PBA	133827.9	5.0000	CLO4-89-ISTD

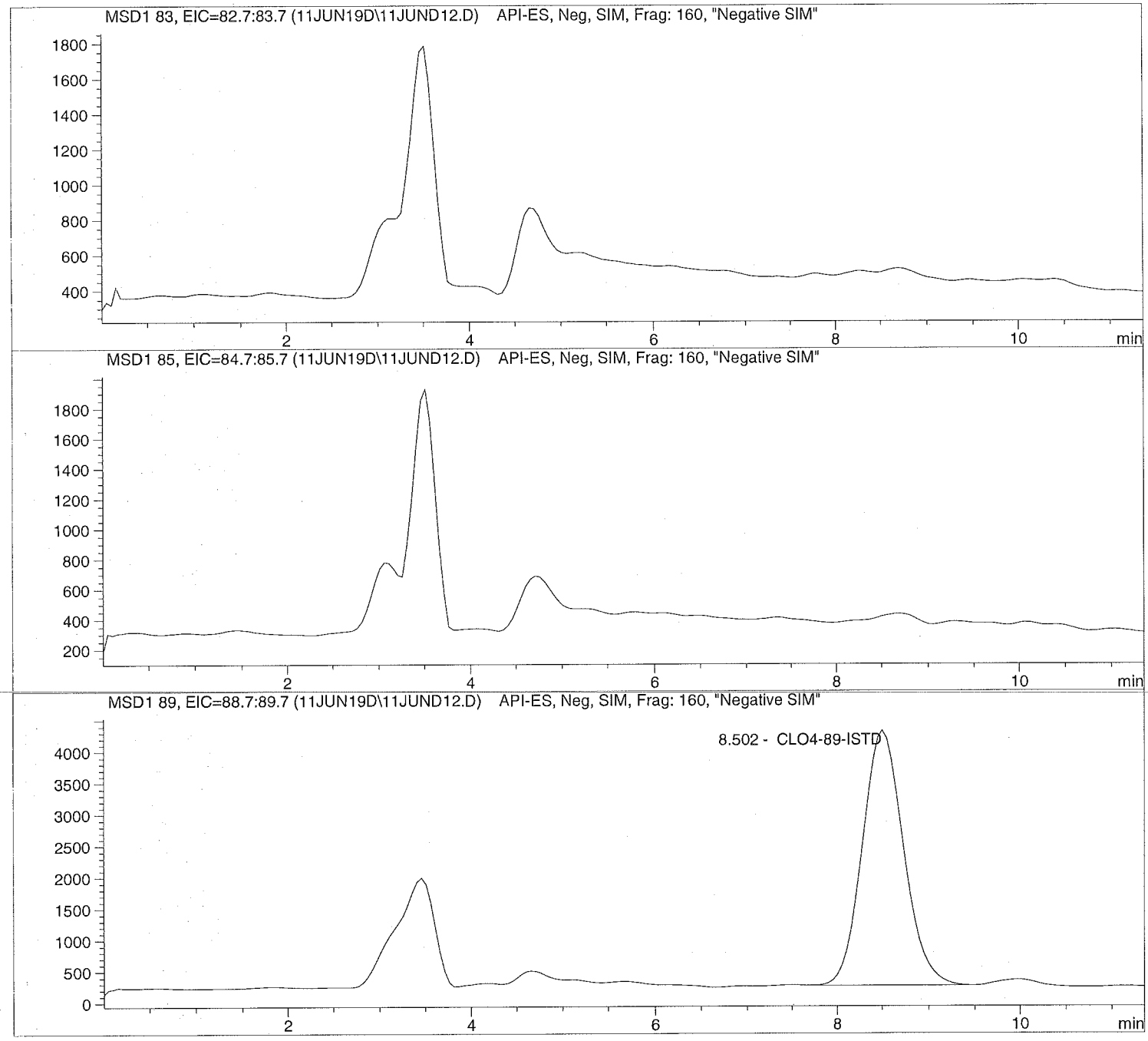
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND12.D Sample Name: 1916232001

Injection Date:	6/11/2019 11:19:06	Seq Line:	12
Sample Name:	1916232001	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND12.D Sample Name: 1916232001

Injection Date:	6/11/2019 11:19:06	Seq Line:	12
Sample Name:	1916232001	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-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.502	BBA	127033.7	5.0000	CLO4-89-ISTD

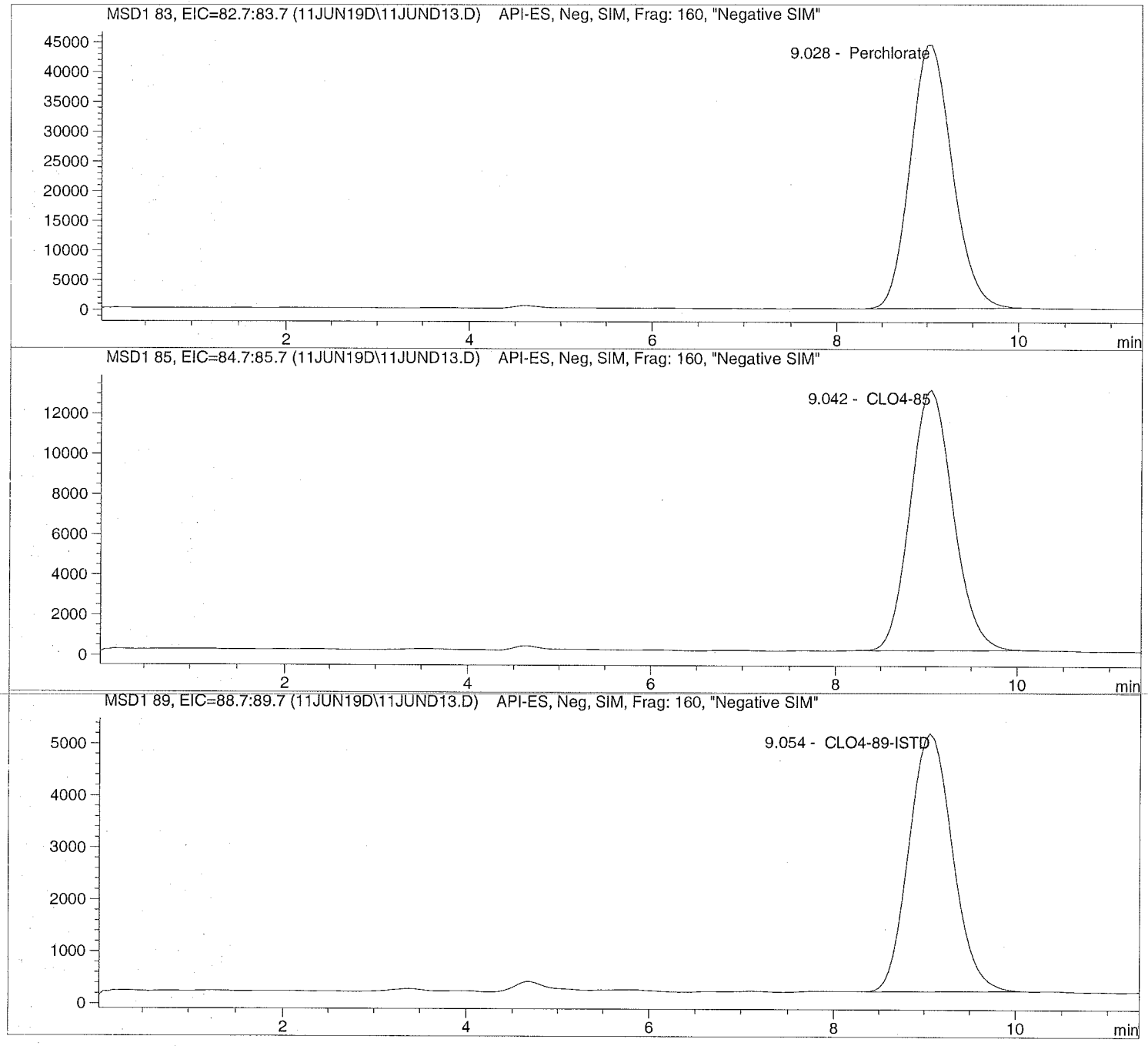
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND13.D Sample Name: 657801 CCV@25

Injection Date:	6/11/2019 11:34:17	Seq Line:	13
Sample Name:	657801 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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND13.D Sample Name: 657801 CCV@25

Injection Date:	6/11/2019 11:34:17	Seq Line:	13
Sample Name:	657801 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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
9.028	PBA	1423337.3	25.9807	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.042	BBA	426236.8	26.2061	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.054	BBA	166286.8	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 : 3/19/2019 2:35:19 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
8.744	1	1	1.00000	7.76074e4	1.28854e-5		1	Perchlorate
		2	2.00000	1.35273e5	1.47849e-5			
		3	5.00000	3.37764e5	1.48033e-5			
		4	10.00000	6.83454e5	1.46316e-5			
		5	25.00000	2.08433e6	1.19943e-5			
		6	50.00000	4.13334e6	1.20968e-5			
		7	75.00000	5.99313e6	1.25143e-5			
8.755	2	1	1.00000	2.36780e4	4.22333e-5		1	CLO4-85
		2	2.00000	4.69486e4	4.25998e-5			
		3	5.00000	1.06124e5	4.71147e-5			
		4	10.00000	2.13523e5	4.68335e-5			
		5	25.00000	6.14295e5	4.06971e-5			
		6	50.00000	1.19814e6	4.17315e-5			
		7	75.00000	1.78355e6	4.20509e-5			
8.766	3	1	5.00000	2.73208e5	1.83011e-5	+I1		CLO4-89-ISTD
		2	5.00000	2.24886e5	2.22335e-5			
		3	5.00000	2.33196e5	2.14412e-5			
		4	5.00000	2.34454e5	2.13262e-5			
		5	5.00000	2.50568e5	1.99547e-5			
		6	5.00000	2.30977e5	2.16472e-5			

RetTime [min]	Sig	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
		7	5.00000	2.21504e5	2.25729e-5			

More compound-specific settings:

Compound: Perchlorate
- Time Window : From 6.654 min To 12.544 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 0.5
  - Level 3 : 0.2
  - Level 4 : 0.1
  - Level 5 : 0.04
  - Level 6 : 0.02
  - Level 7 : 0.013333

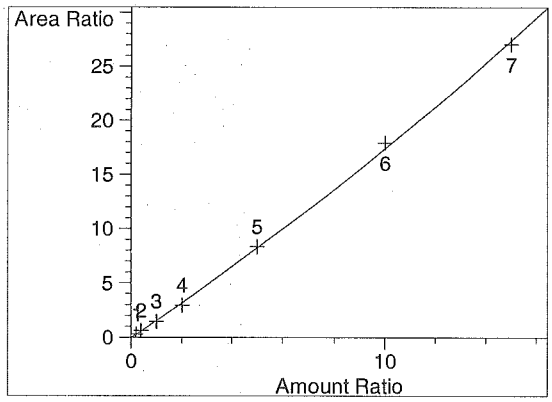
Compound: CLO4-85
- Time Window : From 6.650 min To 12.505 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 0.5
  - Level 3 : 0.2
  - Level 4 : 0.1
  - Level 5 : 0.04
  - Level 6 : 0.02
  - Level 7 : 0.013333

Compound: CLO4-89-ISTD
- Time Window : From 6.659 min To 12.466 min
- Curve Type : Linear
- Origin : Included
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 1
  - Level 3 : 1
  - Level 4 : 1
  - Level 5 : 1
  - Level 6 : 1
  - Level 7 : 1

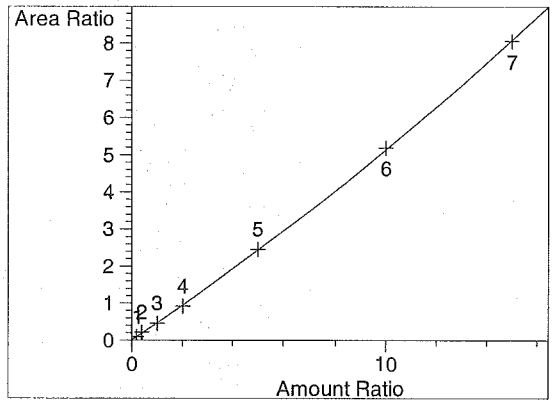
Peak Sum Table

No Entries in table

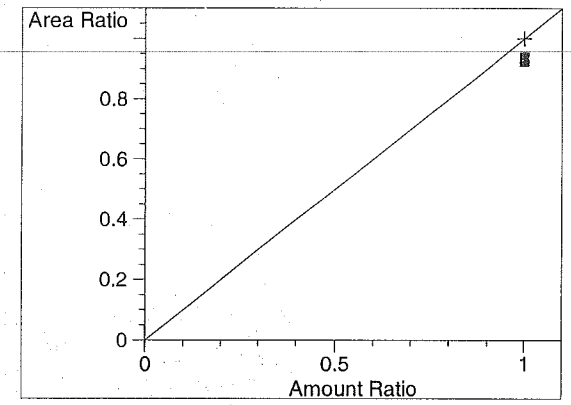
Calibration Curves



Perchlorate at exp. RT: 8.744
MSD1 83, EIC=82.7:83.7
Correlation: 0.99957
Residual Std. Dev.: 0.30744
Formula: $y = ax^2 + bx + c$
a: 1.76988e-2
b: 1.56480
c: -4.92430e-2
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.5
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.013333



CLO4-85 at exp. RT: 8.755
MSD1 85, EIC=84.7:85.7
Correlation: 0.99983
Residual Std. Dev.: 0.03473
Formula: $y = ax^2 + bx + c$
a: 5.13396e-3
b: 4.62055e-1
c: 4.97209e-4
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.5
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.013333



CLO4-89-ISTD at exp. RT: 8.766
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 1 : 1
Level 2 : 1
Level 3 : 1
Level 4 : 1
Level 5 : 1
Level 6 : 1
Level 7 : 1

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP2.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	7.76074e4	8.744	1.06245
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	1.35273e5	8.992	2.06969
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	3.37764e5	8.586	4.73474
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	6.83454e5	8.698	9.27727
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.08433e6	8.451	25.29036
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	4.13334e6	8.810	51.36844
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	5.99313e6	8.586	74.16754
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	7.34719e5	8.702	9.25940

#	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.36780e4	8.755	9.30535e-1
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	4.69486e4	9.012	2.24255
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	1.06124e5	8.602	4.86656
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.13523e5	8.713	9.64312
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	6.14295e5	8.468	25.12159
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	1.19814e6	8.825	50.46721
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	1.78355e6	8.603	74.72019
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.27495e5	8.721	9.54024

#	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	2.73208e5	8.766	5.00000
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	2.24886e5	9.012	5.00000
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	2.33196e5	8.609	5.00000
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.34454e5	8.716	5.00000
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.50568e5	8.472	5.00000
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	2.30977e5	8.825	5.00000
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	2.21504e5	8.610	5.00000
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.52544e5	8.725	5.00000

*** End of Report ***

Sequence Table:

Method and Injection Info Part:

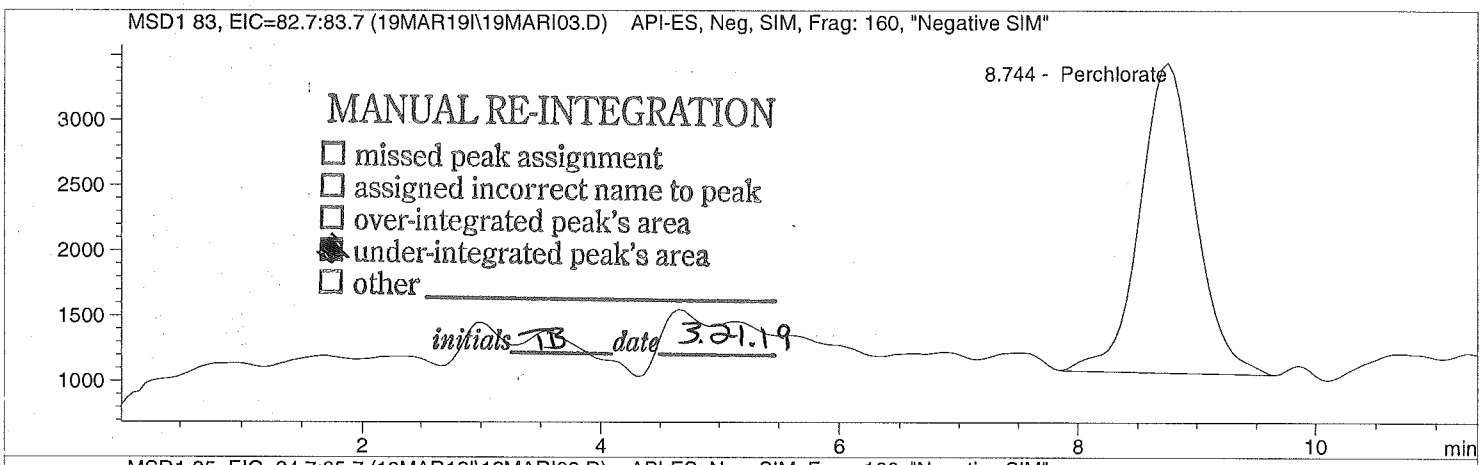
Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	CLO4@ 0.2ug/L	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	CLO4@ 0.5ug/L	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	CLO4@ 1.0ug/L	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	CLO4@ 2.0ug/L	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	CLO4@ 5.0ug/L	CLO4-AQN	1	Ctrl Samp		
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 80	ICAL Verf@10ug/L	CLO4-AQN	1	Ctrl Samp		

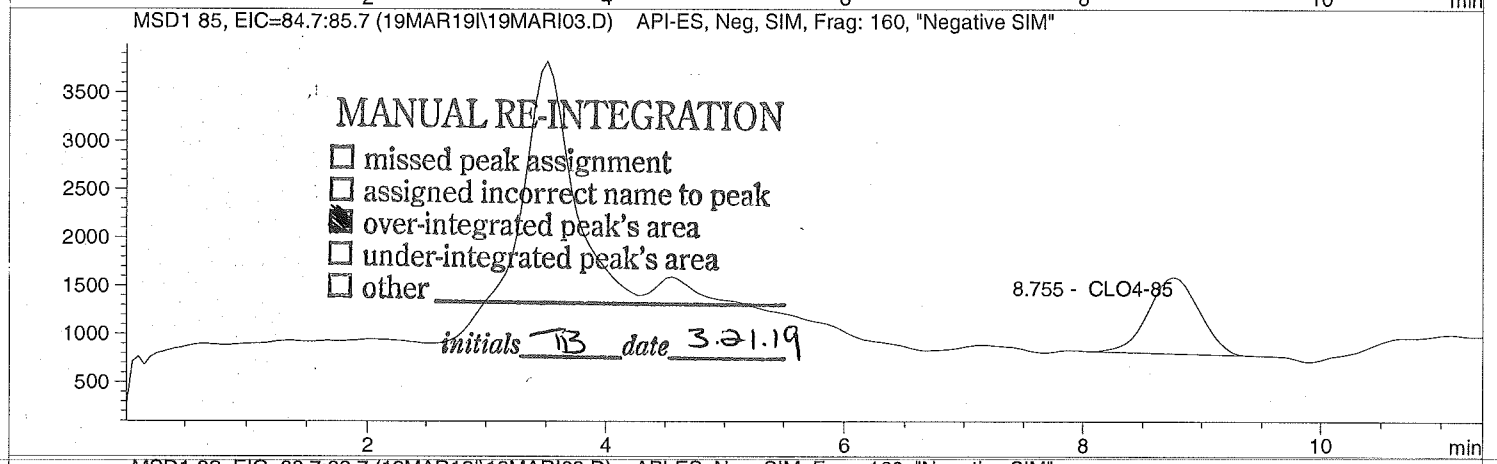
Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

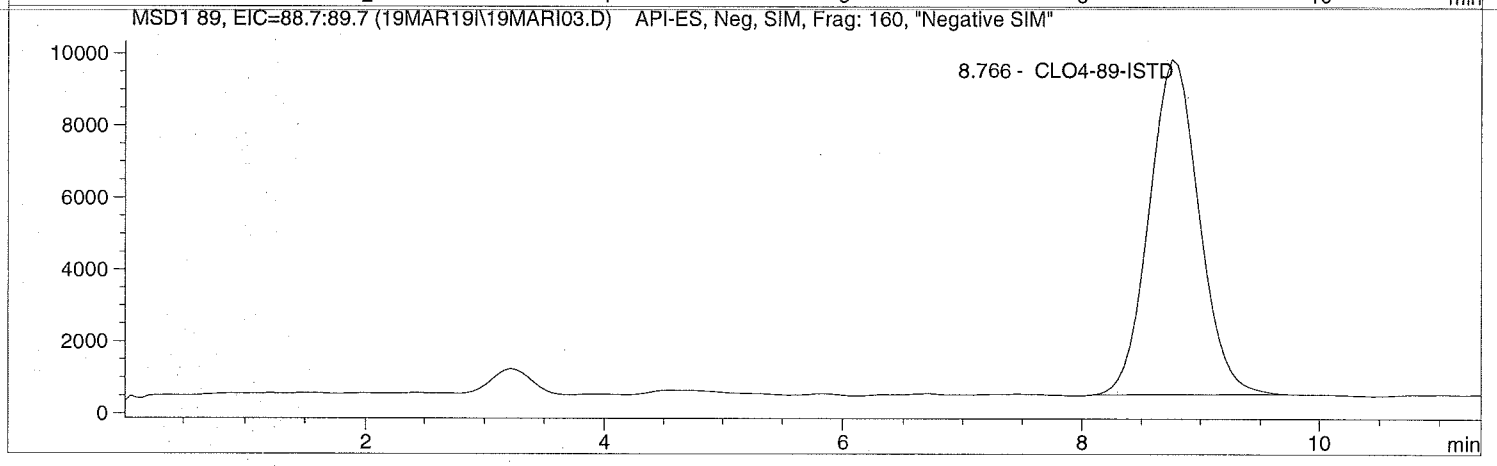
Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 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
8.744	MM	77607.4	1.0625	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	MM	23678.0	0.9305	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

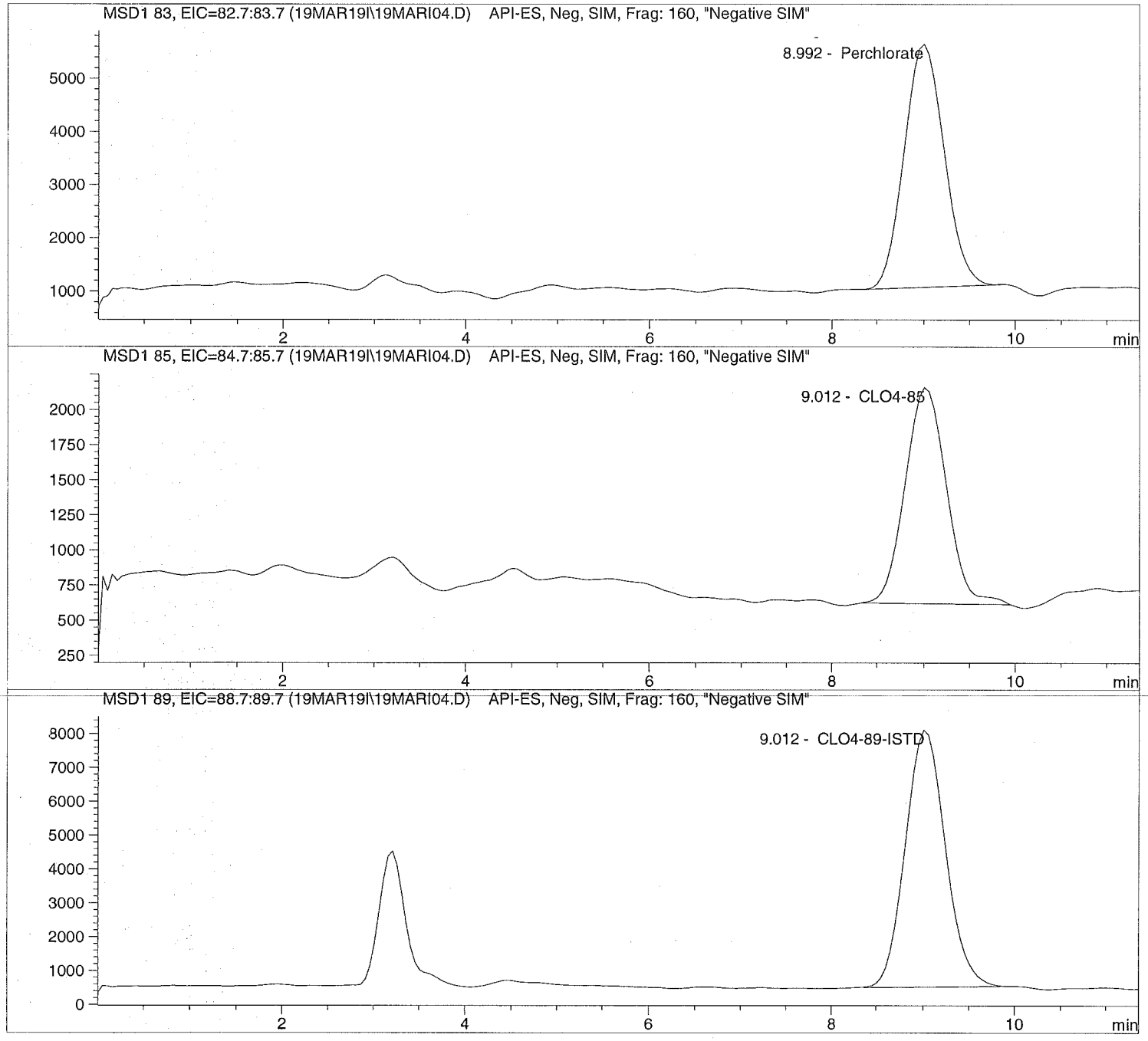
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	3/19/2019 09:53:00	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	3/19/2019 09:53:00	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 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
8.992	BBA	135272.8	2.0697	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	46948.6	2.2425	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	224885.9	5.0000	CLO4-89-ISTD

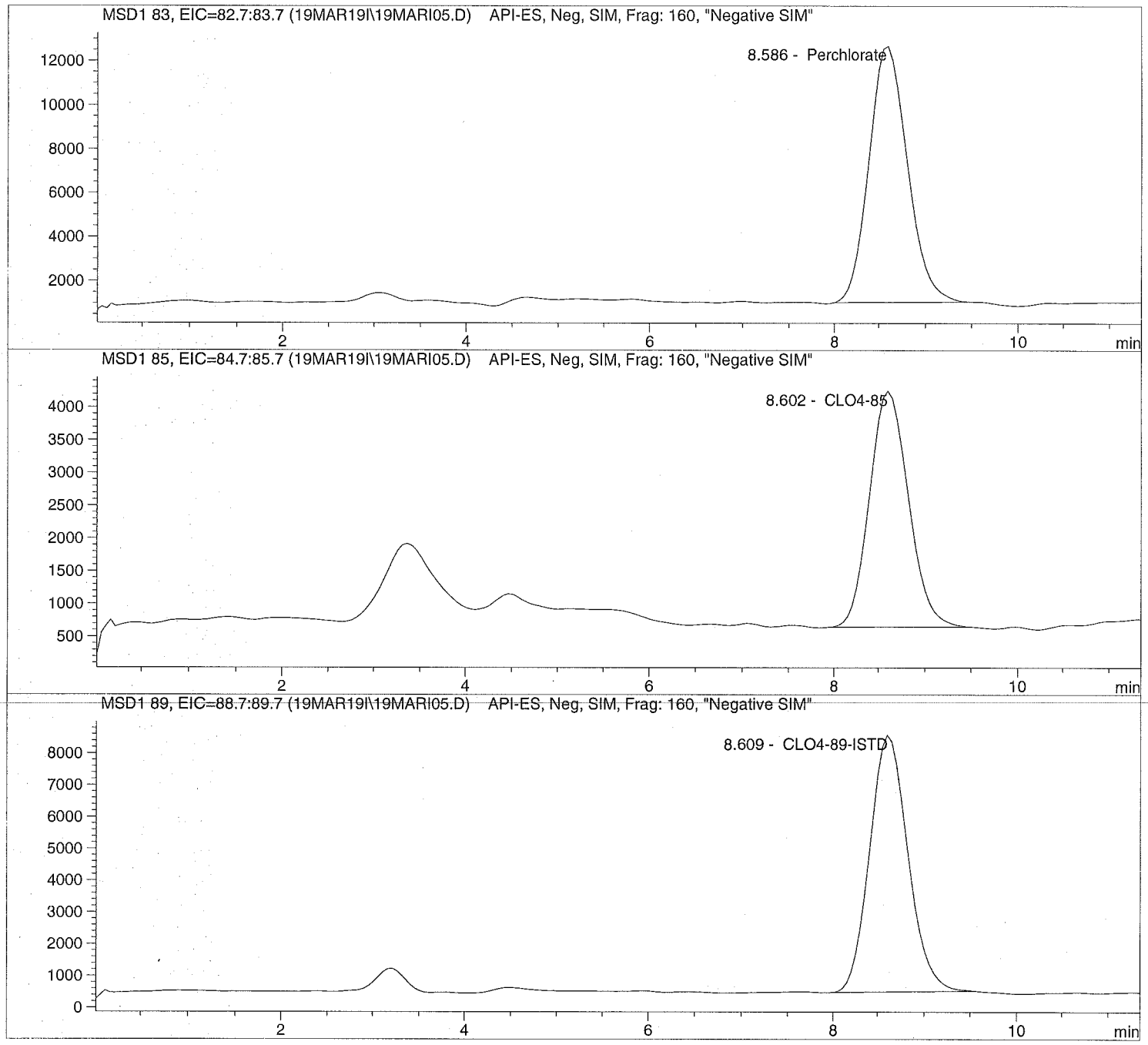
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	3/19/2019 10:06:16	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	3/19/2019 10:06:16	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 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
8.586	PBA	337763.6	4.7347	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.602	PBA	106124.0	4.8666	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.609	PBA	233196.3	5.0000	CLO4-89-ISTD

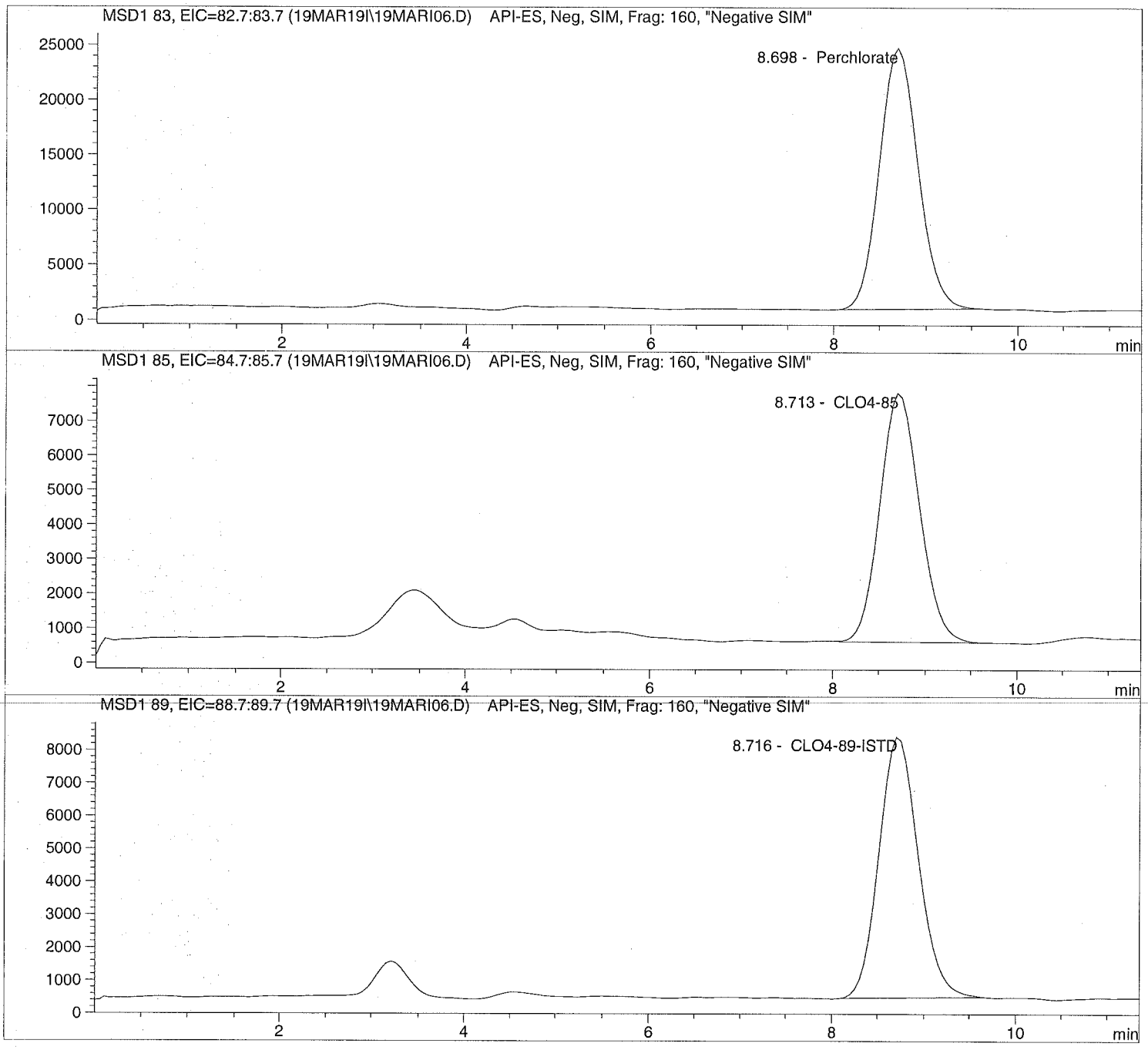
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	3/19/2019 10:19:32	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	3/19/2019 10:19:32	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 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
8.698	PBA	683454.4	9.2773	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.713	BBA	213522.6	9.6431	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.716	PBA	234453.6	5.0000	CLO4-89-ISTD

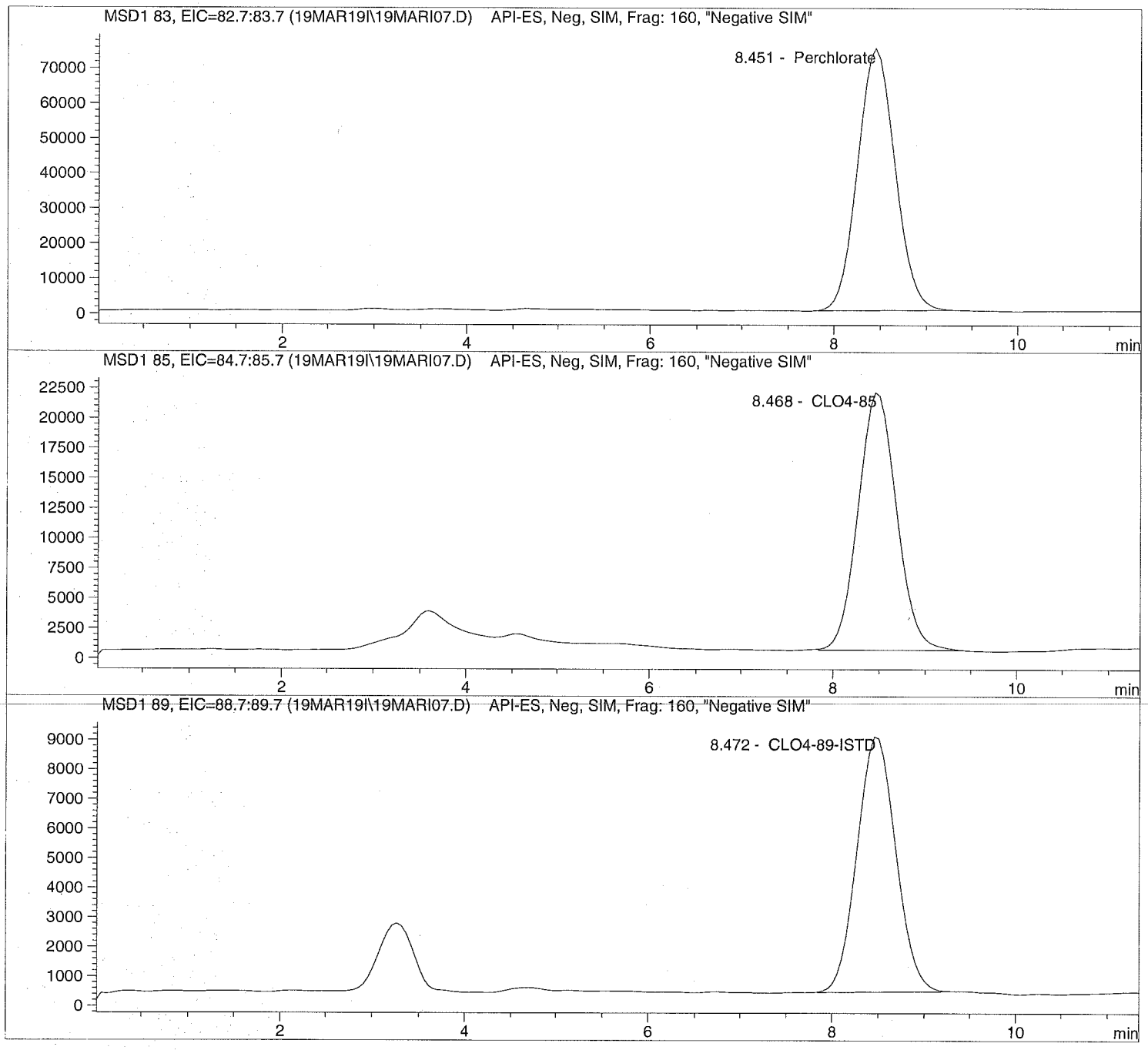
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	3/19/2019 10:32:49	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	3/19/2019 10:32:49	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 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
8.451	PBA	2084327.4	25.2904	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.468	BBA	614294.8	25.1216	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.472	BBA	250568.0	5.0000	CLO4-89-ISTD

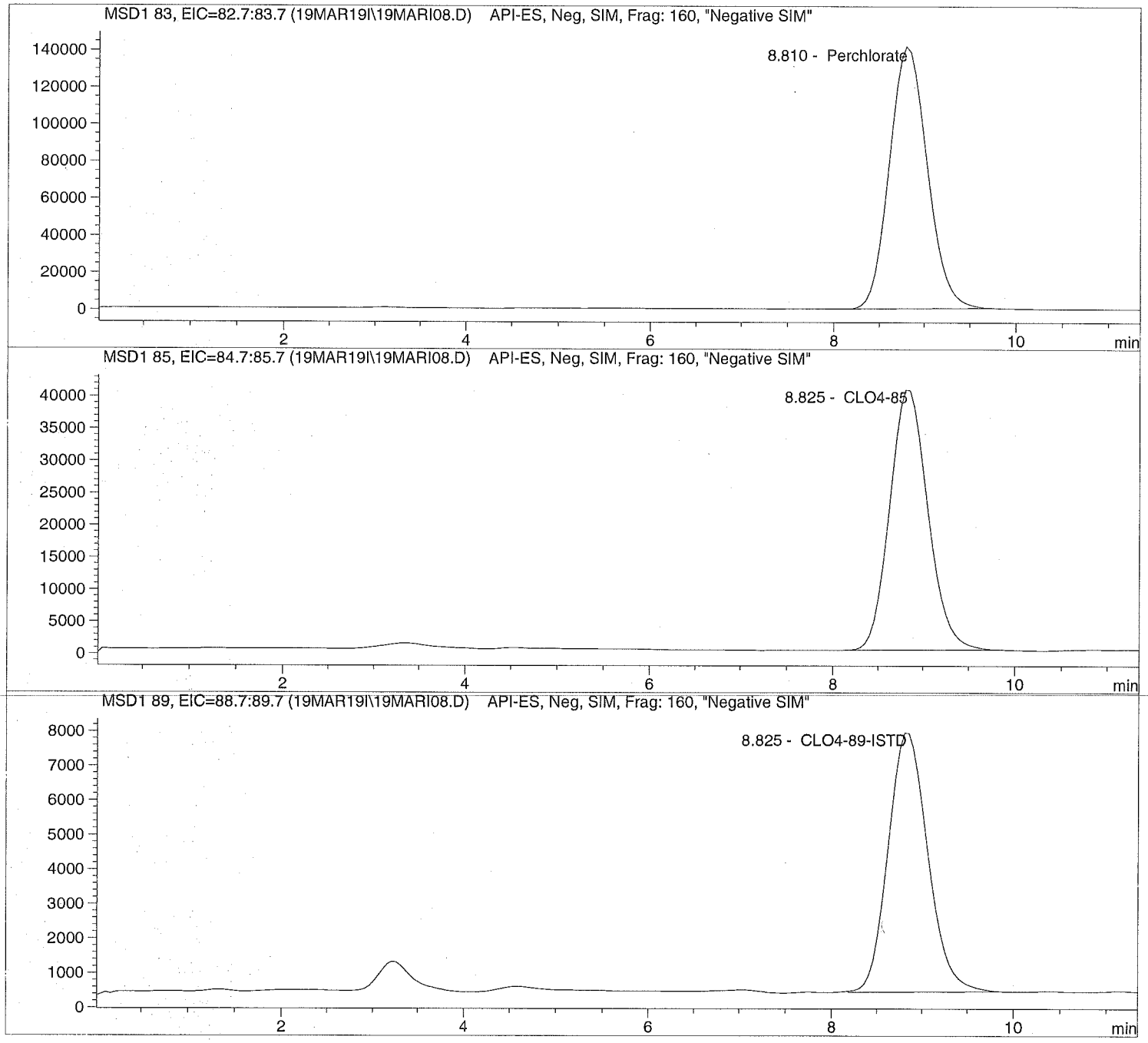
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	3/19/2019 10:46:05	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	3/19/2019 10:46:05	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 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
8.810	PBA	4133340.5	51.3684	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	1198135.6	50.4672	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	230976.7	5.0000	CLO4-89-ISTD

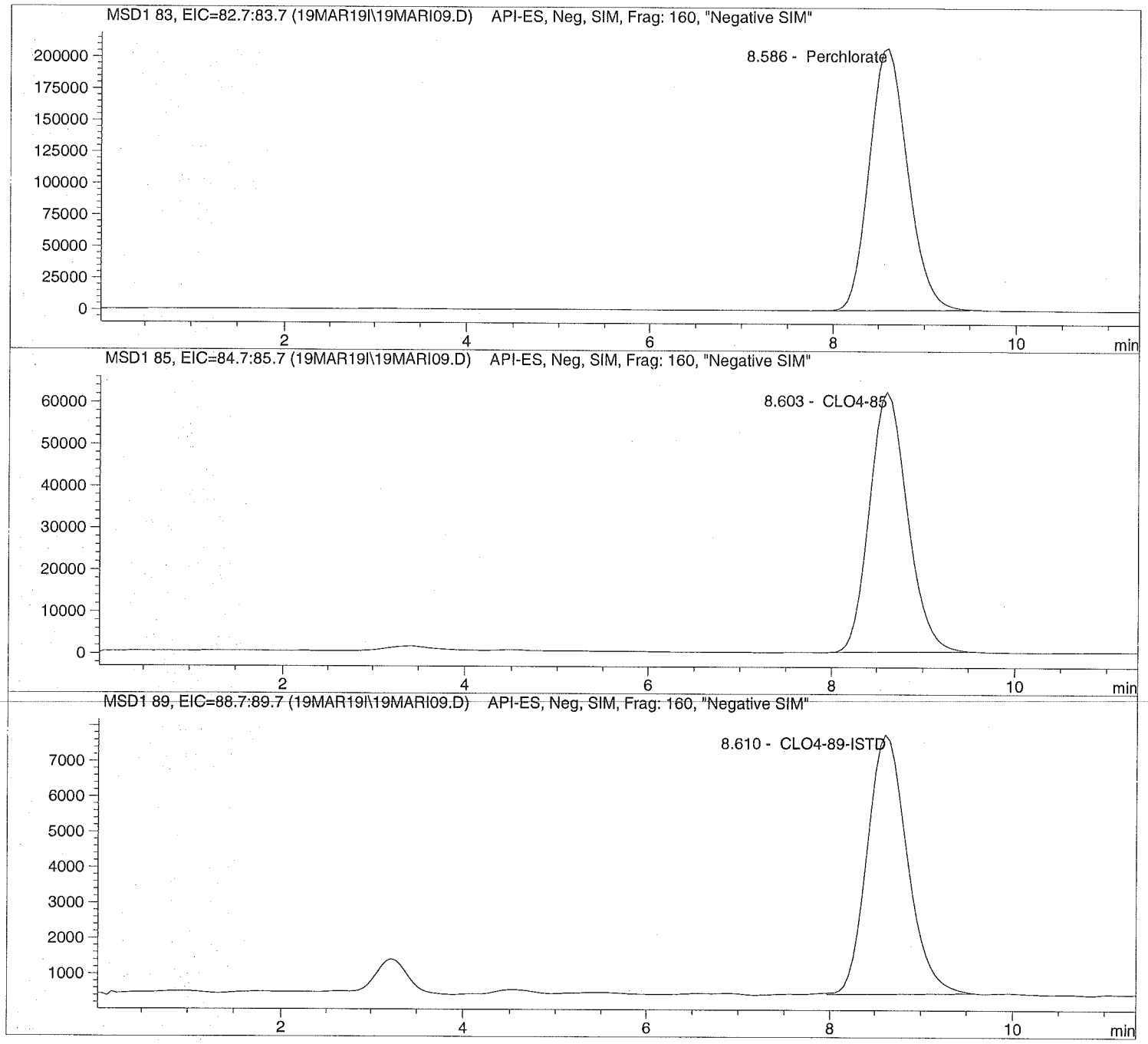
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	3/19/2019 10:59:22	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	3/19/2019 10:59:22	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 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
8.586	PBA	5993128.0	74.1675	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.603	PBA	1783554.4	74.7202	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.610	BBA	221504.5	5.0000	CLO4-89-ISTD

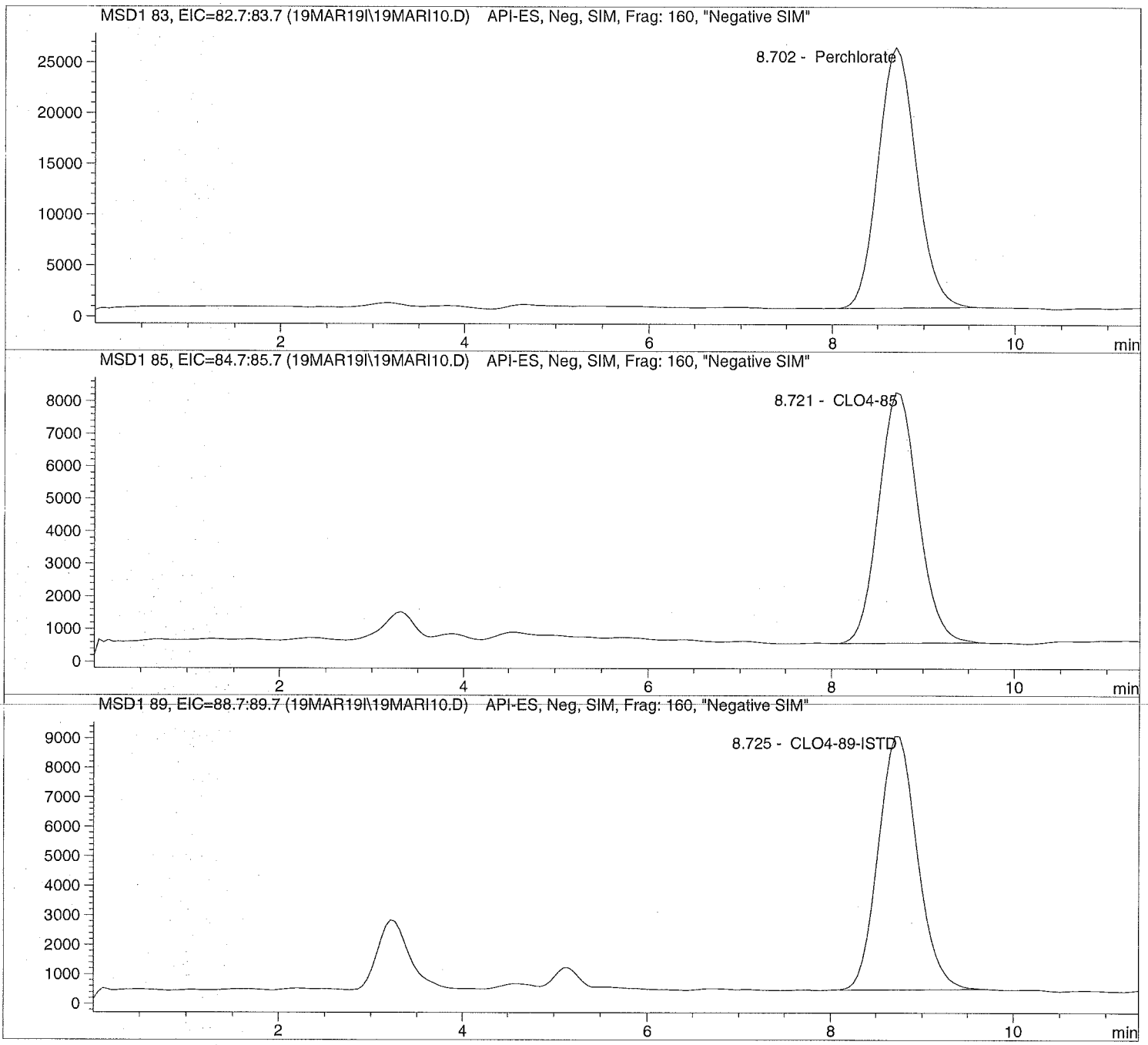
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L

Injection Date:	3/19/2019 11:12:42	Seq Line:	10
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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L

Injection Date:	3/19/2019 11:12:42	Seq Line:	10
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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 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
8.702	PBA	734718.7	9.2594	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.721	PBA	227494.7	9.5402	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.725	BBA	252544.4	5.0000	CLO4-89-ISTD

*** End of Report ***



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

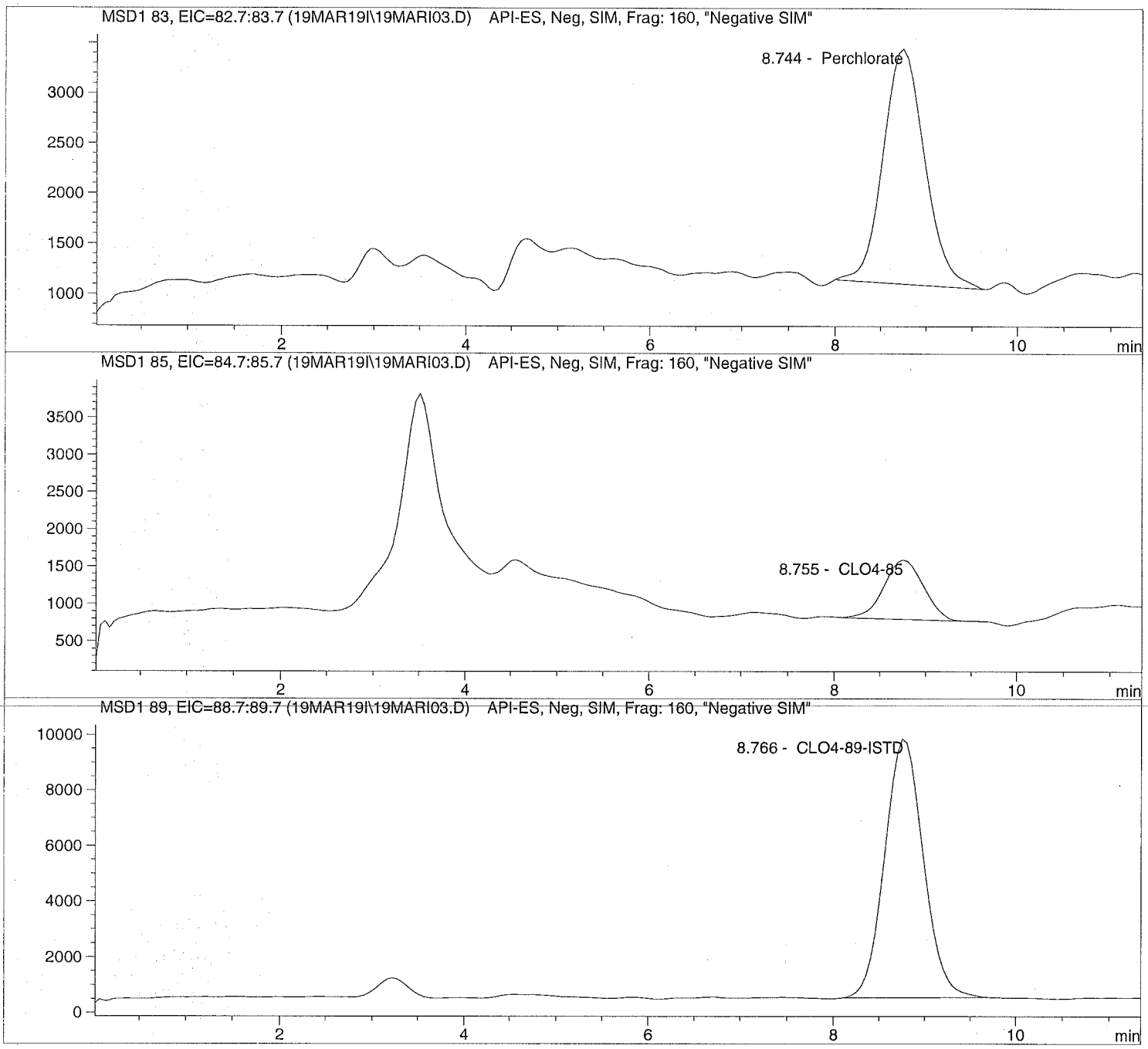
Unmodified

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	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-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	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-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 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
8.744	BBA	74166.3	1.0224	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	BBA	24138.1	0.9487	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	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

June 17, 2019

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

Work Order: **HS19051863**

Laboratory Results for: **LHAAP 18/24 GWTP Quaterly Influent**

Dear Marcia,

ALS Environmental received 2 sample(s) on May 31, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,



Generated By: JUMOKE.LAWAL
RJ Modashia
Project Manager

ALS Houston, US Date: 17-jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Influent
Work Order: HS19051863

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19051863-01	LH18/24-SP140_052919	Groundwater		29-May-2019 14:00	31-May-2019 08:37	☐
HS19051863-02	Trip Blank	Water	ALS-012519-98	29-May-2019 14:00	31-May-2019 08:37	☐

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc. **CASE NARRATIVE**
Project: LHAAP 18/24 GWTP Quaterly Influent
Work Order:

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: 141538

Sample ID: LSCD-141538

- LCS/LCSD RPD exceeded the laboratory acceptance limit for surrogate Nitrobenzene-d5. The individual recoveries met acceptance criteria.

GCMS Volatiles by Method SW8260

Batch ID: R339874

Sample ID: HS19051779-01MS

- MS and MSD are for an unrelated sample

Sample ID: LH18/24-SP140_052919 (HS19051863-01)

- Lowest practical dilution for sample HS19051863-01 due to high concentration of non-target compounds.

Metals by Method SW7470

Batch ID: 141540

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

Metals by Method SW6020

Batch ID: 141478

Sample ID: HS19051850-03MS

- MS and MSD are for an unrelated sample

WetChemistry by Method SW9056

Batch ID: R340350

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

WetChemistry by Method E1664A

Batch ID: R340065

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

WetChemistry by Method E410.4

Batch ID: R339595

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

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Influent
Sample ID: LH18/24-SP140_052919
Collection Date: 29-May-2019 14:00

ANALYTICAL REPORT
WorkOrder:HS19051863
Lab ID:HS19051863-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	50	U	30	50	100	UG/L	100	04-Jun-2019 20:41
1,1,1-Trichloroethane	50	U	20	50	100	UG/L	100	04-Jun-2019 20:41
1,1,2,2-Tetrachloroethane	50	U	50	50	100	UG/L	100	04-Jun-2019 20:41
1,1,2-Trichloroethane	50	U	30	50	100	UG/L	100	04-Jun-2019 20:41
1,1-Dichloroethane	50	U	20	50	100	UG/L	100	04-Jun-2019 20:41
1,1-Dichloroethene	50	U	20	50	100	UG/L	100	04-Jun-2019 20:41
1,1-Dichloropropene	50	U	30	50	100	UG/L	100	04-Jun-2019 20:41
1,2,3-Trichlorobenzene	50	U	40	50	100	UG/L	100	04-Jun-2019 20:41
1,2,3-Trichloropropane	50	U	50	50	100	UG/L	100	04-Jun-2019 20:41
1,2,4-Trichlorobenzene	50	U	50	50	100	UG/L	100	04-Jun-2019 20:41
1,2,4-Trimethylbenzene	50	U	30	50	100	UG/L	100	04-Jun-2019 20:41
1,2-Dibromo-3-chloropropane	50	U	20	50	100	UG/L	100	04-Jun-2019 20:41
1,2-Dibromoethane	50	U	20	50	100	UG/L	100	04-Jun-2019 20:41
1,2-Dichlorobenzene	50	U	50	50	100	UG/L	100	04-Jun-2019 20:41
1,2-Dichloroethane	**53**	J	**20**	**50**	**100**	**UG/L**	100	04-Jun-2019 20:41
1,2-Dichloropropane	50	U	50	50	100	UG/L	100	04-Jun-2019 20:41
1,3,5-Trimethylbenzene	50	U	30	50	100	UG/L	100	04-Jun-2019 20:41
1,3-Dichlorobenzene	50	U	40	50	100	UG/L	100	04-Jun-2019 20:41
1,3-Dichloropropane	50	U	30	50	100	UG/L	100	04-Jun-2019 20:41
1,4-Dichlorobenzene	50	U	40	50	100	UG/L	100	04-Jun-2019 20:41
2,2-Dichloropropane	50	U	20	50	100	UG/L	100	04-Jun-2019 20:41
2-Butanone	100	U	50	100	200	UG/L	100	04-Jun-2019 20:41
2-Chlorotoluene	50	U	30	50	100	UG/L	100	04-Jun-2019 20:41
2-Hexanone	100	U	100	100	200	UG/L	100	04-Jun-2019 20:41
4-Chlorotoluene	50	U	40	50	100	UG/L	100	04-Jun-2019 20:41
4-Isopropyltoluene	50	U	30	50	100	UG/L	100	04-Jun-2019 20:41
4-Methyl-2-pentanone	100	U	70	100	200	UG/L	100	04-Jun-2019 20:41
Acetone	100	U	40	100	200	UG/L	100	04-Jun-2019 20:41
Benzene	50	U	20	50	100	UG/L	100	04-Jun-2019 20:41
Bromobenzene	50	U	40	50	100	UG/L	100	04-Jun-2019 20:41
Bromochloromethane	50	U	20	50	100	UG/L	100	04-Jun-2019 20:41
Bromodichloromethane	50	U	20	50	100	UG/L	100	04-Jun-2019 20:41
Bromoform	50	U	40	50	100	UG/L	100	04-Jun-2019 20:41
Bromomethane	50	U	40	50	100	UG/L	100	04-Jun-2019 20:41
Carbon disulfide	100	U	60	100	200	UG/L	100	04-Jun-2019 20:41
Carbon tetrachloride	50	U	50	50	100	UG/L	100	04-Jun-2019 20:41
Chlorobenzene	50	U	30	50	100	UG/L	100	04-Jun-2019 20:41
Chloroethane	50	U	30	50	100	UG/L	100	04-Jun-2019 20:41
Chloroform	50	U	20	50	100	UG/L	100	04-Jun-2019 20:41

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

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Influent
Sample ID: LH18/24-SP140_052919
Collection Date: 29-May-2019 14:00

ANALYTICAL REPORT
WorkOrder:HS19051863
Lab ID:HS19051863-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	50	U	20	50	100	UG/L	100	04-Jun-2019 20:41
cis-1,2-Dichloroethene	**2,400**		**20**	**50**	**100**	**UG/L**	100	04-Jun-2019 20:41
cis-1,3-Dichloropropene	50	U	10	50	100	UG/L	100	04-Jun-2019 20:41
Dibromochloromethane	50	U	30	50	100	UG/L	100	04-Jun-2019 20:41
Dibromomethane	50	U	20	50	100	UG/L	100	04-Jun-2019 20:41
Dichlorodifluoromethane	50	U	30	50	100	UG/L	100	04-Jun-2019 20:41
Ethylbenzene	50	U	30	50	100	UG/L	100	04-Jun-2019 20:41
Hexachlorobutadiene	100	U	100	100	100	UG/L	100	04-Jun-2019 20:41
Isopropylbenzene	50	U	30	50	100	UG/L	100	04-Jun-2019 20:41
m,p-Xylene	100	U	50	100	200	UG/L	100	04-Jun-2019 20:41
Methylene chloride	**3,900**		**40**	**100**	**200**	**UG/L**	100	04-Jun-2019 20:41
n-Butylbenzene	50	U	40	50	100	UG/L	100	04-Jun-2019 20:41
n-Propylbenzene	50	U	30	50	100	UG/L	100	04-Jun-2019 20:41
Naphthalene	50	U	30	50	100	UG/L	100	04-Jun-2019 20:41
o-Xylene	50	U	30	50	100	UG/L	100	04-Jun-2019 20:41
sec-Butylbenzene	50	U	30	50	100	UG/L	100	04-Jun-2019 20:41
Styrene	50	U	30	50	100	UG/L	100	04-Jun-2019 20:41
tert-Butylbenzene	50	U	30	50	100	UG/L	100	04-Jun-2019 20:41
Tetrachloroethene	**62**	J	**30**	**50**	**100**	**UG/L**	100	04-Jun-2019 20:41
Toluene	50	U	20	50	100	UG/L	100	04-Jun-2019 20:41
trans-1,2-Dichloroethene	50	U	20	50	100	UG/L	100	04-Jun-2019 20:41
trans-1,3-Dichloropropene	50	U	20	50	100	UG/L	100	04-Jun-2019 20:41
Trichloroethene	**5,600**		**20**	**50**	**100**	**UG/L**	100	04-Jun-2019 20:41
Trichlorofluoromethane	50	U	30	50	100	UG/L	100	04-Jun-2019 20:41
Vinyl chloride	50	U	20	50	100	UG/L	100	04-Jun-2019 20:41
Surr: 1,2-Dichloroethane-d4	*91.3*			**0**	*81-118*	*%REC*	*100*	*04-Jun-2019 20:41*
Surr: 4-Bromofluorobenzene	*104*			**0**	*85-114*	*%REC*	*100*	*04-Jun-2019 20:41*
Surr: Dibromofluoromethane	*93.8*			**0**	*80-119*	*%REC*	*100*	*04-Jun-2019 20:41*
Surr: Toluene-d8	*106*			**0**	*89-112*	*%REC*	*100*	*04-Jun-2019 20:41*
SEMIVOLATILES SIM		**Method:SW8270SIM**				Prep:SW3510 / 03-Jun-2019		Analyst: LG
1,4-Dioxane	**8.6**		**0.20**	**0.20**	**0.20**	**ug/L**	20	05-Jun-2019 10:17
Surr: 2-Fluorobiphenyl	*92.5*			**0**	*40-140*	*%REC*	*20*	*05-Jun-2019 10:17*
Surr: 4-Terphenyl-d14	*94.2*			**0**	*40-140*	*%REC*	*20*	*05-Jun-2019 10:17*
Surr: Nitrobenzene-d5	*80.0*			**0**	*40-140*	*%REC*	*20*	*05-Jun-2019 10:17*

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

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Influent
Sample ID: LH18/24-SP140_052919
Collection Date: 29-May-2019 14:00

ANALYTICAL REPORT
WorkOrder:HS19051863
Lab ID:HS19051863-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 31-May-2019		Analyst: JHD
Aluminum	**0.165**		**0.00180**	**0.00500**	**0.0100**	**mg/L**	1	04-Jun-2019 16:34
Antimony	0.000500	U	0.000400	0.000500	0.00200	mg/L	1	04-Jun-2019 16:34
Arsenic	**0.00138**	J	**0.000400**	**0.000500**	**0.00200**	**mg/L**	1	04-Jun-2019 16:34
Barium	**0.448**		**0.00950**	**0.0125**	**0.0200**	**mg/L**	5	01-Jun-2019 00:30
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	04-Jun-2019 16:34
Cadmium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	04-Jun-2019 16:34
Calcium	**22.2**		**0.170**	**0.250**	**2.50**	**mg/L**	5	01-Jun-2019 00:30
Chromium	**0.00112**	J	**0.000400**	**0.000500**	**0.00400**	**mg/L**	1	04-Jun-2019 16:34
Cobalt	**0.00904**		**0.000200**	**0.000500**	**0.00500**	**mg/L**	1	04-Jun-2019 16:34
Iron	**1.04**		**0.0120**	**0.0500**	**0.200**	**mg/L**	1	04-Jun-2019 16:34
Lead	0.00100	U	0.000600	0.00100	0.00200	mg/L	1	04-Jun-2019 16:34
Magnesium	**20.1**		**0.0500**	**0.250**	**1.00**	**mg/L**	5	01-Jun-2019 00:30
Manganese	**0.428**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	04-Jun-2019 16:34
Nickel	**0.00947**		**0.000600**	**0.00100**	**0.00200**	**mg/L**	1	04-Jun-2019 16:34
Potassium	**1.41**		**0.0180**	**0.0500**	**0.200**	**mg/L**	1	04-Jun-2019 16:34
Selenium	0.00250	U	0.00110	0.00250	0.00200	mg/L	1	04-Jun-2019 16:34
Silver	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	04-Jun-2019 16:34
Sodium	**140**		**0.0700**	**0.250**	**1.00**	**mg/L**	5	01-Jun-2019 00:30
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	04-Jun-2019 16:34
Vanadium	**0.00202**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	04-Jun-2019 16:34
Zinc	**0.0260**		**0.00200**	**0.00200**	**0.00400**	**mg/L**	1	04-Jun-2019 16:34
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 03-Jun-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	03-Jun-2019 14:26
OIL & GREASE (HEM) BY E1664A		**Method:E1664A**						Analyst: KAH
Oil and Grease	**6.56**		**0.610**	**1.00**	**2.00**	**mg/L**	1	07-Jun-2019 14:45
CHEMICAL OXYGEN DEMAND BY E410.4		**Method:E410.4**						Analyst: AJA
Chemical Oxygen Demand	**15.0**		**5.00**	**15.0**	**15.0**	**mg/L**	1	31-May-2019 17:30
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Chloride	**240**		**2.00**	**5.00**	**5.00**	**mg/L**	10	11-Jun-2019 22:46
Sulfate	**37.4**		**2.00**	**5.00**	**5.00**	**mg/L**	10	11-Jun-2019 22:46
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	17-Jun-2019 18:06

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

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Influent
Sample ID: Trip Blank
Collection Date: 29-May-2019 14:00

ANALYTICAL REPORT
WorkOrder:HS19051863
Lab ID:HS19051863-02
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 18:14
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 18:14
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	04-Jun-2019 18:14
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 18:14
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 18:14
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 18:14
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 18:14
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jun-2019 18:14
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	04-Jun-2019 18:14
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	04-Jun-2019 18:14
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 18:14
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 18:14
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 18:14
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	04-Jun-2019 18:14
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 18:14
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	04-Jun-2019 18:14
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 18:14
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jun-2019 18:14
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 18:14
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jun-2019 18:14
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 18:14
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	04-Jun-2019 18:14
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 18:14
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	04-Jun-2019 18:14
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jun-2019 18:14
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 18:14
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	04-Jun-2019 18:14
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	04-Jun-2019 18:14
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 18:14
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jun-2019 18:14
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 18:14
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 18:14
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jun-2019 18:14
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jun-2019 18:14
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	04-Jun-2019 18:14
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	04-Jun-2019 18:14
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 18:14
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 18:14
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 18:14

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

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Influent
Sample ID: Trip Blank
Collection Date: 29-May-2019 14:00

ANALYTICAL REPORT
WorkOrder:HS19051863
Lab ID:HS19051863-02
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	04-Jun-2019 18:14
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 18:14
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	04-Jun-2019 18:14
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 18:14
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 18:14
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 18:14
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 18:14
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	04-Jun-2019 18:14
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 18:14
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	04-Jun-2019 18:14
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	04-Jun-2019 18:14
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jun-2019 18:14
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 18:14
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 18:14
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 18:14
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 18:14
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 18:14
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 18:14
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 18:14
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 18:14
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 18:14
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 18:14
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 18:14
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 18:14
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 18:14
Surr: 1,2-Dichloroethane-d4	*89.7*			**0**	*81-118*	*%REC*	*1*	*04-Jun-2019 18:14*
Surr: 4-Bromofluorobenzene	*104*			**0**	*85-114*	*%REC*	*1*	*04-Jun-2019 18:14*
Surr: Dibromofluoromethane	*93.1*			**0**	*80-119*	*%REC*	*1*	*04-Jun-2019 18:14*
Surr: Toluene-d8	*108*			**0**	*89-112*	*%REC*	*1*	*04-Jun-2019 18:14*

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

WEIGHT LOG

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Influent
WorkOrder: HS19051863

Batch ID: 141478 **Method:** ICP-MS METALS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19051863-01	1	10	10 (mL)	1

Batch ID: 141538 **Method:** SEMIVOLATILES SIM **Prep:** 3510_B_SIM

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19051863-01	1	990	1 (mL)	0.00101

Batch ID: 141540 **Method:** MERCURY BY SW7470A **Prep:** HG_WPR

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19051863-01	1	10 (mL)	10 (mL)	1

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Influent
WorkOrder: HS19051863

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 141478	**Test Name :** ICP-MS METALS BY SW6020A			**Matrix:** Groundwater		
HS19051863-01	LH18/24-SP140_052919	29 May 2019 14:00		31 May 2019 11:00	04 Jun 2019 16:34	1
HS19051863-01	LH18/24-SP140_052919	29 May 2019 14:00		31 May 2019 11:00	01 Jun 2019 00:30	5
Batch ID 141538	**Test Name :** SEMIVOLATILES SIM			**Matrix:** Groundwater		
HS19051863-01	LH18/24-SP140_052919	29 May 2019 14:00		03 Jun 2019 13:22	05 Jun 2019 10:17	20
Batch ID 141540	**Test Name :** MERCURY BY SW7470A			**Matrix:** Groundwater		
HS19051863-01	LH18/24-SP140_052919	29 May 2019 14:00		03 Jun 2019 10:00	03 Jun 2019 14:26	1
Batch ID R339595	**Test Name :** CHEMICAL OXYGEN DEMAND BY E410.4			**Matrix:** Groundwater		
HS19051863-01	LH18/24-SP140_052919	29 May 2019 14:00			31 May 2019 17:30	1
Batch ID R339874	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C			**Matrix:** Water		
HS19051863-02	Trip Blank	29 May 2019 14:00			04 Jun 2019 18:14	1
Batch ID R339874	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C			**Matrix:** Groundwater		
HS19051863-01	LH18/24-SP140_052919	29 May 2019 14:00			04 Jun 2019 20:41	100
Batch ID R340065	**Test Name :** OIL & GREASE (HEM) BY E1664A			**Matrix:** Groundwater		
HS19051863-01	LH18/24-SP140_052919	29 May 2019 14:00			07 Jun 2019 14:45	1
Batch ID R340350	**Test Name :** ANIONS BY SW9056A			**Matrix:** Groundwater		
HS19051863-01	LH18/24-SP140_052919	29 May 2019 14:00			11 Jun 2019 22:46	10
Batch ID R340666	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			**Matrix:** Groundwater		
HS19051863-01	LH18/24-SP140_052919	29 May 2019 14:00			17 Jun 2019 18:06	1

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Influent
WorkOrder: HS19051863

QC BATCH REPORT

Batch ID: 141478 (0) **Instrument: ICPMS06** **Method: ICP-MS METALS BY SW6020A**

MBLK Sample ID: **MBLKF1-141478** Units: **mg/L** Analysis Date: **31-May-2019 23:28**
Client ID: Run ID: **ICPMS06_339538** SeqNo: **5102626** PrepDate: **31-May-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.007575	0.0100								J
Antimony	0.000500	0.00200								U
Arsenic	0.000500	0.00200								U
Barium	0.00315	0.00400								J
Beryllium	0.000500	0.00200								U
Cadmium	0.000500	0.00200								U
Calcium	0.04241	0.500								J
Chromium	0.000500	0.00400								U
Cobalt	0.000500	0.00500								U
Iron	0.0500	0.200								U
Lead	0.00100	0.00200								U
Magnesium	0.01861	0.200								J
Manganese	0.000746	0.00500								J
Nickel	0.00100	0.00200								U
Potassium	0.0500	0.200								U
Selenium	0.00250	0.00200								U
Silver	0.000500	0.00200								U
Sodium	0.1198	0.200								J
Thallium	0.000500	0.00200								U
Vanadium	0.00100	0.00500								U
Zinc	0.02232	0.00400								

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Influent
WorkOrder: HS19051863

QC BATCH REPORT

Batch ID: 141478 (0) **Instrument: ICPMS06** **Method: ICP-MS METALS BY SW6020A**

MBLK Sample ID: **MBLK-141478** Units: **mg/L** Analysis Date: **31-May-2019 23:26**
Client ID: Run ID: **ICPMS06_339538** SeqNo: **5102625** PrepDate: **31-May-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.003227	0.0100								J
Antimony	0.000500	0.00200								U
Arsenic	0.000500	0.00200								U
Barium	0.00250	0.00400								U
Beryllium	0.000500	0.00200								U
Cadmium	0.000500	0.00200								U
Calcium	0.0500	0.500								U
Chromium	0.000500	0.00400								U
Cobalt	0.000500	0.00500								U
Iron	0.0500	0.200								U
Lead	0.00100	0.00200								U
Magnesium	0.0500	0.200								U
Manganese	0.00100	0.00500								U
Nickel	0.00100	0.00200								U
Potassium	0.0500	0.200								U
Selenium	0.00250	0.00200								U
Silver	0.000500	0.00200								U
Sodium	0.0500	0.200								U
Thallium	0.000500	0.00200								U
Vanadium	0.00100	0.00500								U
Zinc	0.00200	0.00400								U

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Influent
WorkOrder: HS19051863

QC BATCH REPORT

Batch ID: 141478 (0) **Instrument: ICPMS06** **Method: ICP-MS METALS BY SW6020A**

LCS Sample ID: **LCS-141478** Units: **mg/L** Analysis Date: **31-May-2019 23:30**
Client ID: Run ID: **ICPMS06_339538** SeqNo: **5102627** PrepDate: **31-May-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.09159	0.0100	0.1	0	91.6	80 - 120				
Antimony	0.04956	0.00200	0.05	0	99.1	80 - 120				
Arsenic	0.04876	0.00200	0.05	0	97.5	80 - 120				
Barium	0.04854	0.00400	0.05	0	97.1	80 - 120				
Beryllium	0.04803	0.00200	0.05	0	96.1	80 - 120				
Cadmium	0.04938	0.00200	0.05	0	98.8	80 - 120				
Calcium	4.702	0.500	5	0	94.0	80 - 120				
Chromium	0.04808	0.00400	0.05	0	96.2	80 - 120				
Cobalt	0.04631	0.00500	0.05	0	92.6	80 - 120				
Iron	4.869	0.200	5	0	97.4	80 - 120				
Lead	0.0475	0.00200	0.05	0	95.0	80 - 120				
Magnesium	4.706	0.200	5	0	94.1	80 - 120				
Manganese	0.04804	0.00500	0.05	0	96.1	80 - 120				
Nickel	0.04942	0.00200	0.05	0	98.8	80 - 120				
Potassium	4.811	0.200	5	0	96.2	80 - 120				
Selenium	0.0515	0.00200	0.05	0	103	80 - 120				
Silver	0.0546	0.00200	0.05	0	109	80 - 120				
Sodium	4.751	0.200	5	0	95.0	80 - 120				
Thallium	0.04748	0.00200	0.05	0	95.0	80 - 120				
Vanadium	0.04702	0.00500	0.05	0	94.0	80 - 120				
Zinc	0.05157	0.00400	0.05	0	103	80 - 120				

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Influent
WorkOrder: HS19051863

QC BATCH REPORT

Batch ID: 141478 (0) **Instrument: ICPMS06** **Method: ICP-MS METALS BY SW6020A**

MS Sample ID: **HS19051850-03MS** Units: **mg/L** Analysis Date: **31-May-2019 23:39**
Client ID: Run ID: **ICPMS06_339538** SeqNo: **5102632** PrepDate: **31-May-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.143	0.0100	0.1	0.03095	112	80 - 120				
Antimony	0.04944	0.00200	0.05	-0.000554	100.0	80 - 120				
Arsenic	0.05055	0.00200	0.05	0.000794	99.5	80 - 120				
Barium	0.44	0.00400	0.05	0.3664	147	80 - 120				SO
Beryllium	0.04816	0.00200	0.05	0.000011	96.3	80 - 120				
Cadmium	0.05034	0.00200	0.05	0.000018	101	80 - 120				
Calcium	80.68	0.500	5	73.3	147	80 - 120				SO
Chromium	0.1352	0.00400	0.05	0.0279	215	80 - 120				S
Cobalt	0.05522	0.00500	0.05	0.006927	96.6	80 - 120				
Iron	5.781	0.200	5	0.6969	102	80 - 120				
Lead	0.05114	0.00200	0.05	0.000147	102	80 - 120				
Magnesium	25.76	0.200	5	20.51	105	80 - 120				O
Manganese	0.1893	0.00500	0.05	0.1059	167	80 - 120				S
Nickel	0.2741	0.00200	0.05	0.206	136	80 - 120				SO
Potassium	5.961	0.200	5	1.107	97.1	80 - 120				
Selenium	0.05099	0.00200	0.05	0.000467	101	80 - 120				
Silver	0.05342	0.00200	0.05	-0.000008	107	80 - 120				
Sodium	59.66	0.200	5	53.73	119	80 - 120				O
Thallium	0.05062	0.00200	0.05	-0.000018	101	80 - 120				
Vanadium	0.05114	0.00500	0.05	0.002713	96.9	80 - 120				
Zinc	0.05361	0.00400	0.05	0.003698	99.8	80 - 120				

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Influent
WorkOrder: HS19051863

QC BATCH REPORT

Batch ID: 141478 (0) **Instrument: ICPMS06** **Method: ICP-MS METALS BY SW6020A**

MSD Sample ID: **HS19051850-03MSD** Units: **mg/L** Analysis Date: **31-May-2019 23:41**
Client ID: Run ID: **ICPMS06_339538** SeqNo: **5102633** PrepDate: **31-May-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.151	0.0100	0.1	0.03095	120	80 - 120	0.143	5.46	20	S
Antimony	0.05253	0.00200	0.05	-0.000554	106	80 - 120	0.04944	6.06	20	
Arsenic	0.05277	0.00200	0.05	0.000794	104	80 - 120	0.05055	4.3	20	
Barium	0.4384	0.00400	0.05	0.3664	144	80 - 120	0.44	0.368	20	SO
Beryllium	0.04972	0.00200	0.05	0.000011	99.4	80 - 120	0.04816	3.2	20	
Cadmium	0.0514	0.00200	0.05	0.000018	103	80 - 120	0.05034	2.08	20	
Calcium	84.17	0.500	5	73.3	217	80 - 120	80.68	4.24	20	SO
Chromium	0.1197	0.00400	0.05	0.0279	184	80 - 120	0.1352	12.2	20	S
Cobalt	0.05791	0.00500	0.05	0.006927	102	80 - 120	0.05522	4.74	20	
Iron	6.089	0.200	5	0.6969	108	80 - 120	5.781	5.19	20	
Lead	0.05042	0.00200	0.05	0.000147	101	80 - 120	0.05114	1.41	20	
Magnesium	27.04	0.200	5	20.51	131	80 - 120	25.76	4.87	20	SO
Manganese	0.2094	0.00500	0.05	0.1059	207	80 - 120	0.1893	10.1	20	S
Nickel	0.2818	0.00200	0.05	0.206	152	80 - 120	0.2741	2.77	20	SO
Potassium	6.227	0.200	5	1.107	102	80 - 120	5.961	4.35	20	
Selenium	0.05276	0.00200	0.05	0.000467	105	80 - 120	0.05099	3.42	20	
Silver	0.05362	0.00200	0.05	-0.000008	107	80 - 120	0.05342	0.362	20	
Sodium	62.68	0.200	5	53.73	179	80 - 120	59.66	4.93	20	SO
Thallium	0.05011	0.00200	0.05	-0.000018	100	80 - 120	0.05062	1.01	20	
Vanadium	0.05404	0.00500	0.05	0.002713	103	80 - 120	0.05114	5.52	20	
Zinc	0.05674	0.00400	0.05	0.003698	106	80 - 120	0.05361	5.68	20	

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Influent
WorkOrder: HS19051863

QC BATCH REPORT

Batch ID: 141478 (0) **Instrument: ICPMS06** **Method: ICP-MS METALS BY SW6020A**

PDS Sample ID: **HS19051850-03PDS** Units: **mg/L** Analysis Date: **31-May-2019 23:43**
Client ID: Run ID: **ICPMS06_339538** SeqNo: **5102634** PrepDate: **31-May-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.1521	0.0100	0.1	0.03095	121	75 - 125				
Arsenic	0.1244	0.00200	0.1	0.000794	124	75 - 125				
Cadmium	0.1243	0.00200	0.1	0.000018	124	75 - 125				
Calcium	83.17	0.500	10	73.3	98.6	75 - 125				O
Cobalt	0.1211	0.00500	0.1	0.006927	114	75 - 125				
Iron	12.94	0.200	10	0.6969	122	75 - 125				
Lead	0.1242	0.00200	0.1	0.000147	124	75 - 125				
Magnesium	32.3	0.200	10	20.51	118	75 - 125				
Nickel	0.3242	0.00200	0.1	0.206	118	75 - 125				
Potassium	12.94	0.200	10	1.107	118	75 - 125				
Silver	0.1237	0.00200	0.1	-0.000008	124	75 - 125				
Sodium	64.04	0.200	10	53.73	103	75 - 125				O
Thallium	0.1233	0.00200	0.1	-0.000018	123	75 - 125				
Vanadium	0.122	0.00500	0.1	0.002713	119	75 - 125				
Zinc	0.1272	0.00400	0.1	0.003698	123	75 - 125				

PDS Sample ID: **HS19051850-03PDS** Units: **mg/L** Analysis Date: **03-Jun-2019 12:04**
Client ID: Run ID: **ICPMS04_339653** SeqNo: **5103542** PrepDate: **31-May-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.09062	0.00200	0.1	0	90.6	75 - 125				
Barium	0.4529	0.00400	0.1	0.3664	86.4	75 - 125				
Beryllium	0.09399	0.00200	0.1	0	94.0	75 - 125				
Chromium	0.1265	0.00400	0.1	0.0279	98.6	75 - 125				
Manganese	0.2079	0.00500	0.1	0.1059	102	75 - 125				
Selenium	0.094	0.00200	0.1	0	94.0	75 - 125				

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Influent
WorkOrder: HS19051863

QC BATCH REPORT

Batch ID: 141478 (0) **Instrument: ICPMS06** **Method: ICP-MS METALS BY SW6020A**

SD Sample ID: **HS19051850-03SD** Units: **mg/L** Analysis Date: **31-May-2019 23:38**
Client ID: Run ID: **ICPMS06_339538** SeqNo: **5102631** PrepDate: **31-May-2019** DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Aluminum	0.02554	0.0500					0.03095	0	10	J
Antimony	0.00250	0.0100					-0.000554	0	10	U
Arsenic	0.00250	0.0100					0.000794	0	10	U
Barium	0.3548	0.0200					0.3664	3.18	10	
Beryllium	0.00250	0.0100					0.000011	0	10	U
Cadmium	0.00250	0.0100					0.000018	0	10	U
Calcium	73.23	2.50					73.3	0.105	10	
Chromium	0.02755	0.0200					0.0279	1.26	10	
Cobalt	0.007246	0.0250					0.006927	0	10	J
Iron	0.6583	1.00					0.6969	0	10	J
Lead	0.00500	0.0100					0.000147	0	10	U
Magnesium	21.55	1.00					20.51	5.06	10	
Manganese	0.1139	0.0250					0.1059	7.61	10	
Nickel	0.2156	0.0100					0.206	4.67	10	
Potassium	1.116	1.00					1.107	0.792	10	
Selenium	0.0125	0.0100					0.000467	0	10	U
Silver	0.00250	0.0100					-0.000008	0	10	U
Sodium	55.55	1.00					53.73	3.38	10	
Thallium	0.00250	0.0100					-0.000018	0	10	U
Vanadium	0.008106	0.0250					0.002713	0	10	J
Zinc	0.0100	0.0200					0.003698	0	10	U

The following samples were analyzed in this batch: HS19051863-01

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Influent
WorkOrder: HS19051863

QC BATCH REPORT

Batch ID: 141540 (0) **Instrument: HG03** **Method: MERCURY BY SW7470A**

MBLK Sample ID: **MBLK-141540** Units: **mg/L** Analysis Date: **03-Jun-2019 13:52**
Client ID: Run ID: **HG03_339690** SeqNo: **5104033** PrepDate: **03-Jun-2019** 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-141540** Units: **mg/L** Analysis Date: **03-Jun-2019 13:53**
Client ID: Run ID: **HG03_339690** SeqNo: **5104034** PrepDate: **03-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00503	0.000200	0.005	0	101	80 - 120				

MS Sample ID: **HS19051859-01MS** Units: **mg/L** Analysis Date: **03-Jun-2019 13:57**
Client ID: Run ID: **HG03_339690** SeqNo: **5104036** PrepDate: **03-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.005	0.000200	0.005	0.00009	98.2	75 - 125				

MSD Sample ID: **HS19051859-01MSD** Units: **mg/L** Analysis Date: **03-Jun-2019 13:58**
Client ID: Run ID: **HG03_339690** SeqNo: **5104037** PrepDate: **03-Jun-2019** 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	0.00009	98.6	75 - 125	0.005	0.399	20	

The following samples were analyzed in this batch: HS19051863-01

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Influent
WorkOrder: HS19051863

QC BATCH REPORT

Batch ID: 141538 (0) **Instrument: SV-5** **Method: SEMIVOLATILES SIM**

MBLK Sample ID: **MBLK-141538** Units: **ug/L** Analysis Date: **05-Jun-2019 09:15**
Client ID: Run ID: **SV-5_339895** SeqNo: **5108847** PrepDate: **03-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.010	0.010								U
Surr: 2-Fluorobiphenyl	*0.07056*	*0*	*0.08*	*0*	*88.2*	*40 - 140*				
Surr: 4-Terphenyl-d14	*0.06728*	*0*	*0.08*	*0*	*84.1*	*40 - 140*				
Surr: Nitrobenzene-d5	*0.07988*	*0*	*0.08*	*0*	*99.9*	*40 - 140*				

LCS Sample ID: **LCS-141538** Units: **ug/L** Analysis Date: **05-Jun-2019 08:33**
Client ID: Run ID: **SV-5_339895** SeqNo: **5108833** PrepDate: **03-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.0845	0.010	0.08	0	106	40 - 140				
Surr: 2-Fluorobiphenyl	*0.08883*	*0*	*0.08*	*0*	*111*	*40 - 140*				
Surr: 4-Terphenyl-d14	*0.06752*	*0*	*0.08*	*0*	*84.4*	*40 - 140*				
Surr: Nitrobenzene-d5	*0.06431*	*0*	*0.08*	*0*	*80.4*	*40 - 140*				

LCSD Sample ID: **LCSD-141538** Units: **ug/L** Analysis Date: **05-Jun-2019 08:54**
Client ID: Run ID: **SV-5_339895** SeqNo: **5108846** PrepDate: **03-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.08994	0.010	0.08	0	112	40 - 140	0.0845	6.24	20	
Surr: 2-Fluorobiphenyl	*0.0828*	*0*	*0.08*	*0*	*104*	*40 - 140*	*0.08883*	*7.03*	*20*	
Surr: 4-Terphenyl-d14	*0.0602*	*0*	*0.08*	*0*	*75.2*	*40 - 140*	*0.06752*	*11.5*	*20*	
Surr: Nitrobenzene-d5	*0.08236*	*0*	*0.08*	*0*	*103*	*40 - 140*	*0.06431*	*24.6*	*20*	R

The following samples were analyzed in this batch: HS19051863-01

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Influent
WorkOrder: HS19051863

QC BATCH REPORT

Batch ID: R339874 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-190604** Units: **UG/L** Analysis Date: **04-Jun-2019 17:26**
Client ID: Run ID: **VOA6_339874** SeqNo: **5108298** 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: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Influent
WorkOrder: HS19051863

QC BATCH REPORT

Batch ID: R339874 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-190604** Units: **UG/L** Analysis Date: **04-Jun-2019 17:26**
Client ID: Run ID: **VOA6_339874** SeqNo: **5108298** 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	*44.91*	*1.0*	*50*	*0*	*89.8*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*49.35*	*1.0*	*50*	*0*	*98.7*	*85 - 114*				
Surr: Dibromofluoromethane	*46.74*	*1.0*	*50*	*0*	*93.5*	*80 - 119*				
Surr: Toluene-d8	*53.5*	*1.0*	*50*	*0*	*107*	*89 - 112*				

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Influent
WorkOrder: HS19051863

QC BATCH REPORT

Batch ID: R339874 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-190604** Units: **UG/L** Analysis Date: **04-Jun-2019 16:38**
Client ID: Run ID: **VOA6_339874** SeqNo: **5108297** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	19.65	1.0	20	0	98.2	78 - 124				
1,1,1-Trichloroethane	19.34	1.0	20	0	96.7	74 - 131				
1,1,2,2-Tetrachloroethane	20.2	1.0	20	0	101	71 - 121				
1,1,2-Trichloroethane	20.99	1.0	20	0	105	80 - 119				
1,1-Dichloroethane	19.06	1.0	20	0	95.3	77 - 125				
1,1-Dichloroethene	18.87	1.0	20	0	94.4	71 - 131				
1,1-Dichloropropene	18.09	1.0	20	0	90.4	78 - 125				
1,2,3-Trichlorobenzene	24.79	1.0	20	0	124	69 - 129				
1,2,3-Trichloropropane	19.34	1.0	20	0	96.7	73 - 122				
1,2,4-Trichlorobenzene	23.55	1.0	20	0	118	69 - 130				
1,2,4-Trimethylbenzene	18.31	1.0	20	0	91.6	76 - 124				
1,2-Dibromo-3-chloropropane	20.72	1.0	20	0	104	62 - 128				
1,2-Dibromoethane	20.66	1.0	20	0	103	77 - 121				
1,2-Dichlorobenzene	19.72	1.0	20	0	98.6	80 - 119				
1,2-Dichloroethane	19.85	1.0	20	0	99.2	73 - 128				
1,2-Dichloropropane	20.15	1.0	20	0	101	78 - 122				
1,3,5-Trimethylbenzene	17.9	1.0	20	0	89.5	75 - 124				
1,3-Dichlorobenzene	18.94	1.0	20	0	94.7	80 - 119				
1,3-Dichloropropane	20.87	1.0	20	0	104	80 - 119				
1,4-Dichlorobenzene	18.66	1.0	20	0	93.3	79 - 118				
2,2-Dichloropropane	19.73	1.0	20	0	98.7	60 - 139				
2-Butanone	47.14	2.0	40	0	118	56 - 143				
2-Chlorotoluene	17.89	1.0	20	0	89.5	79 - 122				
2-Hexanone	44.83	2.0	40	0	112	57 - 139				
4-Chlorotoluene	18.29	1.0	20	0	91.4	78 - 122				
4-Isopropyltoluene	17.3	1.0	20	0	86.5	77 - 127				
4-Methyl-2-pentanone	41.57	2.0	40	0	104	67 - 130				
Acetone	49.02	2.0	40	0	123	39 - 160				
Benzene	19.02	1.0	20	0	95.1	79 - 120				
Bromobenzene	19.17	1.0	20	0	95.9	80 - 120				
Bromochloromethane	20.93	1.0	20	0	105	78 - 123				
Bromodichloromethane	19.64	1.0	20	0	98.2	79 - 125				
Bromoform	20.82	1.0	20	0	104	66 - 130				
Bromomethane	23.09	1.0	20	0	115	53 - 141				

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Influent
WorkOrder: HS19051863

QC BATCH REPORT

Batch ID: R339874 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-190604** Units: **UG/L** Analysis Date: **04-Jun-2019 16:38**
Client ID: Run ID: **VOA6_339874** SeqNo: **5108297** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Carbon disulfide	38.69	2.0	40	0	96.7	64 - 133				
Carbon tetrachloride	17.69	1.0	20	0	88.5	72 - 136				
Chlorobenzene	19.45	1.0	20	0	97.3	82 - 118				
Chloroethane	19.14	1.0	20	0	95.7	60 - 138				
Chloroform	20.04	1.0	20	0	100	79 - 124				
Chloromethane	15.66	1.0	20	0	78.3	50 - 139				
cis-1,2-Dichloroethene	19.81	1.0	20	0	99.1	78 - 123				
cis-1,3-Dichloropropene	20.05	1.0	20	0	100	75 - 124				
Dibromochloromethane	20.63	1.0	20	0	103	74 - 126				
Dibromomethane	20.31	1.0	20	0	102	79 - 123				
Dichlorodifluoromethane	18.37	1.0	20	0	91.8	32 - 152				
Ethylbenzene	18.95	1.0	20	0	94.8	79 - 121				
Hexachlorobutadiene	22.08	1.0	20	0	110	66 - 134				
Isopropylbenzene	17.97	1.0	20	0	89.9	72 - 131				
m,p-Xylene	37.67	2.0	40	0	94.2	80 - 121				
Methylene chloride	20.5	2.0	20	0	102	74 - 124				
Naphthalene	24.54	1.0	20	0	123	61 - 128				
n-Butylbenzene	17.48	1.0	20	0	87.4	75 - 128				
n-Propylbenzene	17.36	1.0	20	0	86.8	76 - 126				
o-Xylene	19.08	1.0	20	0	95.4	78 - 122				
sec-Butylbenzene	16.66	1.0	20	0	83.3	77 - 126				
Styrene	19.95	1.0	20	0	99.7	78 - 123				
tert-Butylbenzene	17.22	1.0	20	0	86.1	78 - 124				
Tetrachloroethene	18.71	1.0	20	0	93.5	74 - 129				
Toluene	19.64	1.0	20	0	98.2	80 - 121				
trans-1,2-Dichloroethene	19.19	1.0	20	0	96.0	75 - 124				
trans-1,3-Dichloropropene	20.51	1.0	20	0	103	73 - 127				
Trichloroethene	19.2	1.0	20	0	96.0	79 - 123				
Trichlorofluoromethane	18.09	1.0	20	0	90.5	65 - 141				
Vinyl chloride	18.75	1.0	20	0	93.8	58 - 137				
Surr: 1,2-Dichloroethane-d4	*53.33*	*1.0*	*50*	*0*	*107*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*52.97*	*1.0*	*50*	*0*	*106*	*85 - 114*				
Surr: Dibromofluoromethane	*53.7*	*1.0*	*50*	*0*	*107*	*80 - 119*				
Surr: Toluene-d8	*50.12*	*1.0*	*50*	*0*	*100*	*89 - 112*				

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Influent
WorkOrder: HS19051863

QC BATCH REPORT

Batch ID: R339874 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MS Sample ID: **HS19051779-01MS** Units: **UG/L** Analysis Date: **04-Jun-2019 21:05**
Client ID: Run ID: **VOA6_339874** SeqNo: **5108306** PrepDate: DF: **20**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	379.7	20	400	0	94.9	78 - 124				
1,1,1-Trichloroethane	352	20	400	0	88.0	74 - 131				
1,1,2,2-Tetrachloroethane	366.7	20	400	0	91.7	71 - 121				
1,1,2-Trichloroethane	380.6	20	400	0	95.2	80 - 119				
1,1-Dichloroethane	341.8	20	400	0	85.4	77 - 125				
1,1-Dichloroethene	356.6	20	400	0	89.2	71 - 131				
1,1-Dichloropropene	358.1	20	400	0	89.5	78 - 125				
1,2,3-Trichlorobenzene	347.8	20	400	0	86.9	69 - 129				
1,2,3-Trichloropropane	349.4	20	400	0	87.4	73 - 122				
1,2,4-Trichlorobenzene	373.2	20	400	0	93.3	69 - 130				
1,2,4-Trimethylbenzene	389.8	20	400	0	97.5	76 - 124				
1,2-Dibromo-3-chloropropane	336.5	20	400	0	84.1	62 - 128				
1,2-Dibromoethane	368.3	20	400	0	92.1	77 - 121				
1,2-Dichlorobenzene	382.4	20	400	0	95.6	80 - 119				
1,2-Dichloroethane	354.8	20	400	0	88.7	73 - 128				
1,2-Dichloropropane	375.8	20	400	0	94.0	78 - 122				
1,3,5-Trimethylbenzene	401.3	20	400	0	100	75 - 124				
1,3-Dichlorobenzene	384	20	400	0	96.0	80 - 119				
1,3-Dichloropropane	382.9	20	400	0	95.7	80 - 119				
1,4-Dichlorobenzene	373.9	20	400	0	93.5	79 - 118				
2,2-Dichloropropane	324.6	20	400	0	81.1	60 - 139				
2-Butanone	413.2	40	800	0	51.7	56 - 143				S
2-Chlorotoluene	378.8	20	400	0	94.7	79 - 122				
2-Hexanone	492.1	40	800	0	61.5	57 - 139				
4-Chlorotoluene	380.5	20	400	0	95.1	78 - 122				
4-Isopropyltoluene	397.3	20	400	0	99.3	77 - 127				
4-Methyl-2-pentanone	457.2	40	800	0	57.1	67 - 130				S
Acetone	465.2	40	800	0	58.2	39 - 160				
Benzene	361.9	20	400	0	90.5	79 - 120				
Bromobenzene	387.6	20	400	0	96.9	80 - 120				
Bromochloromethane	345.5	20	400	0	86.4	78 - 123				
Bromodichloromethane	354.6	20	400	0	88.7	79 - 125				
Bromoform	362.7	20	400	0	90.7	66 - 130				
Bromomethane	290.5	20	400	0	72.6	53 - 141				

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Influent
WorkOrder: HS19051863

QC BATCH REPORT

Batch ID: R339874 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MS Sample ID: **HS19051779-01MS** Units: **UG/L** Analysis Date: **04-Jun-2019 21:05**
Client ID: Run ID: **VOA6_339874** SeqNo: **5108306** PrepDate: DF: **20**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	549.2	40	800	0	68.6	64 - 133				
Carbon tetrachloride	364.1	20	400	0	91.0	72 - 136				
Chlorobenzene	376.7	20	400	0	94.2	82 - 118				
Chloroethane	332.8	20	400	0	83.2	60 - 138				
Chloroform	346.2	20	400	0	86.6	79 - 124				
Chloromethane	358	20	400	0	89.5	50 - 139				
cis-1,2-Dichloroethene	345.9	20	400	0	86.5	78 - 123				
cis-1,3-Dichloropropene	355	20	400	0	88.7	75 - 124				
Dibromochloromethane	377.7	20	400	0	94.4	74 - 126				
Dibromomethane	351.1	20	400	0	87.8	79 - 123				
Dichlorodifluoromethane	349.2	20	400	0	87.3	32 - 152				
Ethylbenzene	381.7	20	400	0	95.4	79 - 121				
Hexachlorobutadiene	413.2	20	400	0	103	66 - 134				
Isopropylbenzene	394.8	20	400	0	98.7	72 - 131				
m,p-Xylene	749.4	40	800	0	93.7	80 - 121				
Methylene chloride	414.4	40	400	0	104	74 - 124				
Naphthalene	328.1	20	400	0	82.0	61 - 128				
n-Butylbenzene	392.4	20	400	0	98.1	75 - 128				
n-Propylbenzene	390.4	20	400	0	97.6	76 - 126				
o-Xylene	376.8	20	400	0	94.2	78 - 122				
sec-Butylbenzene	395.7	20	400	0	98.9	77 - 126				
Styrene	377.9	20	400	0	94.5	78 - 123				
tert-Butylbenzene	398.9	20	400	0	99.7	78 - 124				
Tetrachloroethene	407.5	20	400	0	102	74 - 129				
Toluene	393.5	20	400	0	98.4	80 - 121				
trans-1,2-Dichloroethene	346.7	20	400	0	86.7	75 - 124				
trans-1,3-Dichloropropene	347.8	20	400	0	87.0	73 - 127				
Trichloroethene	367.7	20	400	0	91.9	79 - 123				
Trichlorofluoromethane	355.1	20	400	0	88.8	65 - 141				
Vinyl chloride	398.1	20	400	0	99.5	58 - 137				
Surr: 1,2-Dichloroethane-d4	*887.4*	*20*	*1000*	*0*	*88.7*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*1056*	*20*	*1000*	*0*	*106*	*85 - 114*				
Surr: Dibromofluoromethane	*955.1*	*20*	*1000*	*0*	*95.5*	*80 - 119*				
Surr: Toluene-d8	*1063*	*20*	*1000*	*0*	*106*	*89 - 112*				

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Influent
WorkOrder: HS19051863

QC BATCH REPORT

Batch ID: R339874 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MSD Sample ID: **HS19051779-01MSD** Units: **UG/L** Analysis Date: **04-Jun-2019 21:29**
Client ID: Run ID: **VOA6_339874** SeqNo: **5108307** PrepDate: DF: **20**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	367.2	20	400	0	91.8	78 - 124	379.7	3.34	20	
1,1,1-Trichloroethane	332.3	20	400	0	83.1	74 - 131	352	5.78	20	
1,1,2,2-Tetrachloroethane	360.3	20	400	0	90.1	71 - 121	366.7	1.76	20	
1,1,2-Trichloroethane	369.5	20	400	0	92.4	80 - 119	380.6	2.96	20	
1,1-Dichloroethane	325.1	20	400	0	81.3	77 - 125	341.8	5	20	
1,1-Dichloroethene	329.1	20	400	0	82.3	71 - 131	356.6	8.03	20	
1,1-Dichloropropene	337.5	20	400	0	84.4	78 - 125	358.1	5.92	20	
1,2,3-Trichlorobenzene	331.8	20	400	0	83.0	69 - 129	347.8	4.69	20	
1,2,3-Trichloropropane	343.3	20	400	0	85.8	73 - 122	349.4	1.76	20	
1,2,4-Trichlorobenzene	357.2	20	400	0	89.3	69 - 130	373.2	4.39	20	
1,2,4-Trimethylbenzene	377.3	20	400	0	94.3	76 - 124	389.8	3.28	20	
1,2-Dibromo-3-chloropropane	318.8	20	400	0	79.7	62 - 128	336.5	5.41	20	
1,2-Dibromoethane	362.9	20	400	0	90.7	77 - 121	368.3	1.47	20	
1,2-Dichlorobenzene	372.2	20	400	0	93.0	80 - 119	382.4	2.71	20	
1,2-Dichloroethane	338.6	20	400	0	84.6	73 - 128	354.8	4.68	20	
1,2-Dichloropropane	361	20	400	0	90.2	78 - 122	375.8	4.03	20	
1,3,5-Trimethylbenzene	383.3	20	400	0	95.8	75 - 124	401.3	4.61	20	
1,3-Dichlorobenzene	375	20	400	0	93.7	80 - 119	384	2.38	20	
1,3-Dichloropropane	377.7	20	400	0	94.4	80 - 119	382.9	1.36	20	
1,4-Dichlorobenzene	364	20	400	0	91.0	79 - 118	373.9	2.69	20	
2,2-Dichloropropane	300.4	20	400	0	75.1	60 - 139	324.6	7.75	20	
2-Butanone	406.9	40	800	0	50.9	56 - 143	413.2	1.53	20	S
2-Chlorotoluene	361.9	20	400	0	90.5	79 - 122	378.8	4.55	20	
2-Hexanone	486.1	40	800	0	60.8	57 - 139	492.1	1.24	20	
4-Chlorotoluene	368.9	20	400	0	92.2	78 - 122	380.5	3.1	20	
4-Isopropyltoluene	386.4	20	400	0	96.6	77 - 127	397.3	2.78	20	
4-Methyl-2-pentanone	457.6	40	800	0	57.2	67 - 130	457.2	0.0924	20	S
Acetone	450.9	40	800	0	56.4	39 - 160	465.2	3.12	20	
Benzene	344.2	20	400	0	86.0	79 - 120	361.9	5.03	20	
Bromobenzene	376.4	20	400	0	94.1	80 - 120	387.6	2.91	20	
Bromochloromethane	322.4	20	400	0	80.6	78 - 123	345.5	6.9	20	
Bromodichloromethane	345	20	400	0	86.2	79 - 125	354.6	2.76	20	
Bromoform	361.1	20	400	0	90.3	66 - 130	362.7	0.454	20	
Bromomethane	292.3	20	400	0	73.1	53 - 141	290.5	0.628	20	

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Influent
WorkOrder: HS19051863

QC BATCH REPORT

Batch ID: R339874 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MSD Sample ID: **HS19051779-01MSD** Units: **UG/L** Analysis Date: **04-Jun-2019 21:29**
Client ID: Run ID: **VOA6_339874** SeqNo: **5108307** PrepDate: DF: **20**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Carbon disulfide	437.5	40	800	0	54.7	64 - 133	549.2	22.6	20	SR
Carbon tetrachloride	345.2	20	400	0	86.3	72 - 136	364.1	5.33	20	
Chlorobenzene	359.3	20	400	0	89.8	82 - 118	376.7	4.73	20	
Chloroethane	298.2	20	400	0	74.5	60 - 138	332.8	11	20	
Chloroform	327.7	20	400	0	81.9	79 - 124	346.2	5.49	20	
Chloromethane	257.4	20	400	0	64.3	50 - 139	358	32.7	20	R
cis-1,2-Dichloroethene	330	20	400	0	82.5	78 - 123	345.9	4.71	20	
cis-1,3-Dichloropropene	340	20	400	0	85.0	75 - 124	355	4.3	20	
Dibromochloromethane	364.1	20	400	0	91.0	74 - 126	377.7	3.67	20	
Dibromomethane	343.3	20	400	0	85.8	79 - 123	351.1	2.23	20	
Dichlorodifluoromethane	290.4	20	400	0	72.6	32 - 152	349.2	18.4	20	
Ethylbenzene	367.9	20	400	0	92.0	79 - 121	381.7	3.7	20	
Hexachlorobutadiene	395.8	20	400	0	99.0	66 - 134	413.2	4.29	20	
Isopropylbenzene	382.6	20	400	0	95.6	72 - 131	394.8	3.14	20	
m,p-Xylene	717.3	40	800	0	89.7	80 - 121	749.4	4.39	20	
Methylene chloride	347.1	40	400	0	86.8	74 - 124	414.4	17.7	20	
Naphthalene	318.6	20	400	0	79.7	61 - 128	328.1	2.93	20	
n-Butylbenzene	379.9	20	400	0	95.0	75 - 128	392.4	3.24	20	
n-Propylbenzene	376.1	20	400	0	94.0	76 - 126	390.4	3.73	20	
o-Xylene	360.5	20	400	0	90.1	78 - 122	376.8	4.44	20	
sec-Butylbenzene	383.6	20	400	0	95.9	77 - 126	395.7	3.12	20	
Styrene	362.3	20	400	0	90.6	78 - 123	377.9	4.22	20	
tert-Butylbenzene	388.5	20	400	0	97.1	78 - 124	398.9	2.65	20	
Tetrachloroethene	385.4	20	400	0	96.4	74 - 129	407.5	5.57	20	
Toluene	373.9	20	400	0	93.5	80 - 121	393.5	5.13	20	
trans-1,2-Dichloroethene	326.7	20	400	0	81.7	75 - 124	346.7	5.92	20	
trans-1,3-Dichloropropene	332	20	400	0	83.0	73 - 127	347.8	4.67	20	
Trichloroethene	350	20	400	0	87.5	79 - 123	367.7	4.94	20	
Trichlorofluoromethane	333	20	400	0	83.2	65 - 141	355.1	6.44	20	
Vinyl chloride	325.9	20	400	0	81.5	58 - 137	398.1	20	20	
Surr: 1,2-Dichloroethane-d4	*879.9*	*20*	*1000*	*0*	*88.0*	*81 - 118*	*887.4*	*0.843*	*20*	
Surr: 4-Bromofluorobenzene	*1059*	*20*	*1000*	*0*	*106*	*85 - 114*	*1056*	*0.269*	*20*	
Surr: Dibromofluoromethane	*947.2*	*20*	*1000*	*0*	*94.7*	*80 - 119*	*955.1*	*0.821*	*20*	
Surr: Toluene-d8	*1055*	*20*	*1000*	*0*	*105*	*89 - 112*	*1063*	*0.745*	*20*	

ALS Houston, US Date: 17-Jun-19

Client:	Bhate Environmental Associates, Inc.
Project:	LHAAP 18/24 GWTP Quaterly Influent
WorkOrder:	HS19051863

QC BATCH REPORT

Batch ID:	**R339874 (0)**	**Instrument:**	**VOA6**	**Method:**	**VOLATILES ORGANICS BY METHOD 8260C**

The following samples were analyzed in this batch: HS19051863-01 HS19051863-02

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Influent
WorkOrder: HS19051863

QC BATCH REPORT

Batch ID: R339595 (0) **Instrument: WetChem_HS** **Method: CHEMICAL OXYGEN DEMAND BY E410.4**

MBLK Sample ID: **MBLK-R339595** Units: **mg/L** Analysis Date: **31-May-2019 17:30**
Client ID: Run ID: **WetChem_HS_339595** SeqNo: **5101809** 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-R339595** Units: **mg/L** Analysis Date: **31-May-2019 17:30**
Client ID: Run ID: **WetChem_HS_339595** SeqNo: **5101808** 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				

MS Sample ID: **HS19051880-02MS** Units: **mg/L** Analysis Date: **31-May-2019 17:30**
Client ID: Run ID: **WetChem_HS_339595** SeqNo: **5101810** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chemical Oxygen Demand	88	15.0	50	34	108	80 - 120				

DUP Sample ID: **HS19051880-02DUP** Units: **mg/L** Analysis Date: **31-May-2019 17:30**
Client ID: Run ID: **WetChem_HS_339595** SeqNo: **5101811** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chemical Oxygen Demand	32	15.0					34	6.06	20	

The following samples were analyzed in this batch: HS19051863-01

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Influent
WorkOrder: HS19051863

QC BATCH REPORT

Batch ID: R340065 (0) **Instrument: Balance1** **Method: OIL & GREASE (HEM) BY E1664A**

MBLK Sample ID: **WBLKW-060719** Units: **mg/L** Analysis Date: **07-Jun-2019 14:45**
Client ID: Run ID: **Balance1_340065** SeqNo: **5112440** 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-060719** Units: **mg/L** Analysis Date: **07-Jun-2019 14:45**
Client ID: Run ID: **Balance1_340065** SeqNo: **5112442** 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-060719** Units: **mg/L** Analysis Date: **07-Jun-2019 14:45**
Client ID: Run ID: **Balance1_340065** SeqNo: **5112441** 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	2.00	40	0	95.0	78 - 114	38.4	1.05	18	

MS Sample ID: **HS19060196-01MS** Units: **mg/L** Analysis Date: **07-Jun-2019 14:45**
Client ID: Run ID: **Balance1_340065** SeqNo: **5112436** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Oil and Grease	40.83	2.00	40	1.667	97.9	78 - 114				

The following samples were analyzed in this batch: HS19051863-01

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Influent
WorkOrder: HS19051863

QC BATCH REPORT

Batch ID: R340350 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY SW9056A**

MBLK Sample ID: **WBLKW1-061119** Units: **mg/L** Analysis Date: **11-Jun-2019 13:36**
Client ID: Run ID: **ICS-Integrion_340350** SeqNo: **5118828** 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: **WLCSW1-061119** Units: **mg/L** Analysis Date: **11-Jun-2019 13:54**
Client ID: Run ID: **ICS-Integrion_340350** SeqNo: **5118829** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	19.46	0.500	20	0	97.3	80 - 120				
Sulfate	19.67	0.500	20	0	98.4	80 - 120				

LCSD Sample ID: **WLCSDW1-061119** Units: **mg/L** Analysis Date: **11-Jun-2019 14:12**
Client ID: Run ID: **ICS-Integrion_340350** SeqNo: **5118830** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	19.46	0.500	20	0	97.3	80 - 120	19.46	0.0308	20	
Sulfate	19.63	0.500	20	0	98.2	80 - 120	19.67	0.189	20	

MS Sample ID: **HS19060226-01MS** Units: **mg/L** Analysis Date: **11-Jun-2019 16:35**
Client ID: Run ID: **ICS-Integrion_340350** SeqNo: **5118835** PrepDate: DF: **50**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	490.6	25.0	500	13.25	95.5	80 - 120				
Sulfate	1634	25.0	500	1163	94.1	80 - 120				

MS Sample ID: **HS19060224-03MS** Units: **mg/L** Analysis Date: **11-Jun-2019 15:43**
Client ID: Run ID: **ICS-Integrion_340350** SeqNo: **5118832** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	108.2	5.00	100	12.57	95.6	80 - 120				
Sulfate	337.8	5.00	100	245	92.8	80 - 120				

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Influent
WorkOrder: HS19051863

QC BATCH REPORT

Batch ID: R340350 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY SW9056A**

MSD Sample ID: **HS19060226-01MSD** Units: **mg/L** Analysis Date: **11-Jun-2019 17:28**
Client ID: Run ID: **ICS-Integrion_340350** SeqNo: **5118838** PrepDate: DF: **50**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	489.3	25.0	500	13.25	95.2	80 - 120	490.6	0.255	20	
Sulfate	1631	25.0	500	1163	93.7	80 - 120	1634	0.13	20	

MSD Sample ID: **HS19060224-03MSD** Units: **mg/L** Analysis Date: **11-Jun-2019 16:00**
Client ID: Run ID: **ICS-Integrion_340350** SeqNo: **5118833** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	108.4	5.00	100	12.57	95.8	80 - 120	108.2	0.157	20	
Sulfate	338.1	5.00	100	245	93.1	80 - 120	337.8	0.0846	20	

The following samples were analyzed in this batch: HS19051863-01

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Influent
WorkOrder: **HS19051863**

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
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Dept of Defense	ANAB L2231	20-Dec-2021
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019
North Carolina	624-2019	31-Dec-2019
Maryland	343, 2018-2019	30-Jun-2019
Arkansas	19-028-0	27-Mar-2020
Texas	TX104704231-19-23	30-Apr-2020

ALS Houston, US Date: 17-jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Influent
Work Order: HS19051863

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19051863-01	LH18/24-SP140_052919	Login	31/05/2019 11:51:34	PMG	Sub
HS19051863-01	LH18/24-SP140_052919	Login	31/05/2019 11:51:34	PMG	Disposed
HS19051863-01	LH18/24-SP140_052919	Login	31/05/2019 11:51:34	PMG	Disposed
HS19051863-01	LH18/24-SP140_052919	Login	31/05/2019 11:51:34	PMG	Disposed
HS19051863-01	LH18/24-SP140_052919	Login	31/05/2019 11:51:34	PMG	Disposed
HS19051863-01	LH18/24-SP140_052919	Login	31/05/2019 11:51:34	PMG	Disposed
HS19051863-01	LH18/24-SP140_052919	Login	31/05/2019 11:51:34	PMG	Disposed
HS19051863-02	Trip Blank	Login	31/05/2019 11:51:34	PMG	Disposed

ALS Houston, US Date: 17-Jun-19

Sample Receipt Checklist

Client Name: Bhate Environmental
Work Order: HS19051863
Date/Time Received: **31-May-2019 08:37**
Received by: **JRM**

Checklist completed by: *Paresh M. Giga* eSignature 31-May-2019 Date
Reviewed by: *RJ Modashia* eSignature 31-May-2019 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):	2.3c U/c	IR11
Cooler(s)/Kit(s):	44407	
Date/Time sample(s) sent to storage:	5/31/19 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:

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_052919	Water	05/29/19 / 14:00		4	3		1								HCL	
LH18/24-SP140_052919	Water	05/29/19 / 14:00		1		1									HNO3	
LH18/24-SP140_052919	Water	05/29/19 / 14:00		2					1	1					NONE	
LH18/24-SP140_052919	Water	05/29/19 / 14:00		1				1							H2SO4	
LH18/24-SP140_052919	Water	05/29/19 / 14:00		1							1				NONE	
Trip Blank	Water	05/29/19		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	05/29/19	14:30									

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date
J. Macuna	5/31/19	08.37			

Remarks: Cooler 4407
Temp 2.3
VOA's CF 0.0

HS19051863
Bhate Environmental Associates, Inc.
LHAAP 18/24 GWTP Quaterly Influent

(Word) S:\U-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

44407

CUSTODY SEAL

Date: 5/24/19 Time: 1400
Name: Scott Beesinger
Company: BHATE

Seal Broken By: SM
Date: 05/31/19

44407 MAY 31 2019

Must Deliver Next Business Day
Time and Tempature Sensitive!

44407

917 B03 1 10:30 A

ORIGIN ID 8290 (830-6193
SCOTT BEESI 05-31 ASSOCIATES
BHATE ENVIRO AVE. PM8202
1203-B EAST GR
MARSHALL, TX 75670
UNITED STATES US

SHIP DATE: 21SEP18
ACTWGT: 1.00 LB MAN
CAD: 300130/CAFE3211

TO CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099
(281) 530-5656
REF: LHAAP 58 - RJ
RMA:

FedEx Express

TRK# 4380 9532 8290
RETURNS MON-SAT
PRIORITY OVERNIGHT

77099

FedEx
TRK# 4380 9532 8290
FRI 31 MAY 10:30A
PRIORITY OVERNIGHT

AB SGRA
77099
TX-US
IAH

Case Narrative

Method: 6850
Analysis: Perchlorate
Analysis SOP: LC-MS-CLO4
ALS WO ID(s): 1915802, 1915803, 1915852, 1916229; 1916231; 1916232

Client: ALS Laboratories (Houston, TX)
Matrix: Water
ELMS Batch (HBN): 2261 (241120)

General Set Information: There were six 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 samples 1915852001 and 1916229001 were analyzed and reported from 1:1,000 dilutions. The reporting limits have been adjusted accordingly.

Method QC data: The method blank (LMB 657797) was less than 1/2 the CRDL. The recovery for the LCS (657798) was within acceptable parameters.

MS/MSD Analysis: MS/MSD was performed on sample 1915802001 (Client ID: LH18/24-SP650_052919_BIX). 4.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. The spike target was 4.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 – 657795) is reported from the analysis of the Laboratory Control Sample (LCS – 657798) at a level of 4.0µg/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: 19MARI03).

Thomas Bosch June 12, 2019
Analyst Date

ANALYTICAL REPORT

Report Date: June 13, 2019

RJ Modashia
ALS Environmental (Houston)
10450 Stancliff Road
Suite 210
Houston, TX 77099

Phone: 281 530-5656

E-mail: RJ.Modashia@ALSGlobal.com

Workorder: **34-1915852**
Project ID: HS19051863
Purchase Order: HS19051863
Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
LH18/24-SP140_052919	1915852001	05/29/19	06/01/19	

ANALYTICAL REPORT

Workorder: 34-1915852
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **LH18/24-SP140_052919**	Sampling Site: NA	Collected: 05/29/2019
Lab ID: 1915852001	Media: 125 mL Nalgene	Received: 06/01/2019
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/2261 (HBN: 241120)	**Percent Solid:** NA
	Analyzed: 06/11/2019 10:38	**Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	**4900**	1000	2000	4000	1000	

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 06/12/2019 12:46	/S/ Stephen Brose 06/13/2019 10:59

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: 34-1915852
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
	Nevada (TNI)	UT00953201-1	https://ndep.nv.gov/water/lab-certification
	Iowa (TNI)	IA# 376	http://www.shl.uiowa.edu/labcert/idnr/
	Kansas	E-10416	http://www.kdheks.gov/envlab/disclaimer.html
	Oklahoma (TNI)	IJ# 9980	http://www.deq.state.ok.us/CSDnew/labcert.htm
	Texas (TNI)	T104704456-18-9	https://www.tceq.texas.gov/assets/public/compliance/compliance_support/qa/txnelap_lab_list.pdf
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: 1915852

Limits:	Client SOW/Contract Specified	**Preparation:**	NA	**Analysis:**	EPA 6850, DoD QSM
Basis:	DoD QSM	**Batch:**	NA	**Batch:**	ELMS/2261 (HBN: 241120)
		Prepared By:	NA	**Analyzed By:**	Thomas Bosch

Blank

LMB: 657797
Analyzed: 06/11/2019 09:31
Units: ug/L

Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 657798
Analyzed: 06/11/2019 09:04
Dilution: 1
Units: ug/L

Analyte	Result	Target	% Rec	QC Limits	
Perchlorate	4.34	4.00	109	78.8	123.8

Matrix Spike - Matrix Spike Duplicate

Sample:	1915802001	**MS:**	657799
Analyzed:	06/11/2019 09:45	**Analyzed:**	06/11/2019 09:58
Dilution:	1	**Dilution:**	1
Units:	ug/L	**Units:**	ug/L

	MSD:	657800
	Analyzed:	06/11/2019 10:12
	Dilution:	1
	Units:	ug/L

Analyte	Result	Result	Target	% Rec	QC Limits		Result	% Rec	RPD	QC Limits	
Perchlorate	ND	4.57	4	114	78.8	123.8	4.78	120	4.65	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 06/12/2019 12:47	/S/ Stephen Brose 06/13/2019 10:59

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

Subcontract Chain of Custody

SAMPLING STATE: **Colorado**

COC ID: **11500**

18698/# 2 1915852

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:	HS19051863
TSR:	Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS19051863-01**	**LH18/24-SP140_052919**	**Groundwater**	**29 May 2019 14:00**
	SUB_Perch-6850			14 Jun 2019

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

QC Level: DOD IV (DoD Data Package)

Relinquished By: _____ Date/Time: 5/31/19 1800

Received By: _____ Date/Time: 6/1/19 852

Cooler ID(s): 9459 Temperature(s): 2.

ALS Environmental

CHAIN-OF-CUSTODY

Project / Job / Task: HS19051863	***Split:***	**Workorder ID:** 1915852	**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	05/29/2019 00:00	LH18/24-SP140_052919	1915852001		Water	A	1	A
2								
3								
4								
5								
6								
7								
8								
9								
10								

COOL

46 of 120

ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location
Coates, Gayleen	06/01/2019 08:52	ALS Sample Receiving	Sample Login
R.33.1	6.3.19 1505	13B	STORAGE
	6.11.19/08.00	T. Bosch	6850

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

00939400

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: 6/1/19 852

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:	Cooler/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	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.
1	C19 9459	2 °C	4	C19	°C	7	C19	°C
2	C19	°C	5	C19	°C	8	C19	°C
3	C19	°C	6	C19	°C	9	C19	°C

Taken By: _____ (Signature) Meredith Ellings (Printed Name) 6/1/19 (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: _____

CRIR.doc

Revised 01/01/2018



Must Deliver Next Business Day
Time and Tempature Sensitive!

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

SHIP DATE: 31MAY19
ACTWGT: 8.90 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: HS19051856/1859/1863 - RJ

FedEx Express

SATURDAY 12:00P
PRIORITY OVERNIGHT

TRK# 0201 4809 7834 6651

XO BTFA

84123
UT-US SLC

Batch Worklist

Batch: ELMS/ 2261 **Created:** 6/11/2019 07:45 **Instrument:** **HBN:** 241120

Rule: EPA 6850, DoD QSM Water **Analyst:** T. Bosch **Status:** WP

Workorder: 1915802 [ENV_LVL4]
Workorder: 1915803 [ENV_LVL4]
Workorder: 1915852 [ENV_LVL4]
Workorder: 1916229 [ENV_LVL4]
Workorder: 1916231 [ENV_LVL4]
Workorder: 1916232 [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	657794	CCV for HBN 241120 [ELMS/2261]				CCV	3		E685041C3Q	5311		6/13/2019	
2	657795	RLVS for HBN 241120 [ELMS/2261				RLVS	3		E685041C3Q	5311		6/13/2019	
3	657796	ICS for HBN 241120 [ELMS/2261]				ICS	3		E6850..D3Q	5311		6/13/2019	
4	657797	LMB for HBN 241120 [ELMS/2261]				LMB	3		E6850Q413Q	5311		6/13/2019	
5	657798	LCS for HBN 241120 [ELMS/2261]				LCS	3		E6850Q413Q	5311		6/13/2019	
6	1915802001	LH18/24-SP650_052919_BIX				SAMPLE	3	1915802001-A	E6850Q41.3	5480	6/26/2019	6/13/2019	
7	657799	LH18/24-SP650...(1915802001MS)				MS	3		E6850Q413Q	5311		6/13/2019	
8	657800	LH18/24-SP65...(1915802001MSD)				MSD	3		E6850Q413Q	5311		6/13/2019	
9	1915803001	LH18/24-SP650_052919_BIX				SAMPLE	3	1915803001-A	E6850Q41.3	5480	6/26/2019	6/13/2019	
10	1915852001	LH18/24-SP140_052919				SAMPLE	3	1915852001-A	E6850Q41.3	5480	6/26/2019	6/13/2019	
11	1916229001	LH18/24-SP140_060419				SAMPLE	3	1916229001-A	E6850Q41.3	5480	7/2/2019	6/19/2019	
12	1916231001	LH18/24-SP650_060419_BIX				SAMPLE	3	1916231001-A	E6850Q41.3	5480	7/2/2019	6/19/2019	
13	1916232001	LH18/24-SP650_060419_BIX				SAMPLE	3	1916232001-A	E6850Q41.3	5480	7/2/2019	6/19/2019	
14	657801	CCV for HBN 241120 [ELMS/2261]				CCV	3		E685041C3Q	5311		6/13/2019	

00939403

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

ALS Work Order #'s & Sample #( )'s: 1915802 (001), 1915803 (001), 1915852 (001), 1916229 (001); 1916231 (001); 1916232 (001) ELMS Batch/HBN ID: 2261 (241120)
Prep Date: 06/11/2019 Analysis Date: 06/11/2019 Analyst: T. Bosch
Analyte: **Perchlorate** Matrix: **Water** Method: **6850**
Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2019\JUN\11JUN19D.s
Reported DL: **1.0µg/L** Reported LOD: **2.0µg/L** Reported LOQ: **4.0µg/L**

SAMPLE PREPARATION/ANALYSIS:

Water: Samples were prepared by Thomas 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 AH015-4)/0.1% glacial acetic acid (JT-Baker Lot 04802).
Eluent B1: 95% ACN (B&J Lot AH015-4)/ 5% ASTM Type II water (ALS)/0.1% glacial acetic acid (JT-Baker Lot 04802).

STANDARDS: Internal Standard Spiking Solution Horizon# 43730. Dilutions of Working Standard Solution ID 43702 used for CCV's, LODV's, RLVS and IPC.

CALIBRATION CURVE: Used curve from 03/19/2019, sequence 19MAR19D.s Offline Quantitation Method: CLO4-DP2.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: 7 Injection Volume: 35µL
Column: KP-RPPX C8 separator, 250mm Mobile Phase: 70% Eluent A1; 30% Eluent B1

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: 4.0µL of QC Solution Horizon ID 47516 was used for LCS 657798; Target = 4.0µg/L. ASTM type II water was used for LMB 657797.

MS/MSD: The Matrix Spike and duplicate (MS/MSD) were performed on sample 1915802001 (Client ID: LH18/24-SP650_052919_BIX). 4.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. Spike target = 4.0µg/L.

COMMENTS:

1) Results reported in µg/L. Field samples 1915852001 and 1916229001 were analyzed and reported from 1:1,000 dilutions. The reporting limits have been adjusted accordingly.
2) All QC, Blank, CCV, and MS/MSD results were within method parameters.
3) Sample data can be viewed at two directories within the ALS system: \\ALSLTWS013\LCMS\LCMS04\2019\JUN\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
4) Notebook: \\alsltws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2019\241120-DoD-ALS-Hstn LCMS4 or through \\ALSLTWS013\DATAREVIEW\HBN#
5) The Reporting Limit Verification Standard (RLVS – 657795) is reported from the analysis of the Laboratory Control Sample (LCS – 657798) at a level of 4.0µg/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: 19MARI03).

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: 2261 HBN: 241120 Sample Set IDs if Applicable: 1915802/1915803/1915852 1916229/1916231/1916232	Analyst Initials	Reviewer Initials
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
Method Blanks 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 flags applied on QC reports; LCSs analyzed and meet acceptance criteria when performed	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 checked	TB	SB
Preparation and analysis calculations checked	TB	SB
NCRs are completed as necessary NC/CAR#		
Report forms are complete and accurate	TB	SB
Manual integrations checked	TB	SB

STANDARD REPORT

Working Standard - CLO4 WRK

CLO4 WRK — Description - 6850 WKG Std 100.ug/L

Standard: 43702
MFG: ALS/SLC
MFG Lot: TNB: 09/18/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/18/2018 02:09PM

Amount: 10 mL
Expires: 09/18/2019
Usable: Yes
Lab Lot: CLO4 WRK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	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
43701	CLO4 INT	6850 Intermdt AccStd 10.ug/mL	CLO4 INT	0.1 mL	09/18/2019

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: No
Lab Lot: CLO4 STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	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: 43701
MFG: ALS/SLC
MFG Lot: TNB: 09/18/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/18/2018 02:09PM

Amount: 10 mL
Expires: 09/18/2019
Usable: Yes
Lab Lot: CLO4 INT

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
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
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

STANDARD REPORT

Working Standard - CLO4ISTDWRK

CLO4ISTDWRK — Description - Perchlorate ISTD Wrk 1,000ug/L

Standard: 43730
MFG: ALS/SLC
MFG Lot: TNB: 05/09/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/20/2018 09:09AM
Verified By: Thomas Bosch
Verify Date:

Amount: 25 mL
Expires: 09/20/2019
Usable: Yes
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
43729	CLO4ISTDSTK	Perchlorate ISTD Stock	CLO4ISTDSTK	0.25 mL	04/28/2026

STANDARD REPORT

Constituent

Stock Standard - CLO4ISTDSTK

CLO4ISTDSTK — Description - Perchlorate ISTD Stock

Standard: 43729
MFG: Cambridge Isotope
MFG Lot: SDFF-012A
Part ID: OLM-7310-S

Created By: Thomas Bosch
Create Date: 09/20/2018 09:09AM
Verified By: Thomas Bosch
Verify Date:

Amount: 1 mL
Expires: 04/28/2026
Usable: Yes
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

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

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 REFERENCE MATERIAL PRODUCER
ANAB ACCREDITED TESTING LABORATORY

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: JCC-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

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*

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

GHS

Signal Word: None

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.

Cambridge Isotope Laboratories, Inc.

Certificate of Analysis

Quality Standards:
ISO Guide 34 • ISO/IEC 17025 • ISO 13485 • cGMP

23118

Product Name: (Isotopic Label & Enrichment Specification)	PERCHLORIC ACID, SODIUM SALT (18O4, 90%+) 100 UG/ML IN WATER
Lot Number:	SDDG-013
Catalog Number:	OLM-7310-S

Product Information

Chemical Purity Specification:	≥98%
Labeled CAS Number:	NA
Unlabeled CAS Number:	7601-89-0
MW*:	130.4
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.

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.

* *For isotopically labeled compounds, MW listed is for the fully enriched product.*

Approved by: T. J. Eckersley

Timothy I. Eckersley, Ph.D., Quality Assurance

Quality Control Tests and Results

QC Release Date	2/27/2014
Expiration Date	2/27/2024
Concentration Based on Gravimetry	102 µg/mL
Chemical Purity of Neat Material(s)	98%
LC/MS for Concentration	109.4 ± 2.8 µg/mL (k=2)



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

00939422

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP2.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
*	657794 CCV@25	Vial 71	1	Control	1	1.90258e6	8.986	26.94929
*	657798 QC@4.0	Vial 72	1	Control	2	3.85542e5	8.884	4.34115
*	657796 ICS@4.0	Vial 73	1	Control	3	2.32261e5	8.623	3.98229
*	657797 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	1915802001	Vial 75	1	Sample	5	0.00000	0.000	0.00000
*	657799 158021S	Vial 76	1	Sample	6	1.46622e5	8.522	4.56740
*	657800 158021D	Vial 77	1	Sample	7	1.54646e5	8.528	4.78474
*	1915803001	Vial 78	1	Sample	8	0.00000	0.000	0.00000
*	1915852001 1K	Vial 79	1	Sample	9	3.32187e5	9.077	4885.02369
*	1916229001 1K	Vial 80	1	Sample	10	4.13979e5	9.091	6820.05588
*	1916231001	Vial 81	1	Sample	11	0.00000	0.000	0.00000
*	1916232001	Vial 82	1	Sample	12	0.00000	0.000	0.00000
*	657801 CCV@25	Vial 71	1	Control	13	1.42334e6	9.028	25.98075

#	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
*	657794 CCV@25	Vial 71	1	Control	1	5.56917e5	9.003	26.60911
*	657798 QC@4.0	Vial 72	1	Control	2	1.22598e5	8.893	4.50107
*	657796 ICS@4.0	Vial 73	1	Control	3	7.62920e4	8.637	4.24932
*	657797 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	1915802001	Vial 75	1	Sample	5	0.00000	0.000	0.00000
*	657799 158021S	Vial 76	1	Sample	6	5.01097e4	8.545	5.09575
*	657800 158021D	Vial 77	1	Sample	7	5.24358e4	8.548	5.30516
*	1915803001	Vial 78	1	Sample	8	0.00000	0.000	0.00000
*	1915852001 1K	Vial 79	1	Sample	9	1.07205e5	9.093	5161.49233
*	1916229001 1K	Vial 80	1	Sample	10	1.30297e5	9.110	7096.69575
*	1916231001	Vial 81	1	Sample	11	0.00000	0.000	0.00000
*	1916232001	Vial 82	1	Sample	12	0.00000	0.000	0.00000
*	657801 CCV@25	Vial 71	1	Control	13	4.26237e5	9.042	26.20612

#	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
*	657794 CCV@25	Vial 71	1	Control	1	2.13798e5	9.004	5.00000
*	657798 QC@4.0	Vial 72	1	Control	2	2.91481e5	8.904	5.00000
*	657796 ICS@4.0	Vial 73	1	Control	3	1.92225e5	8.645	5.00000
*	657797 LMB	Vial 74	1	Control	4	3.01884e5	9.082	5.00000
*	1915802001	Vial 75	1	Sample	5	1.12941e5	8.589	5.00000
*	657799 158021S	Vial 76	1	Sample	6	1.05110e5	8.545	5.00000
*	657800 158021D	Vial 77	1	Sample	7	1.05604e5	8.552	5.00000
*	1915803001	Vial 78	1	Sample	8	1.14182e5	8.546	5.00000
*	1915852001 1K	Vial 79	1	Sample	9	2.21981e5	9.097	5000.00000
*	1916229001 1K	Vial 80	1	Sample	10	1.95450e5	9.116	5000.00000
*	1916231001	Vial 81	1	Sample	11	1.33828e5	8.518	5.00000
*	1916232001	Vial 82	1	Sample	12	1.27034e5	8.502	5.00000
*	657801 CCV@25	Vial 71	1	Control	13	1.66287e5	9.054	5.00000

*** End of Report ***

Sequence Table:

Method and Injection Info Part:

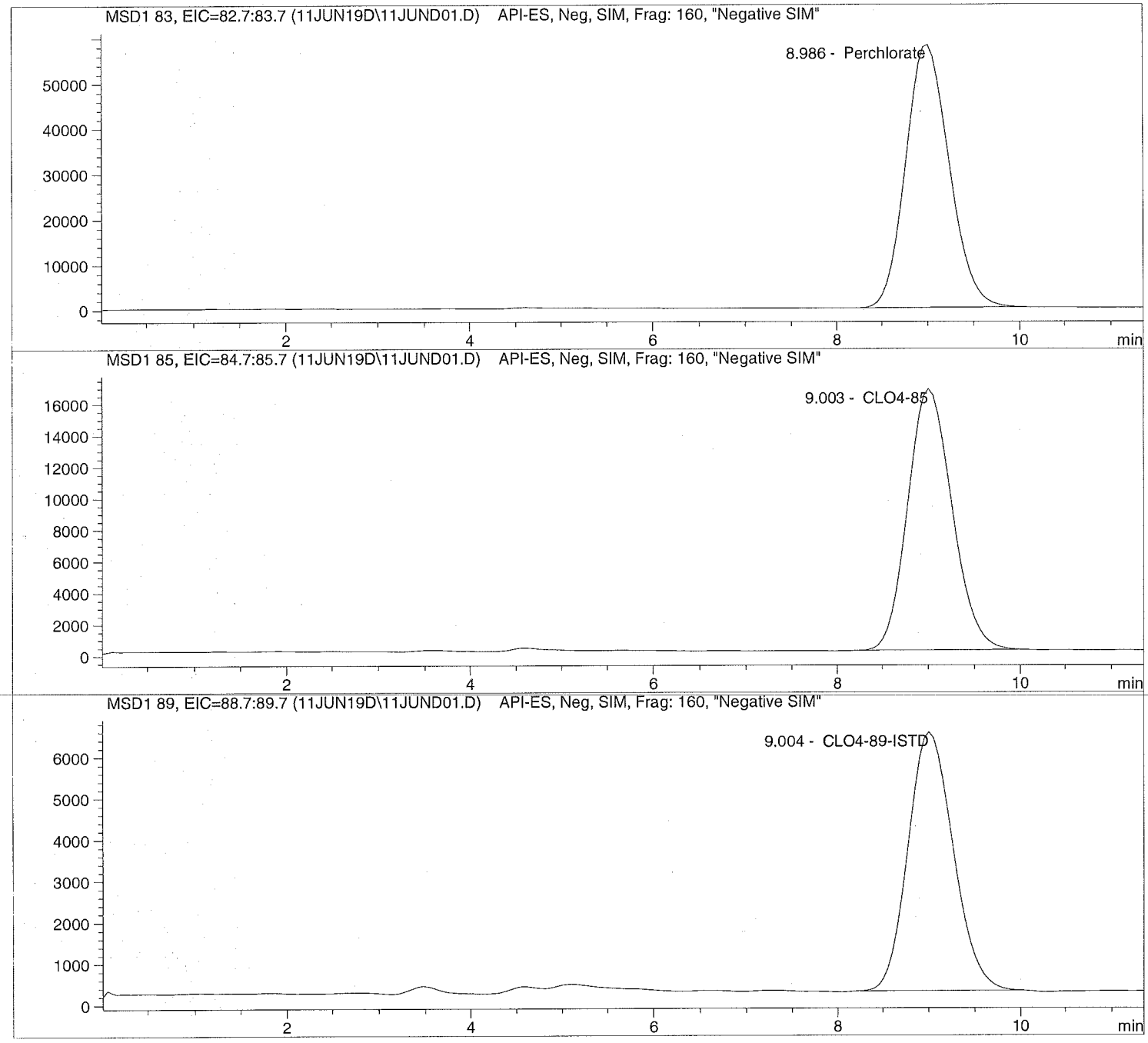
Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	657794 CCV@25	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	657798 QC@4.0	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	657796 ICS@4.0	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	657797 LMB	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	1915802001	CLO4-AQN	1	Sample		
6	Vial 76	657799 158021S	CLO4-AQN	1	Sample		
7	Vial 77	657800 158021D	CLO4-AQN	1	Sample		
8	Vial 78	1915803001	CLO4-AQN	1	Sample		
9	Vial 79	1915852001 1K	CLO4-AQN	1	Sample		
10	Vial 80	1916229001 1K	CLO4-AQN	1	Sample		
11	Vial 81	1916231001	CLO4-AQN	1	Sample		
12	Vial 82	1916232001	CLO4-AQN	1	Sample		
13	Vial 71	657801 CCV@25	CLO4-AQN	1	Ctrl Samp		

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND01.D Sample Name: 657794 CCV@25

Injection Date:	6/11/2019 08:44:35	Seq Line:	1
Sample Name:	657794 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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND01.D Sample Name: 657794 CCV@25

Injection Date:	6/11/2019 08:44:35	Seq Line:	1
Sample Name:	657794 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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.986	PBA	1902575.4	26.9493	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.003	PBA	556916.8	26.6091	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.004	PBA	213798.0	5.0000	CLO4-89-ISTD

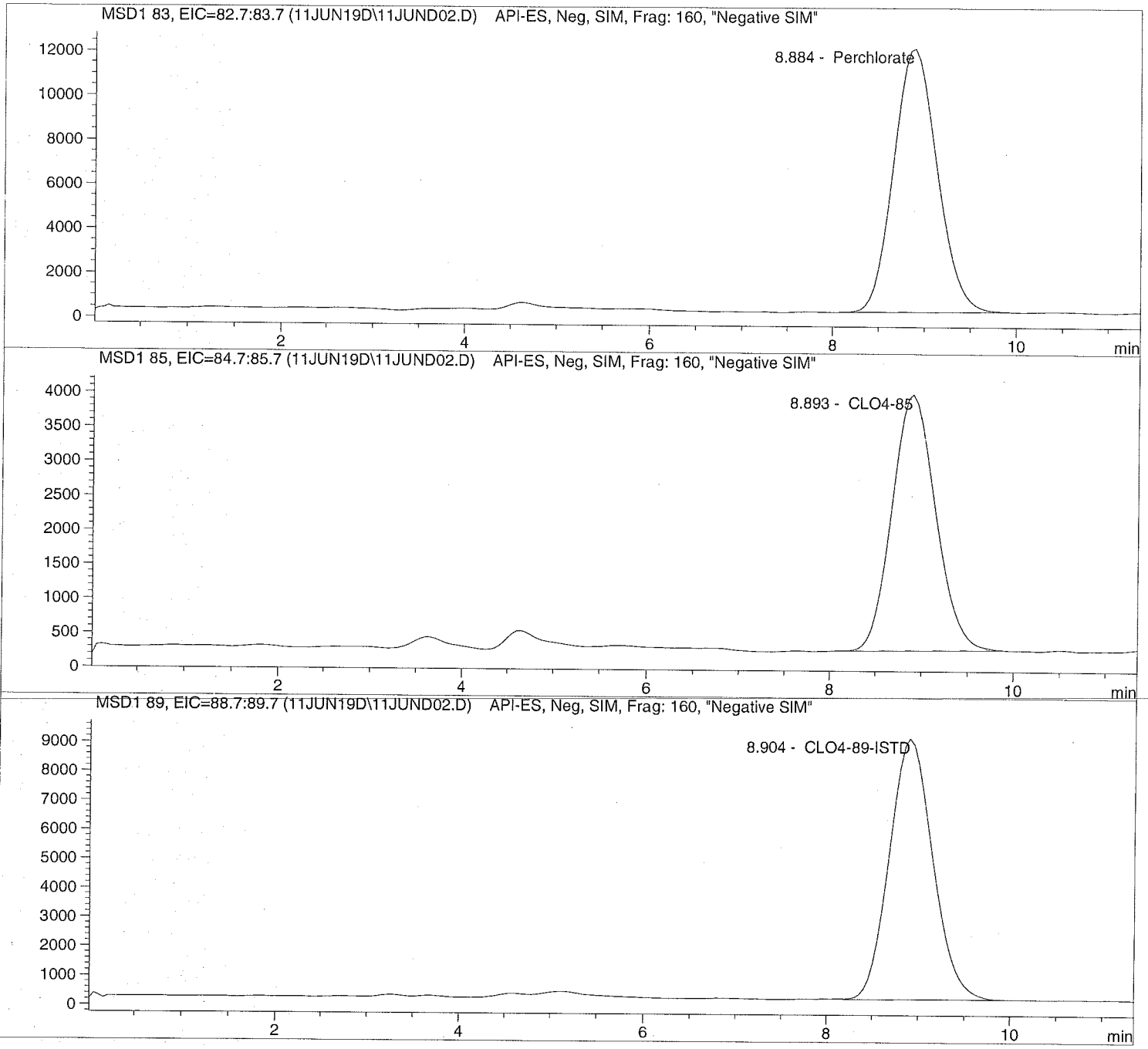
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND02.D Sample Name: 657798 QC@4.0

Injection Date:	6/11/2019 09:04:55	Seq Line:	2
Sample Name:	657798 QC@4.0	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Injection Date: 6/11/2019 09:04:55 Seq Line: 2
Sample Name: 657798 QC@4.0 Location: Vial 72
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Fri, 12. Apr. 2019,07:52:58 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.884	PBA	385541.7	4.3412	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.893	BBA	122598.4	4.5011	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.904	BBA	291480.6	5.0000	CLO4-89-ISTD

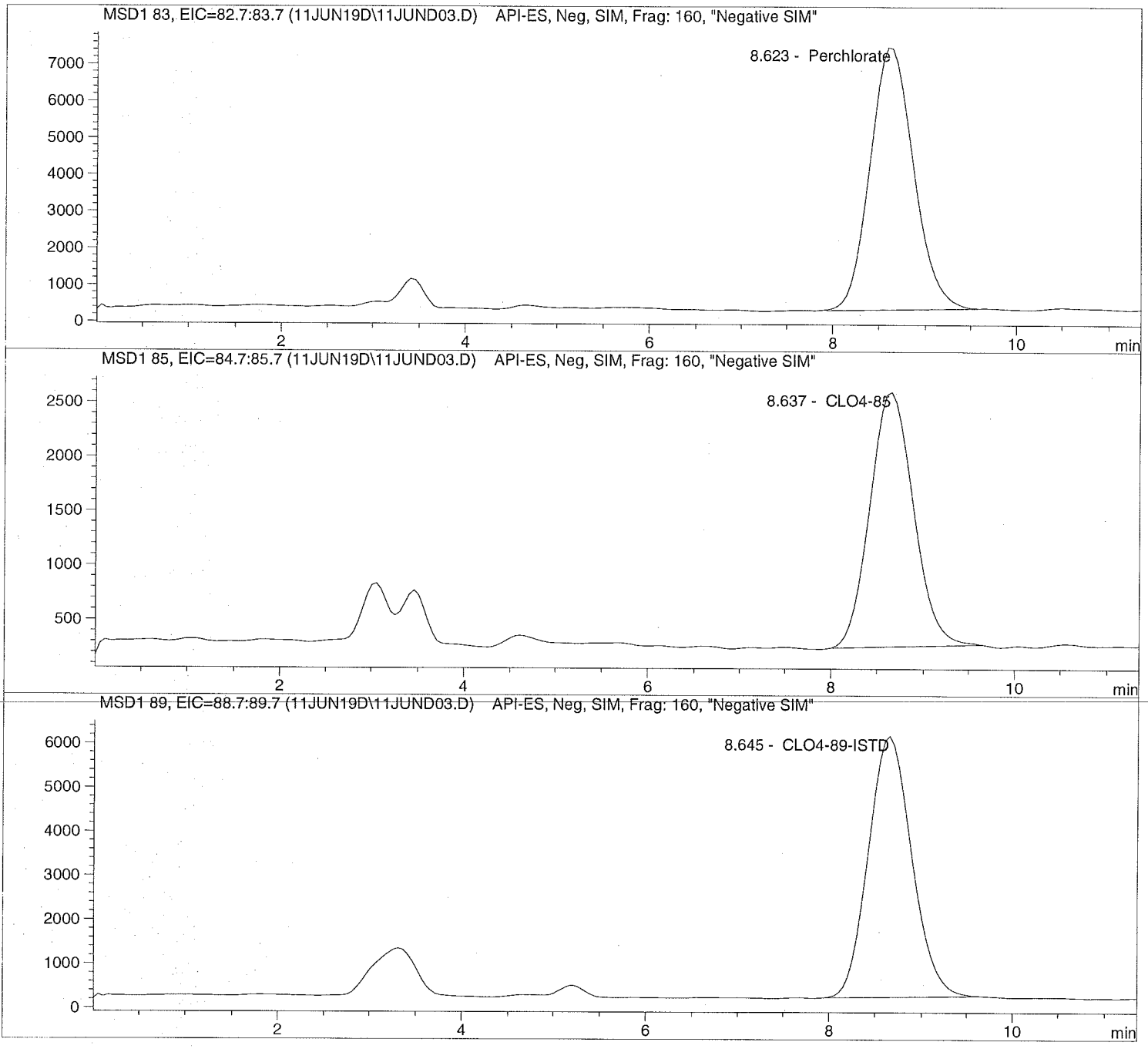
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND03.D Sample Name: 657796 ICS@4.0

Injection Date:	6/11/2019 09:18:21	Seq Line:	3
Sample Name:	657796 ICS@4.0	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND03.D Sample Name: 657796 ICS@4.0

Injection Date:	6/11/2019 09:18:21	Seq Line:	3
Sample Name:	657796 ICS@4.0	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.623	PBA	232261.2	3.9823	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.637	PBA	76292.0	4.2493	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.645	PBA	192224.9	5.0000	CLO4-89-ISTD

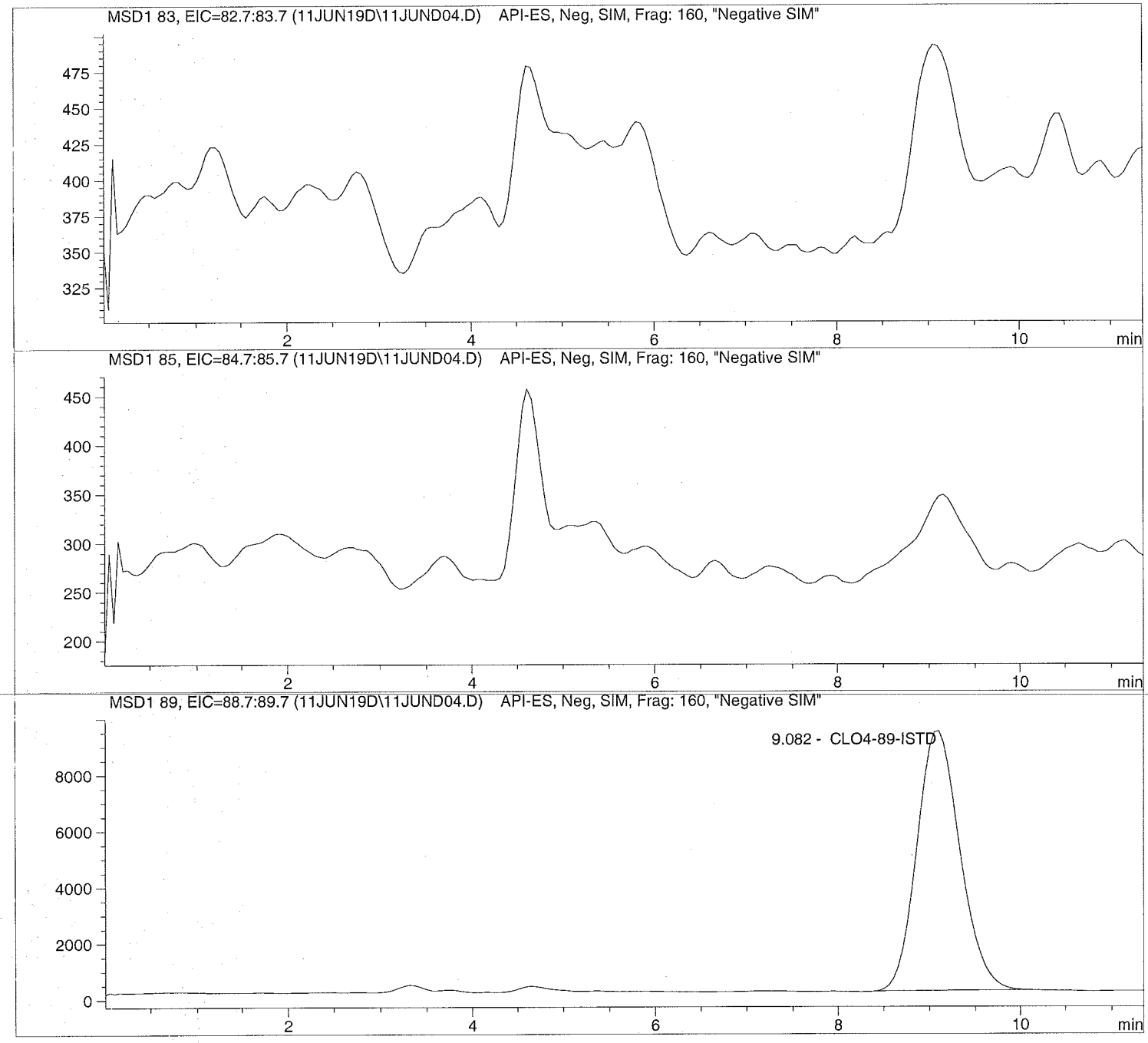
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND04.D Sample Name: 657797 LMB

Injection Date:	6/11/2019 09:31:47	Seq Line:	4
Sample Name:	657797 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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND04.D Sample Name: 657797 LMB

Injection Date:	6/11/2019 09:31:47	Seq Line:	4
Sample Name:	657797 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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
9.082	PBA	301883.5	5.0000	CLO4-89-ISTD

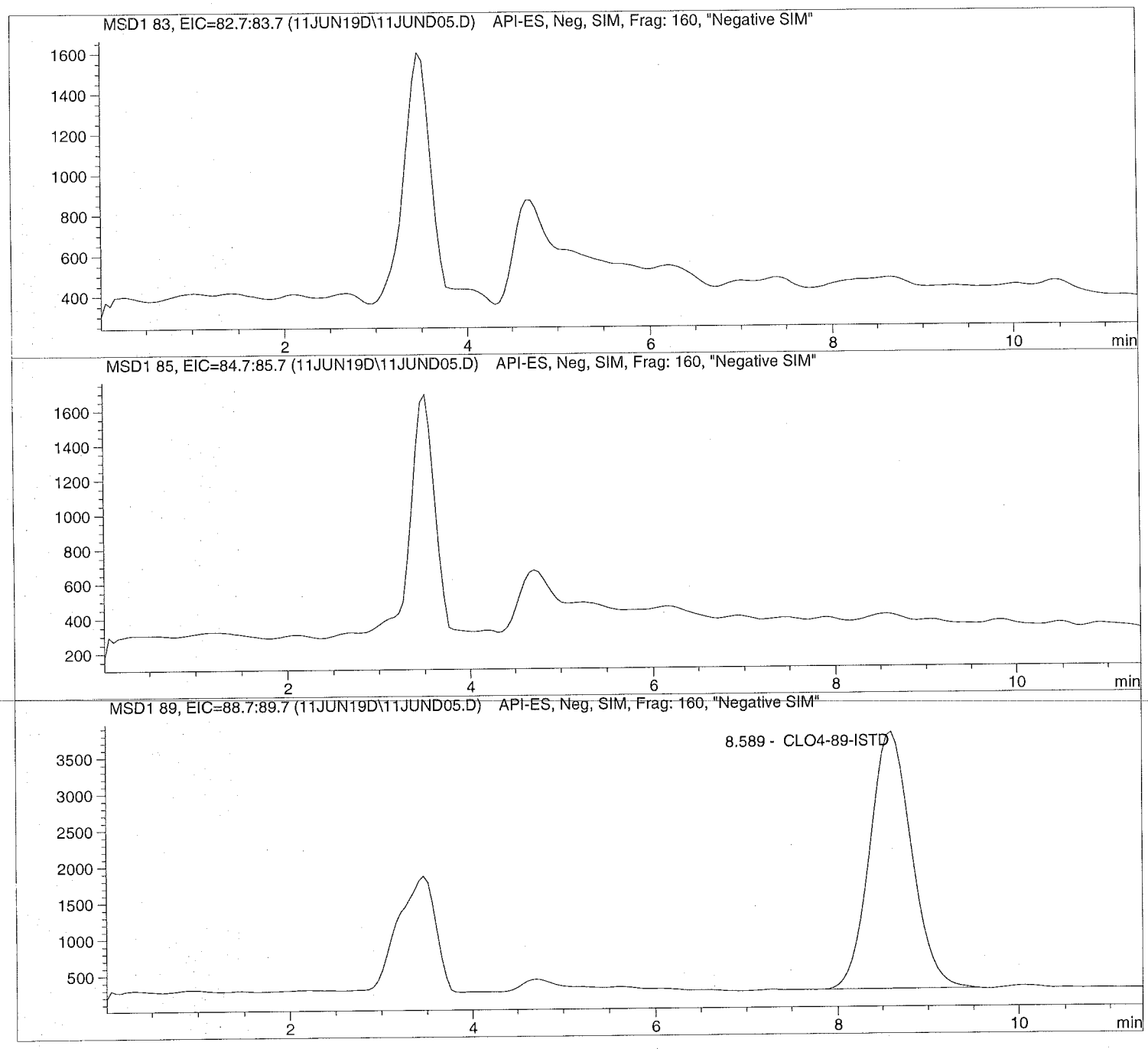
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND05.D Sample Name: 1915802001

Injection Date:	6/11/2019 09:45:13	Seq Line:	5
Sample Name:	1915802001	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND05.D Sample Name: 1915802001

Injection Date:	6/11/2019 09:45:13	Seq Line:	5
Sample Name:	1915802001	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.589	PBA	112941.5	5.0000	CLO4-89-ISTD

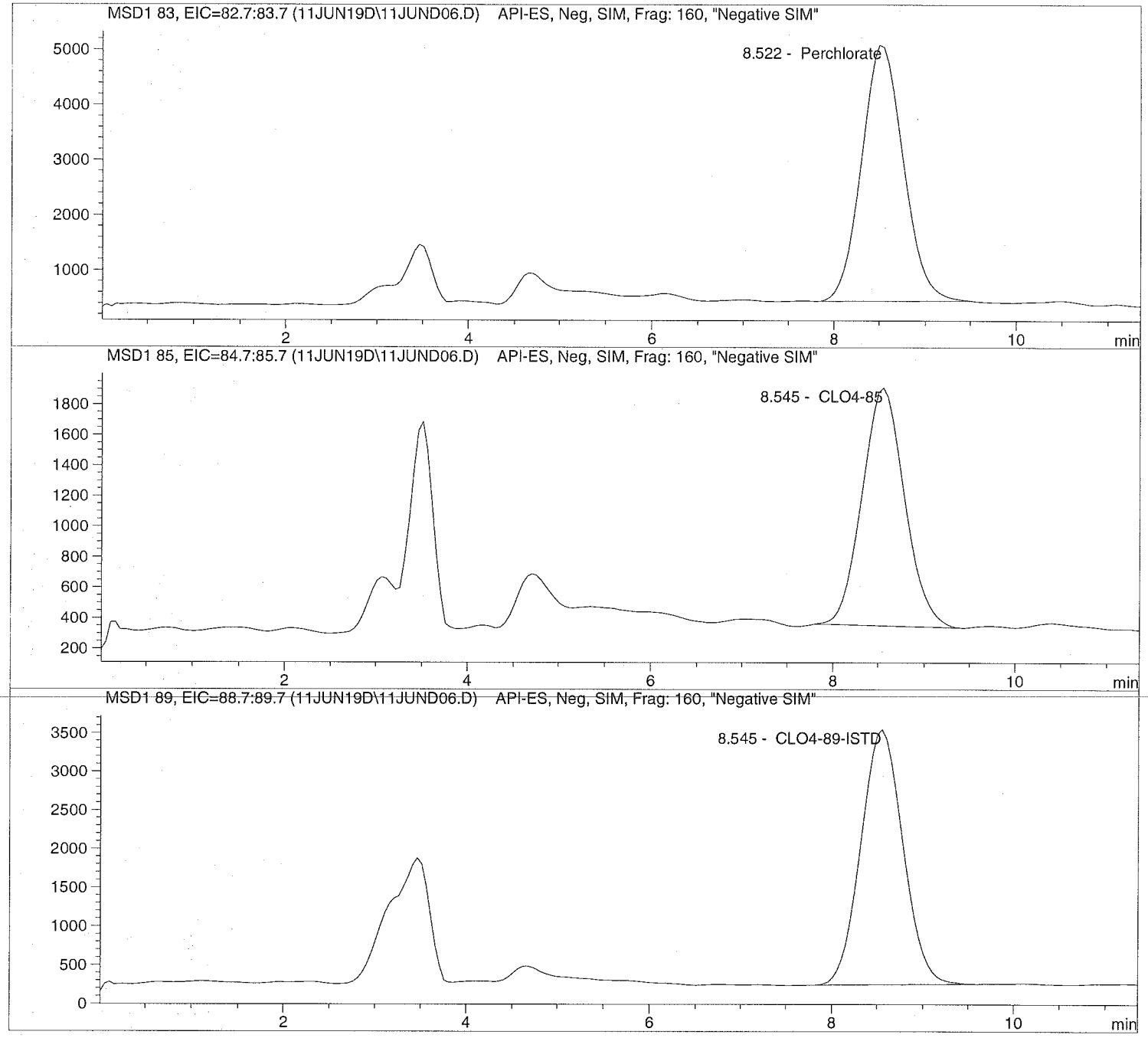
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND06.D Sample Name: 657799 158021S

Injection Date:	6/11/2019 09:58:38	Seq Line:	6
Sample Name:	657799 158021S	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND06.D Sample Name: 657799 158021S

Injection Date:	6/11/2019 09:58:38	Seq Line:	6
Sample Name:	657799 158021S	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-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.522	BBA	146622.1	4.5674	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.545	PBA	50109.7	5.0958	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.545	PBA	105110.4	5.0000	CLO4-89-ISTD

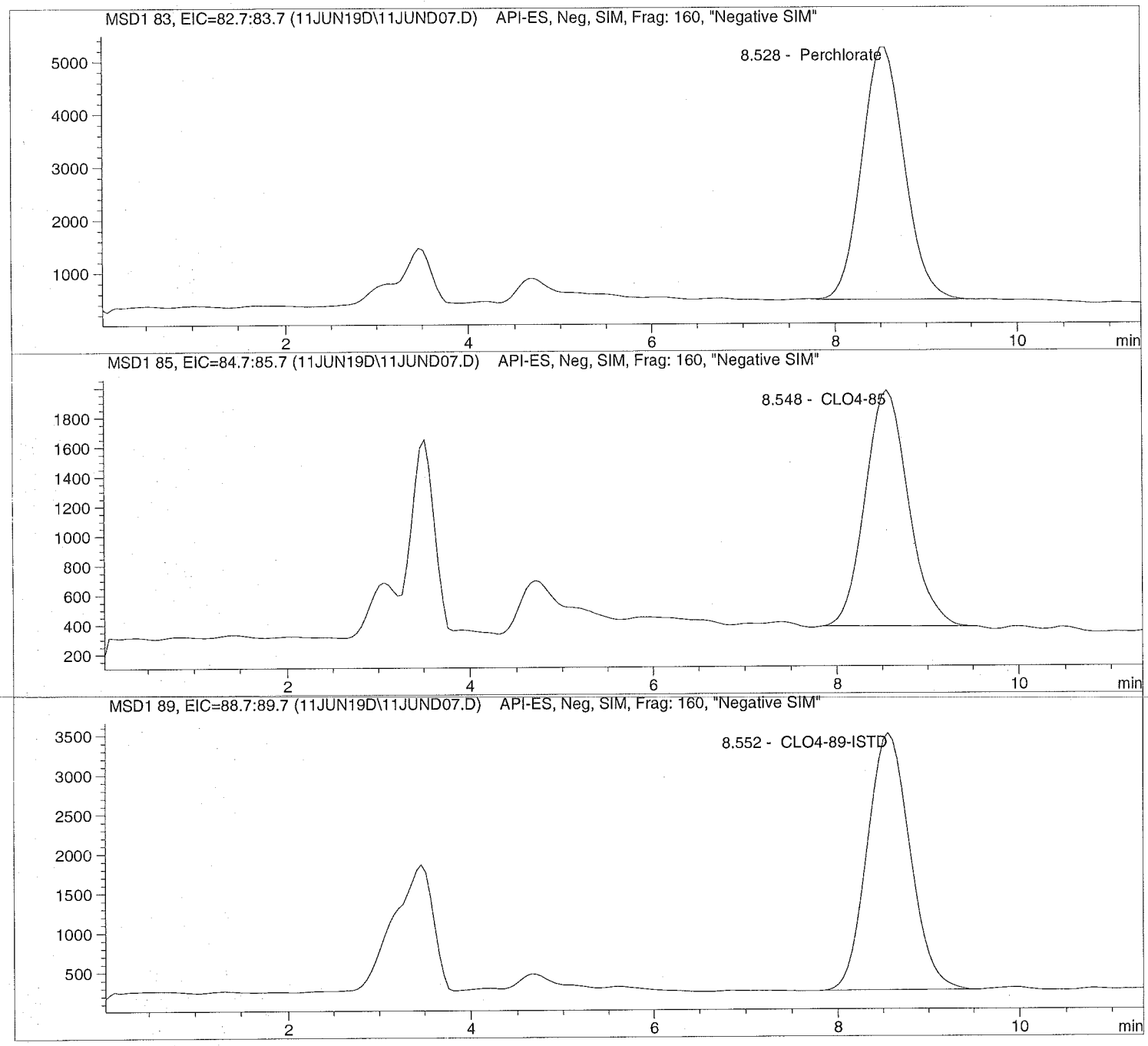
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND07.D Sample Name: 657800 158021D

Injection Date:	6/11/2019 10:12:09	Seq Line:	7
Sample Name:	657800 158021D	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Injection Date: 6/11/2019 10:12:09 Seq Line: 7
Sample Name: 657800 158021D 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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Fri, 12. Apr. 2019,07:52:58 am
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
8.528	BBA	154645.8	4.7847	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.548	PBA	52435.8	5.3052	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.552	PBA	105604.1	5.0000	CLO4-89-ISTD

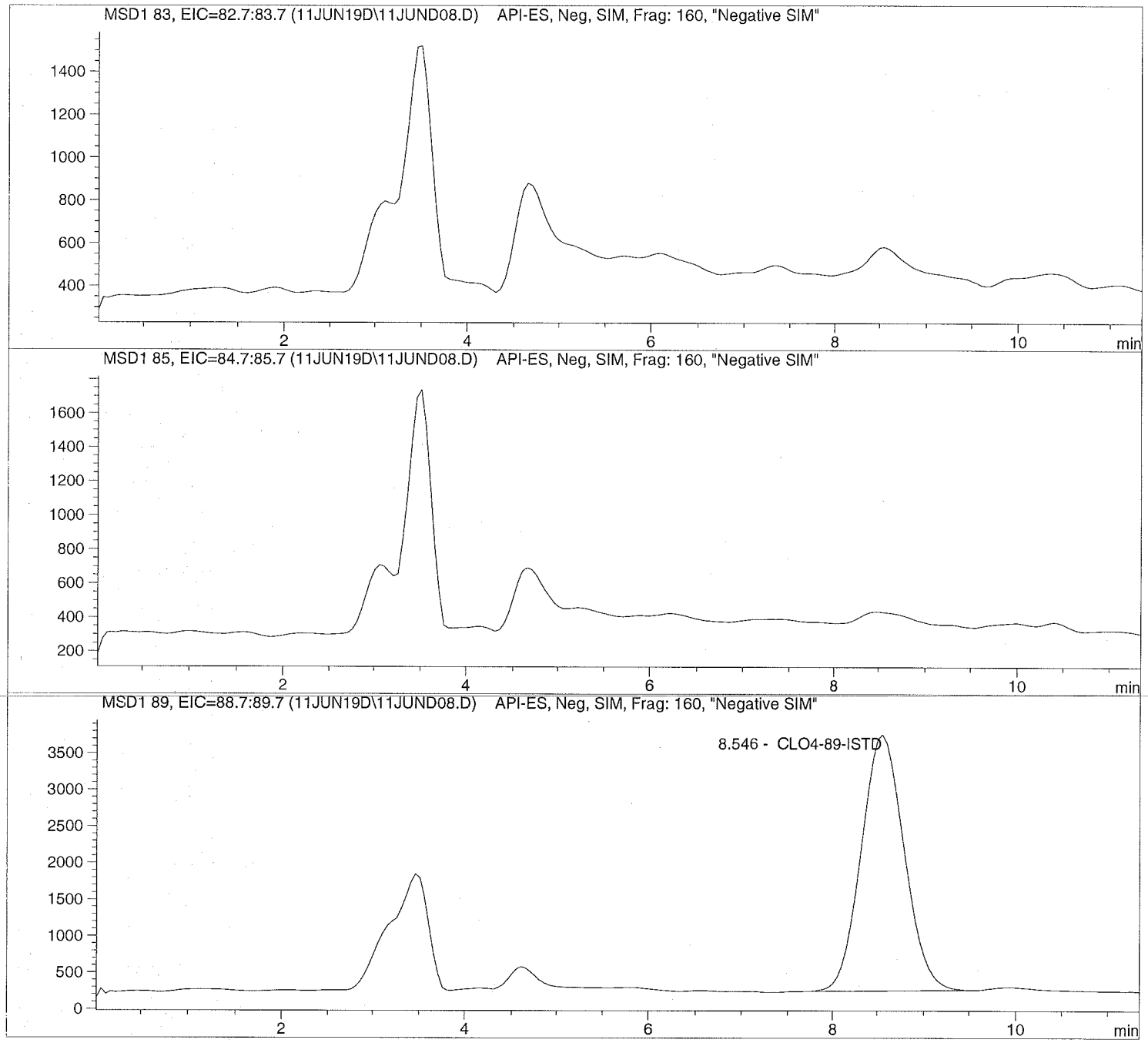
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND08.D Sample Name: 1915803001

Injection Date:	6/11/2019 10:25:32	Seq Line:	8
Sample Name:	1915803001	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND08.D Sample Name: 1915803001

Injection Date:	6/11/2019 10:25:32	Seq Line:	8
Sample Name:	1915803001	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.546	BBA	114182.4	5.0000	CLO4-89-ISTD

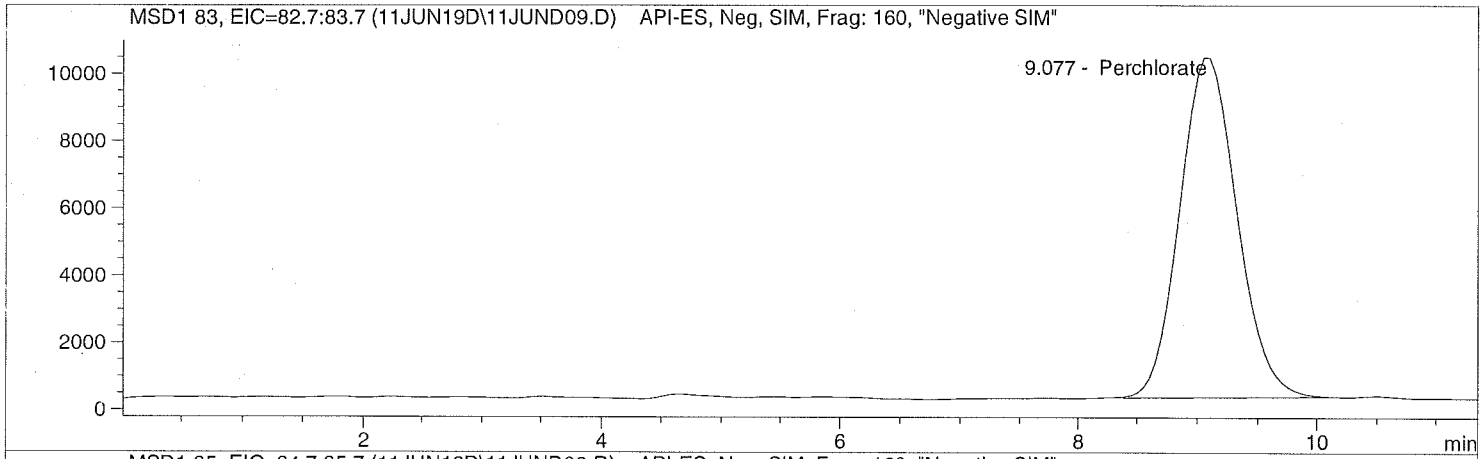
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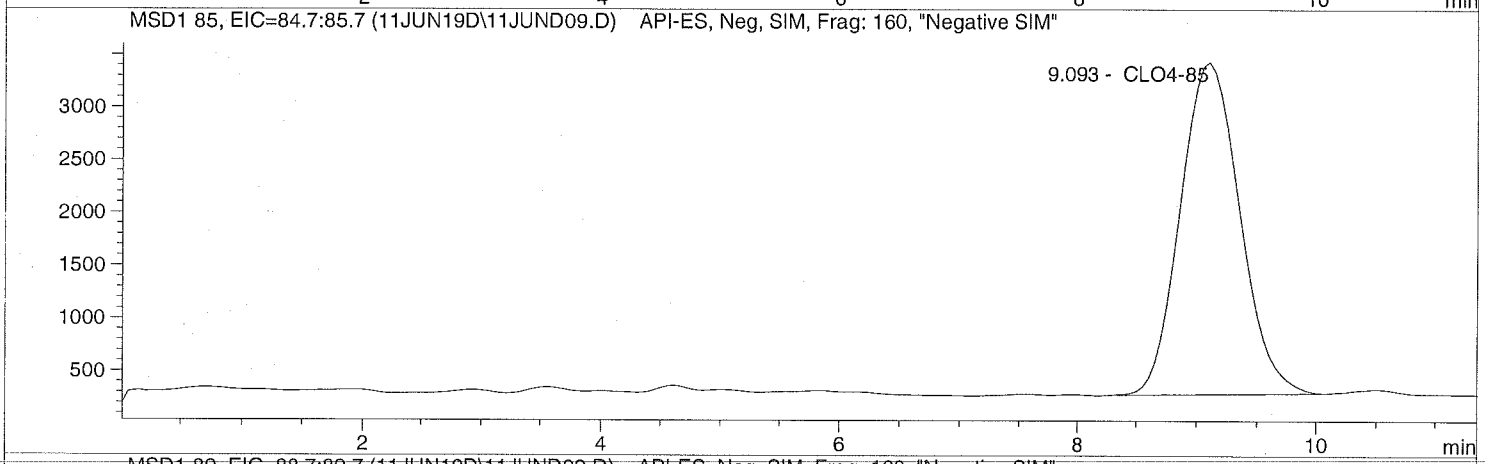
Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND09.D Sample Name: 1915852001 1K

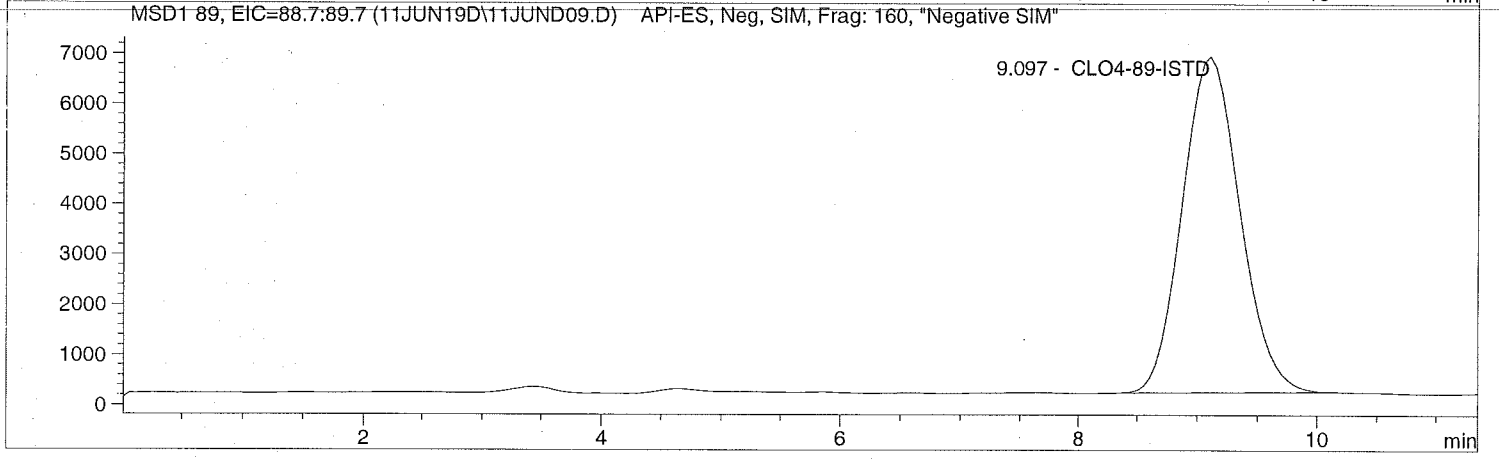
Injection Date:	6/11/2019 10:38:54	Seq Line:	9
Sample Name:	1915852001 1K	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND09.D Sample Name: 1915852001 1K

Injection Date:	6/11/2019 10:38:54	Seq Line:	9
Sample Name:	1915852001 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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
9.077	BBA	332187.1	4885.0237	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.093	PBA	107205.2	5161.4923	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.097	PBA	221981.4	5000.0000	CLO4-89-ISTD

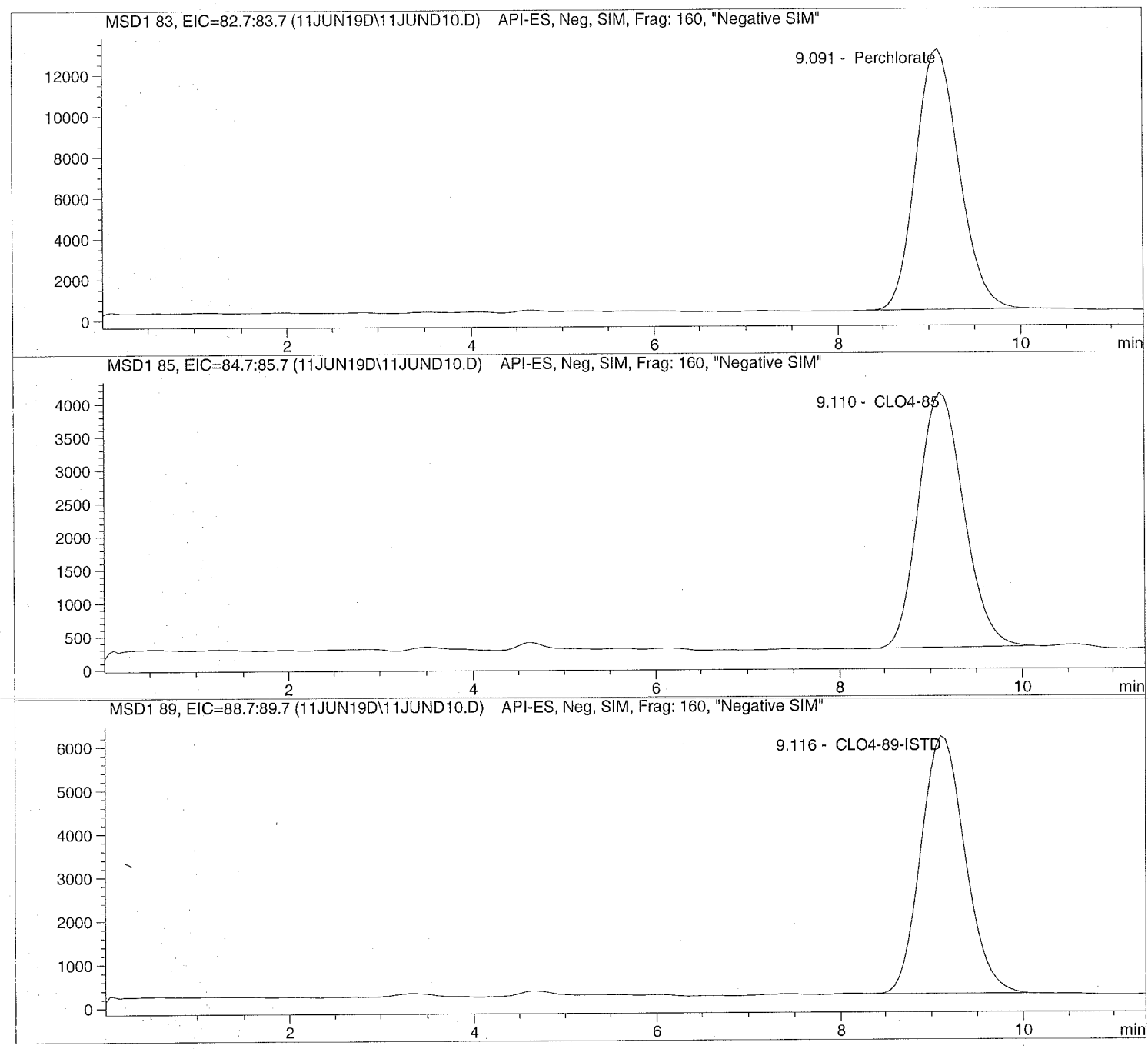
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND10.D Sample Name: 1916229001 1K

Injection Date:	6/11/2019 10:52:22	Seq Line:	10
Sample Name:	1916229001 1K	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND10.D Sample Name: 1916229001 1K

Injection Date:	6/11/2019 10:52:22	Seq Line:	10
Sample Name:	1916229001 1K	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
9.091	BBA	413978.8	6820.0559	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.110	PBA	130297.0	7096.6957	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.116	BBA	195449.6	5000.0000	CLO4-89-ISTD

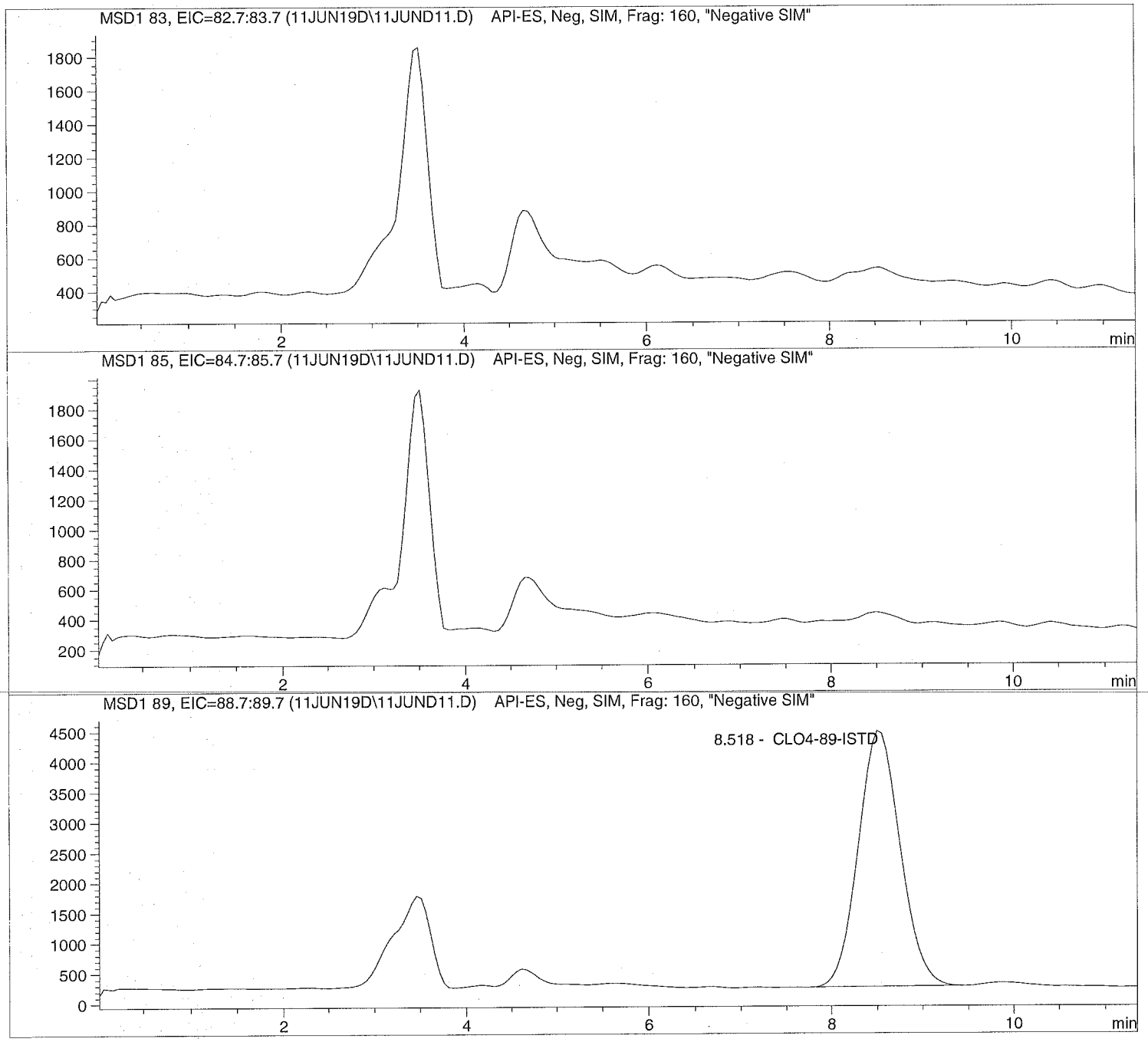
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND11.D Sample Name: 1916231001

Injection Date:	6/11/2019 11:05:44	Seq Line:	11
Sample Name:	1916231001	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND11.D Sample Name: 1916231001

Injection Date:	6/11/2019 11:05:44	Seq Line:	11
Sample Name:	1916231001	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.518	PBA	133827.9	5.0000	CLO4-89-ISTD

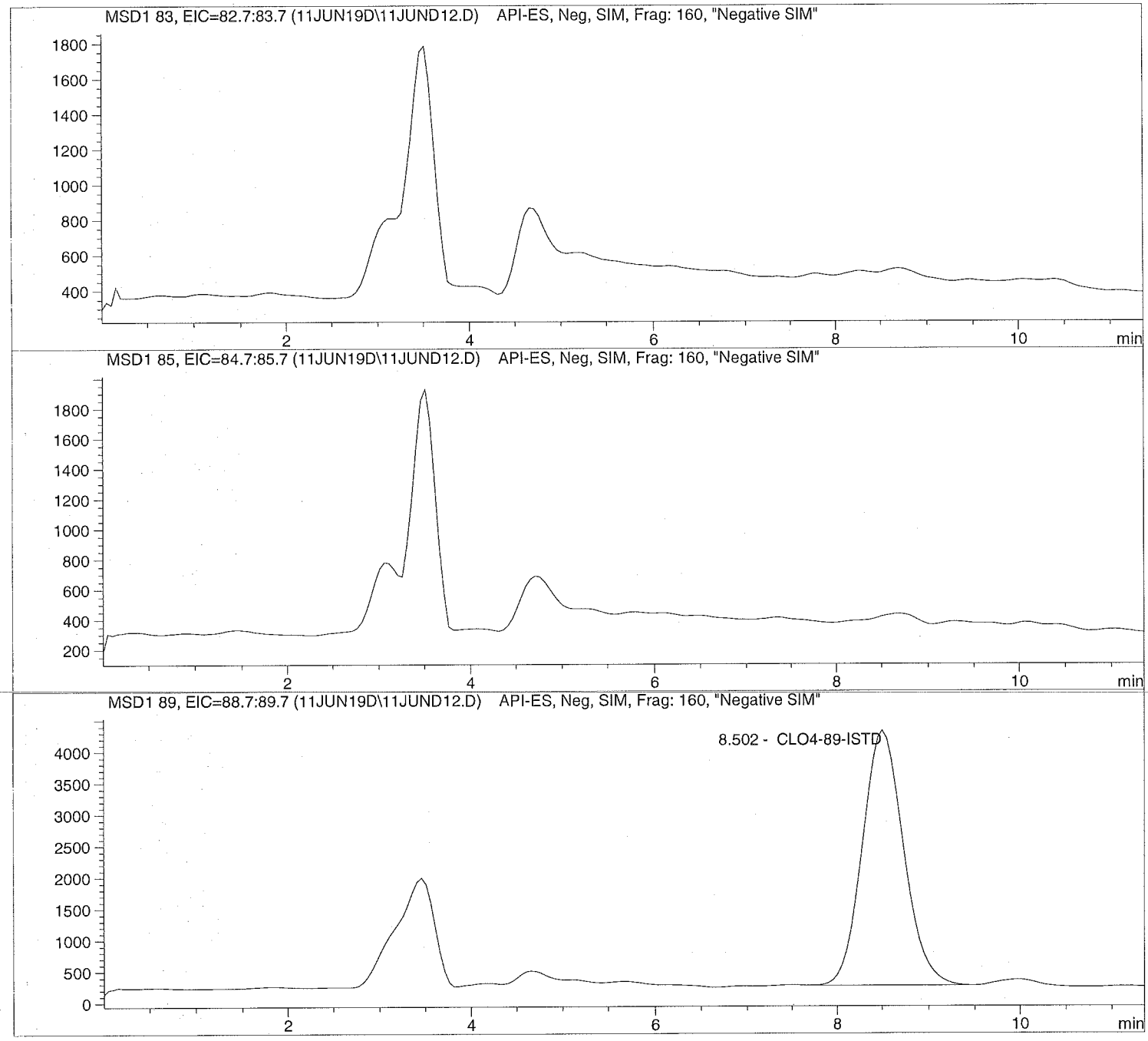
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND12.D Sample Name: 1916232001

Injection Date:	6/11/2019 11:19:06	Seq Line:	12
Sample Name:	1916232001	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND12.D Sample Name: 1916232001

Injection Date:	6/11/2019 11:19:06	Seq Line:	12
Sample Name:	1916232001	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-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.502	BBA	127033.7	5.0000	CLO4-89-ISTD

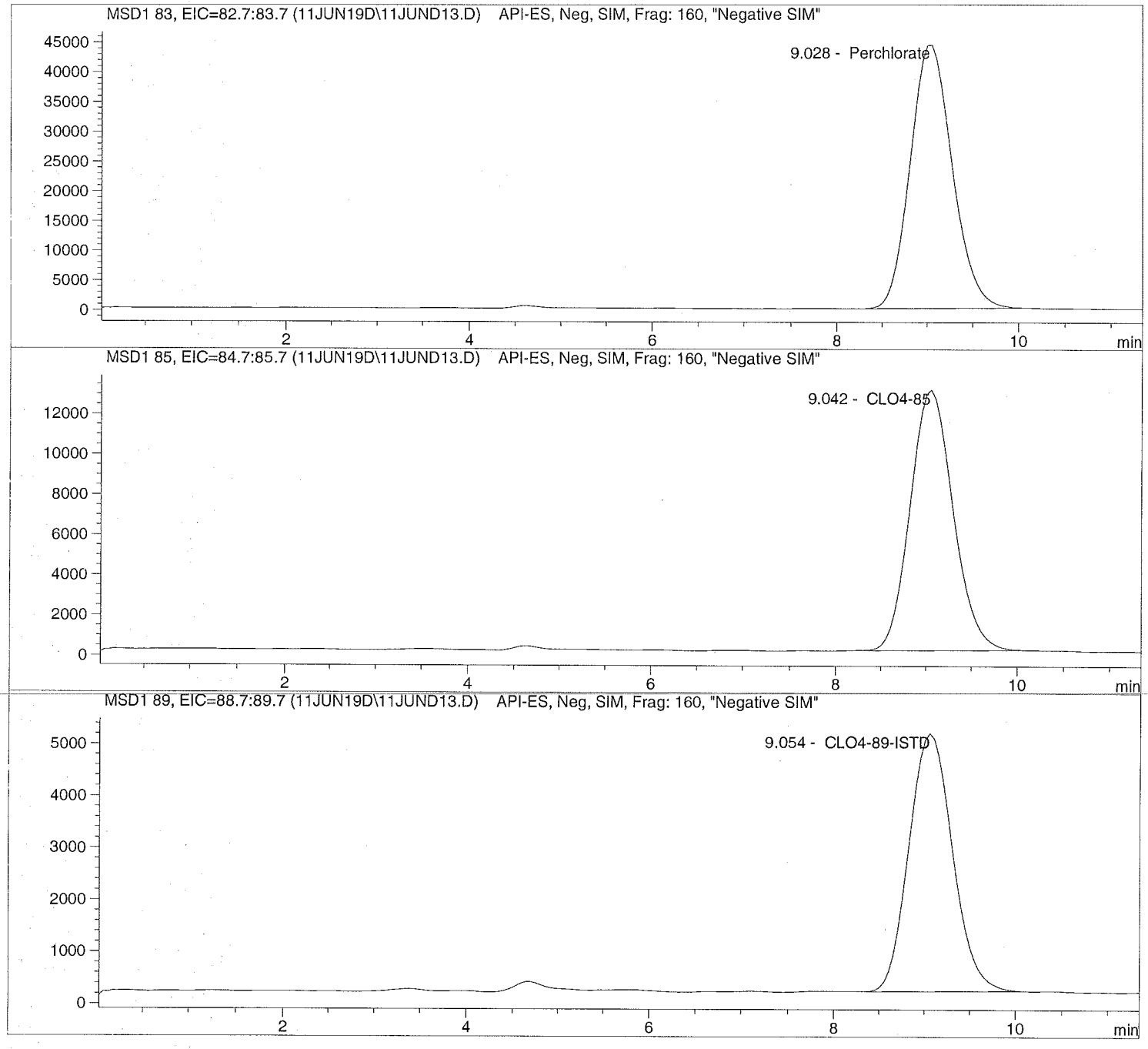
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND13.D Sample Name: 657801 CCV@25

Injection Date:	6/11/2019 11:34:17	Seq Line:	13
Sample Name:	657801 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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND13.D Sample Name: 657801 CCV@25

Injection Date:	6/11/2019 11:34:17	Seq Line:	13
Sample Name:	657801 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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
9.028	PBA	1423337.3	25.9807	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.042	BBA	426236.8	26.2061	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.054	BBA	166286.8	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 : 3/19/2019 2:35:19 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
8.744	1	1	1.00000	7.76074e4	1.28854e-5		1	Perchlorate
		2	2.00000	1.35273e5	1.47849e-5			
		3	5.00000	3.37764e5	1.48033e-5			
		4	10.00000	6.83454e5	1.46316e-5			
		5	25.00000	2.08433e6	1.19943e-5			
		6	50.00000	4.13334e6	1.20968e-5			
		7	75.00000	5.99313e6	1.25143e-5			
8.755	2	1	1.00000	2.36780e4	4.22333e-5		1	CLO4-85
		2	2.00000	4.69486e4	4.25998e-5			
		3	5.00000	1.06124e5	4.71147e-5			
		4	10.00000	2.13523e5	4.68335e-5			
		5	25.00000	6.14295e5	4.06971e-5			
		6	50.00000	1.19814e6	4.17315e-5			
		7	75.00000	1.78355e6	4.20509e-5			
8.766	3	1	5.00000	2.73208e5	1.83011e-5	+I1		CLO4-89-ISTD
		2	5.00000	2.24886e5	2.22335e-5			
		3	5.00000	2.33196e5	2.14412e-5			
		4	5.00000	2.34454e5	2.13262e-5			
		5	5.00000	2.50568e5	1.99547e-5			
		6	5.00000	2.30977e5	2.16472e-5			

RetTime [min]	Sig	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
		7	5.00000	2.21504e5	2.25729e-5			

More compound-specific settings:

Compound: Perchlorate
- Time Window : From 6.654 min To 12.544 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 0.5
  - Level 3 : 0.2
  - Level 4 : 0.1
  - Level 5 : 0.04
  - Level 6 : 0.02
  - Level 7 : 0.013333

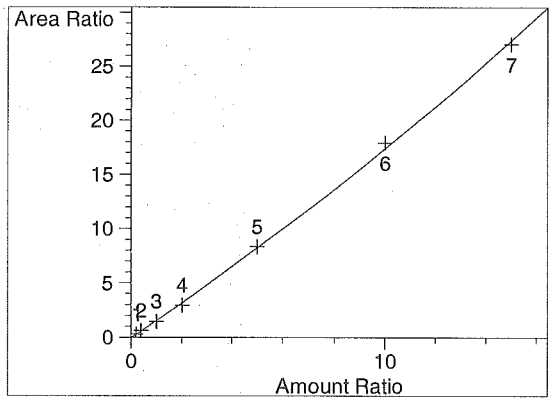
Compound: CLO4-85
- Time Window : From 6.650 min To 12.505 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 0.5
  - Level 3 : 0.2
  - Level 4 : 0.1
  - Level 5 : 0.04
  - Level 6 : 0.02
  - Level 7 : 0.013333

Compound: CLO4-89-ISTD
- Time Window : From 6.659 min To 12.466 min
- Curve Type : Linear
- Origin : Included
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 1
  - Level 3 : 1
  - Level 4 : 1
  - Level 5 : 1
  - Level 6 : 1
  - Level 7 : 1

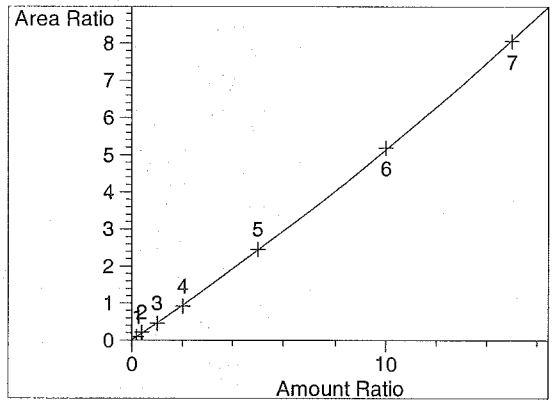
Peak Sum Table

No Entries in table

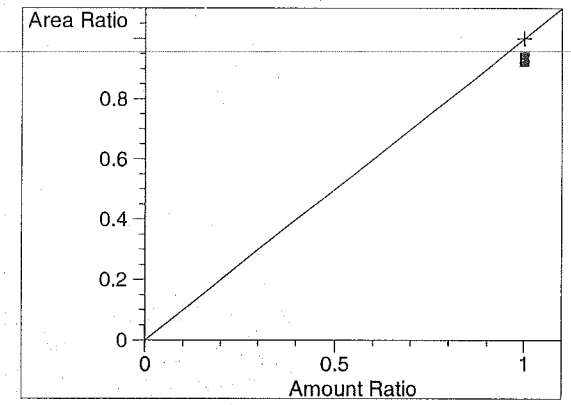
Calibration Curves



Perchlorate at exp. RT: 8.744
MSD1 83, EIC=82.7:83.7
Correlation: 0.99957
Residual Std. Dev.: 0.30744
Formula: $y = ax^2 + bx + c$
a: 1.76988e-2
b: 1.56480
c: -4.92430e-2
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.5
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.013333



CLO4-85 at exp. RT: 8.755
MSD1 85, EIC=84.7:85.7
Correlation: 0.99983
Residual Std. Dev.: 0.03473
Formula: $y = ax^2 + bx + c$
a: 5.13396e-3
b: 4.62055e-1
c: 4.97209e-4
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.5
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.013333



CLO4-89-ISTD at exp. RT: 8.766
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 1 : 1
Level 2 : 1
Level 3 : 1
Level 4 : 1
Level 5 : 1
Level 6 : 1
Level 7 : 1

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP2.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	7.76074e4	8.744	1.06245
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	1.35273e5	8.992	2.06969
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	3.37764e5	8.586	4.73474
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	6.83454e5	8.698	9.27727
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.08433e6	8.451	25.29036
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	4.13334e6	8.810	51.36844
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	5.99313e6	8.586	74.16754
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	7.34719e5	8.702	9.25940

#	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.36780e4	8.755	9.30535e-1
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	4.69486e4	9.012	2.24255
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	1.06124e5	8.602	4.86656
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.13523e5	8.713	9.64312
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	6.14295e5	8.468	25.12159
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	1.19814e6	8.825	50.46721
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	1.78355e6	8.603	74.72019
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.27495e5	8.721	9.54024

#	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	2.73208e5	8.766	5.00000
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	2.24886e5	9.012	5.00000
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	2.33196e5	8.609	5.00000
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.34454e5	8.716	5.00000
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.50568e5	8.472	5.00000
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	2.30977e5	8.825	5.00000
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	2.21504e5	8.610	5.00000
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.52544e5	8.725	5.00000

*** End of Report ***

Sequence Table:

Method and Injection Info Part:

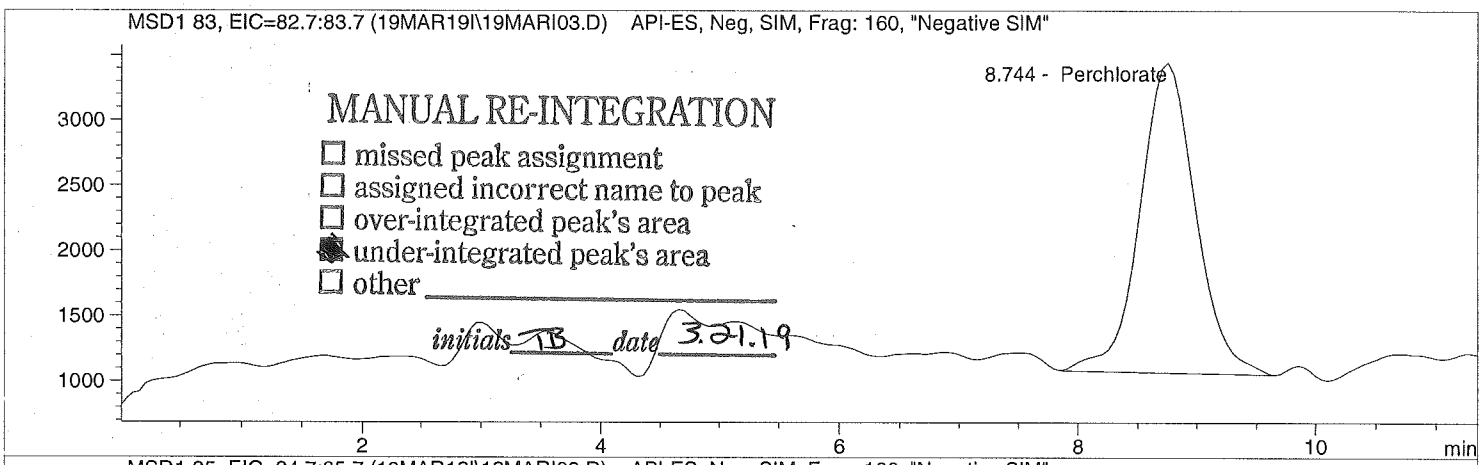
Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	CLO4@ 0.2ug/L	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	CLO4@ 0.5ug/L	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	CLO4@ 1.0ug/L	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	CLO4@ 2.0ug/L	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	CLO4@ 5.0ug/L	CLO4-AQN	1	Ctrl Samp		
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 80	ICAL Verf@10ug/L	CLO4-AQN	1	Ctrl Samp		

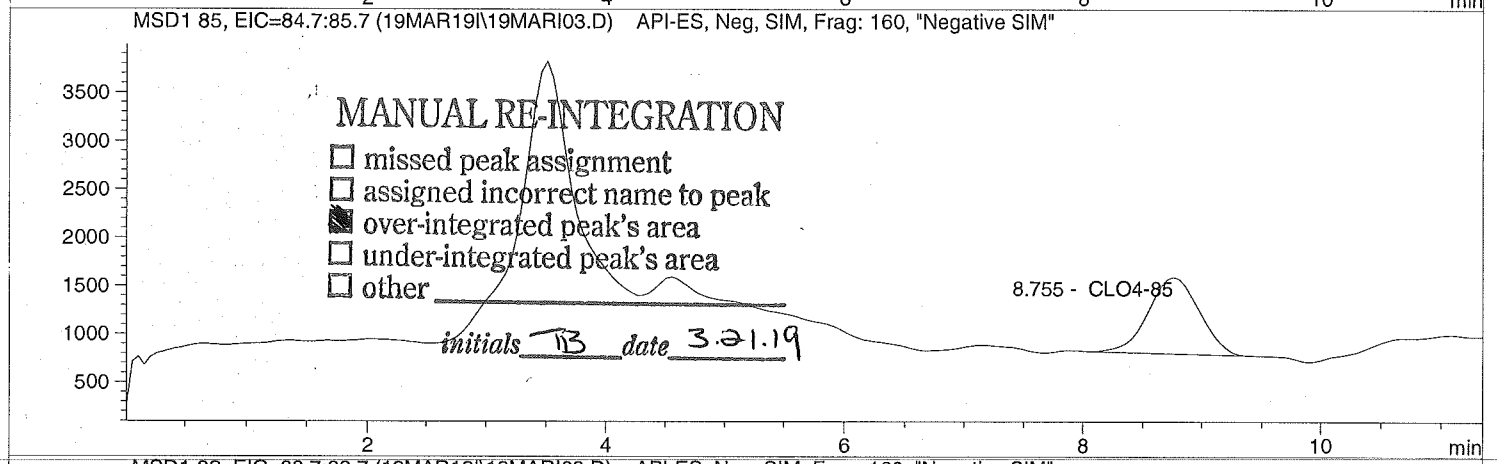
Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

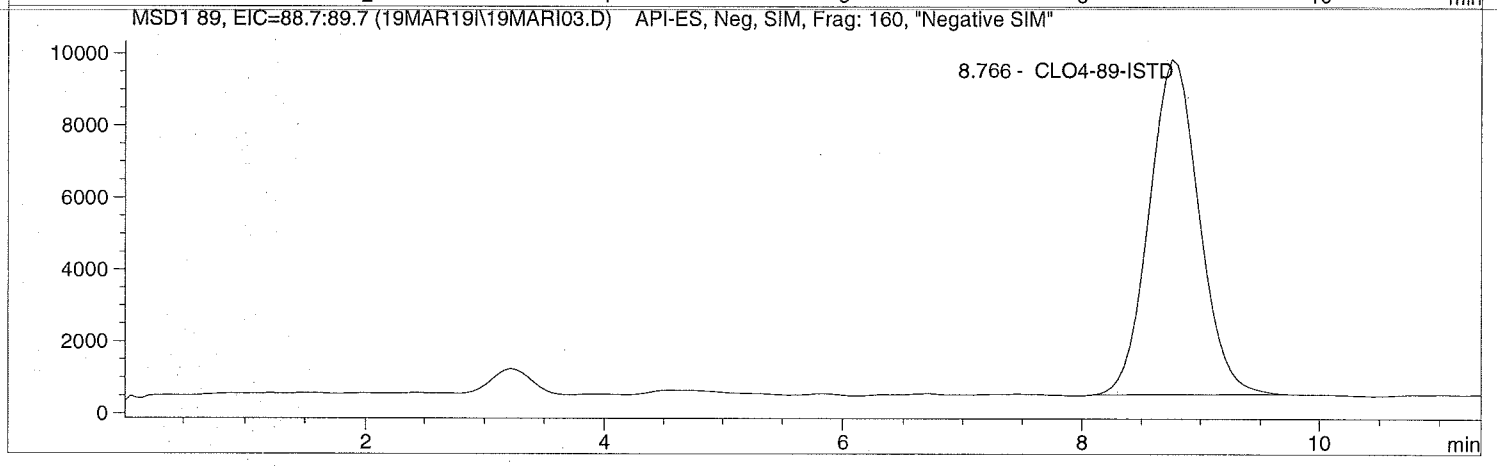
Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 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
8.744	MM	77607.4	1.0625	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	MM	23678.0	0.9305	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

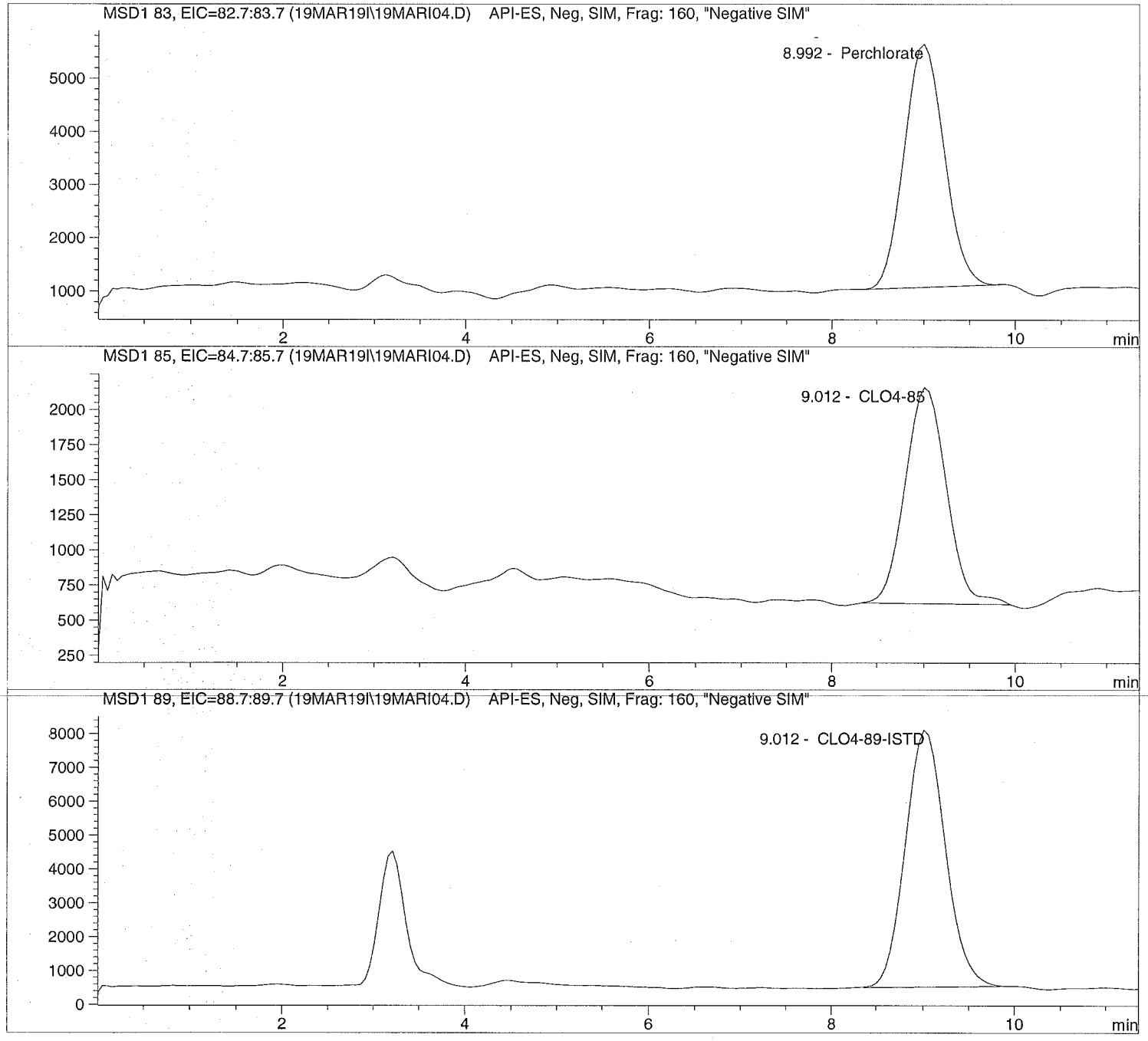
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	3/19/2019 09:53:00	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	3/19/2019 09:53:00	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 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
8.992	BBA	135272.8	2.0697	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	46948.6	2.2425	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	224885.9	5.0000	CLO4-89-ISTD

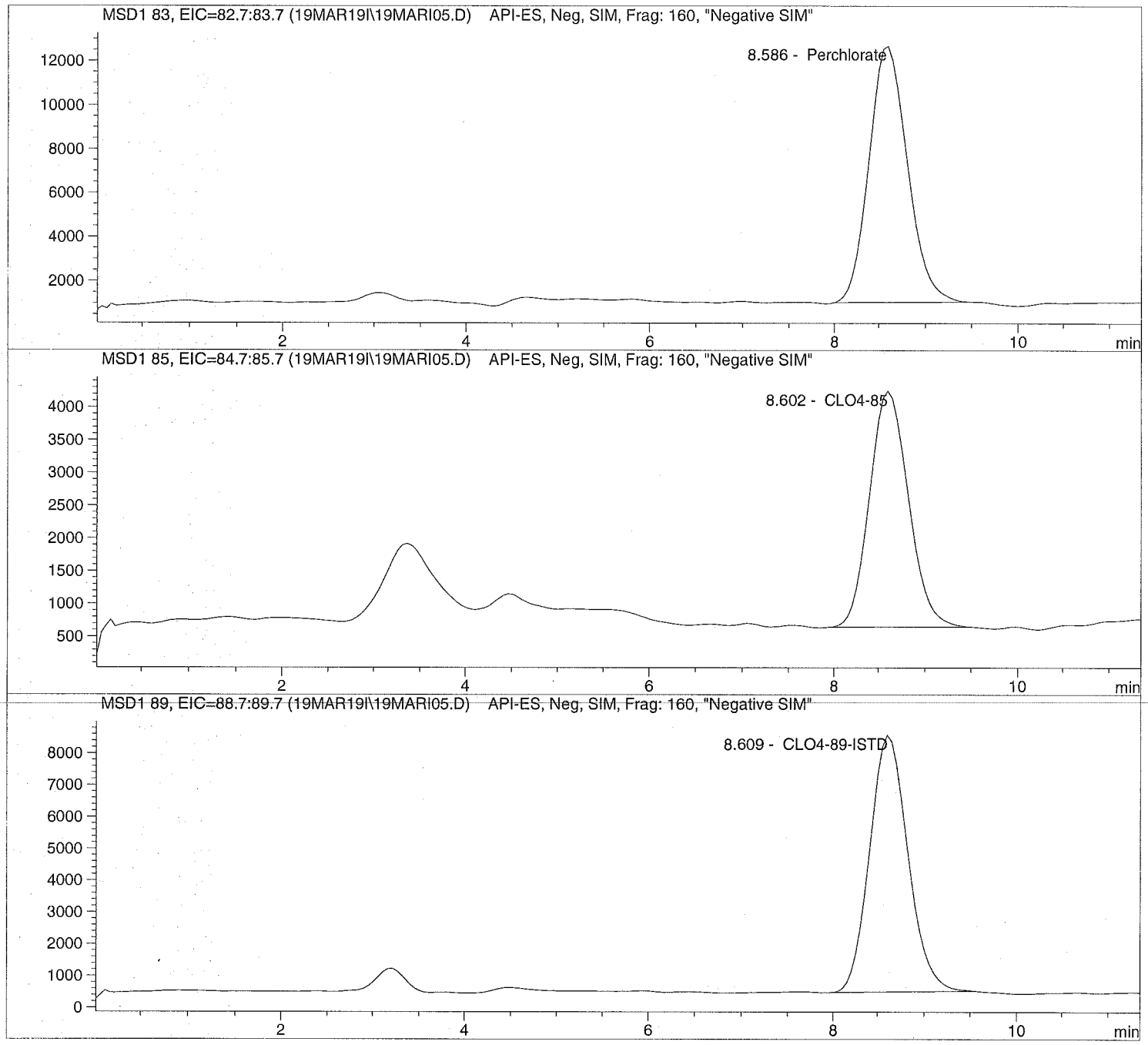
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	3/19/2019 10:06:16	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	3/19/2019 10:06:16	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 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
8.586	PBA	337763.6	4.7347	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.602	PBA	106124.0	4.8666	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.609	PBA	233196.3	5.0000	CLO4-89-ISTD

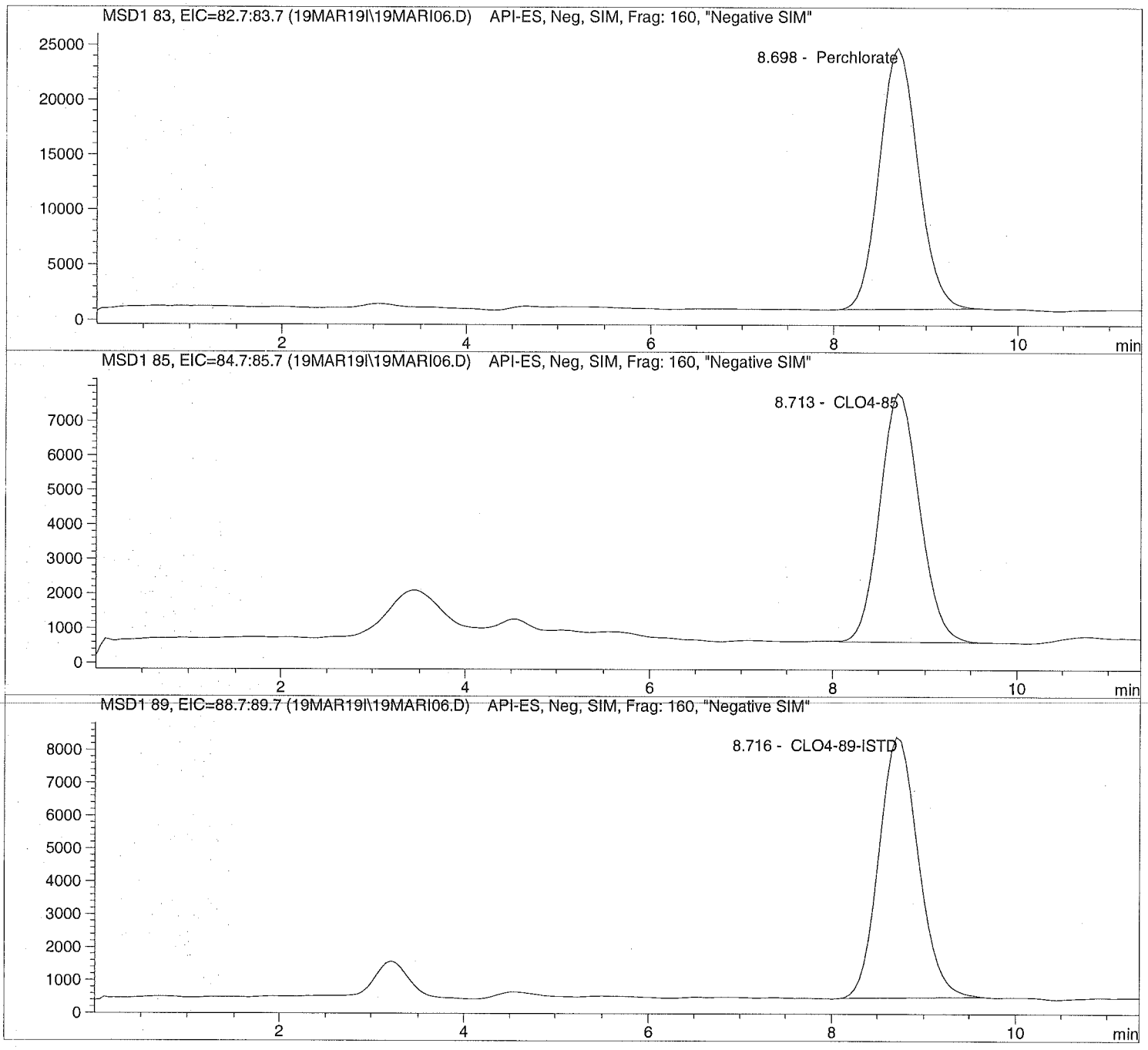
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	3/19/2019 10:19:32	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	3/19/2019 10:19:32	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 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
8.698	PBA	683454.4	9.2773	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.713	BBA	213522.6	9.6431	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.716	PBA	234453.6	5.0000	CLO4-89-ISTD

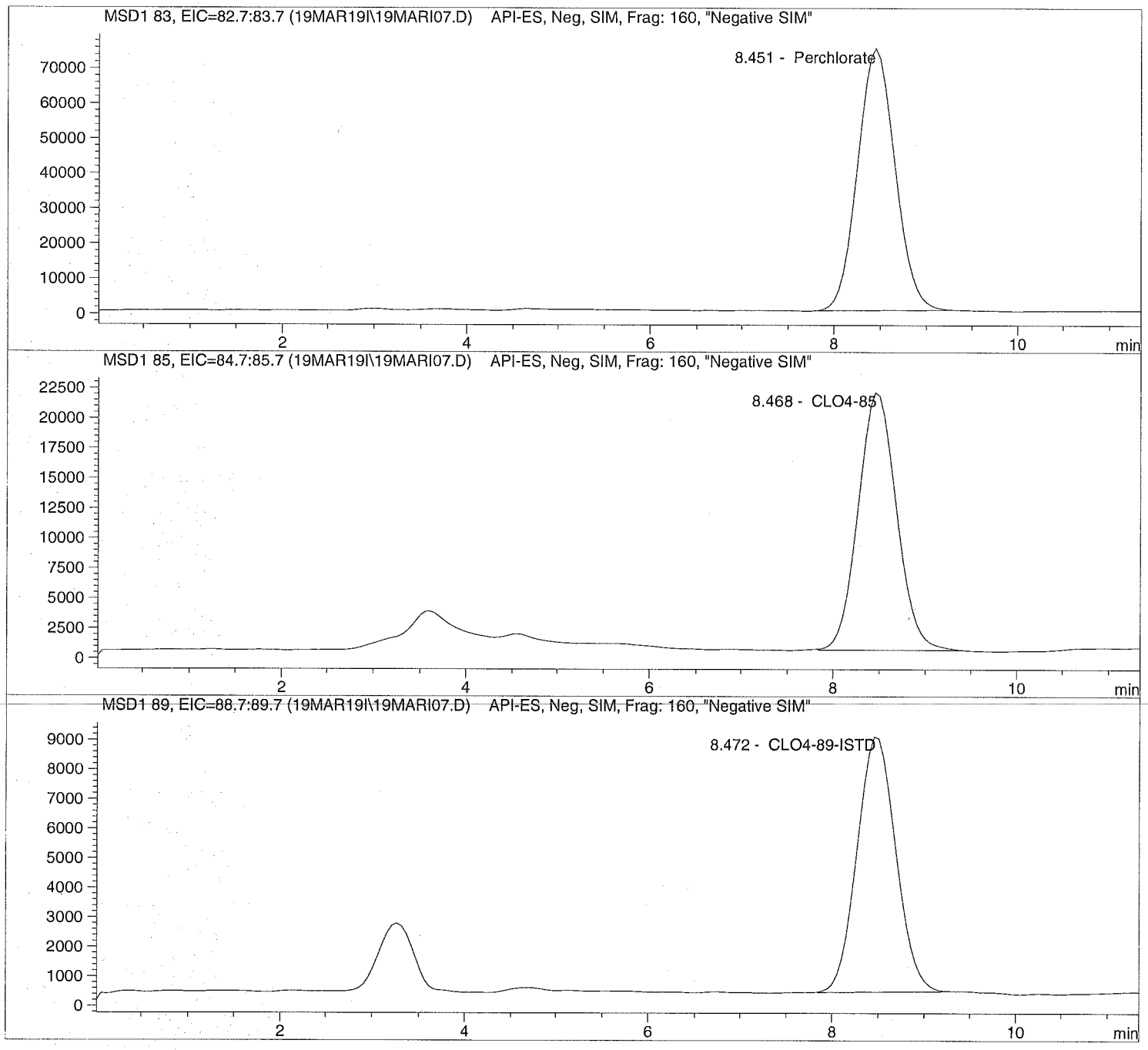
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	3/19/2019 10:32:49	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	3/19/2019 10:32:49	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 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
8.451	PBA	2084327.4	25.2904	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.468	BBA	614294.8	25.1216	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.472	BBA	250568.0	5.0000	CLO4-89-ISTD

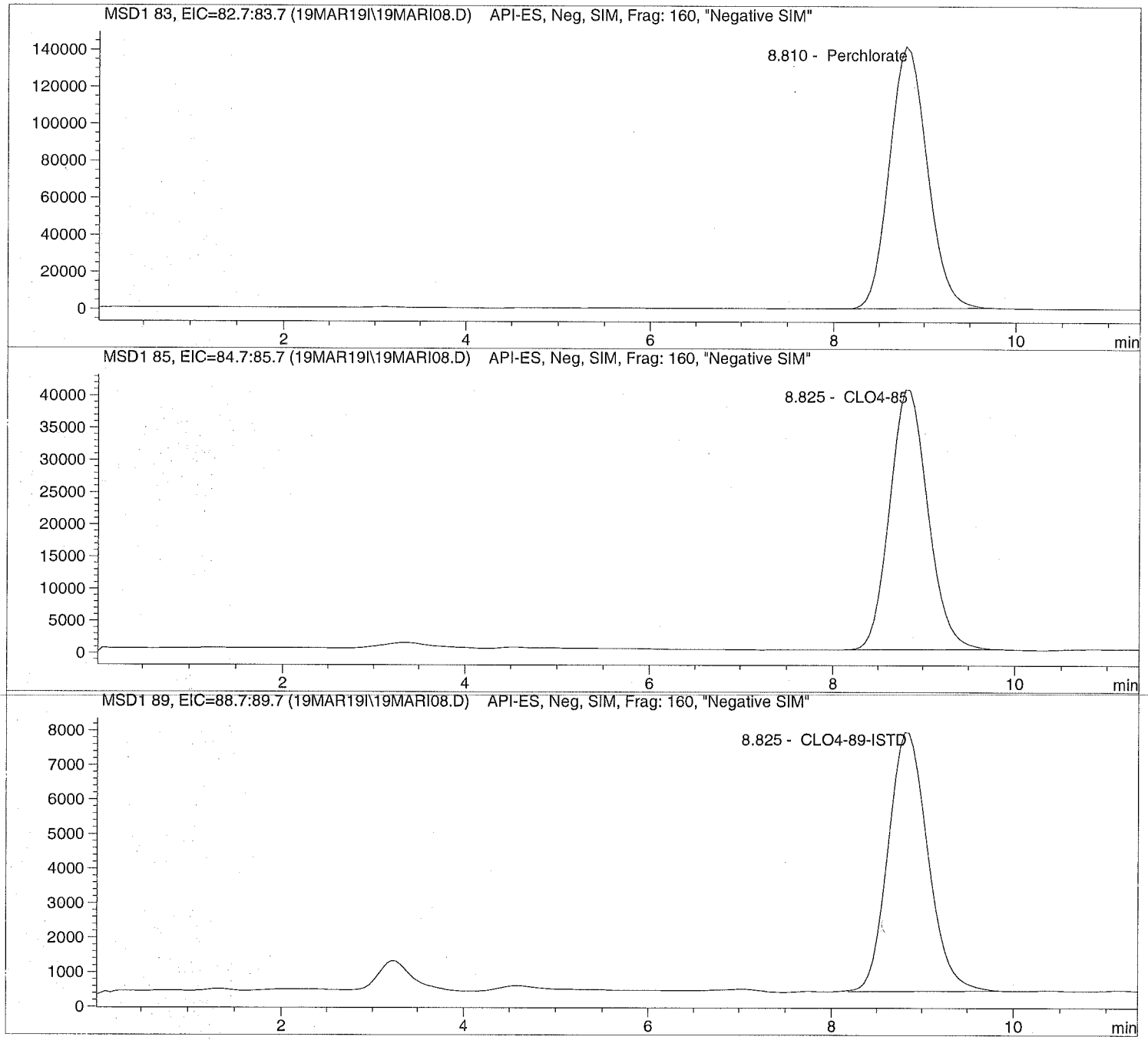
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	3/19/2019 10:46:05	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	3/19/2019 10:46:05	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 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
8.810	PBA	4133340.5	51.3684	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	1198135.6	50.4672	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	230976.7	5.0000	CLO4-89-ISTD

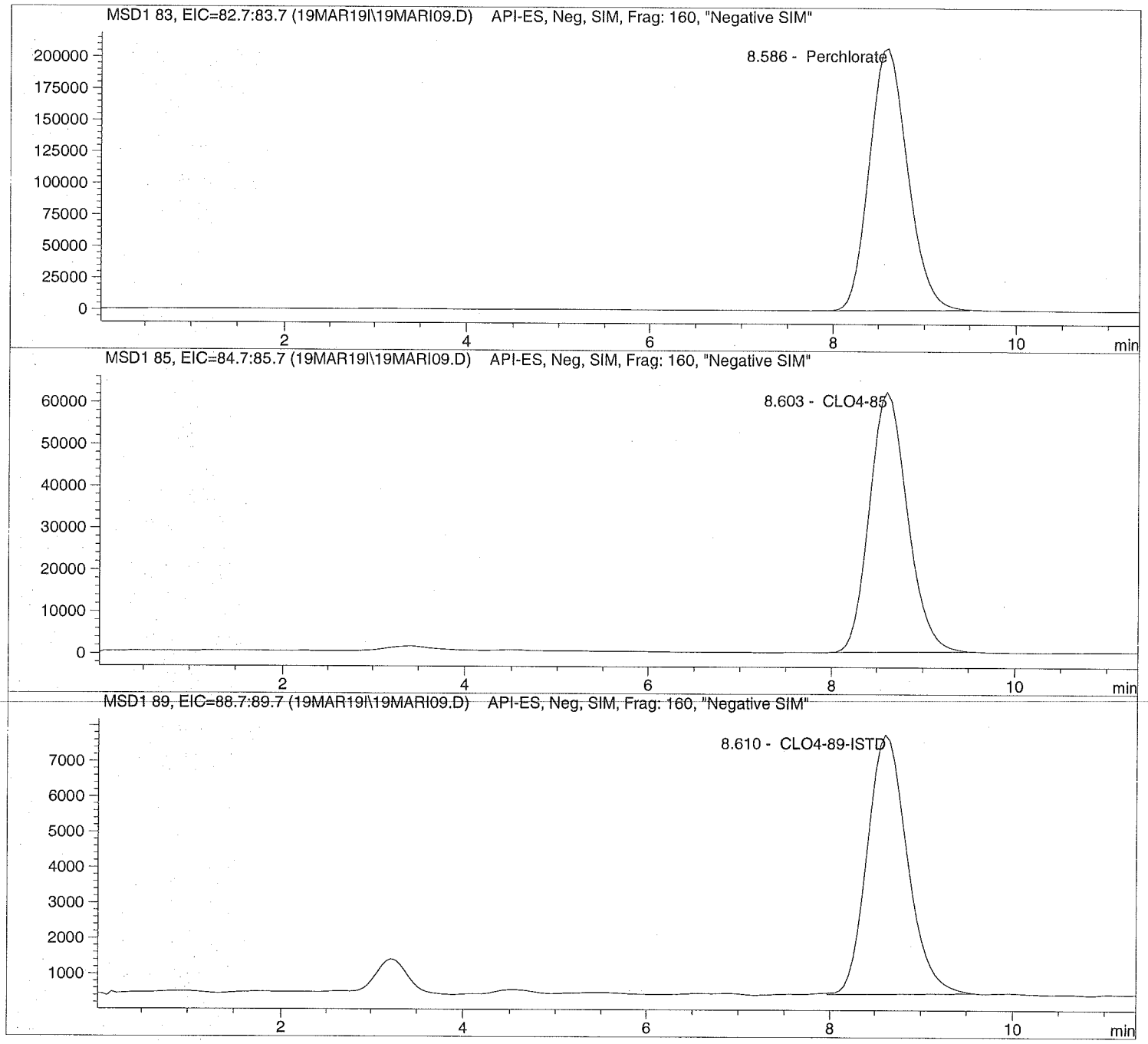
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	3/19/2019 10:59:22	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	3/19/2019 10:59:22	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 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
8.586	PBA	5993128.0	74.1675	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.603	PBA	1783554.4	74.7202	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.610	BBA	221504.5	5.0000	CLO4-89-ISTD

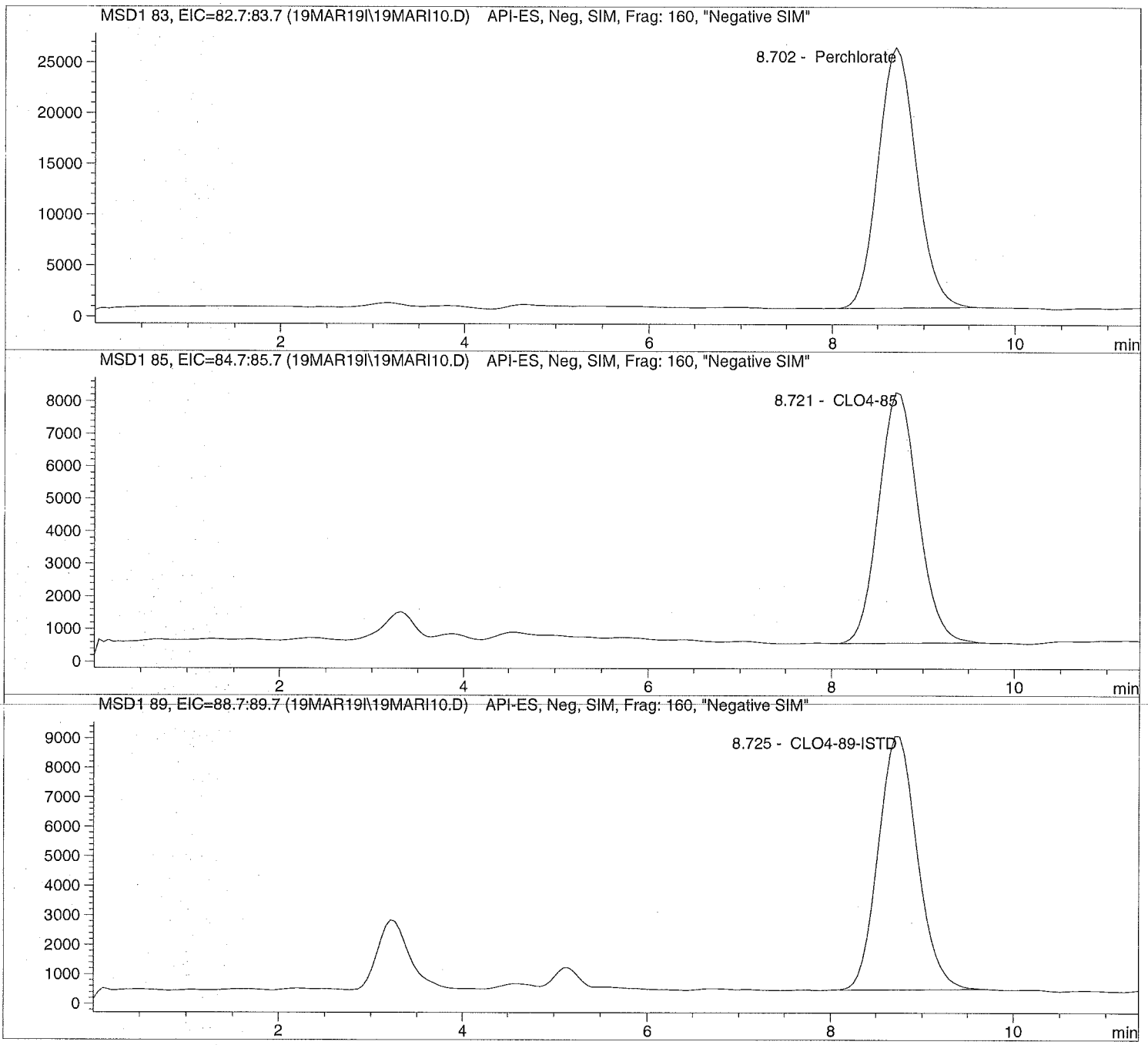
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L

Injection Date:	3/19/2019 11:12:42	Seq Line:	10
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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L

Injection Date:	3/19/2019 11:12:42	Seq Line:	10
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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 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
8.702	PBA	734718.7	9.2594	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.721	PBA	227494.7	9.5402	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.725	BBA	252544.4	5.0000	CLO4-89-ISTD

*** End of Report ***

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

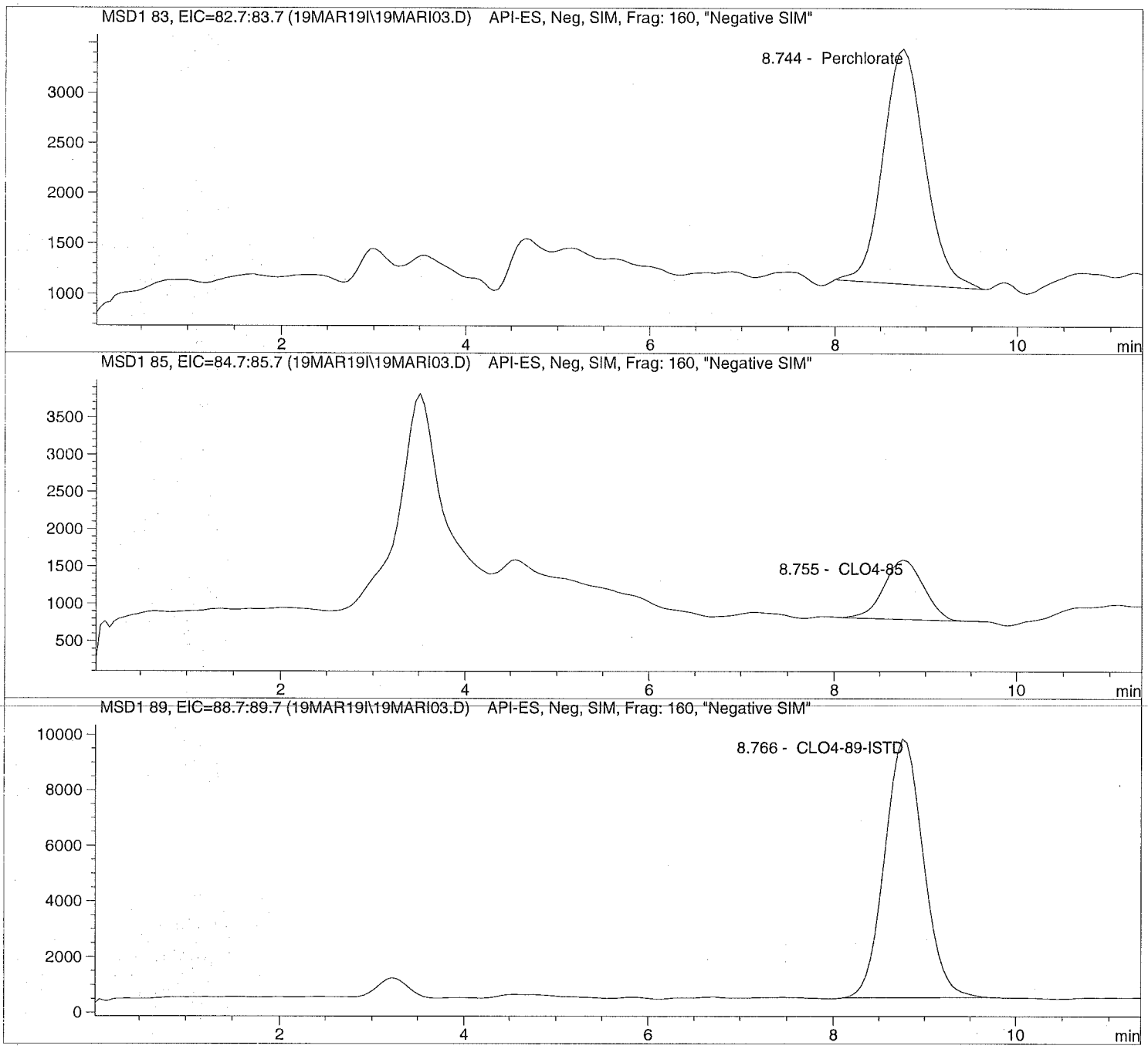
Unmodified

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	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-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	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-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 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
8.744	BBA	74166.3	1.0224	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	BBA	24138.1	0.9487	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

*** End of Report ***

10450 Stancliff Rd. Suite 210
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T: +1 281 530 5656
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June 12, 2019

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

Work Order: **HS19051866**

Laboratory Results for: **Longhorn GW Treatment Plant Bi-Weekly Samples**

Dear Marcia,

ALS Environmental received 2 sample(s) on May 31, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
RJ Modashia
Project Manager

ALS Houston, US Date: 12-jun-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
Work Order: HS19051866

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19051866-01	LH18/24-SP650_052919	Water		29-May-2019 14:00	31-May-2019 08:37	☐
HS19051866-02	Trip Blank	Water	ALS-112818-53	29-May-2019 00:00	31-May-2019 08:37	☐

ALS Houston, US Date: 12-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
Work Order: HS19051866

CASE NARRATIVE

GCMS Volatiles by Method SW8260

Batch ID: R339874

Sample ID: HS19051779-01MS

- MS and MSD are for an unrelated sample

WetChemistry by Method SW9056

Batch ID: R340350

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

ALS Houston, US Date: 12-Jun-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: Longhorn GW Treatment Plant Bi-Weekly Samples WorkOrder:HS19051866
Sample ID: LH18/24-SP650_052919 Lab ID:HS19051866-01
Collection Date: 29-May-2019 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	04-Jun-2019 20:15
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 20:15
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	04-Jun-2019 20:15
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 20:15
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 20:15
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 20:15
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 20:15
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jun-2019 20:15
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	04-Jun-2019 20:15
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	04-Jun-2019 20:15
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 20:15
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 20:15
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 20:15
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	04-Jun-2019 20:15
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 20:15
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	04-Jun-2019 20:15
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 20:15
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jun-2019 20:15
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 20:15
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jun-2019 20:15
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 20:15
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	04-Jun-2019 20:15
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 20:15
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	04-Jun-2019 20:15
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jun-2019 20:15
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 20:15
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	04-Jun-2019 20:15
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	04-Jun-2019 20:15
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 20:15
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jun-2019 20:15
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 20:15
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 20:15
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jun-2019 20:15
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jun-2019 20:15
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	04-Jun-2019 20:15
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	04-Jun-2019 20:15
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 20:15
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 20:15
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 20:15

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

ALS Houston, US Date: 12-Jun-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: Longhorn GW Treatment Plant Bi-Weekly Samples WorkOrder:HS19051866
Sample ID: LH18/24-SP650_052919 Lab ID:HS19051866-01
Collection Date: 29-May-2019 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	04-Jun-2019 20:15
cis-1,2-Dichloroethene	**2.5**		**0.20**	**0.50**	**1.0**	**UG/L**	1	04-Jun-2019 20:15
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	04-Jun-2019 20:15
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 20:15
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 20:15
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 20:15
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 20:15
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	04-Jun-2019 20:15
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 20:15
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	04-Jun-2019 20:15
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	04-Jun-2019 20:15
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jun-2019 20:15
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 20:15
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 20:15
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 20:15
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 20:15
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 20:15
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 20:15
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 20:15
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 20:15
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 20:15
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 20:15
Trichloroethene	**0.85**	J	**0.20**	**0.50**	**1.0**	**UG/L**	1	04-Jun-2019 20:15
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 20:15
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 20:15
Surr: 1,2-Dichloroethane-d4	*90.0*			**0**	*81-118*	*%REC*	*1*	*04-Jun-2019 20:15*
Surr: 4-Bromofluorobenzene	*100*			**0**	*85-114*	*%REC*	*1*	*04-Jun-2019 20:15*
Surr: Dibromofluoromethane	*93.7*			**0**	*80-119*	*%REC*	*1*	*04-Jun-2019 20:15*
Surr: Toluene-d8	*106*			**0**	*89-112*	*%REC*	*1*	*04-Jun-2019 20:15*
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Chloride	**252**		**2.00**	**5.00**	**5.00**	**mg/L**	10	11-Jun-2019 23:03
Sulfate	**34.0**		**2.00**	**5.00**	**5.00**	**mg/L**	10	11-Jun-2019 23:03

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

ALS Houston, US Date: 12-Jun-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: Longhorn GW Treatment Plant Bi-Weekly Samples WorkOrder:HS19051866
Sample ID: Trip Blank Lab ID:HS19051866-02
Collection Date: 29-May-2019 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	04-Jun-2019 18:38
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 18:38
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	04-Jun-2019 18:38
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 18:38
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 18:38
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 18:38
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 18:38
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jun-2019 18:38
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	04-Jun-2019 18:38
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	04-Jun-2019 18:38
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 18:38
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 18:38
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 18:38
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	04-Jun-2019 18:38
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 18:38
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	04-Jun-2019 18:38
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 18:38
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jun-2019 18:38
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 18:38
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jun-2019 18:38
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 18:38
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	04-Jun-2019 18:38
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 18:38
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	04-Jun-2019 18:38
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jun-2019 18:38
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 18:38
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	04-Jun-2019 18:38
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	04-Jun-2019 18:38
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 18:38
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jun-2019 18:38
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 18:38
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 18:38
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jun-2019 18:38
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jun-2019 18:38
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	04-Jun-2019 18:38
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	04-Jun-2019 18:38
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 18:38
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 18:38
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 18:38

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

ALS Houston, US Date: 12-Jun-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**

Project: Longhorn GW Treatment Plant Bi-Weekly Samples WorkOrder:HS19051866

Sample ID: Trip Blank Lab ID:HS19051866-02

Collection Date: 29-May-2019 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	04-Jun-2019 18:38
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 18:38
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	04-Jun-2019 18:38
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 18:38
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 18:38
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 18:38
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 18:38
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	04-Jun-2019 18:38
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 18:38
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	04-Jun-2019 18:38
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	04-Jun-2019 18:38
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jun-2019 18:38
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 18:38
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 18:38
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 18:38
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 18:38
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 18:38
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 18:38
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 18:38
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 18:38
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 18:38
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 18:38
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 18:38
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 18:38
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 18:38
Surr: 1,2-Dichloroethane-d4	*88.6*			**0**	*81-118*	*%REC*	*1*	*04-Jun-2019 18:38*
Surr: 4-Bromofluorobenzene	*99.0*			**0**	*85-114*	*%REC*	*1*	*04-Jun-2019 18:38*
Surr: Dibromofluoromethane	*93.7*			**0**	*80-119*	*%REC*	*1*	*04-Jun-2019 18:38*
Surr: Toluene-d8	*107*			**0**	*89-112*	*%REC*	*1*	*04-Jun-2019 18:38*

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

ALS Houston, US Date: 12-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: HS19051866

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID R339874	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C			**Matrix:** Water		
HS19051866-01	LH18/24-SP650_052919	29 May 2019 14:00			04 Jun 2019 20:15	1
HS19051866-02	Trip Blank	29 May 2019 00:00			04 Jun 2019 18:38	1
Batch ID R340350	**Test Name :** ANIONS BY SW9056A			**Matrix:** Water		
HS19051866-01	LH18/24-SP650_052919	29 May 2019 14:00			11 Jun 2019 23:03	10

ALS Houston, US Date: 12-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: HS19051866

QC BATCH REPORT

Batch ID: R339874 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-190604** Units: **UG/L** Analysis Date: **04-Jun-2019 17:26**
Client ID: Run ID: **VOA6_339874** SeqNo: **5108298** 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-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: HS19051866

QC BATCH REPORT

Batch ID: R339874 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-190604** Units: **UG/L** Analysis Date: **04-Jun-2019 17:26**
Client ID: Run ID: **VOA6_339874** SeqNo: **5108298** 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	*44.91*	*1.0*	*50*	*0*	*89.8*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*49.35*	*1.0*	*50*	*0*	*98.7*	*85 - 114*				
Surr: Dibromofluoromethane	*46.74*	*1.0*	*50*	*0*	*93.5*	*80 - 119*				
Surr: Toluene-d8	*53.5*	*1.0*	*50*	*0*	*107*	*89 - 112*				

ALS Houston, US Date: 12-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: HS19051866

QC BATCH REPORT

Batch ID: R339874 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-190604** Units: **UG/L** Analysis Date: **04-Jun-2019 16:38**
Client ID: Run ID: **VOA6_339874** SeqNo: **5108297** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	19.65	1.0	20	0	98.2	78 - 124				
1,1,1-Trichloroethane	19.34	1.0	20	0	96.7	74 - 131				
1,1,2,2-Tetrachloroethane	20.2	1.0	20	0	101	71 - 121				
1,1,2-Trichloroethane	20.99	1.0	20	0	105	80 - 119				
1,1-Dichloroethane	19.06	1.0	20	0	95.3	77 - 125				
1,1-Dichloroethene	18.87	1.0	20	0	94.4	71 - 131				
1,1-Dichloropropene	18.09	1.0	20	0	90.4	78 - 125				
1,2,3-Trichlorobenzene	24.79	1.0	20	0	124	69 - 129				
1,2,3-Trichloropropane	19.34	1.0	20	0	96.7	73 - 122				
1,2,4-Trichlorobenzene	23.55	1.0	20	0	118	69 - 130				
1,2,4-Trimethylbenzene	18.31	1.0	20	0	91.6	76 - 124				
1,2-Dibromo-3-chloropropane	20.72	1.0	20	0	104	62 - 128				
1,2-Dibromoethane	20.66	1.0	20	0	103	77 - 121				
1,2-Dichlorobenzene	19.72	1.0	20	0	98.6	80 - 119				
1,2-Dichloroethane	19.85	1.0	20	0	99.2	73 - 128				
1,2-Dichloropropane	20.15	1.0	20	0	101	78 - 122				
1,3,5-Trimethylbenzene	17.9	1.0	20	0	89.5	75 - 124				
1,3-Dichlorobenzene	18.94	1.0	20	0	94.7	80 - 119				
1,3-Dichloropropane	20.87	1.0	20	0	104	80 - 119				
1,4-Dichlorobenzene	18.66	1.0	20	0	93.3	79 - 118				
2,2-Dichloropropane	19.73	1.0	20	0	98.7	60 - 139				
2-Butanone	47.14	2.0	40	0	118	56 - 143				
2-Chlorotoluene	17.89	1.0	20	0	89.5	79 - 122				
2-Hexanone	44.83	2.0	40	0	112	57 - 139				
4-Chlorotoluene	18.29	1.0	20	0	91.4	78 - 122				
4-Isopropyltoluene	17.3	1.0	20	0	86.5	77 - 127				
4-Methyl-2-pentanone	41.57	2.0	40	0	104	67 - 130				
Acetone	49.02	2.0	40	0	123	39 - 160				
Benzene	19.02	1.0	20	0	95.1	79 - 120				
Bromobenzene	19.17	1.0	20	0	95.9	80 - 120				
Bromochloromethane	20.93	1.0	20	0	105	78 - 123				
Bromodichloromethane	19.64	1.0	20	0	98.2	79 - 125				
Bromoform	20.82	1.0	20	0	104	66 - 130				
Bromomethane	23.09	1.0	20	0	115	53 - 141				

ALS Houston, US Date: 12-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: HS19051866

QC BATCH REPORT

Batch ID: R339874 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-190604** Units: **UG/L** Analysis Date: **04-Jun-2019 16:38**
Client ID: Run ID: **VOA6_339874** SeqNo: **5108297** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Carbon disulfide	38.69	2.0	40	0	96.7	64 - 133				
Carbon tetrachloride	17.69	1.0	20	0	88.5	72 - 136				
Chlorobenzene	19.45	1.0	20	0	97.3	82 - 118				
Chloroethane	19.14	1.0	20	0	95.7	60 - 138				
Chloroform	20.04	1.0	20	0	100	79 - 124				
Chloromethane	15.66	1.0	20	0	78.3	50 - 139				
cis-1,2-Dichloroethene	19.81	1.0	20	0	99.1	78 - 123				
cis-1,3-Dichloropropene	20.05	1.0	20	0	100	75 - 124				
Dibromochloromethane	20.63	1.0	20	0	103	74 - 126				
Dibromomethane	20.31	1.0	20	0	102	79 - 123				
Dichlorodifluoromethane	18.37	1.0	20	0	91.8	32 - 152				
Ethylbenzene	18.95	1.0	20	0	94.8	79 - 121				
Hexachlorobutadiene	22.08	1.0	20	0	110	66 - 134				
Isopropylbenzene	17.97	1.0	20	0	89.9	72 - 131				
m,p-Xylene	37.67	2.0	40	0	94.2	80 - 121				
Methylene chloride	20.5	2.0	20	0	102	74 - 124				
Naphthalene	24.54	1.0	20	0	123	61 - 128				
n-Butylbenzene	17.48	1.0	20	0	87.4	75 - 128				
n-Propylbenzene	17.36	1.0	20	0	86.8	76 - 126				
o-Xylene	19.08	1.0	20	0	95.4	78 - 122				
sec-Butylbenzene	16.66	1.0	20	0	83.3	77 - 126				
Styrene	19.95	1.0	20	0	99.7	78 - 123				
tert-Butylbenzene	17.22	1.0	20	0	86.1	78 - 124				
Tetrachloroethene	18.71	1.0	20	0	93.5	74 - 129				
Toluene	19.64	1.0	20	0	98.2	80 - 121				
trans-1,2-Dichloroethene	19.19	1.0	20	0	96.0	75 - 124				
trans-1,3-Dichloropropene	20.51	1.0	20	0	103	73 - 127				
Trichloroethene	19.2	1.0	20	0	96.0	79 - 123				
Trichlorofluoromethane	18.09	1.0	20	0	90.5	65 - 141				
Vinyl chloride	18.75	1.0	20	0	93.8	58 - 137				
Surr: 1,2-Dichloroethane-d4	*53.33*	*1.0*	*50*	*0*	*107*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*52.97*	*1.0*	*50*	*0*	*106*	*85 - 114*				
Surr: Dibromofluoromethane	*53.7*	*1.0*	*50*	*0*	*107*	*80 - 119*				
Surr: Toluene-d8	*50.12*	*1.0*	*50*	*0*	*100*	*89 - 112*				

ALS Houston, US Date: 12-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: HS19051866

QC BATCH REPORT

Batch ID: R339874 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MS Sample ID: **HS19051779-01MS** Units: **UG/L** Analysis Date: **04-Jun-2019 21:05**
Client ID: Run ID: **VOA6_339874** SeqNo: **5108306** PrepDate: DF: **20**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	379.7	20	400	0	94.9	78 - 124				
1,1,1-Trichloroethane	352	20	400	0	88.0	74 - 131				
1,1,2,2-Tetrachloroethane	366.7	20	400	0	91.7	71 - 121				
1,1,2-Trichloroethane	380.6	20	400	0	95.2	80 - 119				
1,1-Dichloroethane	341.8	20	400	0	85.4	77 - 125				
1,1-Dichloroethene	356.6	20	400	0	89.2	71 - 131				
1,1-Dichloropropene	358.1	20	400	0	89.5	78 - 125				
1,2,3-Trichlorobenzene	347.8	20	400	0	86.9	69 - 129				
1,2,3-Trichloropropane	349.4	20	400	0	87.4	73 - 122				
1,2,4-Trichlorobenzene	373.2	20	400	0	93.3	69 - 130				
1,2,4-Trimethylbenzene	389.8	20	400	0	97.5	76 - 124				
1,2-Dibromo-3-chloropropane	336.5	20	400	0	84.1	62 - 128				
1,2-Dibromoethane	368.3	20	400	0	92.1	77 - 121				
1,2-Dichlorobenzene	382.4	20	400	0	95.6	80 - 119				
1,2-Dichloroethane	354.8	20	400	0	88.7	73 - 128				
1,2-Dichloropropane	375.8	20	400	0	94.0	78 - 122				
1,3,5-Trimethylbenzene	401.3	20	400	0	100	75 - 124				
1,3-Dichlorobenzene	384	20	400	0	96.0	80 - 119				
1,3-Dichloropropane	382.9	20	400	0	95.7	80 - 119				
1,4-Dichlorobenzene	373.9	20	400	0	93.5	79 - 118				
2,2-Dichloropropane	324.6	20	400	0	81.1	60 - 139				
2-Butanone	413.2	40	800	0	51.7	56 - 143				S
2-Chlorotoluene	378.8	20	400	0	94.7	79 - 122				
2-Hexanone	492.1	40	800	0	61.5	57 - 139				
4-Chlorotoluene	380.5	20	400	0	95.1	78 - 122				
4-Isopropyltoluene	397.3	20	400	0	99.3	77 - 127				
4-Methyl-2-pentanone	457.2	40	800	0	57.1	67 - 130				S
Acetone	465.2	40	800	0	58.2	39 - 160				
Benzene	361.9	20	400	0	90.5	79 - 120				
Bromobenzene	387.6	20	400	0	96.9	80 - 120				
Bromochloromethane	345.5	20	400	0	86.4	78 - 123				
Bromodichloromethane	354.6	20	400	0	88.7	79 - 125				
Bromoform	362.7	20	400	0	90.7	66 - 130				
Bromomethane	290.5	20	400	0	72.6	53 - 141				

ALS Houston, US Date: 12-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: HS19051866

QC BATCH REPORT

Batch ID: R339874 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MS Sample ID: **HS19051779-01MS** Units: **UG/L** Analysis Date: **04-Jun-2019 21:05**
Client ID: Run ID: **VOA6_339874** SeqNo: **5108306** PrepDate: DF: **20**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	549.2	40	800	0	68.6	64 - 133				
Carbon tetrachloride	364.1	20	400	0	91.0	72 - 136				
Chlorobenzene	376.7	20	400	0	94.2	82 - 118				
Chloroethane	332.8	20	400	0	83.2	60 - 138				
Chloroform	346.2	20	400	0	86.6	79 - 124				
Chloromethane	358	20	400	0	89.5	50 - 139				
cis-1,2-Dichloroethene	345.9	20	400	0	86.5	78 - 123				
cis-1,3-Dichloropropene	355	20	400	0	88.7	75 - 124				
Dibromochloromethane	377.7	20	400	0	94.4	74 - 126				
Dibromomethane	351.1	20	400	0	87.8	79 - 123				
Dichlorodifluoromethane	349.2	20	400	0	87.3	32 - 152				
Ethylbenzene	381.7	20	400	0	95.4	79 - 121				
Hexachlorobutadiene	413.2	20	400	0	103	66 - 134				
Isopropylbenzene	394.8	20	400	0	98.7	72 - 131				
m,p-Xylene	749.4	40	800	0	93.7	80 - 121				
Methylene chloride	414.4	40	400	0	104	74 - 124				
Naphthalene	328.1	20	400	0	82.0	61 - 128				
n-Butylbenzene	392.4	20	400	0	98.1	75 - 128				
n-Propylbenzene	390.4	20	400	0	97.6	76 - 126				
o-Xylene	376.8	20	400	0	94.2	78 - 122				
sec-Butylbenzene	395.7	20	400	0	98.9	77 - 126				
Styrene	377.9	20	400	0	94.5	78 - 123				
tert-Butylbenzene	398.9	20	400	0	99.7	78 - 124				
Tetrachloroethene	407.5	20	400	0	102	74 - 129				
Toluene	393.5	20	400	0	98.4	80 - 121				
trans-1,2-Dichloroethene	346.7	20	400	0	86.7	75 - 124				
trans-1,3-Dichloropropene	347.8	20	400	0	87.0	73 - 127				
Trichloroethene	367.7	20	400	0	91.9	79 - 123				
Trichlorofluoromethane	355.1	20	400	0	88.8	65 - 141				
Vinyl chloride	398.1	20	400	0	99.5	58 - 137				
Surr: 1,2-Dichloroethane-d4	*887.4*	*20*	*1000*	*0*	*88.7*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*1056*	*20*	*1000*	*0*	*106*	*85 - 114*				
Surr: Dibromofluoromethane	*955.1*	*20*	*1000*	*0*	*95.5*	*80 - 119*				
Surr: Toluene-d8	*1063*	*20*	*1000*	*0*	*106*	*89 - 112*				

ALS Houston, US Date: 12-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: HS19051866

QC BATCH REPORT

Batch ID: R339874 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS19051779-01MSD** Units: **UG/L** Analysis Date: **04-Jun-2019 21:29**
Client ID: Run ID: **VOA6_339874** SeqNo: **5108307** PrepDate: DF: **20**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	367.2	20	400	0	91.8	78 - 124	379.7	3.34	20	
1,1,1-Trichloroethane	332.3	20	400	0	83.1	74 - 131	352	5.78	20	
1,1,2,2-Tetrachloroethane	360.3	20	400	0	90.1	71 - 121	366.7	1.76	20	
1,1,2-Trichloroethane	369.5	20	400	0	92.4	80 - 119	380.6	2.96	20	
1,1-Dichloroethane	325.1	20	400	0	81.3	77 - 125	341.8	5	20	
1,1-Dichloroethene	329.1	20	400	0	82.3	71 - 131	356.6	8.03	20	
1,1-Dichloropropene	337.5	20	400	0	84.4	78 - 125	358.1	5.92	20	
1,2,3-Trichlorobenzene	331.8	20	400	0	83.0	69 - 129	347.8	4.69	20	
1,2,3-Trichloropropane	343.3	20	400	0	85.8	73 - 122	349.4	1.76	20	
1,2,4-Trichlorobenzene	357.2	20	400	0	89.3	69 - 130	373.2	4.39	20	
1,2,4-Trimethylbenzene	377.3	20	400	0	94.3	76 - 124	389.8	3.28	20	
1,2-Dibromo-3-chloropropane	318.8	20	400	0	79.7	62 - 128	336.5	5.41	20	
1,2-Dibromoethane	362.9	20	400	0	90.7	77 - 121	368.3	1.47	20	
1,2-Dichlorobenzene	372.2	20	400	0	93.0	80 - 119	382.4	2.71	20	
1,2-Dichloroethane	338.6	20	400	0	84.6	73 - 128	354.8	4.68	20	
1,2-Dichloropropane	361	20	400	0	90.2	78 - 122	375.8	4.03	20	
1,3,5-Trimethylbenzene	383.3	20	400	0	95.8	75 - 124	401.3	4.61	20	
1,3-Dichlorobenzene	375	20	400	0	93.7	80 - 119	384	2.38	20	
1,3-Dichloropropane	377.7	20	400	0	94.4	80 - 119	382.9	1.36	20	
1,4-Dichlorobenzene	364	20	400	0	91.0	79 - 118	373.9	2.69	20	
2,2-Dichloropropane	300.4	20	400	0	75.1	60 - 139	324.6	7.75	20	
2-Butanone	406.9	40	800	0	50.9	56 - 143	413.2	1.53	20	S
2-Chlorotoluene	361.9	20	400	0	90.5	79 - 122	378.8	4.55	20	
2-Hexanone	486.1	40	800	0	60.8	57 - 139	492.1	1.24	20	
4-Chlorotoluene	368.9	20	400	0	92.2	78 - 122	380.5	3.1	20	
4-Isopropyltoluene	386.4	20	400	0	96.6	77 - 127	397.3	2.78	20	
4-Methyl-2-pentanone	457.6	40	800	0	57.2	67 - 130	457.2	0.0924	20	S
Acetone	450.9	40	800	0	56.4	39 - 160	465.2	3.12	20	
Benzene	344.2	20	400	0	86.0	79 - 120	361.9	5.03	20	
Bromobenzene	376.4	20	400	0	94.1	80 - 120	387.6	2.91	20	
Bromochloromethane	322.4	20	400	0	80.6	78 - 123	345.5	6.9	20	
Bromodichloromethane	345	20	400	0	86.2	79 - 125	354.6	2.76	20	
Bromoform	361.1	20	400	0	90.3	66 - 130	362.7	0.454	20	
Bromomethane	292.3	20	400	0	73.1	53 - 141	290.5	0.628	20	

ALS Houston, US Date: 12-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: HS19051866

QC BATCH REPORT

Batch ID: R339874 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MSD Sample ID: **HS19051779-01MSD** Units: **UG/L** Analysis Date: **04-Jun-2019 21:29**
Client ID: Run ID: **VOA6_339874** SeqNo: **5108307** PrepDate: DF: **20**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Carbon disulfide	437.5	40	800	0	54.7	64 - 133	549.2	22.6	20	SR
Carbon tetrachloride	345.2	20	400	0	86.3	72 - 136	364.1	5.33	20	
Chlorobenzene	359.3	20	400	0	89.8	82 - 118	376.7	4.73	20	
Chloroethane	298.2	20	400	0	74.5	60 - 138	332.8	11	20	
Chloroform	327.7	20	400	0	81.9	79 - 124	346.2	5.49	20	
Chloromethane	257.4	20	400	0	64.3	50 - 139	358	32.7	20	R
cis-1,2-Dichloroethene	330	20	400	0	82.5	78 - 123	345.9	4.71	20	
cis-1,3-Dichloropropene	340	20	400	0	85.0	75 - 124	355	4.3	20	
Dibromochloromethane	364.1	20	400	0	91.0	74 - 126	377.7	3.67	20	
Dibromomethane	343.3	20	400	0	85.8	79 - 123	351.1	2.23	20	
Dichlorodifluoromethane	290.4	20	400	0	72.6	32 - 152	349.2	18.4	20	
Ethylbenzene	367.9	20	400	0	92.0	79 - 121	381.7	3.7	20	
Hexachlorobutadiene	395.8	20	400	0	99.0	66 - 134	413.2	4.29	20	
Isopropylbenzene	382.6	20	400	0	95.6	72 - 131	394.8	3.14	20	
m,p-Xylene	717.3	40	800	0	89.7	80 - 121	749.4	4.39	20	
Methylene chloride	347.1	40	400	0	86.8	74 - 124	414.4	17.7	20	
Naphthalene	318.6	20	400	0	79.7	61 - 128	328.1	2.93	20	
n-Butylbenzene	379.9	20	400	0	95.0	75 - 128	392.4	3.24	20	
n-Propylbenzene	376.1	20	400	0	94.0	76 - 126	390.4	3.73	20	
o-Xylene	360.5	20	400	0	90.1	78 - 122	376.8	4.44	20	
sec-Butylbenzene	383.6	20	400	0	95.9	77 - 126	395.7	3.12	20	
Styrene	362.3	20	400	0	90.6	78 - 123	377.9	4.22	20	
tert-Butylbenzene	388.5	20	400	0	97.1	78 - 124	398.9	2.65	20	
Tetrachloroethene	385.4	20	400	0	96.4	74 - 129	407.5	5.57	20	
Toluene	373.9	20	400	0	93.5	80 - 121	393.5	5.13	20	
trans-1,2-Dichloroethene	326.7	20	400	0	81.7	75 - 124	346.7	5.92	20	
trans-1,3-Dichloropropene	332	20	400	0	83.0	73 - 127	347.8	4.67	20	
Trichloroethene	350	20	400	0	87.5	79 - 123	367.7	4.94	20	
Trichlorofluoromethane	333	20	400	0	83.2	65 - 141	355.1	6.44	20	
Vinyl chloride	325.9	20	400	0	81.5	58 - 137	398.1	20	20	
Surr: 1,2-Dichloroethane-d4	*879.9*	*20*	*1000*	*0*	*88.0*	*81 - 118*	*887.4*	*0.843*	*20*	
Surr: 4-Bromofluorobenzene	*1059*	*20*	*1000*	*0*	*106*	*85 - 114*	*1056*	*0.269*	*20*	
Surr: Dibromofluoromethane	*947.2*	*20*	*1000*	*0*	*94.7*	*80 - 119*	*955.1*	*0.821*	*20*	
Surr: Toluene-d8	*1055*	*20*	*1000*	*0*	*105*	*89 - 112*	*1063*	*0.745*	*20*	

ALS Houston, US Date: 12-Jun-19

Client:	Bhate Environmental Associates, Inc.
Project:	Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder:	HS19051866

QC BATCH REPORT

Batch ID:	**R339874 (0)**	**Instrument:**	**VOA6**	**Method:**	**VOLATILES ORGANICS BY METHOD 8260C**

The following samples were analyzed in this batch: HS19051866-01 HS19051866-02

ALS Houston, US Date: 12-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: HS19051866

QC BATCH REPORT

Batch ID: R340350 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY SW9056A**

MBLK Sample ID: **WBLKW1-061119** Units: **mg/L** Analysis Date: **11-Jun-2019 13:36**
Client ID: Run ID: **ICS-Integrion_340350** SeqNo: **5118828** 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: **WLCSW1-061119** Units: **mg/L** Analysis Date: **11-Jun-2019 13:54**
Client ID: Run ID: **ICS-Integrion_340350** SeqNo: **5118829** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	19.46	0.500	20	0	97.3	80 - 120				
Sulfate	19.67	0.500	20	0	98.4	80 - 120				

LCSD Sample ID: **WLCSDW1-061119** Units: **mg/L** Analysis Date: **11-Jun-2019 14:12**
Client ID: Run ID: **ICS-Integrion_340350** SeqNo: **5118830** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	19.46	0.500	20	0	97.3	80 - 120	19.46	0.0308	20	
Sulfate	19.63	0.500	20	0	98.2	80 - 120	19.67	0.189	20	

MS Sample ID: **HS19060226-01MS** Units: **mg/L** Analysis Date: **11-Jun-2019 16:35**
Client ID: Run ID: **ICS-Integrion_340350** SeqNo: **5118835** PrepDate: DF: **50**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	490.6	25.0	500	13.25	95.5	80 - 120				
Sulfate	1634	25.0	500	1163	94.1	80 - 120				

MS Sample ID: **HS19060224-03MS** Units: **mg/L** Analysis Date: **11-Jun-2019 15:43**
Client ID: Run ID: **ICS-Integrion_340350** SeqNo: **5118832** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	108.2	5.00	100	12.57	95.6	80 - 120				
Sulfate	337.8	5.00	100	245	92.8	80 - 120				

ALS Houston, US Date: 12-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: HS19051866

QC BATCH REPORT

Batch ID: R340350 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY SW9056A**

MSD Sample ID: **HS19060226-01MSD** Units: **mg/L** Analysis Date: **11-Jun-2019 17:28**
Client ID: Run ID: **ICS-Integrion_340350** SeqNo: **5118838** PrepDate: DF: **50**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	489.3	25.0	500	13.25	95.2	80 - 120	490.6	0.255	20	
Sulfate	1631	25.0	500	1163	93.7	80 - 120	1634	0.13	20	

MSD Sample ID: **HS19060224-03MSD** Units: **mg/L** Analysis Date: **11-Jun-2019 16:00**
Client ID: Run ID: **ICS-Integrion_340350** SeqNo: **5118833** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	108.4	5.00	100	12.57	95.8	80 - 120	108.2	0.157	20	
Sulfate	338.1	5.00	100	245	93.1	80 - 120	337.8	0.0846	20	

The following samples were analyzed in this batch: HS19051866-01

ALS Houston, US Date: 12-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: **HS19051866**

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
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Dept of Defense	ANAB L2231	20-Dec-2021
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019
North Carolina	624-2019	31-Dec-2019
Maryland	343, 2018-2019	30-Jun-2019
Arkansas	19-028-0	27-Mar-2020
Texas	TX104704231-19-23	30-Apr-2020

ALS Houston, US Date: 12-jun-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
Work Order: HS19051866

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19051866-01	LH18/24-SP650_052919	Login	31/05/2019 12:30:50	PMG	WET158
HS19051866-01	LH18/24-SP650_052919	Login	31/05/2019 12:30:50	PMG	VOA216
HS19051866-02	Trip Blank	Login	31/05/2019 12:30:50	PMG	VOA216

ALS Houston, US Date: 12-Jun-19

Sample Receipt Checklist

Client Name: Bhate Environmental
Work Order: HS19051866
Date/Time Received: **31-May-2019 08:37**
Received by: **JRM**

Checklist completed by: *Paresh M. Giga* eSignature 31-May-2019 Date
Reviewed by: *RJ Modashia* eSignature 31-May-2019 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):	2.3c U/c	IR11
Cooler(s)/Kit(s):	44407	
Date/Time sample(s) sent to storage:	5/31/19 12:40	

Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:			

Login Notes:

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

HS19051866

Bhate Environmental Associates. Inc.
onghorn 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_052919	Water	05/29/19 / 14:00		3	3		HCL	
LH18/24-SP650_052919	Water	05/29/19 / 14:00		1		1	NONE	
Trip Blank	Water	05/29/19		2	2		HCL	

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	05/29/19	14:30									

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition
J. Maynard	5/31/19	08:37							

Remarks: Cooler 44407
Temp 2.3
1121 CF0.0

(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

44407

CUSTODY SEAL

Date: 5/29/19 Time: 1400
Name: Scott Beesinger
Company: BHATE

Seal Broken By:
Date: 05/31/19

44407 MAY 31 2019

Must Deliver Next Business Day
Time and Tempature Sensitive!

44407

917 B03 1 10:30 A 8200 05 31

ORIGIN ID: 930 6193
SCOTT BEESI
BHATE ENVIRON ASSOCIATES
1203-B EAST GR. AVE. PMB202
MARSHALL, TX 75670
UNITED STATES US

SHIP DATE: 21SEP18
ACTWGT: 1.00 LB MAN
CAD: 3001307CAFE3211

TO CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099
(281) 530-5656
REF: LHAAP 58 - RJ
RMA:

FedEx Express

TRK# (0221) 4380 9532 8290

RETURNS MON-SAT
PRIORITY OVERNIGHT

77099

FedEx
TRK# (0221) 4380 9532 8290

FRI - 31 MAY 10:30A
PRIORITY OVERNIGHT

77099
TX-US
IAH

AB SGRA

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

June 18, 2019

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

Work Order: **HS19060168**

Laboratory Results for: **LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples**

Dear Marcia,

ALS Environmental received 3 sample(s) on Jun 05, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
RJ Modashia
Project Manager

ALS Houston, US Date: 18-jun-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples
Work Order: HS19060168

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19060168-01	LH18/24-SP650_060419	Water		04-Jun-2019 14:00	05-Jun-2019 09:50	☐
HS19060168-02	LH18/24-SP650_060419_BIX	Water		04-Jun-2019 14:00	05-Jun-2019 09:50	☐
HS19060168-03	Trip Blank	Water		04-Jun-2019 00:00	05-Jun-2019 09:50	☐

ALS Houston, US Date: 18-Jun-19

Client: Bhate Environmental Associates, Inc. **CASE NARRATIVE**
Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples
Work Order:

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: 141868

Sample ID: LCSD-141868

• LCS/LCSD RPD exceeded the laboratory acceptance limit for 4-Terphenyl-d14. The individual recoveries met acceptance criteria.

GCMS Volatiles by Method SW8260

Batch ID: R339998

Sample ID: HS19060123-01MS

• MS and MSD were performed on unrelated sample

Metals by Method SW6020

Batch ID: 141628

Sample ID: LH18/24-SP650_060419 (HS19060168-01MS)

• Selenium failed on MS/MSD but passed on PDS.

WetChemistry by Method SW7196

Batch ID: R339853

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

ALS Houston, US Date: 18-Jun-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**

Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples WorkOrder:HS19060168

Sample ID: LH18/24-SP650_060419 Lab ID:HS19060168-01

Collection Date: 04-Jun-2019 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	06-Jun-2019 14:33
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	06-Jun-2019 14:33
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	06-Jun-2019 14:33
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	06-Jun-2019 14:33
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	06-Jun-2019 14:33
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	06-Jun-2019 14:33
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	06-Jun-2019 14:33
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	06-Jun-2019 14:33
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	06-Jun-2019 14:33
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	06-Jun-2019 14:33
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	06-Jun-2019 14:33
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	06-Jun-2019 14:33
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	06-Jun-2019 14:33
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	06-Jun-2019 14:33
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	06-Jun-2019 14:33
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	06-Jun-2019 14:33
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	06-Jun-2019 14:33
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	06-Jun-2019 14:33
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	06-Jun-2019 14:33
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	06-Jun-2019 14:33
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	06-Jun-2019 14:33
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	06-Jun-2019 14:33
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	06-Jun-2019 14:33
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	06-Jun-2019 14:33
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	06-Jun-2019 14:33
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	06-Jun-2019 14:33
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	06-Jun-2019 14:33
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	06-Jun-2019 14:33
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	06-Jun-2019 14:33
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	06-Jun-2019 14:33
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	06-Jun-2019 14:33
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	06-Jun-2019 14:33
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	06-Jun-2019 14:33
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	06-Jun-2019 14:33
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	06-Jun-2019 14:33
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	06-Jun-2019 14:33
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	06-Jun-2019 14:33
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	06-Jun-2019 14:33
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	06-Jun-2019 14:33

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

ALS Houston, US Date: 18-Jun-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**

Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples WorkOrder:HS19060168

Sample ID: LH18/24-SP650_060419 Lab ID:HS19060168-01

Collection Date: 04-Jun-2019 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	06-Jun-2019 14:33
cis-1,2-Dichloroethene	**2.3**		**0.20**	**0.50**	**1.0**	**UG/L**	1	06-Jun-2019 14:33
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	06-Jun-2019 14:33
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	06-Jun-2019 14:33
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	06-Jun-2019 14:33
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	06-Jun-2019 14:33
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	06-Jun-2019 14:33
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	06-Jun-2019 14:33
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	06-Jun-2019 14:33
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	06-Jun-2019 14:33
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	06-Jun-2019 14:33
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	06-Jun-2019 14:33
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	06-Jun-2019 14:33
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	06-Jun-2019 14:33
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	06-Jun-2019 14:33
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	06-Jun-2019 14:33
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	06-Jun-2019 14:33
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	06-Jun-2019 14:33
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	06-Jun-2019 14:33
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	06-Jun-2019 14:33
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	06-Jun-2019 14:33
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	06-Jun-2019 14:33
Trichloroethene	**0.76**	J	**0.20**	**0.50**	**1.0**	**UG/L**	1	06-Jun-2019 14:33
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	06-Jun-2019 14:33
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	06-Jun-2019 14:33
Surr: 1,2-Dichloroethane-d4	*94.7*			**0**	*81-118*	*%REC*	*1*	*06-Jun-2019 14:33*
Surr: 4-Bromofluorobenzene	*104*			**0**	*85-114*	*%REC*	*1*	*06-Jun-2019 14:33*
Surr: Dibromofluoromethane	*95.7*			**0**	*80-119*	*%REC*	*1*	*06-Jun-2019 14:33*
Surr: Toluene-d8	*105*			**0**	*89-112*	*%REC*	*1*	*06-Jun-2019 14:33*
SEMIVOLATILES SIM		**Method:SW8270SIM**				Prep:SW3510 / 10-Jun-2019		Analyst: LG
1,4-Dioxane	**6.2**		**0.20**	**0.20**	**0.20**	**ug/L**	20	13-Jun-2019 13:43
Surr: 2-Fluorobiphenyl	*71.2*			**0**	*40-140*	*%REC*	*20*	*13-Jun-2019 13:43*
Surr: 4-Terphenyl-d14	*83.4*			**0**	*40-140*	*%REC*	*20*	*13-Jun-2019 13:43*
Surr: Nitrobenzene-d5	*98.4*			**0**	*40-140*	*%REC*	*20*	*13-Jun-2019 13:43*
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 05-Jun-2019		Analyst: JHD
Barium	**0.175**		**0.00190**	**0.00250**	**0.00500**	**mg/L**	1	05-Jun-2019 22:09
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	05-Jun-2019 22:09
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	05-Jun-2019 22:09
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	05-Jun-2019 22:09

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

ALS Houston, US Date: 18-Jun-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**

Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples WorkOrder:HS19060168

Sample ID: LH18/24-SP650_060419 Lab ID:HS19060168-01

Collection Date: 04-Jun-2019 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	05-Jun-2019 12:00

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

ALS Houston, US Date: 18-Jun-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**

Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples WorkOrder:HS19060168

Sample ID: LH18/24-SP650_060419_BIX Lab ID:HS19060168-02

Collection Date: 04-Jun-2019 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	17-Jun-2019 18:06

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

ALS Houston, US Date: 18-Jun-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**

Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples WorkOrder:HS19060168

Sample ID: Trip Blank Lab ID:HS19060168-03

Collection Date: 04-Jun-2019 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	06-Jun-2019 13:45
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	06-Jun-2019 13:45
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	06-Jun-2019 13:45
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	06-Jun-2019 13:45
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	06-Jun-2019 13:45
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	06-Jun-2019 13:45
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	06-Jun-2019 13:45
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	06-Jun-2019 13:45
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	06-Jun-2019 13:45
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	06-Jun-2019 13:45
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	06-Jun-2019 13:45
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	06-Jun-2019 13:45
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	06-Jun-2019 13:45
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	06-Jun-2019 13:45
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	06-Jun-2019 13:45
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	06-Jun-2019 13:45
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	06-Jun-2019 13:45
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	06-Jun-2019 13:45
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	06-Jun-2019 13:45
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	06-Jun-2019 13:45
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	06-Jun-2019 13:45
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	06-Jun-2019 13:45
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	06-Jun-2019 13:45
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	06-Jun-2019 13:45
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	06-Jun-2019 13:45
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	06-Jun-2019 13:45
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	06-Jun-2019 13:45
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	06-Jun-2019 13:45
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	06-Jun-2019 13:45
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	06-Jun-2019 13:45
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	06-Jun-2019 13:45
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	06-Jun-2019 13:45
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	06-Jun-2019 13:45
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	06-Jun-2019 13:45
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	06-Jun-2019 13:45
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	06-Jun-2019 13:45
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	06-Jun-2019 13:45
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	06-Jun-2019 13:45
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	06-Jun-2019 13:45

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

ALS Houston, US Date: 18-Jun-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**

Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples WorkOrder:HS19060168

Sample ID: Trip Blank Lab ID:HS19060168-03

Collection Date: 04-Jun-2019 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	06-Jun-2019 13:45
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	06-Jun-2019 13:45
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	06-Jun-2019 13:45
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	06-Jun-2019 13:45
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	06-Jun-2019 13:45
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	06-Jun-2019 13:45
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	06-Jun-2019 13:45
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	06-Jun-2019 13:45
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	06-Jun-2019 13:45
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	06-Jun-2019 13:45
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	06-Jun-2019 13:45
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	06-Jun-2019 13:45
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	06-Jun-2019 13:45
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	06-Jun-2019 13:45
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	06-Jun-2019 13:45
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	06-Jun-2019 13:45
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	06-Jun-2019 13:45
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	06-Jun-2019 13:45
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	06-Jun-2019 13:45
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	06-Jun-2019 13:45
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	06-Jun-2019 13:45
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	06-Jun-2019 13:45
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	06-Jun-2019 13:45
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	06-Jun-2019 13:45
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	06-Jun-2019 13:45
Surr: 1,2-Dichloroethane-d4	*93.0*			**0**	*81-118*	*%REC*	*1*	*06-Jun-2019 13:45*
Surr: 4-Bromofluorobenzene	*102*			**0**	*85-114*	*%REC*	*1*	*06-Jun-2019 13:45*
Surr: Dibromofluoromethane	*94.2*			**0**	*80-119*	*%REC*	*1*	*06-Jun-2019 13:45*
Surr: Toluene-d8	*107*			**0**	*89-112*	*%REC*	*1*	*06-Jun-2019 13:45*

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

WEIGHT LOG

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS19060168

Batch ID: 141628 **Method:** METALS BY ICPMS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19060168-01	1	10	10 (mL)	1

Batch ID: 141868 **Method:** SEMIVOLATILES SIM **Prep:** 3510_B_SIM

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19060168-01	1	990	1 (mL)	0.00101

ALS Houston, US Date: 18-jun-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS19060168

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 141628	**Test Name :** METALS BY ICPMS BY SW6020A			**Matrix:** Water		
HS19060168-01	LH18/24-SP650_060419	04 Jun 2019 14:00		05 Jun 2019 14:21	05 Jun 2019 22:09	1
Batch ID 141868	**Test Name :** SEMIVOLATILES SIM			**Matrix:** Water		
HS19060168-01	LH18/24-SP650_060419	04 Jun 2019 14:00		10 Jun 2019 06:54	13 Jun 2019 13:43	20
Batch ID R339853	**Test Name :** HEXAVALENT CHROMIUM BY SW7196A			**Matrix:** Water		
HS19060168-01	LH18/24-SP650_060419	04 Jun 2019 14:00			05 Jun 2019 12:00	1
Batch ID R339998	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C			**Matrix:** Water		
HS19060168-01	LH18/24-SP650_060419	04 Jun 2019 14:00			06 Jun 2019 14:33	1
HS19060168-03	Trip Blank	04 Jun 2019 00:00			06 Jun 2019 13:45	1
Batch ID R340666	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			**Matrix:** Water		
HS19060168-02	LH18/24-SP650_060419_BIX	04 Jun 2019 14:00			17 Jun 2019 18:06	1

ALS Houston, US Date: 18-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS19060168

QC BATCH REPORT

Batch ID: 141628 (0) **Instrument: ICPMS06** **Method: ICP-MS METALS BY SW6020A**

MBLK Sample ID: **MBLK-141628** Units: **mg/L** Analysis Date: **05-Jun-2019 22:04**
Client ID: Run ID: **ICPMS06_339849** SeqNo: **5108740** PrepDate: **05-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Barium	0.00250	0.00400								U
Lead	0.00100	0.00200								U
Selenium	0.00250	0.00200								U
Silver	0.000500	0.00200								U

LCS Sample ID: **LCS-141628** Units: **mg/L** Analysis Date: **05-Jun-2019 22:05**
Client ID: Run ID: **ICPMS06_339849** SeqNo: **5108741** PrepDate: **05-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Barium	0.0527	0.00400	0.05	0	105	80 - 120				
Lead	0.05321	0.00200	0.05	0	106	80 - 120				
Selenium	0.05646	0.00200	0.05	0	113	80 - 120				
Silver	0.04978	0.00200	0.05	0	99.6	80 - 120				

LCSD Sample ID: **LCSD-141628** Units: **mg/L** Analysis Date: **05-Jun-2019 22:07**
Client ID: Run ID: **ICPMS06_339849** SeqNo: **5108742** PrepDate: **05-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Barium	0.05316	0.00400	0.05	0	106	80 - 120	0.0527	0.882	20	
Lead	0.05358	0.00200	0.05	0	107	80 - 120	0.05321	0.684	20	
Selenium	0.05732	0.00200	0.05	0	115	80 - 120	0.05646	1.52	20	
Silver	0.04954	0.00200	0.05	0	99.1	80 - 120	0.04978	0.491	20	

MS Sample ID: **HS19060168-01MS** Units: **mg/L** Analysis Date: **05-Jun-2019 22:13**
Client ID: **LH18/24-SP650_060419** Run ID: **ICPMS06_339849** SeqNo: **5108745** PrepDate: **05-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Barium	0.2325	0.00400	0.05	0.1747	116	80 - 120				
Lead	0.05364	0.00200	0.05	0.000107	107	80 - 120				
Selenium	0.02727	0.00200	0.05	0.00018	54.2	80 - 120				S
Silver	0.04571	0.00200	0.05	-0.000008	91.4	80 - 120				

ALS Houston, US Date: 18-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS19060168

QC BATCH REPORT

Batch ID: 141628 (0) **Instrument: ICPMS06** **Method: ICP-MS METALS BY SW6020A**

MSD Sample ID: **HS19060168-01MSD** Units: **mg/L** Analysis Date: **05-Jun-2019 22:14**
Client ID: **LH18/24-SP650_060419** Run ID: **ICPMS06_339849** SeqNo: **5108746** PrepDate: **05-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Barium	0.233	0.00400	0.05	0.1747	117	80 - 120	0.2325	0.23	20	
Lead	0.05541	0.00200	0.05	0.000107	111	80 - 120	0.05364	3.23	20	
Selenium	0.02972	0.00200	0.05	0.00018	59.1	80 - 120	0.02727	8.59	20	S
Silver	0.04632	0.00200	0.05	-0.000008	92.6	80 - 120	0.04571	1.31	20	

PDS Sample ID: **HS19060168-01PDS** Units: **mg/L** Analysis Date: **05-Jun-2019 22:16**
Client ID: **LH18/24-SP650_060419** Run ID: **ICPMS06_339849** SeqNo: **5108747** PrepDate: **05-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Barium	0.275	0.00400	0.1	0.1747	100	75 - 125				
Lead	0.1028	0.00200	0.1	0.000107	103	75 - 125				
Selenium	0.1059	0.00200	0.1	0.00018	106	75 - 125				
Silver	0.08679	0.00200	0.1	-0.000008	86.8	75 - 125				

SD Sample ID: **HS19060168-01SD** Units: **mg/L** Analysis Date: **05-Jun-2019 22:11**
Client ID: **LH18/24-SP650_060419** Run ID: **ICPMS06_339849** SeqNo: **5108744** PrepDate: **05-Jun-2019** DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Barium	0.1719	0.0200					0.1747	1.56	10	
Lead	0.00500	0.0100					0.000107	0	10	U
Selenium	0.0125	0.0100					0.00018	0	10	U
Silver	0.00250	0.0100					-0.000008	0	10	U

The following samples were analyzed in this batch: HS19060168-01

ALS Houston, US Date: 18-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS19060168

QC BATCH REPORT

Batch ID: 141868 (0) **Instrument: SV-5** **Method: SEMIVOLATILES SIM**

MBLK Sample ID: **MBLK-141868** Units: **ug/L** Analysis Date: **13-Jun-2019 11:58**
Client ID: Run ID: **SV-5_340404** SeqNo: **5120994** PrepDate: **10-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.010	0.010								U
Surr: 2-Fluorobiphenyl	*0.06676*	*0*	*0.08*	*0*	*83.5*	*40 - 140*				
Surr: 4-Terphenyl-d14	*0.05034*	*0*	*0.08*	*0*	*62.9*	*40 - 140*				
Surr: Nitrobenzene-d5	*0.08606*	*0*	*0.08*	*0*	*108*	*40 - 140*				

LCS Sample ID: **LCS-141868** Units: **ug/L** Analysis Date: **13-Jun-2019 12:18**
Client ID: Run ID: **SV-5_340404** SeqNo: **5120995** PrepDate: **10-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.09236	0.010	0.08	0	115	40 - 140				
Surr: 2-Fluorobiphenyl	*0.06994*	*0*	*0.08*	*0*	*87.4*	*40 - 140*				
Surr: 4-Terphenyl-d14	*0.07525*	*0*	*0.08*	*0*	*94.1*	*40 - 140*				
Surr: Nitrobenzene-d5	*0.09839*	*0*	*0.08*	*0*	*123*	*40 - 140*				

LCSD Sample ID: **LCSD-141868** Units: **ug/L** Analysis Date: **13-Jun-2019 12:39**
Client ID: Run ID: **SV-5_340404** SeqNo: **5120996** PrepDate: **10-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.09246	0.010	0.08	0	116	40 - 140	0.09236	0.109	20	
Surr: 2-Fluorobiphenyl	*0.06934*	*0*	*0.08*	*0*	*86.7*	*40 - 140*	*0.06994*	*0.867*	*20*	
Surr: 4-Terphenyl-d14	*0.06065*	*0*	*0.08*	*0*	*75.8*	*40 - 140*	*0.07525*	*21.5*	*20*	R
Surr: Nitrobenzene-d5	*0.09377*	*0*	*0.08*	*0*	*117*	*40 - 140*	*0.09839*	*4.81*	*20*	

The following samples were analyzed in this batch: HS19060168-01

ALS Houston, US Date: 18-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS19060168

QC BATCH REPORT

Batch ID: R339998 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-190606** Units: **UG/L** Analysis Date: **06-Jun-2019 12:57**
Client ID: Run ID: **VOA6_339998** SeqNo: **5110994** 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: 18-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS19060168

QC BATCH REPORT

Batch ID: R339998 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-190606** Units: **UG/L** Analysis Date: **06-Jun-2019 12:57**
Client ID: Run ID: **VOA6_339998** SeqNo: **5110994** 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	*45.27*	*1.0*	*50*	*0*	*90.5*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.82*	*1.0*	*50*	*0*	*102*	*85 - 114*				
Surr: Dibromofluoromethane	*46.66*	*1.0*	*50*	*0*	*93.3*	*80 - 119*				
Surr: Toluene-d8	*53.19*	*1.0*	*50*	*0*	*106*	*89 - 112*				

ALS Houston, US Date: 18-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS19060168

QC BATCH REPORT

Batch ID: R339998 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-190606** Units: **UG/L** Analysis Date: **06-Jun-2019 12:09**
Client ID: Run ID: **VOA6_339998** SeqNo: **5110993** 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	19.6	1.0	20	0	98.0	78 - 124				
1,1,1-Trichloroethane	20.25	1.0	20	0	101	74 - 131				
1,1,2,2-Tetrachloroethane	18.44	1.0	20	0	92.2	71 - 121				
1,1,2-Trichloroethane	20.4	1.0	20	0	102	80 - 119				
1,1-Dichloroethane	19.43	1.0	20	0	97.2	77 - 125				
1,1-Dichloroethene	19.42	1.0	20	0	97.1	71 - 131				
1,1-Dichloropropene	19.63	1.0	20	0	98.1	78 - 125				
1,2,3-Trichlorobenzene	17.18	1.0	20	0	85.9	69 - 129				
1,2,3-Trichloropropane	17.93	1.0	20	0	89.6	73 - 122				
1,2,4-Trichlorobenzene	18.84	1.0	20	0	94.2	69 - 130				
1,2,4-Trimethylbenzene	19.91	1.0	20	0	99.6	76 - 124				
1,2-Dibromo-3-chloropropane	17.46	1.0	20	0	87.3	62 - 128				
1,2-Dibromoethane	19.86	1.0	20	0	99.3	77 - 121				
1,2-Dichlorobenzene	19.41	1.0	20	0	97.0	80 - 119				
1,2-Dichloroethane	20.31	1.0	20	0	102	73 - 128				
1,2-Dichloropropane	21.15	1.0	20	0	106	78 - 122				
1,3,5-Trimethylbenzene	19.82	1.0	20	0	99.1	75 - 124				
1,3-Dichlorobenzene	19.66	1.0	20	0	98.3	80 - 119				
1,3-Dichloropropane	21.39	1.0	20	0	107	80 - 119				
1,4-Dichlorobenzene	19.4	1.0	20	0	97.0	79 - 118				
2,2-Dichloropropane	19.78	1.0	20	0	98.9	60 - 139				
2-Butanone	42.76	2.0	40	0	107	56 - 143				
2-Chlorotoluene	19.33	1.0	20	0	96.6	79 - 122				
2-Hexanone	41.93	2.0	40	0	105	57 - 139				
4-Chlorotoluene	19.88	1.0	20	0	99.4	78 - 122				
4-Isopropyltoluene	20.23	1.0	20	0	101	77 - 127				
4-Methyl-2-pentanone	40	2.0	40	0	100.0	67 - 130				
Acetone	45.22	2.0	40	0	113	39 - 160				
Benzene	20.3	1.0	20	0	102	79 - 120				
Bromobenzene	18.84	1.0	20	0	94.2	80 - 120				
Bromochloromethane	20.35	1.0	20	0	102	78 - 123				
Bromodichloromethane	19.68	1.0	20	0	98.4	79 - 125				
Bromoform	18.77	1.0	20	0	93.8	66 - 130				
Bromomethane	22.57	1.0	20	0	113	53 - 141				

ALS Houston, US Date: 18-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS19060168

QC BATCH REPORT

Batch ID: R339998 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-190606** Units: **UG/L** Analysis Date: **06-Jun-2019 12:09**
Client ID: Run ID: **VOA6_339998** SeqNo: **5110993** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	46.05	2.0	40	0	115	64 - 133				
Carbon tetrachloride	19.1	1.0	20	0	95.5	72 - 136				
Chlorobenzene	19.54	1.0	20	0	97.7	82 - 118				
Chloroethane	19.4	1.0	20	0	97.0	60 - 138				
Chloroform	20.61	1.0	20	0	103	79 - 124				
Chloromethane	17.27	1.0	20	0	86.3	50 - 139				
cis-1,2-Dichloroethene	19.72	1.0	20	0	98.6	78 - 123				
cis-1,3-Dichloropropene	20.52	1.0	20	0	103	75 - 124				
Dibromochloromethane	19.92	1.0	20	0	99.6	74 - 126				
Dibromomethane	19.98	1.0	20	0	99.9	79 - 123				
Dichlorodifluoromethane	18.99	1.0	20	0	95.0	32 - 152				
Ethylbenzene	19.69	1.0	20	0	98.5	79 - 121				
Hexachlorobutadiene	21.04	1.0	20	0	105	66 - 134				
Isopropylbenzene	20.27	1.0	20	0	101	72 - 131				
m,p-Xylene	39.34	2.0	40	0	98.4	80 - 121				
Methylene chloride	20.93	2.0	20	0	105	74 - 124				
Naphthalene	16.9	1.0	20	0	84.5	61 - 128				
n-Butylbenzene	20.45	1.0	20	0	102	75 - 128				
n-Propylbenzene	19.65	1.0	20	0	98.2	76 - 126				
o-Xylene	19.83	1.0	20	0	99.2	78 - 122				
sec-Butylbenzene	20.1	1.0	20	0	101	77 - 126				
Styrene	20.15	1.0	20	0	101	78 - 123				
tert-Butylbenzene	19.68	1.0	20	0	98.4	78 - 124				
Tetrachloroethene	19.96	1.0	20	0	99.8	74 - 129				
Toluene	20.51	1.0	20	0	103	80 - 121				
trans-1,2-Dichloroethene	19.57	1.0	20	0	97.9	75 - 124				
trans-1,3-Dichloropropene	20.06	1.0	20	0	100	73 - 127				
Trichloroethene	19.8	1.0	20	0	99.0	79 - 123				
Trichlorofluoromethane	19.03	1.0	20	0	95.2	65 - 141				
Vinyl chloride	17.4	1.0	20	0	87.0	58 - 137				
Surr: 1,2-Dichloroethane-d4	*52.35*	*1.0*	*50*	*0*	*105*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*52.64*	*1.0*	*50*	*0*	*105*	*85 - 114*				
Surr: Dibromofluoromethane	*52.92*	*1.0*	*50*	*0*	*106*	*80 - 119*				
Surr: Toluene-d8	*50.05*	*1.0*	*50*	*0*	*100*	*89 - 112*				

ALS Houston, US Date: 18-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS19060168

QC BATCH REPORT

Batch ID: R339998 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS19060123-01MS** Units: **UG/L** Analysis Date: **06-Jun-2019 17:22**
Client ID: Run ID: **VOA6_339998** SeqNo: **5111005** 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	19.23	1.0	20	0	96.2	78 - 124				
1,1,1-Trichloroethane	18.32	1.0	20	0	91.6	74 - 131				
1,1,2,2-Tetrachloroethane	20.07	1.0	20	0	100	71 - 121				
1,1,2-Trichloroethane	19.28	1.0	20	0	96.4	80 - 119				
1,1-Dichloroethane	18.26	1.0	20	0.6532	88.0	77 - 125				
1,1-Dichloroethene	20.79	1.0	20	2.626	90.8	71 - 131				
1,1-Dichloropropene	18.92	1.0	20	0	94.6	78 - 125				
1,2,3-Trichlorobenzene	19.87	1.0	20	0	99.3	69 - 129				
1,2,3-Trichloropropane	19.78	1.0	20	0	98.9	73 - 122				
1,2,4-Trichlorobenzene	20.91	1.0	20	0	105	69 - 130				
1,2,4-Trimethylbenzene	21.06	1.0	20	0	105	76 - 124				
1,2-Dibromo-3-chloropropane	18.9	1.0	20	0	94.5	62 - 128				
1,2-Dibromoethane	19	1.0	20	0	95.0	77 - 121				
1,2-Dichlorobenzene	19.7	1.0	20	0	98.5	80 - 119				
1,2-Dichloroethane	18.95	1.0	20	1.07	89.4	73 - 128				
1,2-Dichloropropane	19.37	1.0	20	0	96.9	78 - 122				
1,3,5-Trimethylbenzene	21.09	1.0	20	0	105	75 - 124				
1,3-Dichlorobenzene	20.09	1.0	20	0	100	80 - 119				
1,3-Dichloropropane	20.01	1.0	20	0	100	80 - 119				
1,4-Dichlorobenzene	19.95	1.0	20	0	99.7	79 - 118				
2,2-Dichloropropane	18.73	1.0	20	0	93.6	60 - 139				
2-Butanone	23.81	2.0	40	0	59.5	56 - 143				
2-Chlorotoluene	20.36	1.0	20	0	102	79 - 122				
2-Hexanone	28.12	2.0	40	0	70.3	57 - 139				
4-Chlorotoluene	20.2	1.0	20	0	101	78 - 122				
4-Isopropyltoluene	21.86	1.0	20	0	109	77 - 127				
4-Methyl-2-pentanone	27.78	2.0	40	0	69.4	67 - 130				
Acetone	23.63	2.0	40	0	59.1	39 - 160				
Benzene	18.3	1.0	20	0	91.5	79 - 120				
Bromobenzene	19.74	1.0	20	0	98.7	80 - 120				
Bromochloromethane	17.4	1.0	20	0	87.0	78 - 123				
Bromodichloromethane	17.55	1.0	20	0	87.7	79 - 125				
Bromoform	18.81	1.0	20	0	94.0	66 - 130				
Bromomethane	13.86	1.0	20	0	69.3	53 - 141				

ALS Houston, US Date: 18-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS19060168

QC BATCH REPORT

Batch ID: R339998 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS19060123-01MS** Units: **UG/L** Analysis Date: **06-Jun-2019 17:22**
Client ID: Run ID: **VOA6_339998** SeqNo: **5111005** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	24.97	2.0	40	0	62.4	64 - 133				S
Carbon tetrachloride	18.6	1.0	20	0	93.0	72 - 136				
Chlorobenzene	19.12	1.0	20	0	95.6	82 - 118				
Chloroethane	18.53	1.0	20	0	92.7	60 - 138				
Chloroform	17.48	1.0	20	0	87.4	79 - 124				
Chloromethane	15.15	1.0	20	0	75.8	50 - 139				
cis-1,2-Dichloroethene	17.54	1.0	20	0	87.7	78 - 123				
cis-1,3-Dichloropropene	18.2	1.0	20	0	91.0	75 - 124				
Dibromochloromethane	19.19	1.0	20	0	95.9	74 - 126				
Dibromomethane	18.09	1.0	20	0	90.4	79 - 123				
Dichlorodifluoromethane	16.95	1.0	20	0	84.8	32 - 152				
Ethylbenzene	19.96	1.0	20	0	99.8	79 - 121				
Hexachlorobutadiene	22.14	1.0	20	0	111	66 - 134				
Isopropylbenzene	21.05	1.0	20	0	105	72 - 131				
m,p-Xylene	39.46	2.0	40	0	98.7	80 - 121				
Methylene chloride	17.85	2.0	20	0	89.3	74 - 124				
Naphthalene	19.51	1.0	20	0	97.5	61 - 128				
n-Butylbenzene	21.99	1.0	20	0	110	75 - 128				
n-Propylbenzene	21.93	1.0	20	0	110	76 - 126				
o-Xylene	19.69	1.0	20	0	98.4	78 - 122				
sec-Butylbenzene	21.68	1.0	20	0	108	77 - 126				
Styrene	19.76	1.0	20	0	98.8	78 - 123				
tert-Butylbenzene	21.36	1.0	20	0	107	78 - 124				
Tetrachloroethene	21.49	1.0	20	0	107	74 - 129				
Toluene	19.87	1.0	20	0	99.4	80 - 121				
trans-1,2-Dichloroethene	17.94	1.0	20	0	89.7	75 - 124				
trans-1,3-Dichloropropene	17.84	1.0	20	0	89.2	73 - 127				
Trichloroethene	18.93	1.0	20	0	94.6	79 - 123				
Trichlorofluoromethane	18.45	1.0	20	0	92.2	65 - 141				
Vinyl chloride	16.29	1.0	20	0	81.5	58 - 137				
Surr: 1,2-Dichloroethane-d4	*46.56*	*1.0*	*50*	*0*	*93.1*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*53.01*	*1.0*	*50*	*0*	*106*	*85 - 114*				
Surr: Dibromofluoromethane	*48.12*	*1.0*	*50*	*0*	*96.2*	*80 - 119*				
Surr: Toluene-d8	*52.79*	*1.0*	*50*	*0*	*106*	*89 - 112*				

ALS Houston, US Date: 18-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS19060168

QC BATCH REPORT

Batch ID: R339998 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS19060123-01MSD** Units: **UG/L** Analysis Date: **06-Jun-2019 17:46**
Client ID: Run ID: **VOA6_339998** SeqNo: **5111006** 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	19.18	1.0	20	0	95.9	78 - 124	19.23	0.269	20	
1,1,1-Trichloroethane	17.98	1.0	20	0	89.9	74 - 131	18.32	1.89	20	
1,1,2,2-Tetrachloroethane	19.55	1.0	20	0	97.8	71 - 121	20.07	2.61	20	
1,1,2-Trichloroethane	19.48	1.0	20	0	97.4	80 - 119	19.28	1.07	20	
1,1-Dichloroethane	18.13	1.0	20	0.6532	87.4	77 - 125	18.26	0.715	20	
1,1-Dichloroethene	20.63	1.0	20	2.626	90.0	71 - 131	20.79	0.774	20	
1,1-Dichloropropene	18.82	1.0	20	0	94.1	78 - 125	18.92	0.492	20	
1,2,3-Trichlorobenzene	20.45	1.0	20	0	102	69 - 129	19.87	2.89	20	
1,2,3-Trichloropropane	18.73	1.0	20	0	93.7	73 - 122	19.78	5.48	20	
1,2,4-Trichlorobenzene	21.43	1.0	20	0	107	69 - 130	20.91	2.47	20	
1,2,4-Trimethylbenzene	20.23	1.0	20	0	101	76 - 124	21.06	4.02	20	
1,2-Dibromo-3-chloropropane	18.98	1.0	20	0	94.9	62 - 128	18.9	0.434	20	
1,2-Dibromoethane	19.16	1.0	20	0	95.8	77 - 121	19	0.856	20	
1,2-Dichlorobenzene	20.04	1.0	20	0	100	80 - 119	19.7	1.7	20	
1,2-Dichloroethane	19.18	1.0	20	1.07	90.5	73 - 128	18.95	1.22	20	
1,2-Dichloropropane	19.21	1.0	20	0	96.1	78 - 122	19.37	0.843	20	
1,3,5-Trimethylbenzene	20.82	1.0	20	0	104	75 - 124	21.09	1.28	20	
1,3-Dichlorobenzene	19.85	1.0	20	0	99.3	80 - 119	20.09	1.17	20	
1,3-Dichloropropane	19.84	1.0	20	0	99.2	80 - 119	20.01	0.838	20	
1,4-Dichlorobenzene	19.38	1.0	20	0	96.9	79 - 118	19.95	2.92	20	
2,2-Dichloropropane	17.93	1.0	20	0	89.6	60 - 139	18.73	4.38	20	
2-Butanone	23.77	2.0	40	0	59.4	56 - 143	23.81	0.164	20	
2-Chlorotoluene	19.2	1.0	20	0	96.0	79 - 122	20.36	5.91	20	
2-Hexanone	27.85	2.0	40	0	69.6	57 - 139	28.12	0.961	20	
4-Chlorotoluene	20.09	1.0	20	0	100	78 - 122	20.2	0.521	20	
4-Isopropyltoluene	21.3	1.0	20	0	106	77 - 127	21.86	2.64	20	
4-Methyl-2-pentanone	27.75	2.0	40	0	69.4	67 - 130	27.78	0.097	20	
Acetone	26.08	2.0	40	0	65.2	39 - 160	23.63	9.87	20	
Benzene	18.4	1.0	20	0	92.0	79 - 120	18.3	0.55	20	
Bromobenzene	19.31	1.0	20	0	96.6	80 - 120	19.74	2.21	20	
Bromochloromethane	17.07	1.0	20	0	85.3	78 - 123	17.4	1.95	20	
Bromodichloromethane	18.04	1.0	20	0	90.2	79 - 125	17.55	2.74	20	
Bromoform	18.98	1.0	20	0	94.9	66 - 130	18.81	0.91	20	
Bromomethane	14.73	1.0	20	0	73.7	53 - 141	13.86	6.06	20	

ALS Houston, US Date: 18-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS19060168

QC BATCH REPORT

Batch ID: R339998 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MSD Sample ID: **HS19060123-01MSD** Units: **UG/L** Analysis Date: **06-Jun-2019 17:46**
Client ID: Run ID: **VOA6_339998** SeqNo: **5111006** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	26.56	2.0	40	0	66.4	64 - 133	24.97	6.14	20	
Carbon tetrachloride	18.54	1.0	20	0	92.7	72 - 136	18.6	0.321	20	
Chlorobenzene	19.02	1.0	20	0	95.1	82 - 118	19.12	0.541	20	
Chloroethane	15.64	1.0	20	0	78.2	60 - 138	18.53	16.9	20	
Chloroform	17.45	1.0	20	0	87.2	79 - 124	17.48	0.195	20	
Chloromethane	14.56	1.0	20	0	72.8	50 - 139	15.15	4.02	20	
cis-1,2-Dichloroethene	17.39	1.0	20	0	87.0	78 - 123	17.54	0.879	20	
cis-1,3-Dichloropropene	18.41	1.0	20	0	92.0	75 - 124	18.2	1.14	20	
Dibromochloromethane	19.11	1.0	20	0	95.6	74 - 126	19.19	0.387	20	
Dibromomethane	18.02	1.0	20	0	90.1	79 - 123	18.09	0.394	20	
Dichlorodifluoromethane	16.45	1.0	20	0	82.2	32 - 152	16.95	3.02	20	
Ethylbenzene	19.33	1.0	20	0	96.6	79 - 121	19.96	3.23	20	
Hexachlorobutadiene	22.88	1.0	20	0	114	66 - 134	22.14	3.31	20	
Isopropylbenzene	21.25	1.0	20	0	106	72 - 131	21.05	0.955	20	
m,p-Xylene	38.53	2.0	40	0	96.3	80 - 121	39.46	2.39	20	
Methylene chloride	17.48	2.0	20	0	87.4	74 - 124	17.85	2.11	20	
Naphthalene	20.11	1.0	20	0	101	61 - 128	19.51	3.06	20	
n-Butylbenzene	22.68	1.0	20	0	113	75 - 128	21.99	3.11	20	
n-Propylbenzene	20.87	1.0	20	0	104	76 - 126	21.93	4.97	20	
o-Xylene	20.2	1.0	20	0	101	78 - 122	19.69	2.56	20	
sec-Butylbenzene	21.08	1.0	20	0	105	77 - 126	21.68	2.77	20	
Styrene	20.2	1.0	20	0	101	78 - 123	19.76	2.22	20	
tert-Butylbenzene	21.09	1.0	20	0	105	78 - 124	21.36	1.3	20	
Tetrachloroethene	20.81	1.0	20	0	104	74 - 129	21.49	3.2	20	
Toluene	19.76	1.0	20	0	98.8	80 - 121	19.87	0.565	20	
trans-1,2-Dichloroethene	17.51	1.0	20	0	87.5	75 - 124	17.94	2.45	20	
trans-1,3-Dichloropropene	18.41	1.0	20	0	92.1	73 - 127	17.84	3.14	20	
Trichloroethene	18.87	1.0	20	0	94.3	79 - 123	18.93	0.321	20	
Trichlorofluoromethane	18.14	1.0	20	0	90.7	65 - 141	18.45	1.7	20	
Vinyl chloride	15.81	1.0	20	0	79.0	58 - 137	16.29	3.03	20	
Surr: 1,2-Dichloroethane-d4	*46.22*	*1.0*	*50*	*0*	*92.4*	*81 - 118*	*46.56*	*0.735*	*20*	
Surr: 4-Bromofluorobenzene	*53.76*	*1.0*	*50*	*0*	*108*	*85 - 114*	*53.01*	*1.41*	*20*	
Surr: Dibromofluoromethane	*48.02*	*1.0*	*50*	*0*	*96.0*	*80 - 119*	*48.12*	*0.217*	*20*	
Surr: Toluene-d8	*52.32*	*1.0*	*50*	*0*	*105*	*89 - 112*	*52.79*	*0.907*	*20*	

ALS Houston, US Date: 18-Jun-19

Client:	Bhate Environmental Associates, Inc.
Project:	LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder:	HS19060168

QC BATCH REPORT

Batch ID:	**R339998 (0)**	**Instrument:**	**VOA6**	**Method:**	**VOLATILES ORGANICS BY METHOD 8260C**

The following samples were analyzed in this batch: HS19060168-01 HS19060168-03

ALS Houston, US Date: 18-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS19060168

QC BATCH REPORT

Batch ID: R339853 (0) **Instrument: UV-2450** **Method: HEXAVALENT CHROMIUM BY SW7196A**

MBLK Sample ID: **MBLK-339853** Units: **mg/L** Analysis Date: **05-Jun-2019 12:00**
Client ID: Run ID: **UV-2450_339853** SeqNo: **5107895** 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-339853** Units: **mg/L** Analysis Date: **05-Jun-2019 12:00**
Client ID: Run ID: **UV-2450_339853** SeqNo: **5107896** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	0.23	0.0100	0.25	0	92.0	80 - 120				

MS Sample ID: **HS19060177-01MS** Units: **mg/L** Analysis Date: **05-Jun-2019 12:00**
Client ID: Run ID: **UV-2450_339853** SeqNo: **5107965** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	0.268	0.0100	0.25	-0.004	109	75 - 125				

MSD Sample ID: **HS19060177-01MSD** Units: **mg/L** Analysis Date: **05-Jun-2019 12:00**
Client ID: Run ID: **UV-2450_339853** SeqNo: **5107966** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	0.265	0.0100	0.25	-0.004	108	75 - 125	0.268	1.13	20	

The following samples were analyzed in this batch: HS19060168-01

ALS Houston, US Date: 18-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: **HS19060168**

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
Dept of Defense	ANAB L2231	20-Dec-2021
Illinois	004438	29-Jun-2019
Kansas	E-10352 2018-2019	31-Jul-2019
Louisiana	03087	30-Jun-2019
Maryland	343, 2018-2019	30-Jun-2019
North Carolina	624-2019	31-Dec-2019
Oklahoma	2018-156	31-Aug-2019
Texas	TX104704231-19-23	30-Apr-2020

ALS Houston, US Date: 18-jun-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples
Work Order: HS19060168

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19060168-01	LH18/24-SP650_060419	Login	05/06/2019 10:32:53	NDR	EXT189
HS19060168-01	LH18/24-SP650_060419	Login	05/06/2019 10:32:53	NDR	WET250
HS19060168-01	LH18/24-SP650_060419	Login	05/06/2019 10:32:53	NDR	MET053
HS19060168-01	LH18/24-SP650_060419	Login	05/06/2019 10:32:53	NDR	VOA061
HS19060168-02	LH18/24-SP650_060419_BIX	Login	05/06/2019 10:32:53	NDR	Sub
HS19060168-03	Trip Blank	Login	05/06/2019 10:32:53	NDR	VOA061

ALS Houston, US Date: 18-Jun-19

Sample Receipt Checklist

Client Name: Bhate Environmental
Work Order: HS19060168
Date/Time Received: **05-Jun-2019 09:50**
Received by: **RPG**

Checklist completed by: *Nilesh D. Ranchod* eSignature — 5-Jun-2019 Date
Reviewed by: *RJ Modashia* eSignature — 5-Jun-2019 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):	4.1c uc/c	IR 25
Cooler(s)/Kit(s):	43593	
Date/Time sample(s) sent to storage:	06/05/2019 11:30	

Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

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

HS19060168

Bhate Environmental Associates, Inc.
18/24 Longhorn GW Treatment Plant Monthly Effluer

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_060419	Water	06/04/19 / 14:00		3	X					HCL	
LH18/24-SP650_060419	Water	06/04/19 / 14:00		2			X	X		NONE	
LH18/24-SP650_060419_BIX	Water	06/04/19 / 14:00		1					X	NONE	
LH18/24-SP650_060419	Water	06/04/19 / 14:00		1		X				HNO3	
Trip Blank	Water	06/04/19		2	X					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	06/04/19	14:30	R Ciga	6/5/19	07:30						

For Lab Use Only

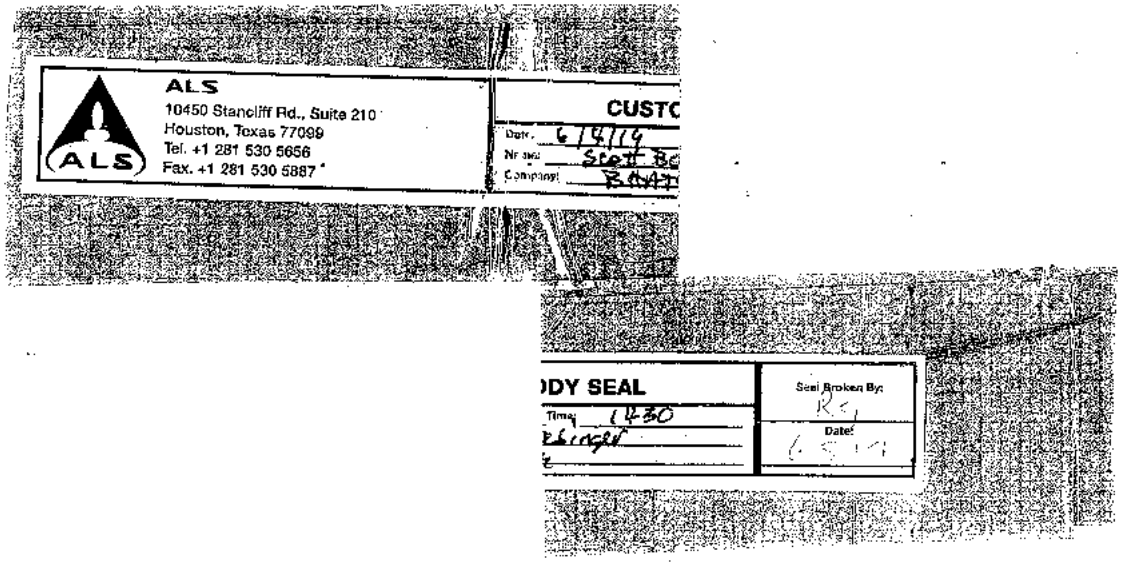
Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition
				R Ciga	6/5/19	07:30	4+1c	–	Cooler # 43593 IR #25 CF0

Remarks:

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

RETURNS MON – SAT
PRIORITY OVERNIGHT

TRK# (0221) 4380 9532 8304



Case Narrative

Method: 6850
Analysis: Perchlorate
Analysis SOP: LC-MS-CLO4
ALS WO ID(s): 1915802, 1915803, 1915852, 1916229; 1916231; 1916232

Client: ALS Laboratories (Houston, TX)
Matrix: Water
ELMS Batch (HBN): 2261 (241120)

General Set Information: There were six 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 samples 1915852001 and 1916229001 were analyzed and reported from 1:1,000 dilutions. The reporting limits have been adjusted accordingly.

Method QC data: The method blank (LMB 657797) was less than 1/2 the CRDL. The recovery for the LCS (657798) was within acceptable parameters.

MS/MSD Analysis: MS/MSD was performed on sample 1915802001 (Client ID: LH18/24-SP650_052919_BIX). 4.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. The spike target was 4.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 – 657795) is reported from the analysis of the Laboratory Control Sample (LCS – 657798) at a level of 4.0µg/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: 19MARI03).

Thomas Bosch June 12, 2019
Analyst Date

ANALYTICAL REPORT

Report Date: June 13, 2019

RJ Modashia
ALS Environmental (Houston)
10450 Stancliff Road
Suite 210
Houston, TX 77099

Phone: 281 530-5656

E-mail: RJ.Modashia@ALSGlobal.com

Workorder: **34-1916231**
Project ID: HS19060168
Purchase Order: HS19060168
Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
LH18/24-SP650_060419_BIX	1916231001	06/04/19	06/06/19	

ANALYTICAL REPORT

Workorder: 34-1916231
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **LH18/24-SP650_060419_BIX**	Sampling Site: NA	Collected: 06/04/2019
Lab ID: 1916231001	Media: 125 mL Nalgene	Received: 06/06/2019
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/2261 (HBN: 241120)	**Percent Solid:** NA
	Analyzed: 06/11/2019 11:05	**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 06/12/2019 12:46	/S/ Stephen Brose 06/13/2019 10:59

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: 34-1916231
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
	Nevada (TNI)	UT00953201-1	https://ndep.nv.gov/water/lab-certification
	Iowa (TNI)	IA# 376	http://www.shl.uiowa.edu/labcert/idnr/
	Kansas	E-10416	http://www.kdheks.gov/envlab/disclaimer.html
	Oklahoma (TNI)	IJ# 9980	http://www.deq.state.ok.us/CSDnew/labcert.htm
	Texas (TNI)	T104704456-18-9	https://www.tceq.texas.gov/assets/public/compliance/compliance_support/qa/txnelap_lab_list.pdf
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: 1916231

Limits:	Client SOW/Contract Specified	**Preparation:**	NA	**Analysis:**	EPA 6850, DoD QSM
Basis:	DoD QSM	**Batch:**	NA	**Batch:**	ELMS/2261 (HBN: 241120)
		Prepared By:	NA	**Analyzed By:**	Thomas Bosch

Blank

LMB: 657797
Analyzed: 06/11/2019 09:31
Units: ug/L

Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 657798
Analyzed: 06/11/2019 09:04
Dilution: 1
Units: ug/L

Analyte	Result	Target	% Rec	QC Limits	
Perchlorate	4.34	4.00	109	78.8	123.8

Matrix Spike - Matrix Spike Duplicate

Sample:	1915802001	**MS:**	657799
Analyzed:	06/11/2019 09:45	**Analyzed:**	06/11/2019 09:58
Dilution:	1	**Dilution:**	1
Units:	ug/L	**Units:**	ug/L

	MSD:	657800
	Analyzed:	06/11/2019 10:12
	Dilution:	1
	Units:	ug/L

Analyte	Result	Result	Target	% Rec	QC Limits		Result	% Rec	RPD	QC Limits	
Perchlorate	ND	4.57	4	114	78.8	123.8	4.78	120	4.65	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 06/12/2019 12:47	/S/ Stephen Brose 06/13/2019 10:59

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 1916231

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

18698/#2
191623

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID: 11518**

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:	HS19060168
TSR:	Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS19060168-02**	**LH18/24-SP650_060419_BIX**	**Water**	**04 Jun 2019 14:00**
	SUB_Perch-6850			19 Jun 2019

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

QC Level: DOD IV (DoD Data Package)

Relinquished By: _____ Date/Time: 6/5/19 1800

Received By: _____ Date/Time: 6-6-19 0955

Cooler ID(s): _____ Temperature(s): _____

ALS Environmental

CHAIN-OF-CUSTODY

Project / Job / Task: HS19060168	***Split:***	**Workorder ID:** 1916231	**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	COOL	Requested Analysis: EPA 6850, DoD QSM												
1	06/04/2019 14:00	LH18/24-SP650_060419_BIX	1916231001		Water	A	1		A												
2																					
3																					
4																					
5																					
6																					
7																					
8																					
9																					
10																					

38 of 112

ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location
Coates, Gayleen	06/06/2019 09:55	ALS Sample Receiving	Sample Login
[signature] R-33.1	6.6.19 1420	3B	STORAGE
	6-11-19/08:00	T. Board	6850

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

00939537

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: 6-6-19 0955

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	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.
1	C19 9676	1 °C	4	C19	°C	7	C19	°C
2	C19	°C	5	C19	°C	8	C19	°C
3	C19	°C	6	C19	°C	9	C19	°C

Taken By: [signature] GAYLEEN CORTES 6-6-19

Signature / Printed Name / 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: _____

CRIR.doc

Revised 01/01/2018

Must Deliver Next Business Day
Time and Tempature Sensitive!

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

SHIP DATE: 05JUN19
ACTWGT: 10.85 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: HS19060168/172/174-RJ

SS1CL/0210/104C

FedEx Express

J181118066501 ur

TRK# 0201 4809 7834 7670

THU - 06 JUN 3:00P
STANDARD OVERNIGHT

AX BTFA

84123
UT-US SLC

Batch Worklist

Batch: ELMS/ 2261 **Created:** 6/11/2019 07:45 **Instrument:** **HBN:** 241120

Rule: EPA 6850, DoD QSM Water **Analyst:** T. Bosch **Status:** WP

Workorder: 1915802 [ENV_LVL4]
Workorder: 1915803 [ENV_LVL4]
Workorder: 1915852 [ENV_LVL4]
Workorder: 1916229 [ENV_LVL4]
Workorder: 1916231 [ENV_LVL4]
Workorder: 1916232 [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	657794	CCV for HBN 241120 [ELMS/2261]				CCV	3		E685041C3Q	5311		6/13/2019	
2	657795	RLVS for HBN 241120 [ELMS/2261				RLVS	3		E685041C3Q	5311		6/13/2019	
3	657796	ICS for HBN 241120 [ELMS/2261]				ICS	3		E6850..D3Q	5311		6/13/2019	
4	657797	LMB for HBN 241120 [ELMS/2261]				LMB	3		E6850Q413Q	5311		6/13/2019	
5	657798	LCS for HBN 241120 [ELMS/2261]				LCS	3		E6850Q413Q	5311		6/13/2019	
6	1915802001	LH18/24-SP650_052919_BIX				SAMPLE	3	1915802001-A	E6850Q41.3	5480	6/26/2019	6/13/2019	
7	657799	LH18/24-SP650...(1915802001MS)				MS	3		E6850Q413Q	5311		6/13/2019	
8	657800	LH18/24-SP65...(1915802001MSD)				MSD	3		E6850Q413Q	5311		6/13/2019	
9	1915803001	LH18/24-SP650_052919_BIX				SAMPLE	3	1915803001-A	E6850Q41.3	5480	6/26/2019	6/13/2019	
10	1915852001	LH18/24-SP140_052919				SAMPLE	3	1915852001-A	E6850Q41.3	5480	6/26/2019	6/13/2019	
11	1916229001	LH18/24-SP140_060419				SAMPLE	3	1916229001-A	E6850Q41.3	5480	7/2/2019	6/19/2019	
12	1916231001	LH18/24-SP650_060419_BIX				SAMPLE	3	1916231001-A	E6850Q41.3	5480	7/2/2019	6/19/2019	
13	1916232001	LH18/24-SP650_060419_BIX				SAMPLE	3	1916232001-A	E6850Q41.3	5480	7/2/2019	6/19/2019	
14	657801	CCV for HBN 241120 [ELMS/2261]				CCV	3		E685041C3Q	5311		6/13/2019	

00939540

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

ALS Work Order #'s & Sample #( )'s: 1915802 (001), 1915803 (001), 1915852 (001), 1916229 (001); 1916231 (001); 1916232 (001) ELMS Batch/HBN ID: 2261 (241120)
Prep Date: 06/11/2019 Analysis Date: 06/11/2019 Analyst: T. Bosch
Analyte: **Perchlorate** Matrix: **Water** Method: **6850**
Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2019\JUN\11JUN19D.s
Reported DL: **1.0µg/L** Reported LOD: **2.0µg/L** Reported LOQ: **4.0µg/L**

SAMPLE PREPARATION/ANALYSIS:

Water: Samples were prepared by Thomas 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 AH015-4)/0.1% glacial acetic acid (JT-Baker Lot 04802).
Eluent B1: 95% ACN (B&J Lot AH015-4)/ 5% ASTM Type II water (ALS)/0.1% glacial acetic acid (JT-Baker Lot 04802).

STANDARDS: Internal Standard Spiking Solution Horizon# 43730. Dilutions of Working Standard Solution ID 43702 used for CCV's, LODV's, RLVS and IPC.

CALIBRATION CURVE: Used curve from 03/19/2019, sequence 19MAR19D.s Offline Quantitation Method: CLO4-DP2.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: 7 Injection Volume: 35µL
Column: KP-RPPX C8 separator, 250mm Mobile Phase: 70% Eluent A1; 30% Eluent B1

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: 4.0µL of QC Solution Horizon ID 47516 was used for LCS 657798; Target = 4.0µg/L. ASTM type II water was used for LMB 657797.

MS/MSD: The Matrix Spike and duplicate (MS/MSD) were performed on sample 1915802001 (Client ID: LH18/24-SP650_052919_BIX). 4.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. Spike target = 4.0µg/L.

COMMENTS:

1) Results reported in µg/L. Field samples 1915852001 and 1916229001 were analyzed and reported from 1:1,000 dilutions. The reporting limits have been adjusted accordingly.
2) All QC, Blank, CCV, and MS/MSD results were within method parameters.
3) Sample data can be viewed at two directories within the ALS system: \\ALSLTWS013\LCMS\LCMS04\2019\JUN\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
4) Notebook: \\alsltws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2019\241120-DoD-ALS-Hstn LCMS4 or through \\ALSLTWS013\DATAREVIEW\HBN#
5) The Reporting Limit Verification Standard (RLVS – 657795) is reported from the analysis of the Laboratory Control Sample (LCS – 657798) at a level of 4.0µg/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: 19MARI03).

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: 2261 HBN: 241120 1915802/1915803/1915852 Sample Set IDs if Applicable: 1916229/1916231/1916232	Analyst Initials	Reviewer Initials
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
Method Blanks 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 flags applied on QC reports; LCSs analyzed and meet acceptance criteria when performed	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 checked	TB	SB
Preparation and analysis calculations checked	TB	SB
NCRs are completed as necessary NC/CAR#		
Report forms are complete and accurate	TB	SB
Manual integrations checked	TB	SB

STANDARD REPORT

Working Standard - CLO4 WRK

CLO4 WRK — Description - 6850 WKG Std 100.ug/L

Standard: 43702
MFG: ALS/SLC
MFG Lot: TNB: 09/18/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/18/2018 02:09PM

Amount: 10 mL
Expires: 09/18/2019
Usable: Yes
Lab Lot: CLO4 WRK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	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
43701	CLO4 INT	6850 Intermdt AccStd 10.ug/mL	CLO4 INT	0.1 mL	09/18/2019

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: No
Lab Lot: CLO4 STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	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: 43701
MFG: ALS/SLC
MFG Lot: TNB: 09/18/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/18/2018 02:09PM

Amount: 10 mL
Expires: 09/18/2019
Usable: Yes
Lab Lot: CLO4 INT

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
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
MFG: Ultra Scientific
MFG Lot: CP-0860
Part ID: ICC-013

Created By: Thomas Bosch
Create Date: 05/11/2017 01:05PM

Amount: 100 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL

STANDARD REPORT

Constituent

Working Standard - CLO4 QC INT

CLO4 QC INT — Description - 6850 QC Intrmdt Std-QC 10ug/mL

Standard: 47515
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

STANDARD REPORT

Working Standard - CLO4ISTDWRK

CLO4ISTDWRK — Description - Perchlorate ISTD Wrk 1,000ug/L

Standard: 43730	Created By: Thomas Bosch	Amount: 25 mL
MFG: ALS/SLC	Create Date: 09/20/2018 09:09AM	Expires: 09/20/2019
MFG Lot: TNB: 05/09/2018	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
43729	CLO4ISTDSTK	Perchlorate ISTD Stock	CLO4ISTDSTK	0.25 mL	04/28/2026

STANDARD REPORT

Constituent

Stock Standard - CLO4ISTDSTK

CLO4ISTDSTK — Description - Perchlorate ISTD Stock

Standard: 43729
MFG: Cambridge Isotope
MFG Lot: SDFF-012A
Part ID: OLM-7310-S

Created By: Thomas Bosch
Create Date: 09/20/2018 09:09AM
Verified By: Thomas Bosch
Verify Date:

Amount: 1 mL
Expires: 04/28/2026
Usable: Yes
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

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

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
ANAB ACCREDITED

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

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.

Cambridge Isotope Laboratories, Inc.

Certificate of Analysis

Quality Standards:
ISO Guide 34 • ISO/IEC 17025 • ISO 13485 • cGMP

23118

Product Name: (Isotopic Label & Enrichment Specification)	PERCHLORIC ACID, SODIUM SALT (18O4, 90%+) 100 UG/ML IN WATER
Lot Number:	SDDG-013
Catalog Number:	OLM-7310-S

Product Information

Chemical Purity Specification:	≥98%
Labeled CAS Number:	NA
Unlabeled CAS Number:	7601-89-0
MW*:	130.4
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.

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/NCSL 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.

* *For isotopically labeled compounds, MW listed is for the fully enriched product.*

Approved by: T. J. Eckersley

Timothy J. Eckersley, Ph.D., Quality Assurance

Quality Control Tests and Results

QC Release Date	2/27/2014
Expiration Date	2/27/2024
Concentration Based on Gravimetry	102 µg/mL
Chemical Purity of Neat Material(s)	98%
LC/MS for Concentration	109.4 ± 2.8 µg/mL (k=2)



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

00939559

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP2.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
*	657794 CCV@25	Vial 71	1	Control	1	1.90258e6	8.986	26.94929
*	657798 QC@4.0	Vial 72	1	Control	2	3.85542e5	8.884	4.34115
*	657796 ICS@4.0	Vial 73	1	Control	3	2.32261e5	8.623	3.98229
*	657797 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	1915802001	Vial 75	1	Sample	5	0.00000	0.000	0.00000
*	657799 158021S	Vial 76	1	Sample	6	1.46622e5	8.522	4.56740
*	657800 158021D	Vial 77	1	Sample	7	1.54646e5	8.528	4.78474
*	1915803001	Vial 78	1	Sample	8	0.00000	0.000	0.00000
*	1915852001 1K	Vial 79	1	Sample	9	3.32187e5	9.077	4885.02369
*	1916229001 1K	Vial 80	1	Sample	10	4.13979e5	9.091	6820.05588
*	1916231001	Vial 81	1	Sample	11	0.00000	0.000	0.00000
*	1916232001	Vial 82	1	Sample	12	0.00000	0.000	0.00000
*	657801 CCV@25	Vial 71	1	Control	13	1.42334e6	9.028	25.98075

#	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
*	657794 CCV@25	Vial 71	1	Control	1	5.56917e5	9.003	26.60911
*	657798 QC@4.0	Vial 72	1	Control	2	1.22598e5	8.893	4.50107
*	657796 ICS@4.0	Vial 73	1	Control	3	7.62920e4	8.637	4.24932
*	657797 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	1915802001	Vial 75	1	Sample	5	0.00000	0.000	0.00000
*	657799 158021S	Vial 76	1	Sample	6	5.01097e4	8.545	5.09575
*	657800 158021D	Vial 77	1	Sample	7	5.24358e4	8.548	5.30516
*	1915803001	Vial 78	1	Sample	8	0.00000	0.000	0.00000
*	1915852001 1K	Vial 79	1	Sample	9	1.07205e5	9.093	5161.49233
*	1916229001 1K	Vial 80	1	Sample	10	1.30297e5	9.110	7096.69575
*	1916231001	Vial 81	1	Sample	11	0.00000	0.000	0.00000
*	1916232001	Vial 82	1	Sample	12	0.00000	0.000	0.00000
*	657801 CCV@25	Vial 71	1	Control	13	4.26237e5	9.042	26.20612

#	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
*	657794 CCV@25	Vial 71	1	Control	1	2.13798e5	9.004	5.00000
*	657798 QC@4.0	Vial 72	1	Control	2	2.91481e5	8.904	5.00000
*	657796 ICS@4.0	Vial 73	1	Control	3	1.92225e5	8.645	5.00000
*	657797 LMB	Vial 74	1	Control	4	3.01884e5	9.082	5.00000
*	1915802001	Vial 75	1	Sample	5	1.12941e5	8.589	5.00000
*	657799 158021S	Vial 76	1	Sample	6	1.05110e5	8.545	5.00000
*	657800 158021D	Vial 77	1	Sample	7	1.05604e5	8.552	5.00000
*	1915803001	Vial 78	1	Sample	8	1.14182e5	8.546	5.00000
*	1915852001 1K	Vial 79	1	Sample	9	2.21981e5	9.097	5000.00000
*	1916229001 1K	Vial 80	1	Sample	10	1.95450e5	9.116	5000.00000
*	1916231001	Vial 81	1	Sample	11	1.33828e5	8.518	5.00000
*	1916232001	Vial 82	1	Sample	12	1.27034e5	8.502	5.00000
*	657801 CCV@25	Vial 71	1	Control	13	1.66287e5	9.054	5.00000

*** End of Report ***

Sequence Table:

Method and Injection Info Part:

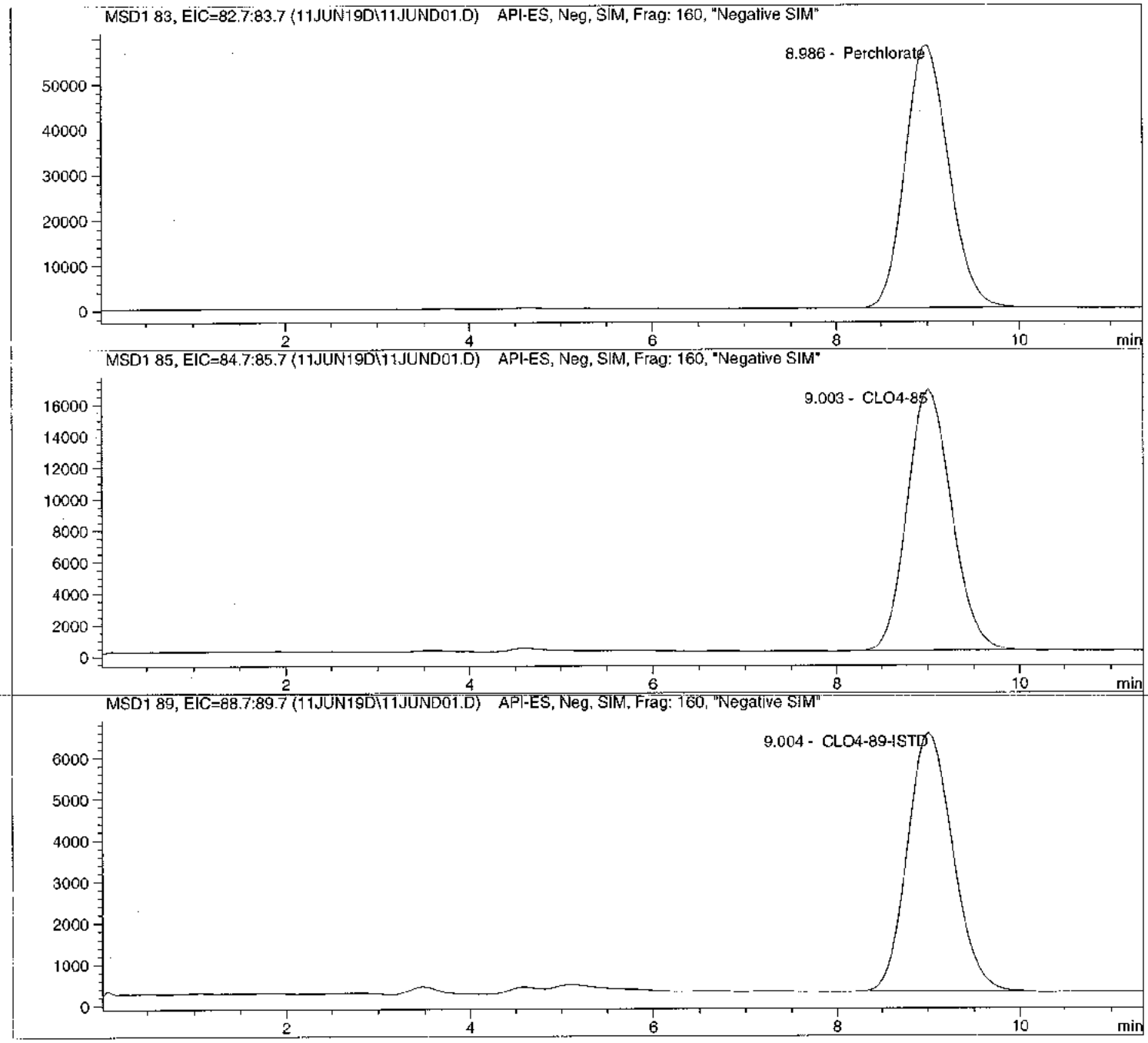
Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	657794 CCV@25	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	657798 QC@4.0	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	657796 ICS@4.0	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	657797 LMB	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	1915802001	CLO4-AQN	1	Sample		
6	Vial 76	657799 158021S	CLO4-AQN	1	Sample		
7	Vial 77	657800 158021D	CLO4-AQN	1	Sample		
8	Vial 78	1915803001	CLO4-AQN	1	Sample		
9	Vial 79	1915852001 1K	CLO4-AQN	1	Sample		
10	Vial 80	1916229001 1K	CLO4-AQN	1	Sample		
11	Vial 81	1916231001	CLO4-AQN	1	Sample		
12	Vial 82	1916232001	CLO4-AQN	1	Sample		
13	Vial 71	657801 CCV@25	CLO4-AQN	1	Ctrl Samp		

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND01.D Sample Name: 657794 CCV@25

Injection Date:	6/11/2019 08:44:35	Seq Line:	1
Sample Name:	657794 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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND01.D Sample Name: 657794 CCV@25

Injection Date:	6/11/2019 08:44:35	Seq Line:	1
Sample Name:	657794 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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.986	PBA	1902575.4	26.9493	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.003	PBA	556916.8	26.6091	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.004	PBA	213798.0	5.0000	CLO4-89-ISTD

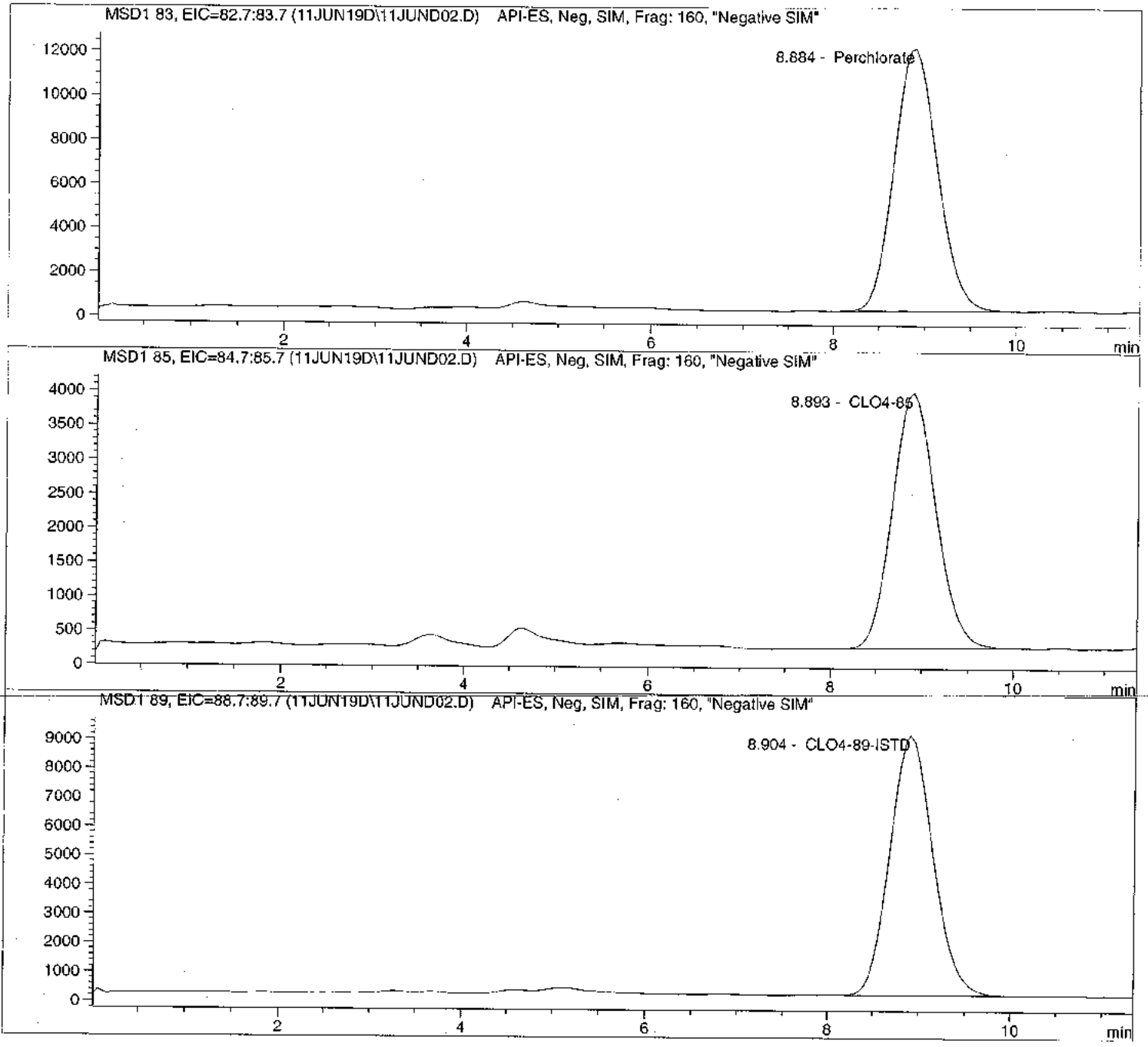
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND02.D Sample Name: 657798 QC@4.0

Injection Date:	6/11/2019 09:04:55	Seq Line:	2
Sample Name:	657798 QC@4.0	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND02.D Sample Name: 657798 QC@4.0

Injection Date:	6/11/2019 09:04:55	Seq Line:	2
Sample Name:	657798 QC@4.0	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.884	PBA	385541.7	4.3412	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.893	BBA	122598.4	4.5011	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.904	BBA	291480.6	5.0000	CLO4-89-ISTD

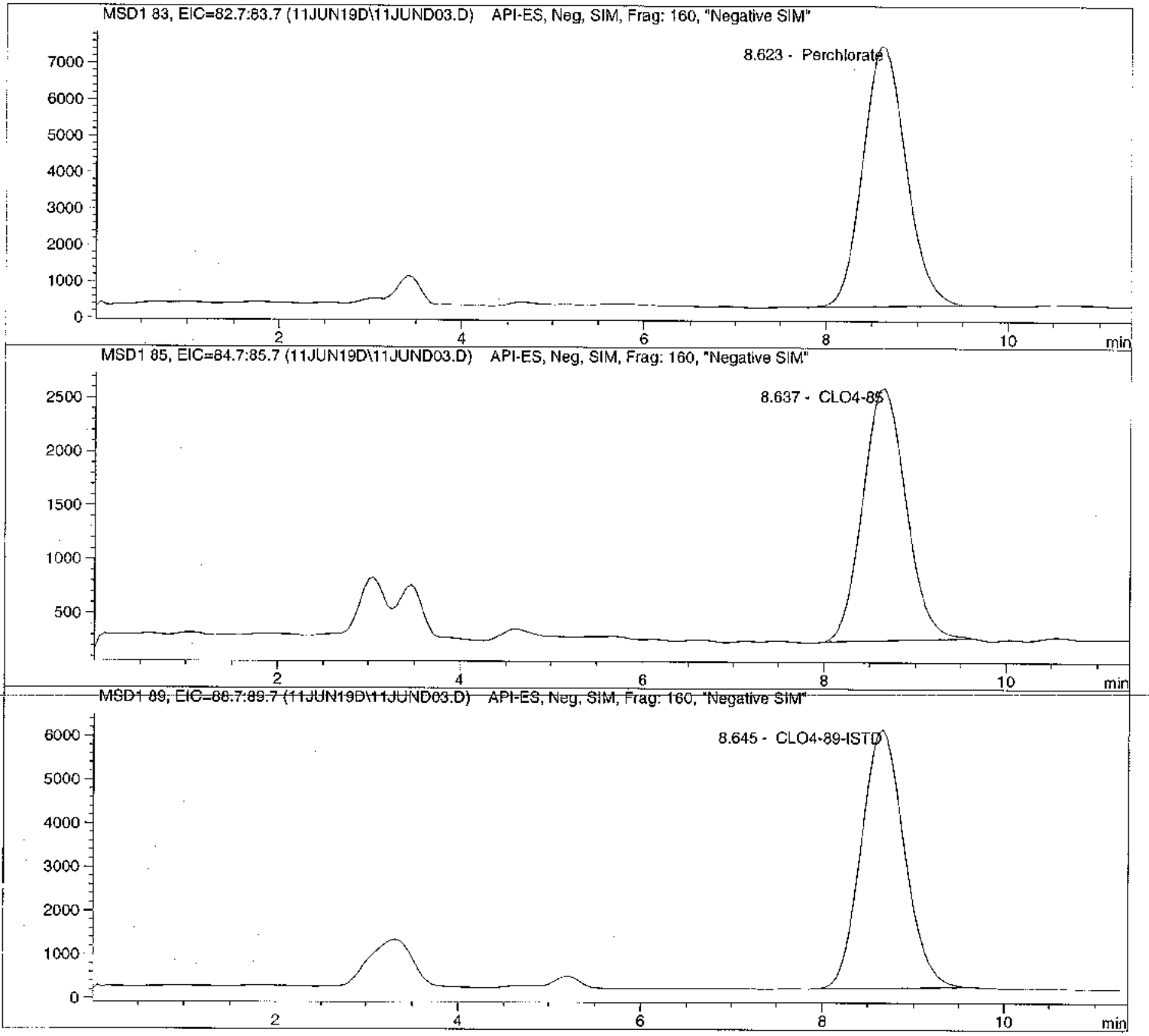
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND03.D Sample Name: 657796 ICS@4.0

Injection Date:	6/11/2019 09:18:21	Seq Line:	3
Sample Name:	657796 ICS@4.0	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND03.D Sample Name: 657796 ICS@4.0

Injection Date:	6/11/2019 09:18:21	Seq Line:	3
Sample Name:	657796 ICS@4.0	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.623	PBA	232261.2	3.9823	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.637	PBA	76292.0	4.2493	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.645	PBA	192224.9	5.0000	CLO4-89-ISTD

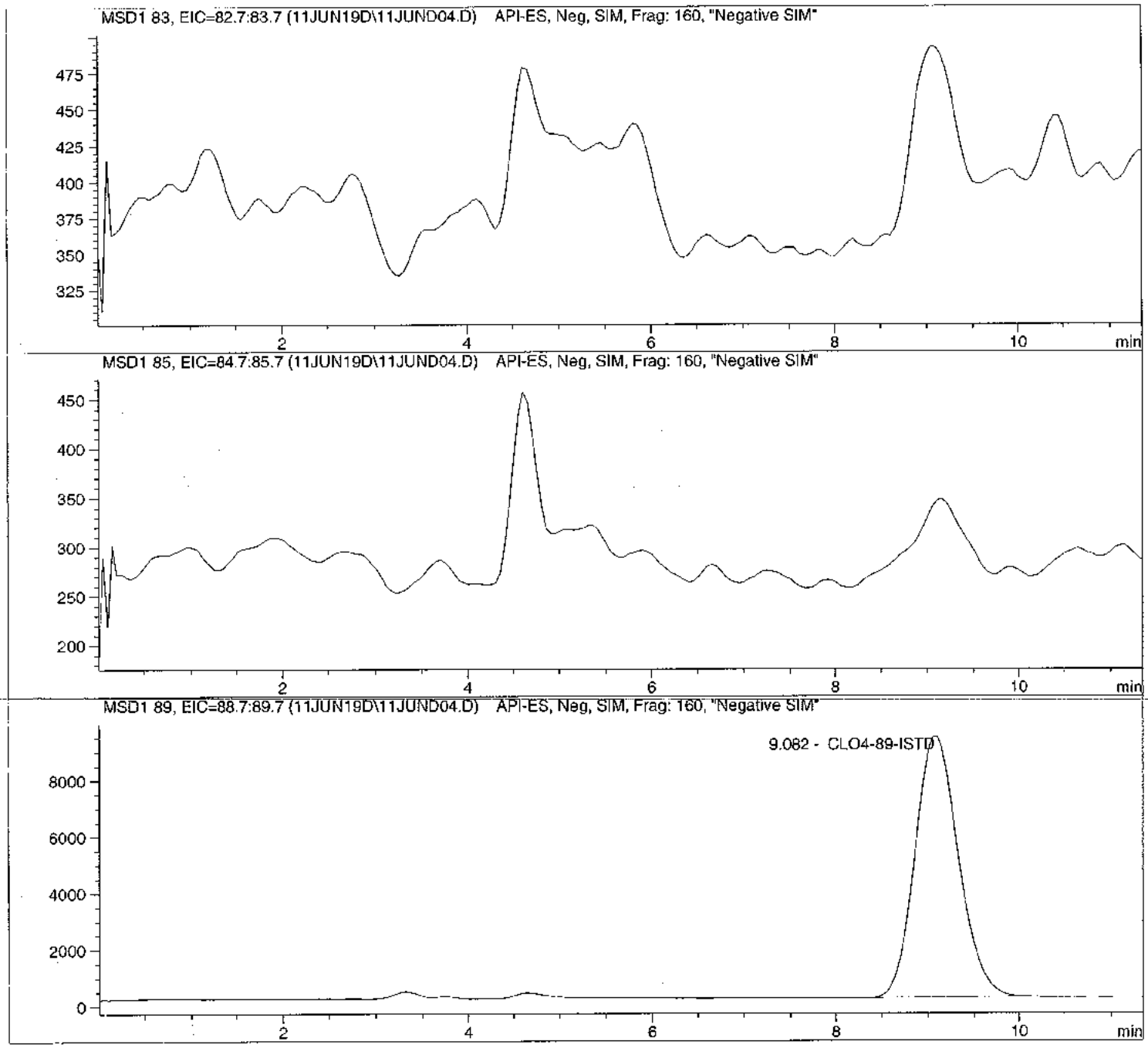
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND04.D Sample Name: 657797 LMB

Injection Date:	6/11/2019 09:31:47	Seq Line:	4
Sample Name:	657797 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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND04.D Sample Name: 657797 LMB

Injection Date:	6/11/2019 09:31:47	Seq Line:	4
Sample Name:	657797 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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
9.082	PBA	301883.5	5.0000	CLO4-89-ISTD

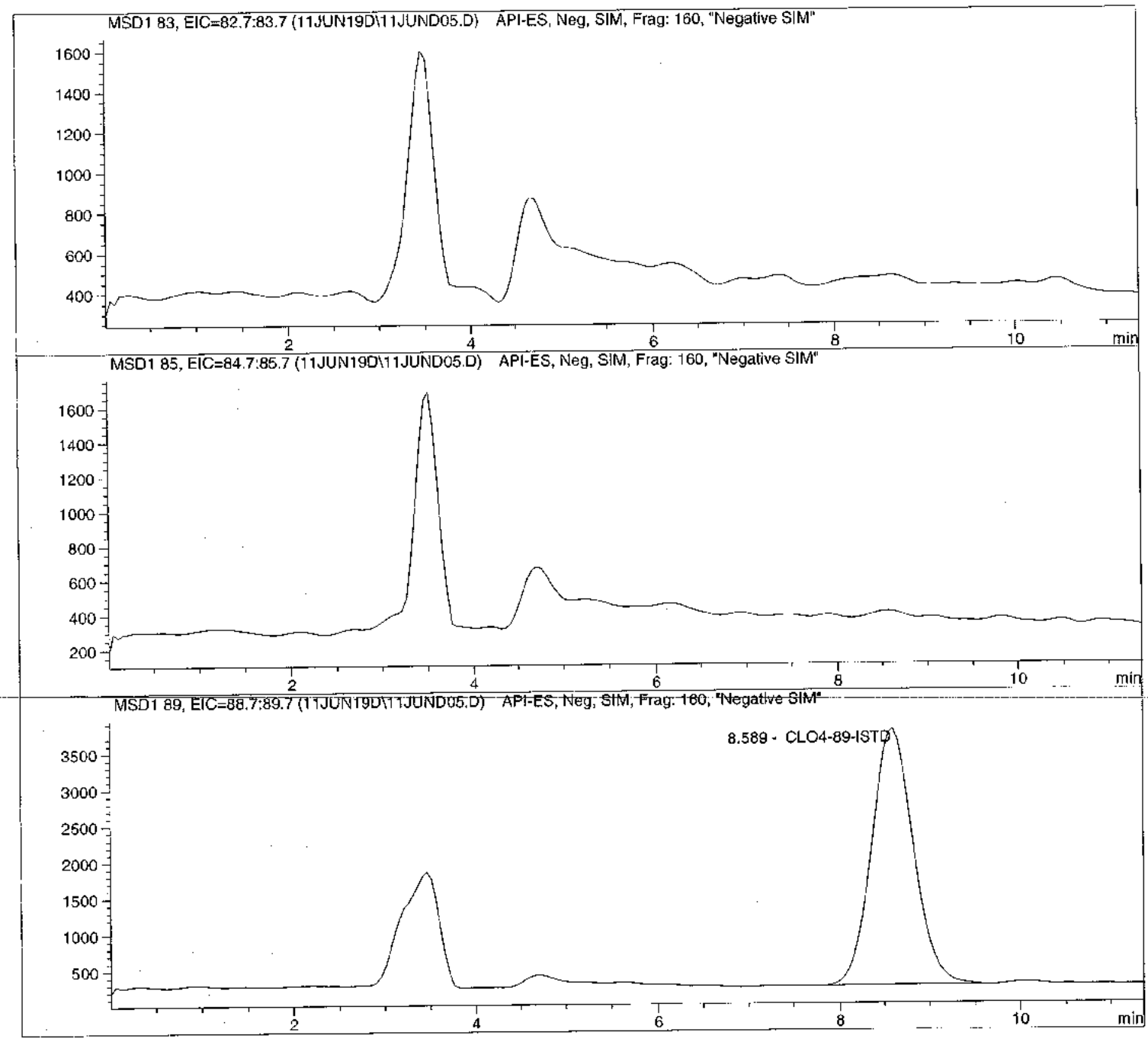
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND05.D Sample Name: 1915802001

Injection Date:	6/11/2019 09:45:13	Seq Line:	5
Sample Name:	1915802001	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND05.D Sample Name: 1915802001

Injection Date:	6/11/2019 09:45:13	Seq Line:	5
Sample Name:	1915802001	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Fri, 12. Apr. 2019,07:52:58 am
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
8.589	PBA	112941.5	5.0000	CLO4-89-ISTD

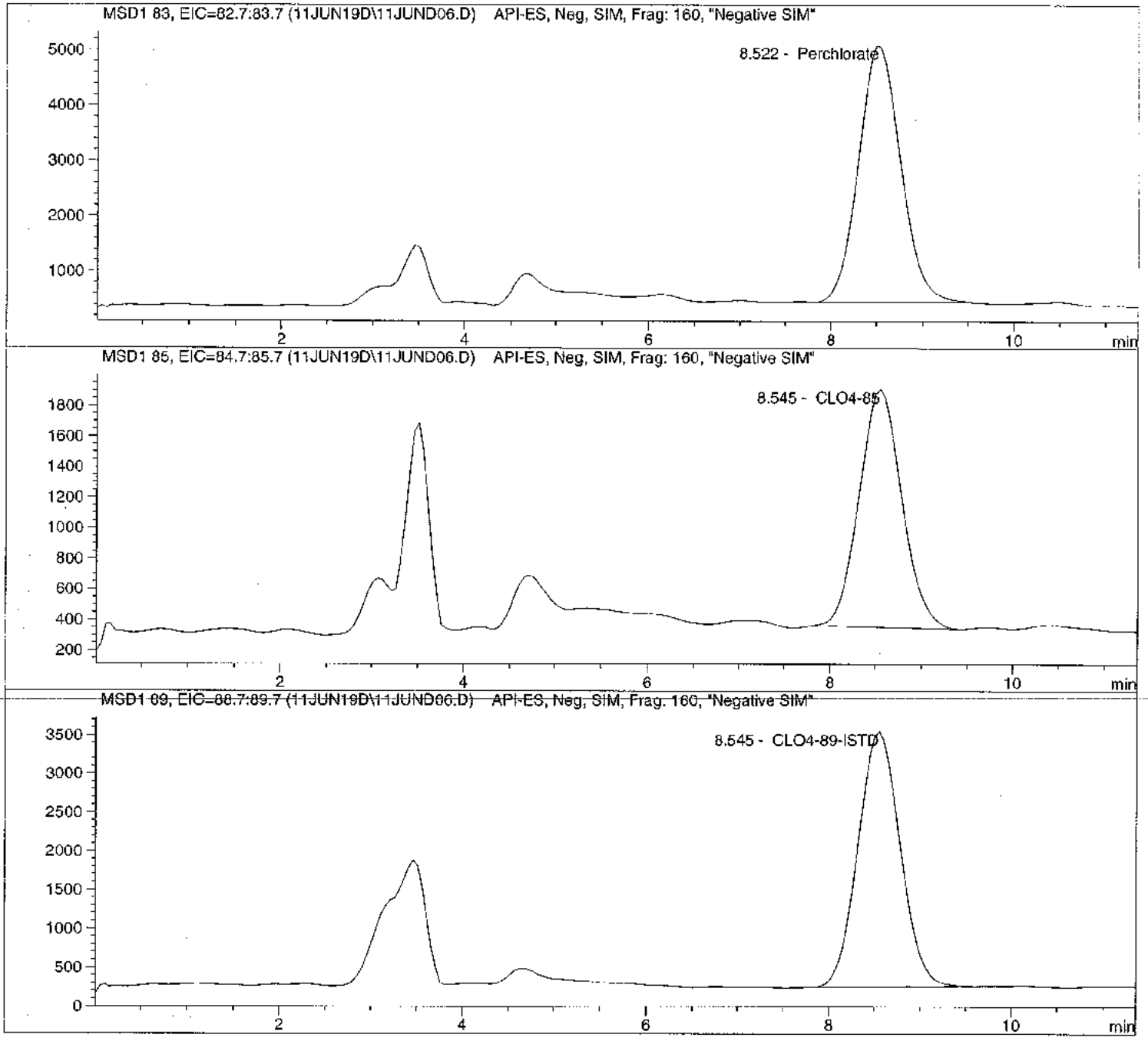
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND06.D Sample Name: 657799 158021S

Injection Date:	6/11/2019 09:58:38	Seq Line:	6
Sample Name:	657799 158021S	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND06.D Sample Name: 657799 158021S

Injection Date:	6/11/2019 09:58:38	Seq Line:	6
Sample Name:	657799 158021S	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.522	BBA	146622.1	4.5674	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.545	PBA	50109.7	5.0958	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.545	PBA	105110.4	5.0000	CLO4-89-ISTD

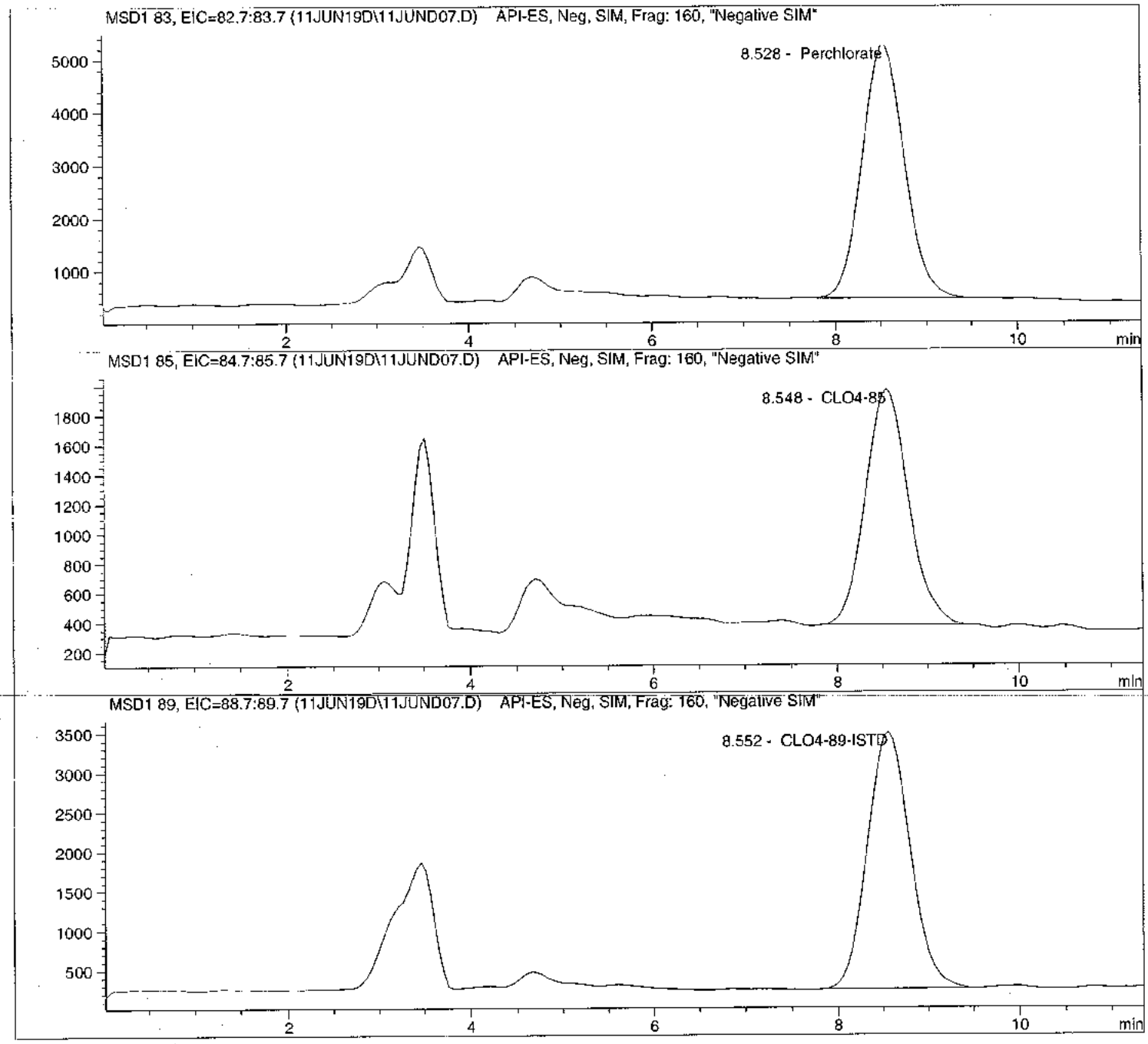
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND07.D Sample Name: 657800 158021D

Injection Date:	6/11/2019 10:12:09	Seq Line:	7
Sample Name:	657800 158021D	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Injection Date:	6/11/2019 10:12:09	Seq Line:	7
Sample Name:	657800 158021D	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-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.528	BBA	154645.8	4.7847	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.548	PBA	52435.8	5.3052	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.552	PBA	105604.1	5.0000	CLO4-89-ISTD

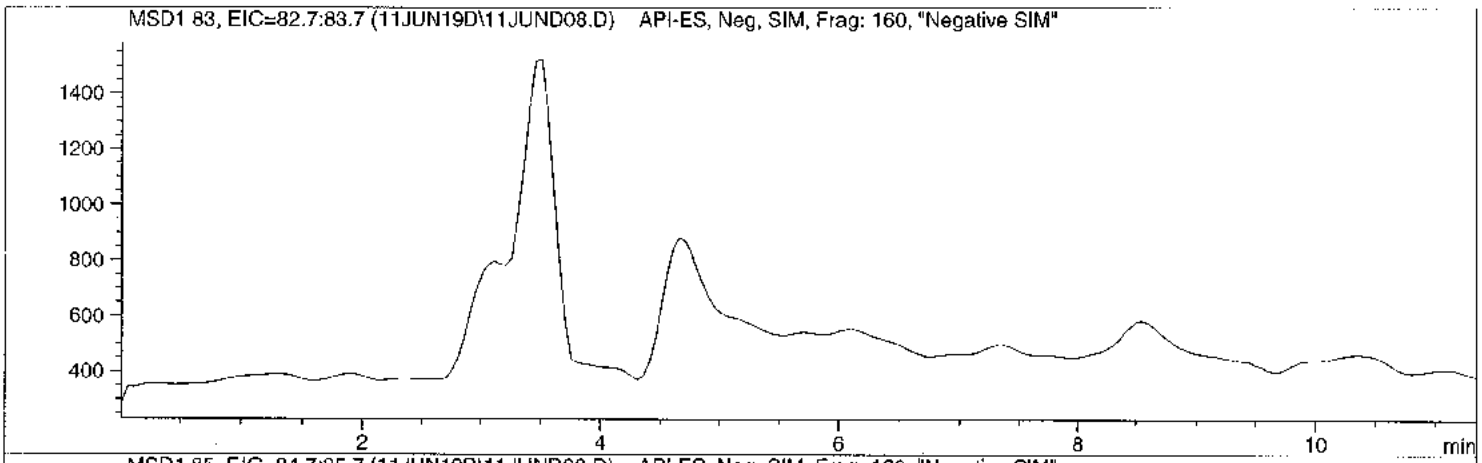
*** End of Report ***

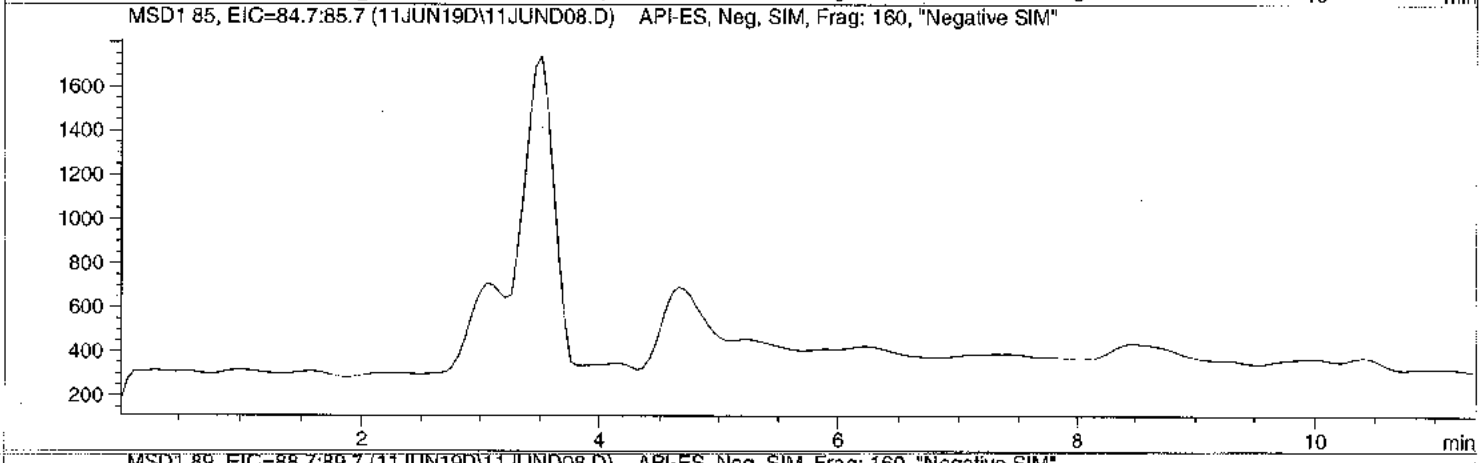
Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND08.D Sample Name: 1915803001

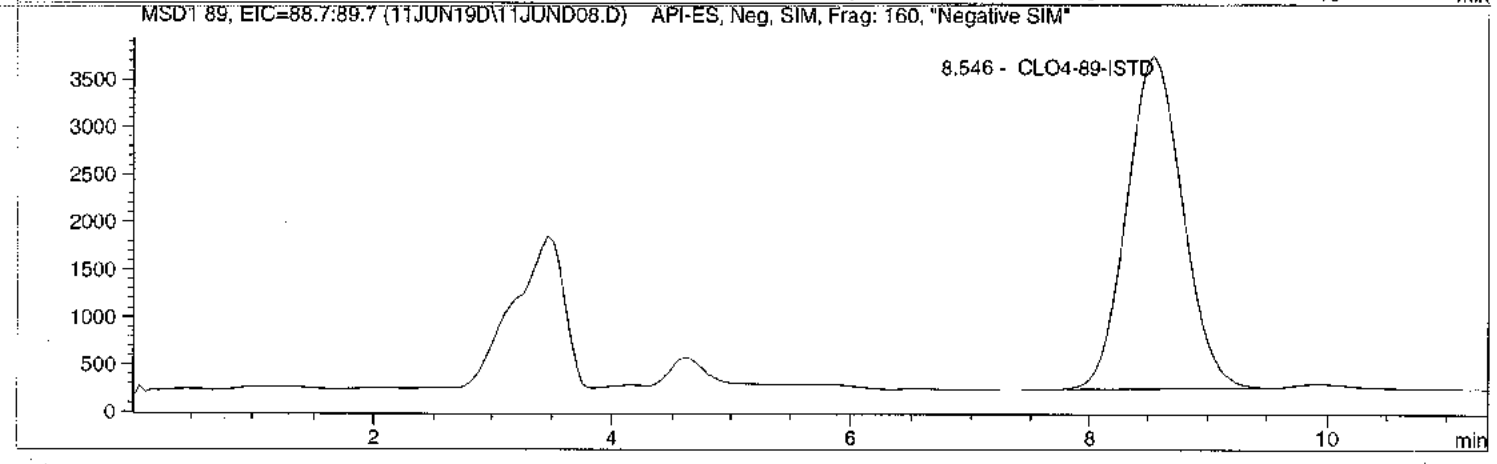
Injection Date:	6/11/2019 10:25:32	Seq Line:	8
Sample Name:	1915803001	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND08.D Sample Name: 1915803001

Injection Date:	6/11/2019 10:25:32	Seq Line:	8
Sample Name:	1915803001	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.546	BBA	114182.4	5.0000	CLO4-89-ISTD

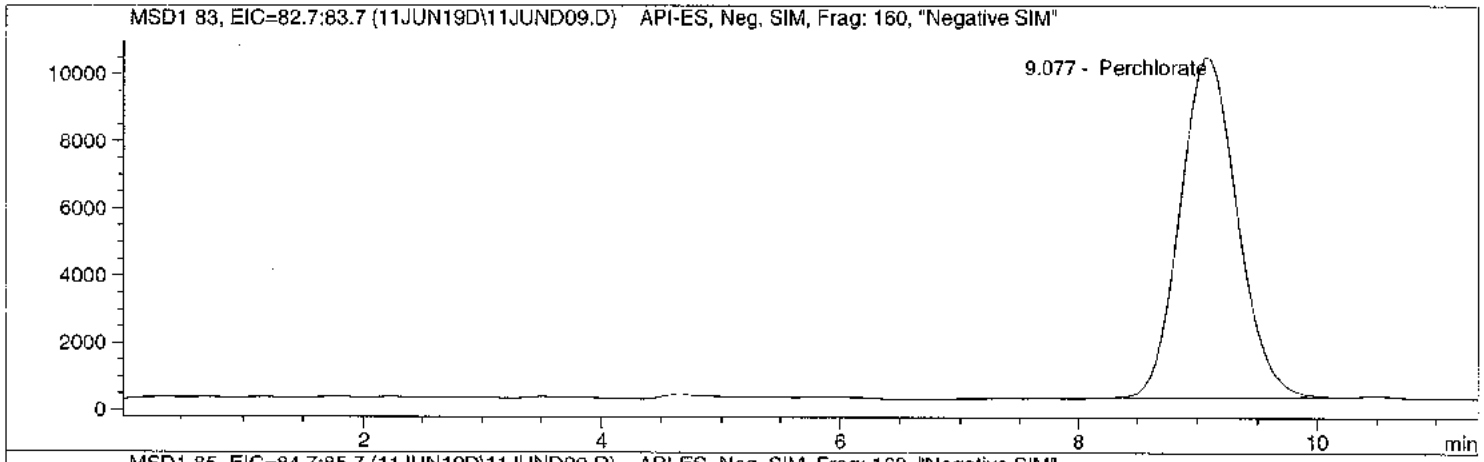
*** End of Report ***

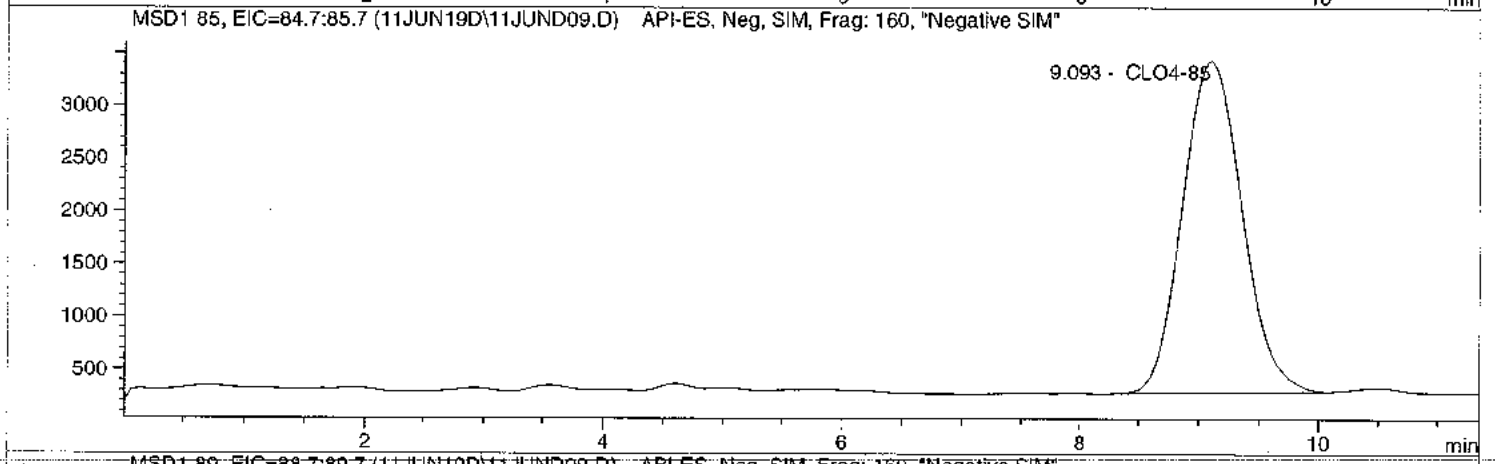
Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND09.D Sample Name: 1915852001 1K

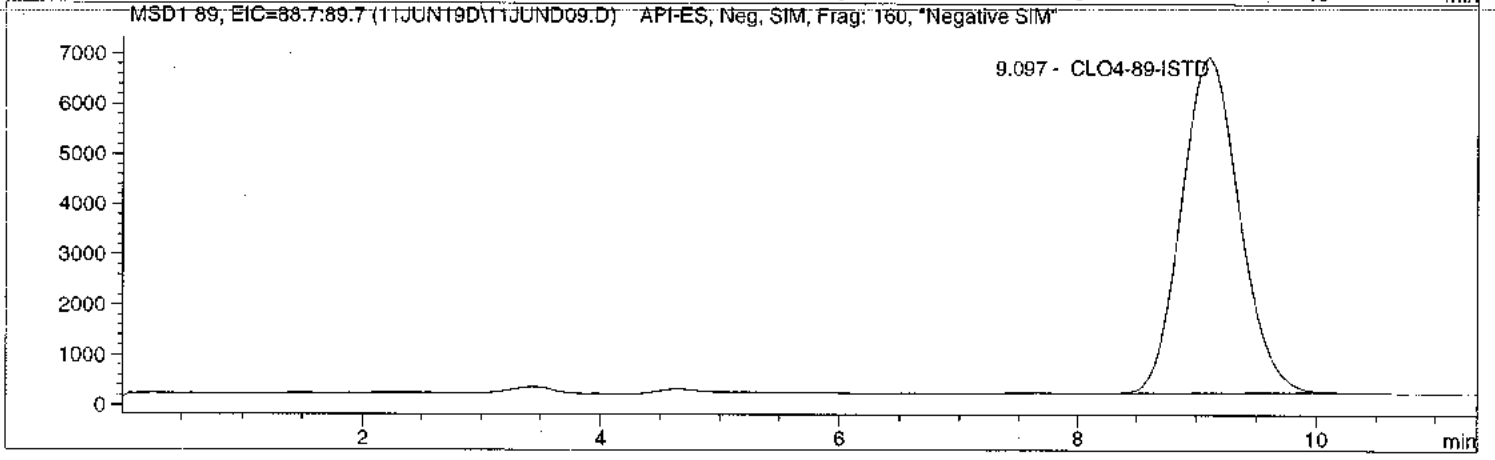
Injection Date:	6/11/2019 10:38:54	Seq Line:	9
Sample Name:	1915852001 1K	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND09.D Sample Name: 1915852001 1K

Injection Date:	6/11/2019 10:38:54	Seq Line:	9
Sample Name:	1915852001 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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Fri, 12. Apr. 2019,07:52:58 am
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
9.077	BBA	332187.1	4885.0237	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.093	PBA	107205.2	5161.4923	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.097	PBA	221981.4	5000.0000	CLO4-89-ISTD

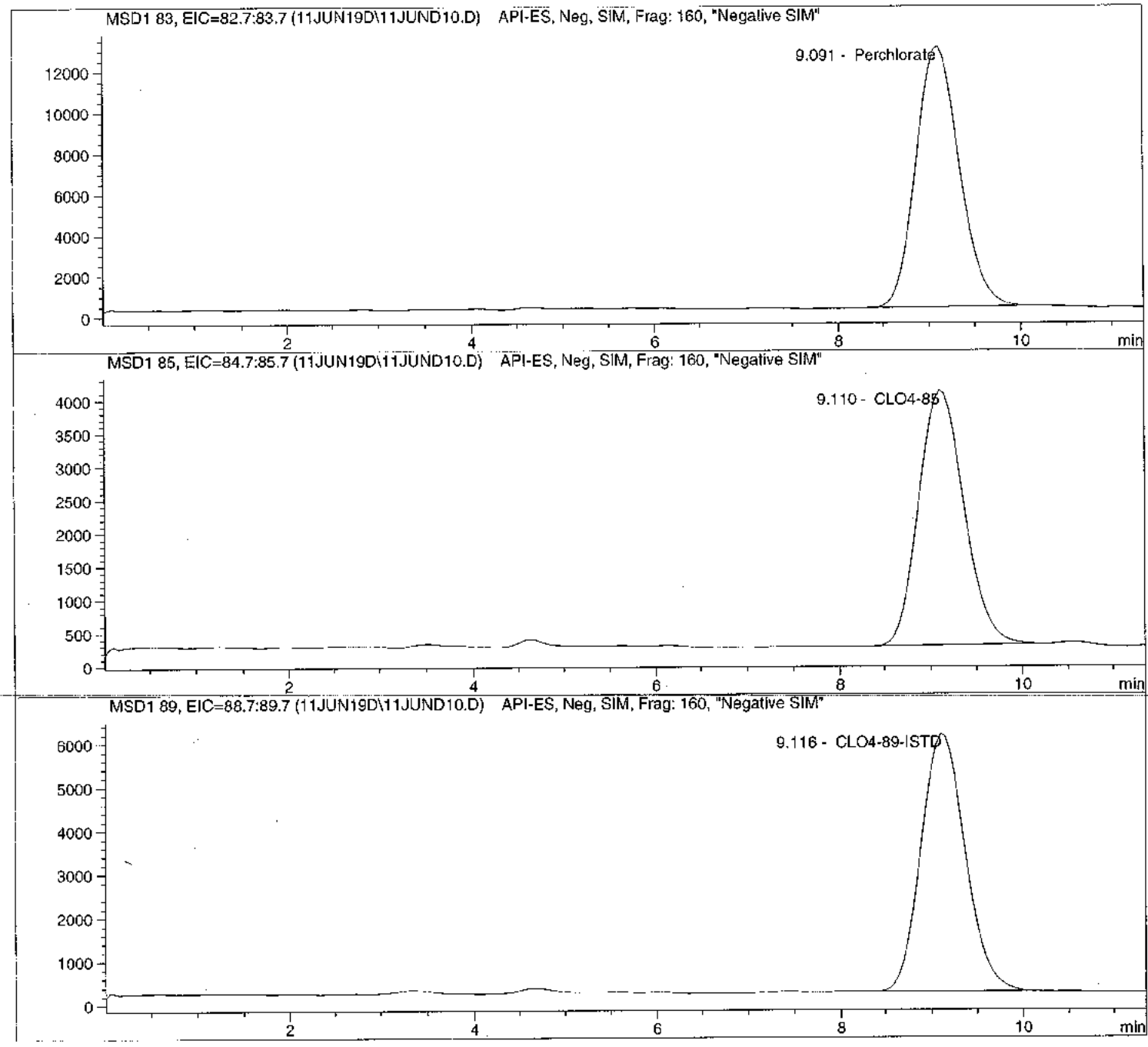
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND10.D Sample Name: 1916229001 1K

Injection Date:	6/11/2019 10:52:22	Seq Line:	10
Sample Name:	1916229001 1K	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND10.D Sample Name: 1916229001 1K

Injection Date:	6/11/2019 10:52:22	Seq Line:	10
Sample Name:	1916229001 1K	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
9.091	BBA	413978.8	6820.0559	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.110	PBA	130297.0	7096.6957	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.116	BBA	195449.6	5000.0000	CLO4-89-ISTD

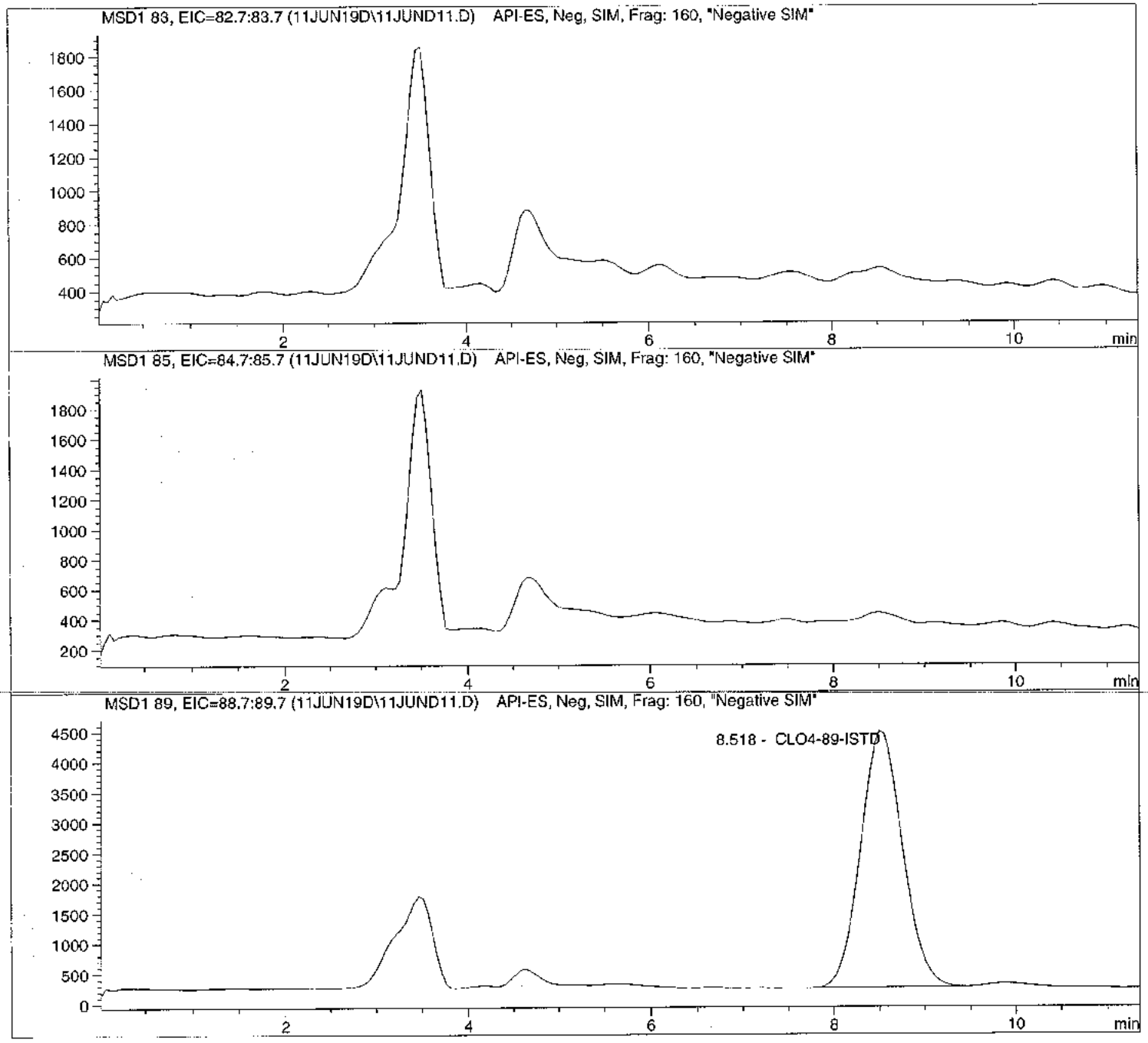
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND11.D Sample Name: 1916231001

Injection Date:	6/11/2019 11:05:44	Seq Line:	11
Sample Name:	1916231001	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND11.D Sample Name: 1916231001

Injection Date:	6/11/2019 11:05:44	Seq Line:	11
Sample Name:	1916231001	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.518	PBA	133827.9	5.0000	CLO4-89-ISTD

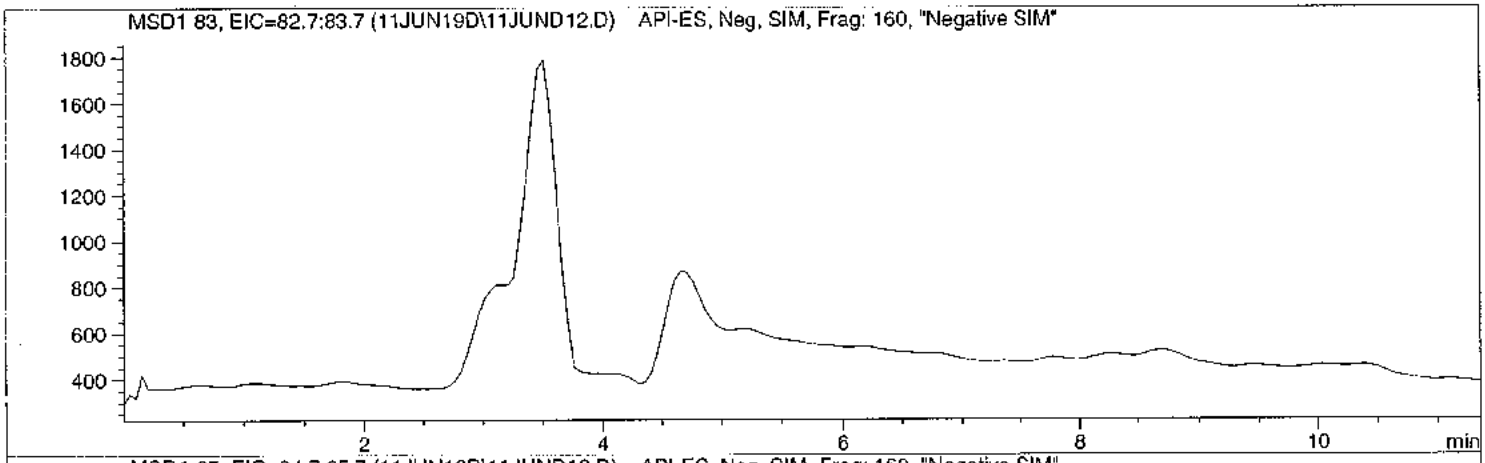
*** End of Report ***

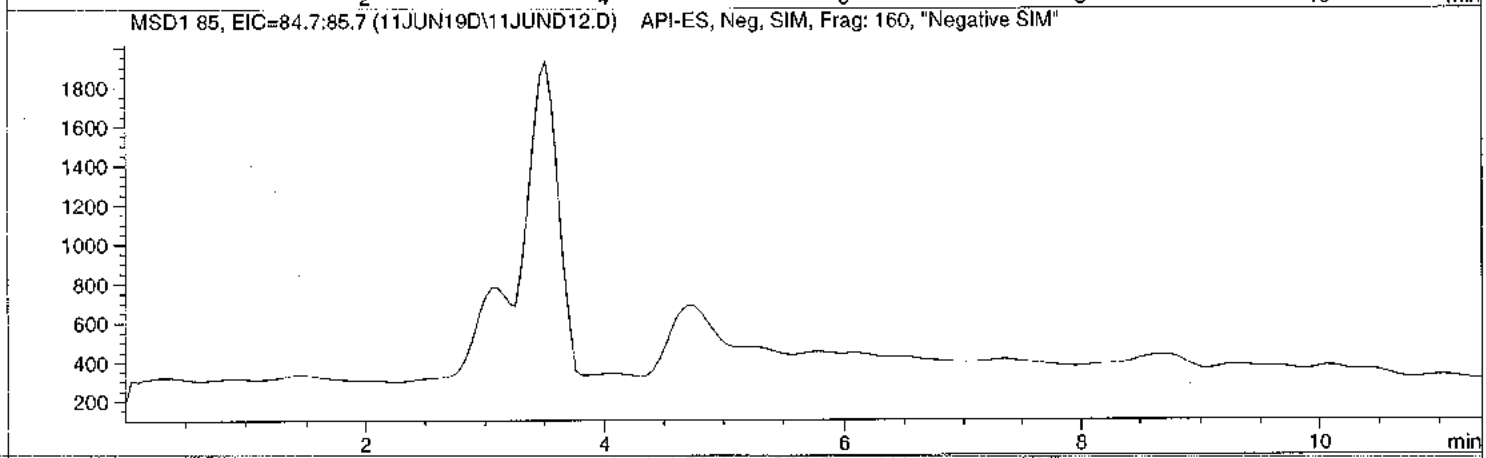
Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND12.D Sample Name: 1916232001

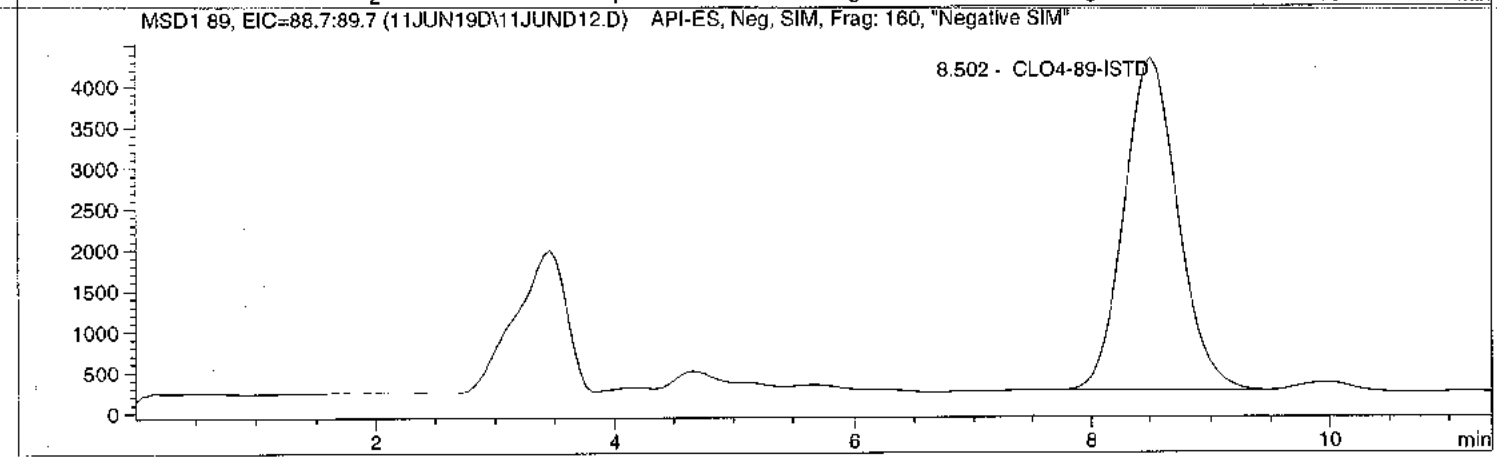
Injection Date:	6/11/2019 11:19:06	Seq Line:	12
Sample Name:	1916232001	Location:	Vial 82
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND12.D Sample Name: 1916232001

Injection Date:	6/11/2019 11:19:06	Seq Line:	12
Sample Name:	1916232001	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-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.502	BBA	127033.7	5.0000	CLO4-89-ISTD

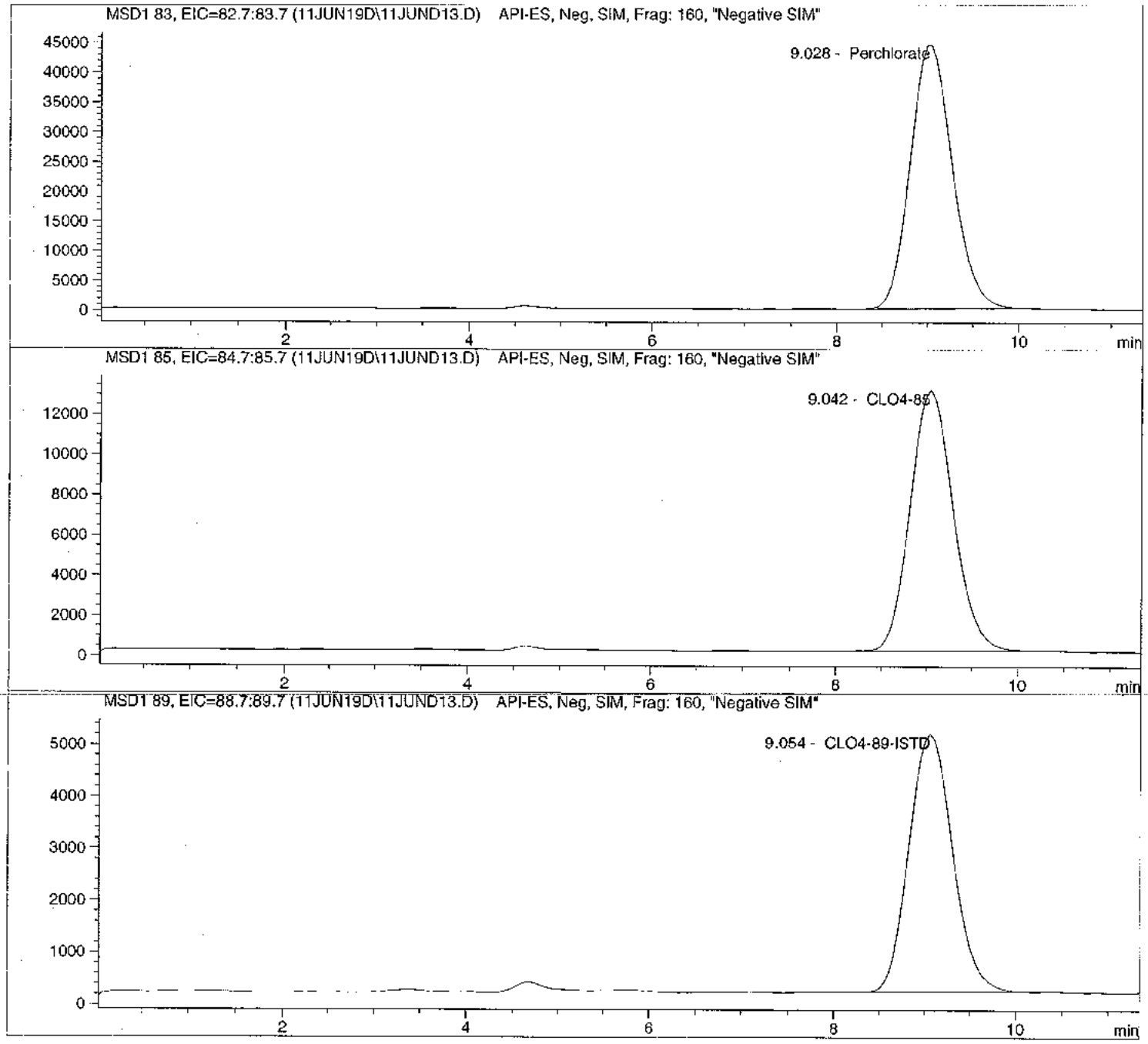
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND13.D Sample Name: 657801 CCV@25

Injection Date:	6/11/2019 11:34:17	Seq Line:	13
Sample Name:	657801 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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND13.D Sample Name: 657801 CCV@25

Injection Date:	6/11/2019 11:34:17	Seq Line:	13
Sample Name:	657801 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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
9.028	PBA	1423337.3	25.9807	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.042	BBA	426236.8	26.2061	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.054	BBA	166286.8	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 : 3/19/2019 2:35:19 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
8.744	1	1	1.00000	7.76074e4	1.28854e-5		1	Perchlorate
		2	2.00000	1.35273e5	1.47849e-5			
		3	5.00000	3.37764e5	1.48033e-5			
		4	10.00000	6.83454e5	1.46316e-5			
		5	25.00000	2.08433e6	1.19943e-5			
		6	50.00000	4.13334e6	1.20968e-5			
		7	75.00000	5.99313e6	1.25143e-5			
8.755	2	1	1.00000	2.36780e4	4.22333e-5		1	CLO4-85
		2	2.00000	4.69486e4	4.25998e-5			
		3	5.00000	1.06124e5	4.71147e-5			
		4	10.00000	2.13523e5	4.68335e-5			
		5	25.00000	6.14295e5	4.06971e-5			
		6	50.00000	1.19814e6	4.17315e-5			
		7	75.00000	1.78355e6	4.20509e-5			
8.766	3	1	5.00000	2.73208e5	1.83011e-5	+I1		CLO4-89-ISTD
		2	5.00000	2.24886e5	2.22335e-5			
		3	5.00000	2.33196e5	2.14412e-5			
		4	5.00000	2.34454e5	2.13262e-5			
		5	5.00000	2.50568e5	1.99547e-5			
		6	5.00000	2.30977e5	2.16472e-5			

RetTime [min]	Sig	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
		7	5.00000	2.21504e5	2.25729e-5			

More compound-specific settings:

Compound: Perchlorate
- Time Window : From 6.654 min To 12.544 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 0.5
  - Level 3 : 0.2
  - Level 4 : 0.1
  - Level 5 : 0.04
  - Level 6 : 0.02
  - Level 7 : 0.013333

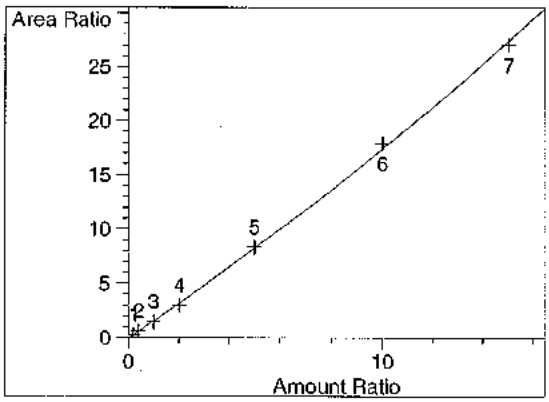
Compound: CLO4-85
- Time Window : From 6.650 min To 12.505 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 0.5
  - Level 3 : 0.2
  - Level 4 : 0.1
  - Level 5 : 0.04
  - Level 6 : 0.02
  - Level 7 : 0.013333

Compound: CLO4-89-ISTD
- Time Window : From 6.659 min To 12.466 min
- Curve Type : Linear
- Origin : Included
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 1
  - Level 3 : 1
  - Level 4 : 1
  - Level 5 : 1
  - Level 6 : 1
  - Level 7 : 1

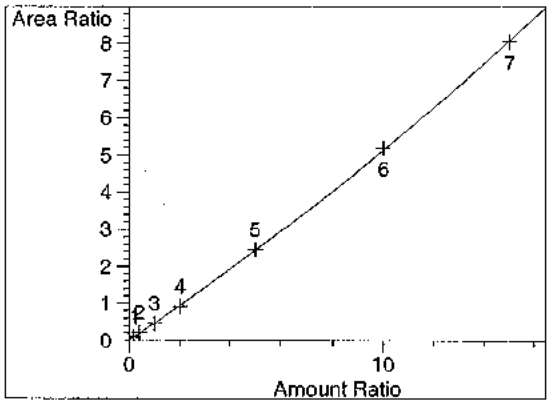
Peak Sum Table

No Entries in table

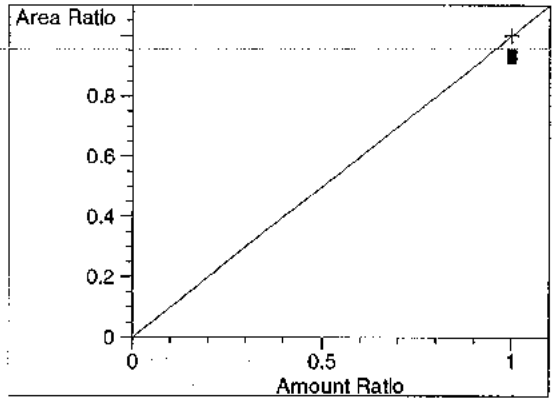
Calibration Curves



Perchlorate at exp. RT: 8.744
MSD1 83, EIC=82.7:83.7
Correlation: 0.99957
Residual Std. Dev.: 0.30744
Formula: $y = ax^2 + bx + c$
a: 1.76988e-2
b: 1.56480
c: -4.92430e-2
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.5
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.013333



CLO4-85 at exp. RT: 8.755
MSD1 85, EIC=84.7:85.7
Correlation: 0.99983
Residual Std. Dev.: 0.03473
Formula: $y = ax^2 + bx + c$
a: 5.13396e-3
b: 4.62055e-1
c: 4.97209e-4
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.5
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.013333



CLO4-89-ISTD at exp. RT: 8.766
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 1 : 1
Level 2 : 1
Level 3 : 1
Level 4 : 1
Level 5 : 1
Level 6 : 1
Level 7 : 1

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP2.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	7.76074e4	8.744	1.06245
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	1.35273e5	8.992	2.06969
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	3.37764e5	8.586	4.73474
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	6.83454e5	8.698	9.27727
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.08433e6	8.451	25.29036
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	4.13334e6	8.810	51.36844
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	5.99313e6	8.586	74.16754
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	7.34719e5	8.702	9.25940

#	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.36780e4	8.755	9.30535e-1
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	4.69486e4	9.012	2.24255
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	1.06124e5	8.602	4.86656
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.13523e5	8.713	9.64312
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	6.14295e5	8.468	25.12159
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	1.19814e6	8.825	50.46721
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	1.78355e6	8.603	74.72019
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.27495e5	8.721	9.54024

#	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	2.73208e5	8.766	5.00000
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	2.24886e5	9.012	5.00000
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	2.33196e5	8.609	5.00000
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.34454e5	8.716	5.00000
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.50568e5	8.472	5.00000
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	2.30977e5	8.825	5.00000
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	2.21504e5	8.610	5.00000
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.52544e5	8.725	5.00000

*** End of Report ***

Sequence Table:

Method and Injection Info Part:

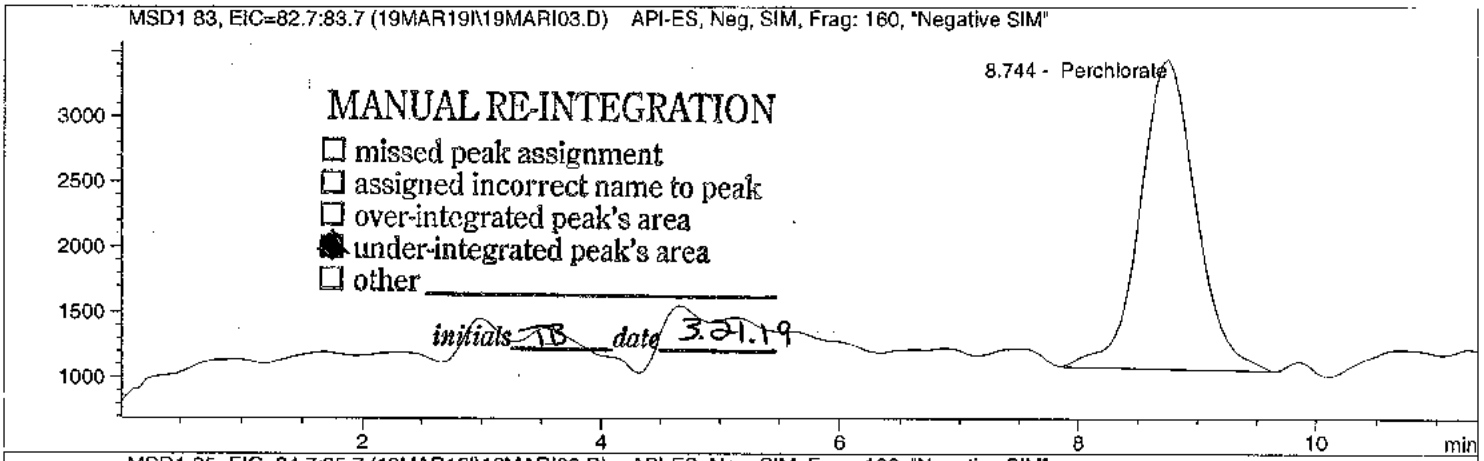
Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	CLO4@ 0.2ug/L	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	CLO4@ 0.5ug/L	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	CLO4@ 1.0ug/L	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	CLO4@ 2.0ug/L	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	CLO4@ 5.0ug/L	CLO4-AQN	1	Ctrl Samp		
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 80	ICAL Verf@10ug/L	CLO4-AQN	1	Ctrl Samp		

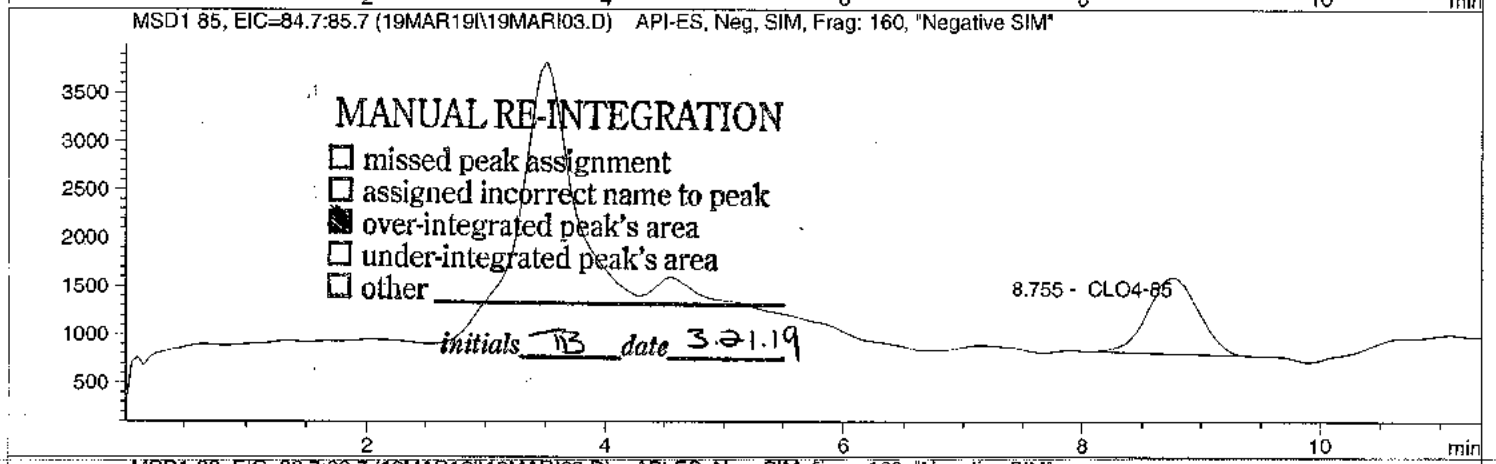
Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

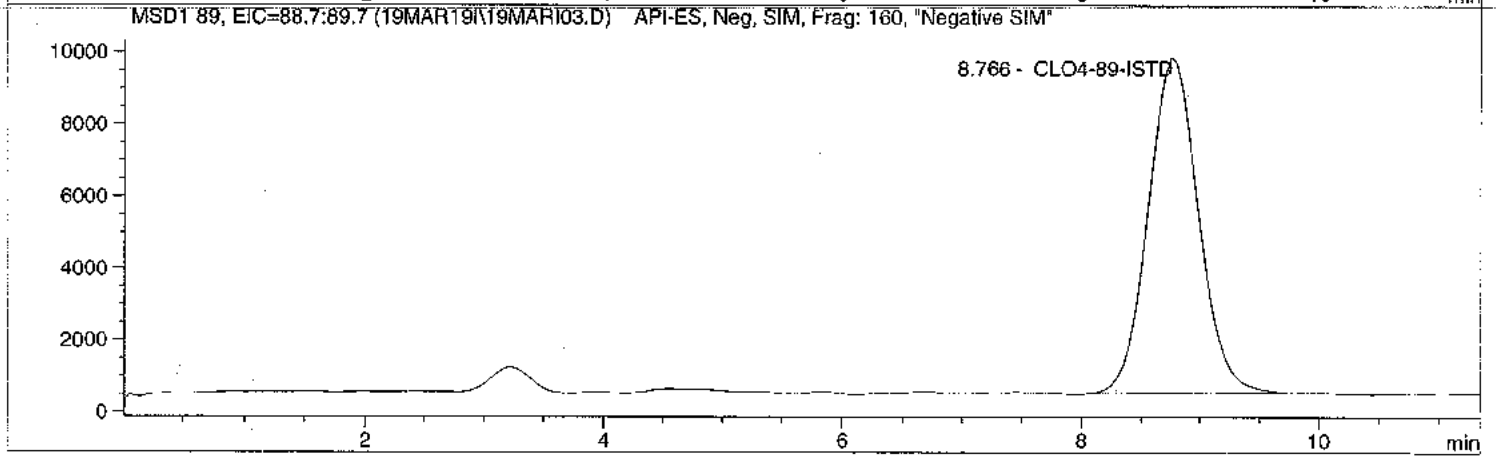
Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 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
8.744	MM	77607.4	1.0625	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	MM	23678.0	0.9305	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

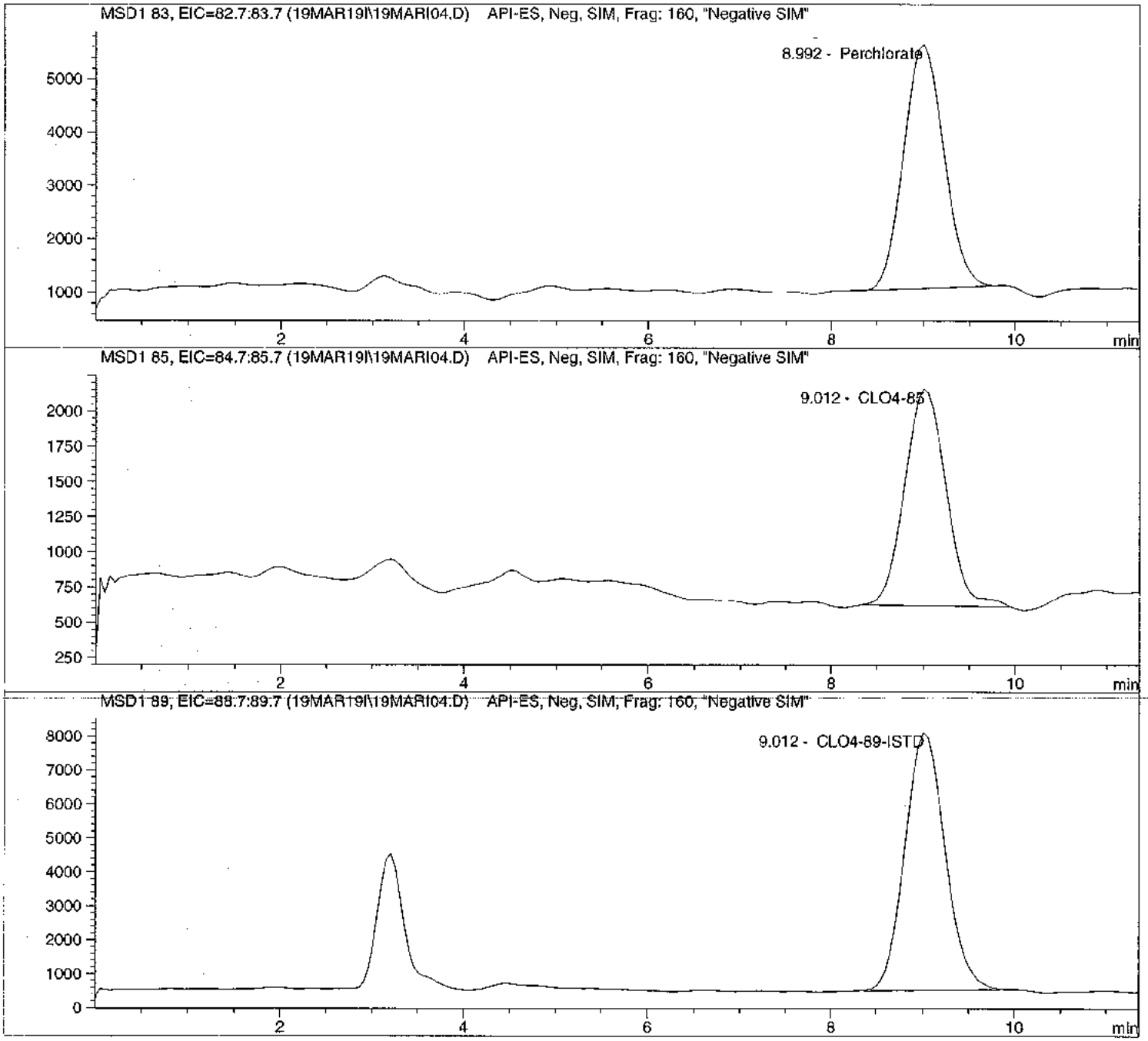
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	3/19/2019 09:53:00	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	3/19/2019 09:53:00	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 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
8.992	BBA	135272.8	2.0697	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	46948.6	2.2425	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	224885.9	5.0000	CLO4-89-ISTD

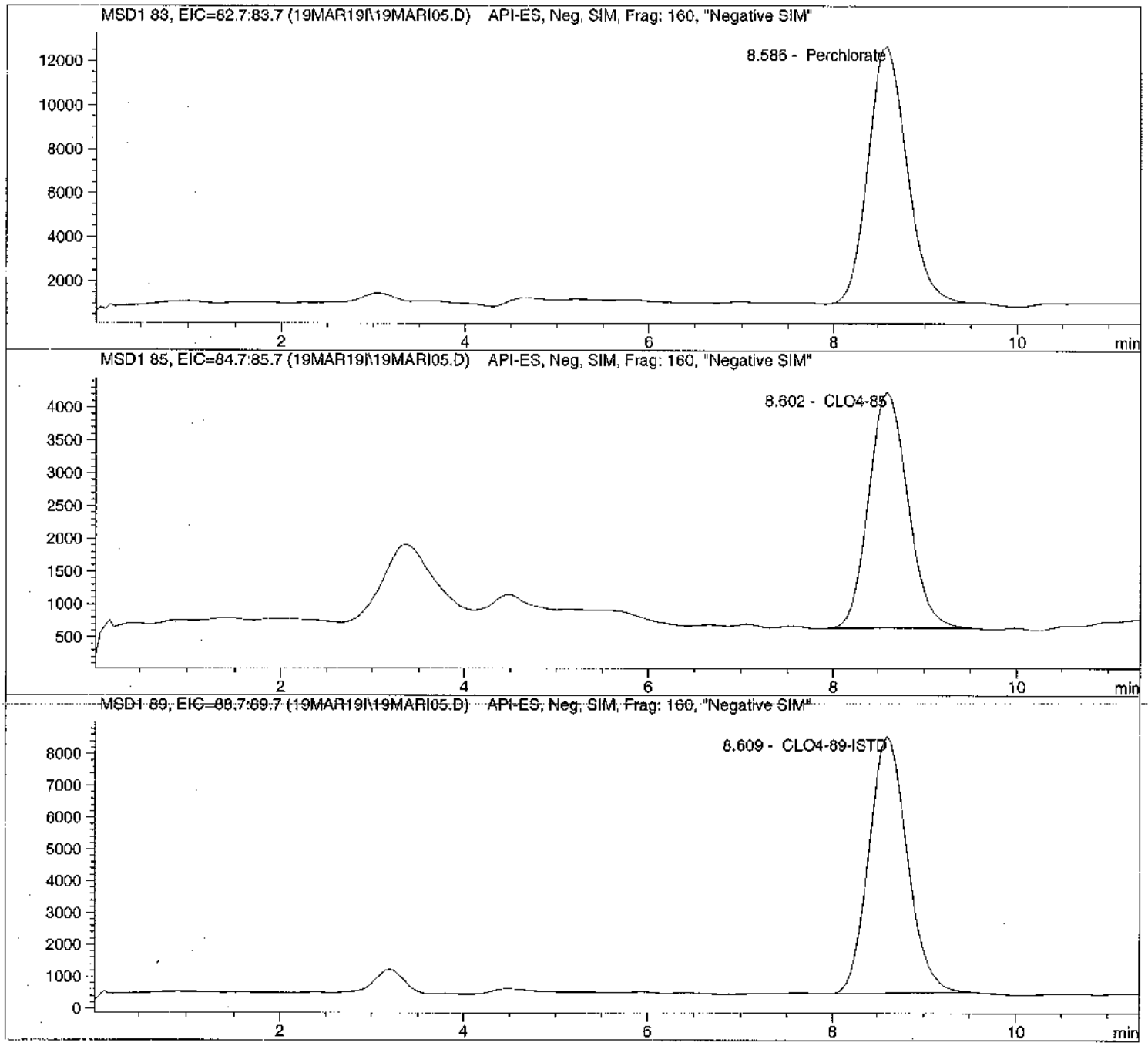
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	3/19/2019 10:06:16	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	3/19/2019 10:06:16	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 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
8.586	PBA	337763.6	4.7347	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.602	PBA	106124.0	4.8666	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.609	PBA	233196.3	5.0000	CLO4-89-ISTD

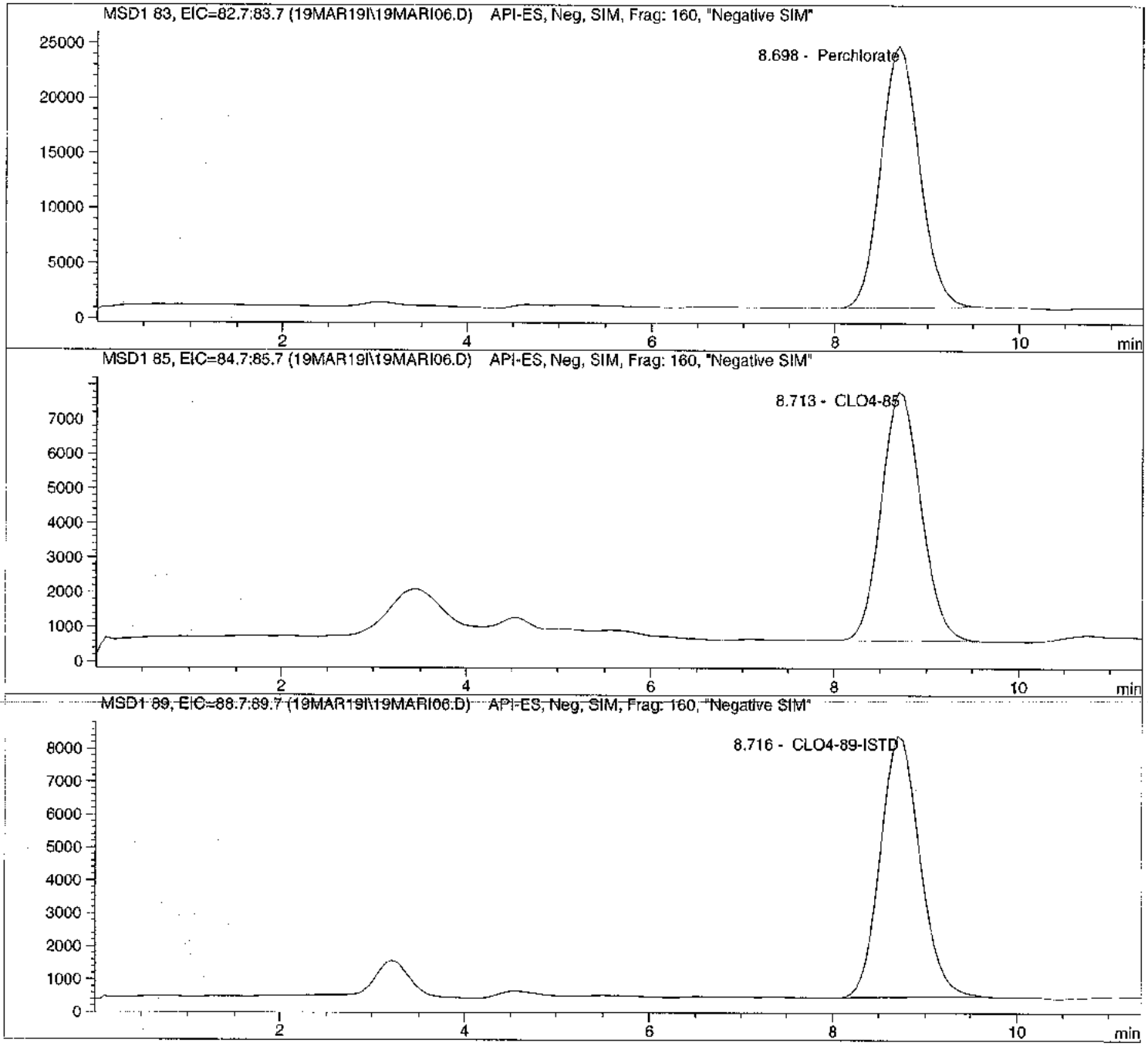
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	3/19/2019 10:19:32	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	3/19/2019 10:19:32	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 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
8.698	PBA	683454.4	9.2773	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.713	BBA	213522.6	9.6431	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.716	PBA	234453.6	5.0000	CLO4-89-ISTD

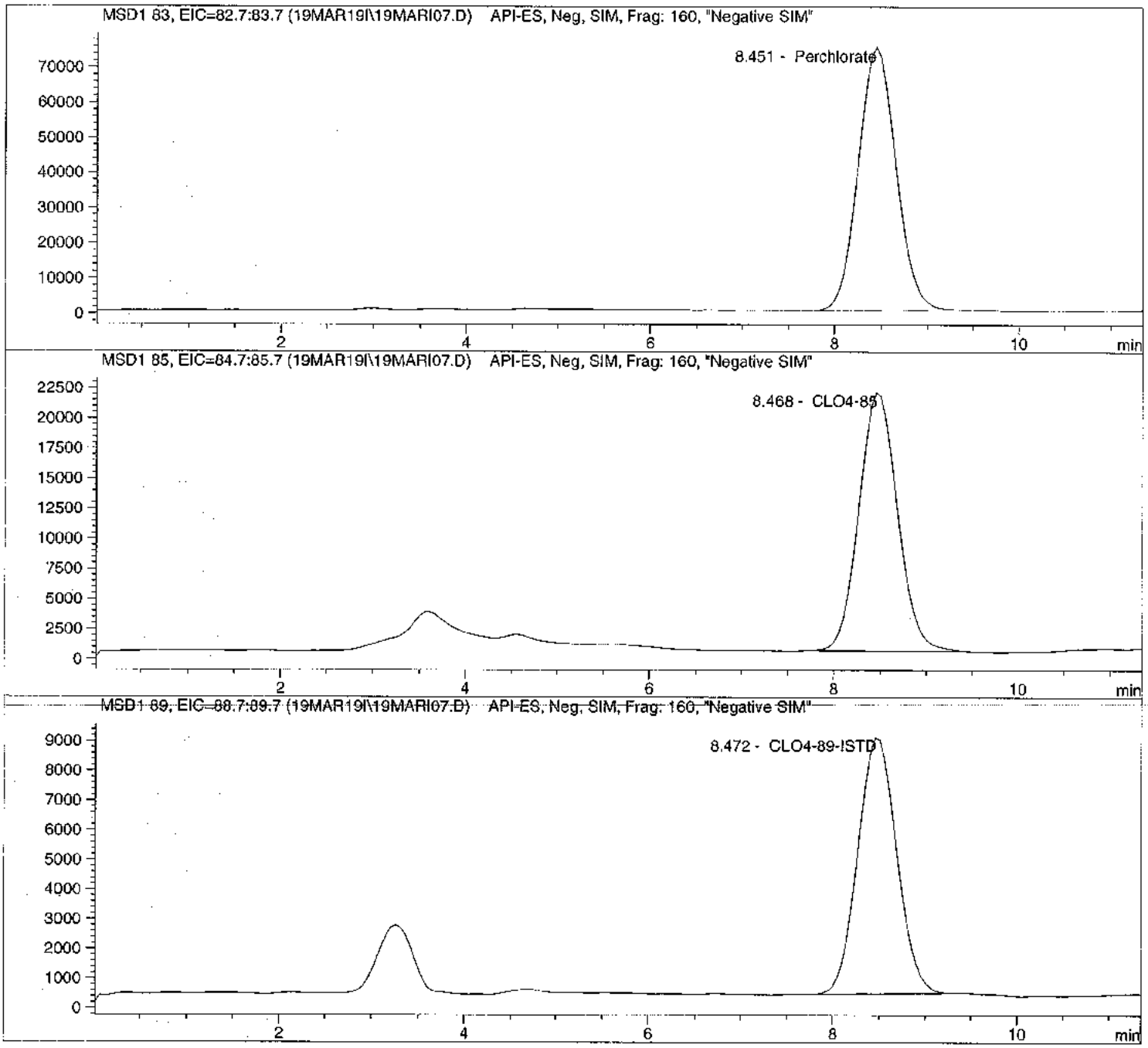
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	3/19/2019 10:32:49	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	3/19/2019 10:32:49	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 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
8.451	PBA	2084327.4	25.2904	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.468	BBA	614294.8	25.1216	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.472	BBA	250568.0	5.0000	CLO4-89-ISTD

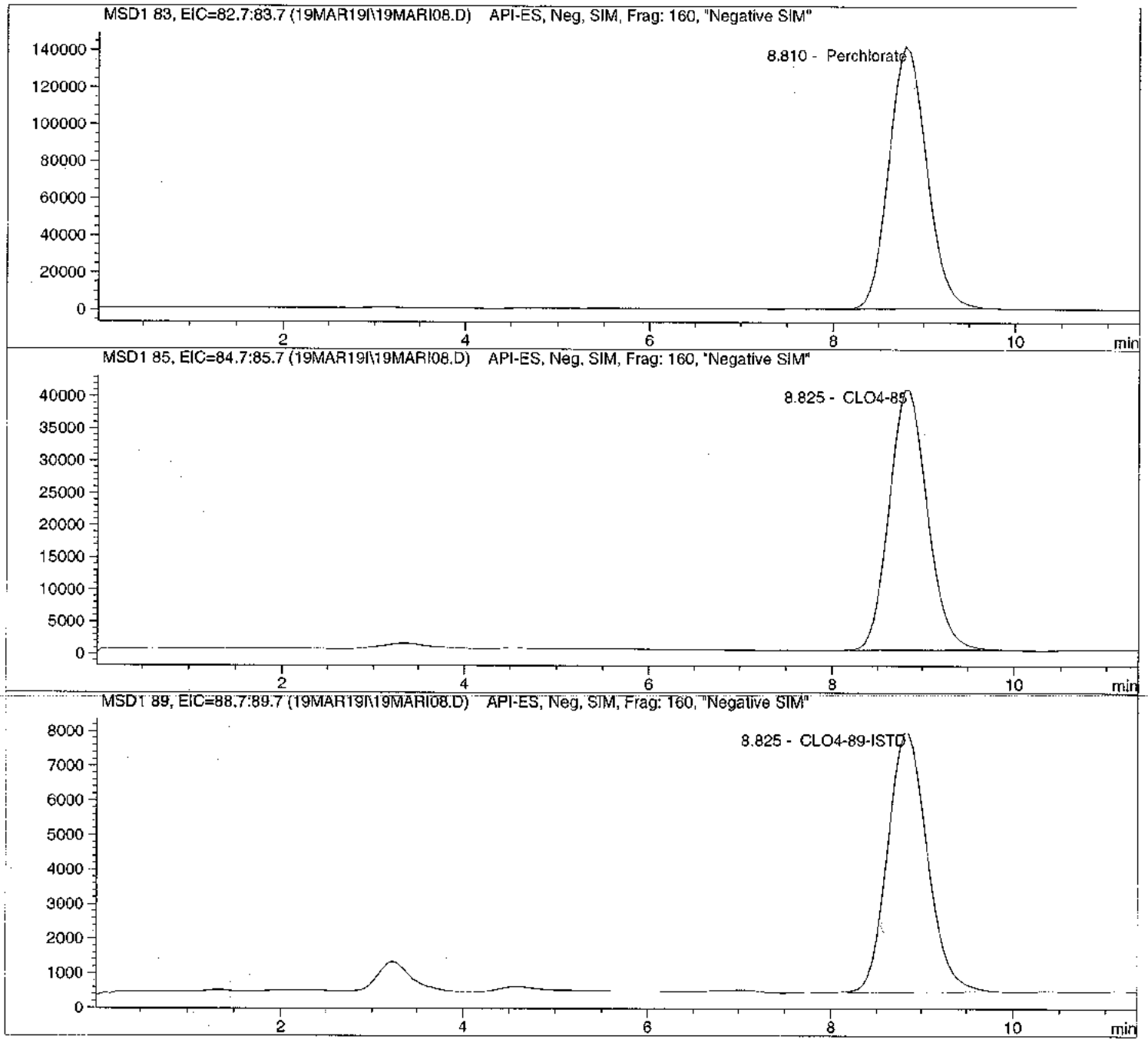
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	3/19/2019 10:46:05	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	3/19/2019 10:46:05	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 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
8.810	PBA	4133340.5	51.3684	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	1198135.6	50.4672	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	230976.7	5.0000	CLO4-89-ISTD

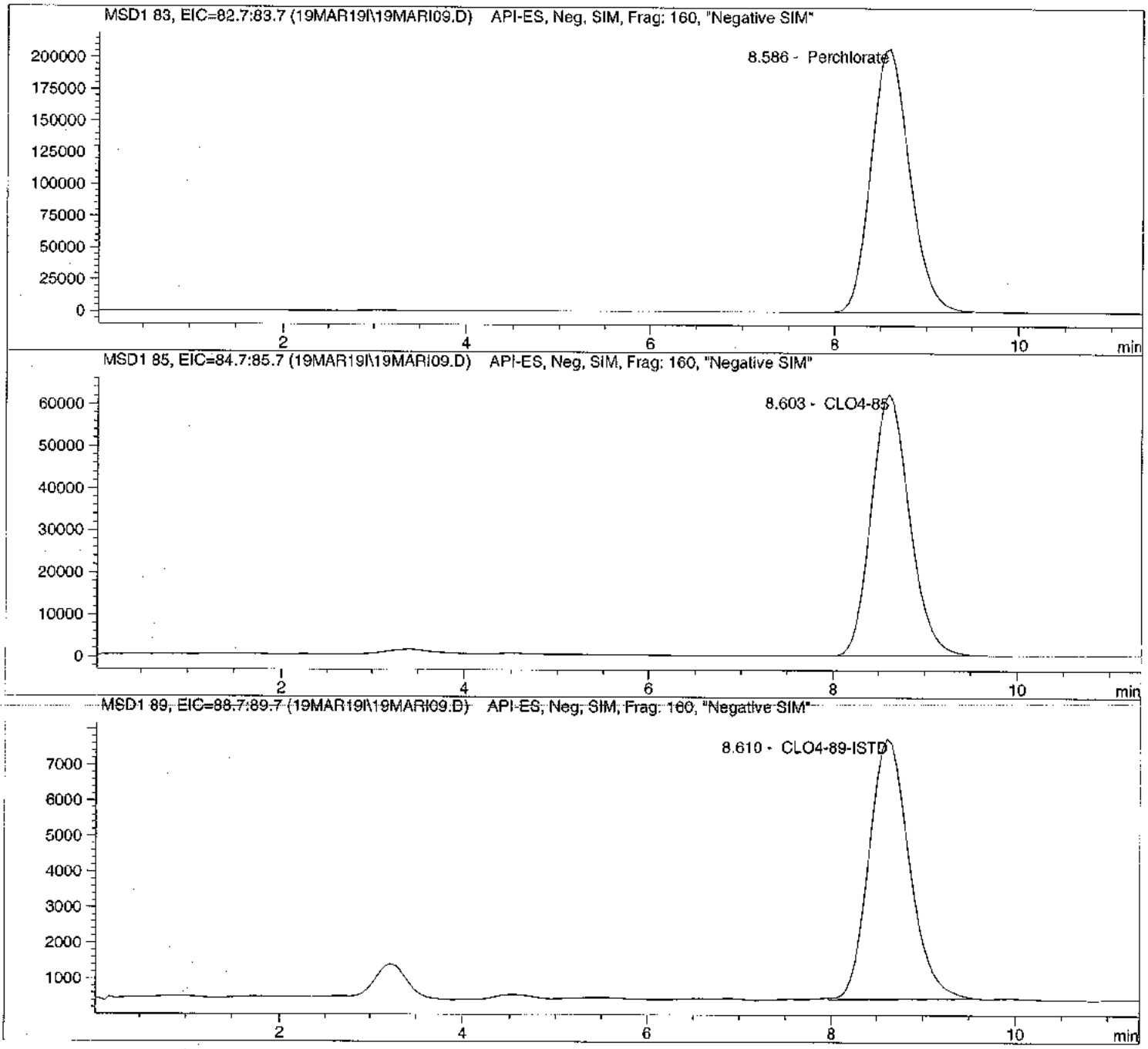
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	3/19/2019 10:59:22	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	3/19/2019 10:59:22	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 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
8.586	PBA	5993128.0	74.1675	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.603	PBA	1783554.4	74.7202	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.610	BBA	221504.5	5.0000	CLO4-89-ISTD

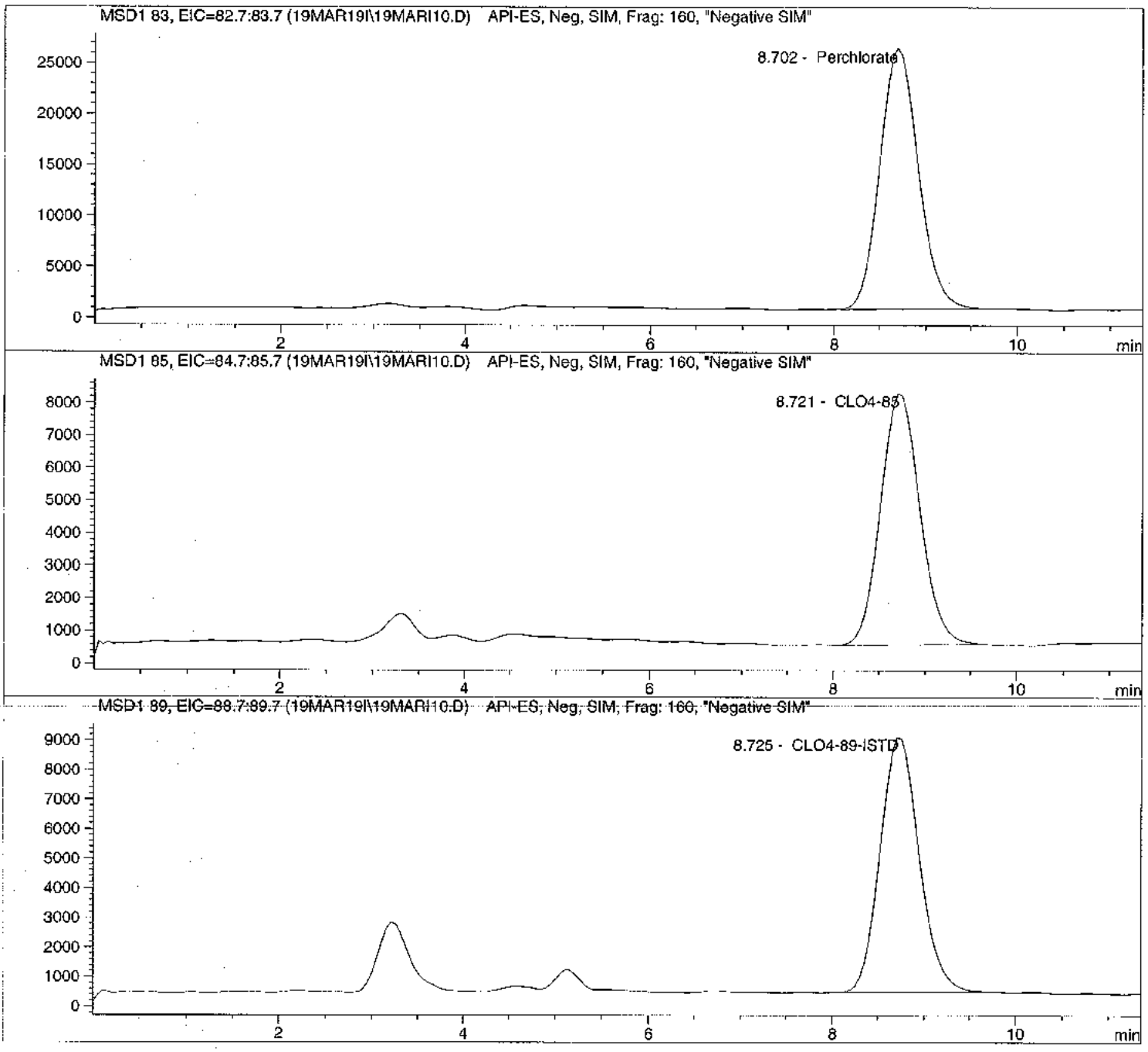
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L

Injection Date:	3/19/2019 11:12:42	Seq Line:	10
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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L

Injection Date:	3/19/2019 11:12:42	Seq Line:	10
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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 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
8.702	PBA	734718.7	9.2594	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.721	PBA	227494.7	9.5402	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.725	BBA	252544.4	5.0000	CLO4-89-ISTD

*** End of Report ***



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

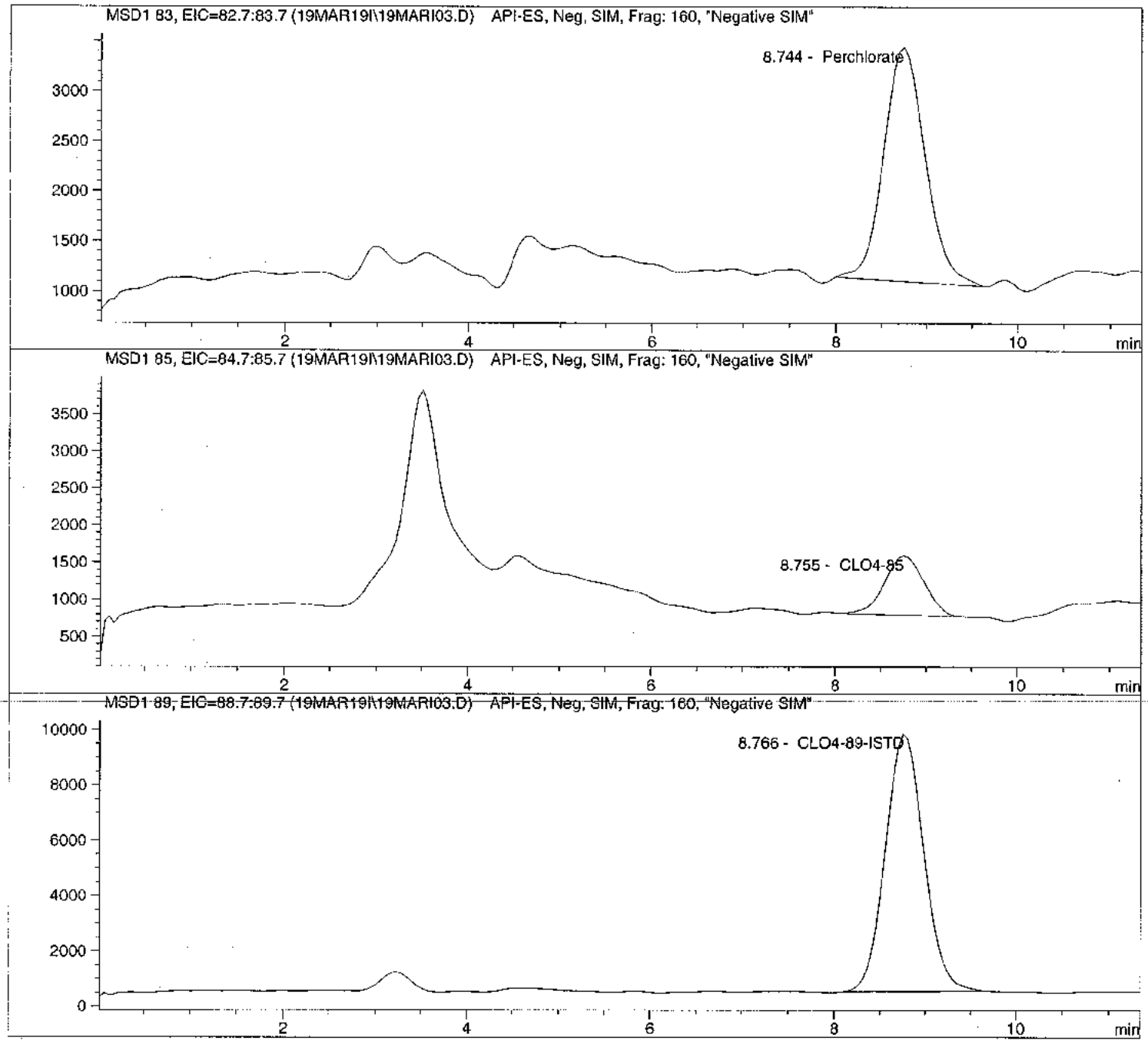
Unmodified

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	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-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	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-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 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
8.744	BBA	74166.3	1.0224	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	BBA	24138.1	0.9487	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	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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June 27, 2019

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

Work Order: **HS19060172**

Laboratory Results for: **LH18/24 Longhorn GW Treatment Plant Weekly Samples**

Dear Marcia,

ALS Environmental received 2 sample(s) on Jun 05, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
RJ Modashia
Project Manager

ALS Houston, US Date: 27-jun-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples
Work Order: HS19060172

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19060172-01	LH18/24-SP650_060419	Water		04-Jun-2019 14:00	05-Jun-2019 09:00	☐
HS19060172-02	LH18/24-SP650_060419_BIX	Water		04-Jun-2019 14:00	05-Jun-2019 09:00	☐

ALS Houston, US Date: 27-Jun-19

Client: Bhate Environmental Associates, Inc. **CASE NARRATIVE**
Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples
Work Order:

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: R340032

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

WetChemistry by Method E365.3

Batch ID: R339873

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

ALS Houston, US Date: 27-Jun-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**

Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples WorkOrder:HS19060172

Sample ID: LH18/24-SP650_060419 Lab ID:HS19060172-01

Collection Date: 04-Jun-2019 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)	**7.5**		**0.20**	**0.10**	**0.20**	**mg/L**	1	07-Jun-2019 10:45
ORTHO PHOSPHATE (PO4) AS P BY E365.3		**Method:E365.3**						Analyst: MZD
Phosphorus, Total Orthophosphate (As P)	**2.11**		**0.100**	**0.200**	**0.250**	**mg/L**	10	05-Jun-2019 14:55
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	20-Jun-2019 10:27

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

ALS Houston, US Date: 27-Jun-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**

Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples WorkOrder:HS19060172

Sample ID: LH18/24-SP650_060419_BIX Lab ID:HS19060172-02

Collection Date: 04-Jun-2019 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	17-Jun-2019 18:06

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

ALS Houston, US Date: 27-jun-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples
WorkOrder: HS19060172

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID R339873	**Test Name :** ORTHO PHOSPHATE (PO4) AS P BY E365.3			**Matrix:** Water		
HS19060172-01	LH18/24-SP650_060419	04 Jun 2019 14:00			05 Jun 2019 14:55	10
Batch ID R340032	**Test Name :** AMMONIA AS N BY E350.3(ISE)			**Matrix:** Water		
HS19060172-01	LH18/24-SP650_060419	04 Jun 2019 14:00			07 Jun 2019 10:45	1
Batch ID R340666	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			**Matrix:** Water		
HS19060172-02	LH18/24-SP650_060419_BIX	04 Jun 2019 14:00			17 Jun 2019 18:06	1
Batch ID R340873	**Test Name :** SUBCONTRACT ANALYSIS - TOC ANALYSIS			**Matrix:** Water		
HS19060172-01	LH18/24-SP650_060419	04 Jun 2019 14:00			20 Jun 2019 10:27	1

ALS Houston, US Date: 27-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples
WorkOrder: HS19060172

QC BATCH REPORT

Batch ID: R339873 (0) **Instrument: UV-2450** **Method: ORTHO PHOSPHATE (PO4) AS P BY E365.3**

MBLK Sample ID: **MBLK-339873** Units: **mg/L** Analysis Date: **05-Jun-2019 14:55**
Client ID: Run ID: **UV-2450_339873** SeqNo: **5108274** 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)	0.0200	0.0250								U

LCS Sample ID: **LCS-339873** Units: **mg/L** Analysis Date: **05-Jun-2019 14:55**
Client ID: Run ID: **UV-2450_339873** SeqNo: **5108275** 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)	0.251	0.0250	0.25	0	100	85 - 115				

MS Sample ID: **HS19060172-01MS** Units: **mg/L** Analysis Date: **05-Jun-2019 14:55**
Client ID: **LH18/24-SP650_060419** Run ID: **UV-2450_339873** SeqNo: **5108277** 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)	4.42	0.250	2.5	2.11	92.4	80 - 120				

MSD Sample ID: **HS19060172-01MSD** Units: **mg/L** Analysis Date: **05-Jun-2019 14:55**
Client ID: **LH18/24-SP650_060419** Run ID: **UV-2450_339873** SeqNo: **5108278** 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)	4.55	0.250	2.5	2.11	97.6	80 - 120	4.42	2.9	20	

The following samples were analyzed in this batch: HS19060172-01

ALS Houston, US Date: 27-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples
WorkOrder: HS19060172

QC BATCH REPORT

Batch ID: R340032 (0) **Instrument: WetChem_HS** **Method: AMMONIA AS N BY E350.3(ISE)**

MBLK Sample ID: **MBLK-R340032** Units: **mg/L** Analysis Date: **07-Jun-2019 10:45**
Client ID: Run ID: **WetChem_HS_340032** SeqNo: **5111522** 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-R340032** Units: **mg/L** Analysis Date: **07-Jun-2019 10:45**
Client ID: Run ID: **WetChem_HS_340032** SeqNo: **5111521** 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)	10.54	0.20	10	0	105	80 - 120				

MS Sample ID: **HS19051885-01MS** Units: **mg/L** Analysis Date: **07-Jun-2019 10:45**
Client ID: Run ID: **WetChem_HS_340032** SeqNo: **5111524** 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	0.2668	104	80 - 120				

MSD Sample ID: **HS19051885-01MSD** Units: **mg/L** Analysis Date: **07-Jun-2019 10:45**
Client ID: Run ID: **WetChem_HS_340032** SeqNo: **5111523** 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)	10.64	0.20	10	0.2668	104	80 - 120	10.69	0.469	20	

The following samples were analyzed in this batch: HS19060172-01

ALS Houston, US Date: 27-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples
WorkOrder: **HS19060172**

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
Dept of Defense	ANAB L2231	20-Dec-2021
Illinois	004438	29-Jun-2019
Kansas	E-10352 2018-2019	31-Jul-2019
Louisiana	03087	30-Jun-2019
Maryland	343, 2018-2019	30-Jun-2019
North Carolina	624-2019	31-Dec-2019
Oklahoma	2018-156	31-Aug-2019
Texas	TX104704231-19-23	30-Apr-2020

ALS Houston, US Date: 27-jun-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples
Work Order: HS19060172

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19060172-01	LH18/24-SP650_060419	Login	05/06/2019 10:50:41	NDR	WET161
HS19060172-01	LH18/24-SP650_060419	Login	05/06/2019 10:50:41	NDR	WET161
HS19060172-01	LH18/24-SP650_060419	Login	05/06/2019 10:50:41	NDR	Sub
HS19060172-02	LH18/24-SP650_060419_BIX	Login	05/06/2019 10:50:41	NDR	Sub

ALS Houston, US Date: 27-Jun-19

Sample Receipt Checklist

Client Name: Bhate Environmental
Work Order: HS19060172
Date/Time Received: **05-Jun-2019 09:00**
Received by: **NDR**

Checklist completed by: *Nilesh D. Ranchod* eSignature — 5-Jun-2019 Date
Reviewed by: *RJ Modashia* eSignature — 5-Jun-2019 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:N/A
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☐	No ☑	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	4.1c UC/C	IR25
Cooler(s)/Kit(s):	43593	
Date/Time sample(s) sent to storage:	06/05/2019 11:30am	

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: Sample Bottle count does not match
Sx -LH18/24-SP650_060419 COC= 2 Bottles
Received = 3

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 Modshia

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

HS19060172

Bhate Environmental Associates, Inc.
18/24 Longhorn GW Treatment Plant Weekly Sampl

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_060419	Water	06/04/19 / 14:00		2	X	X			H2SO4	
LH18/24-SP650_060419	Water	06/04/19 / 14:00		1			X		NONE	
LH18/24-SP650_060419_BIX	Water	06/04/19 / 14:00		1				X	NONE	

Analyses

Additional Remarks: **Standard TAT on all parameters**

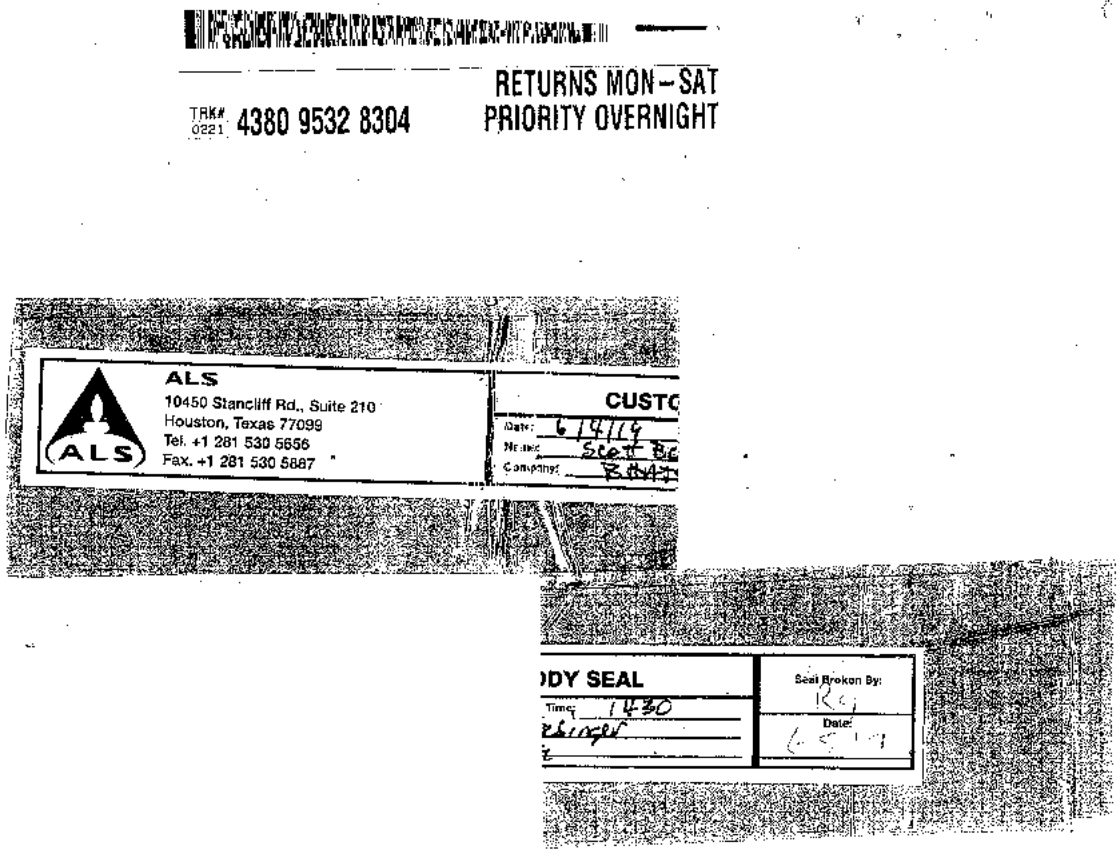
Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	06/04/19	14:30	R Cigan	6/5/19	09:00						

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition
				R Cigan	6/5/19	09:00	4°C	-	cooler # 435913 IR #25 CPO

Remarks:

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



TRK# 0221 4380 9532 8304

RETURNS MON – SAT
PRIORITY OVERNIGHT

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

CUSTO
Date: 6/14/14
Name: Scott Bo
Company: Battel

DY SEAL
Time: 1430
Seal Broken By:
Date:

ALS Environmental
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June 19, 2019

Analytical Report for Service Request No: K1905259

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

RE: HS19060172

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory June 06, 2019
For your reference, these analyses have been assigned our service request number **K1905259.**

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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1317 South 13th Ave, Kelso, WA 98626 | 1-360-577-7222 | www.alsglobal.com

Client: ALS Environmental - US
Project: HS19060172
Sample Matrix: Water

Service Request: K1905259
Date Received: 06/06/2019

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples for the Tier level IV requested by the client.

Sample Receipt:

One water sample was received for analysis at ALS Environmental on 06/06/2019. 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 06/19/2019

Chain of Custody

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L1905259

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Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID:** **11519**

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:	HS19060172
TSR:	Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS19060172-01**	**LH18/24-SP650_060419**	**Water**	**04 Jun 2019 14:00**
	TOC Analysis for DOD Level IV			19 Jun 2019

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

QC Level: DOD IV (DoD Data Package)

Relinquished By: [signature] Date/Time: 6/5/19 1800

Received By: [signature] ALS Kelso Date/Time: 6/6/19 0940

Cooler ID(s): _____ Temperature(s): _____

00939635

PC KL

Cooler Receipt and Preservation Form

Client ALS-Houston Service Request K19 05259

Received: 6/6/19 Opened: 6/6/19 By: AM Unloaded: 6/6/19 By:

1. Samples were received via? *USPS* (*Fed Ex*) *UPS* *DHL* *PDX* *Courier* *Hand Delivered*
2. Samples were received in: (circle) (*Cooler*) *Box* *Envelope* *Other* _____ *NA*
3. Were custody seals on coolers? NA (Y) N If yes, how many and where? 2-Front
   If present, were custody seals intact? (Y) N If present, were they signed and dated? (Y) N

Raw Cooler Temp	Corrected Cooler Temp	Raw Temp Blank	Corrected Temp Blank	Corr. Factor	Thermometer ID	Cooler/COC ID NA	Tracking Number NA	Filed
0.2	0.2	2.4	2.4	0	381	11919	480978347636	

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

Sample ID on Bottle	Sample ID on COC	Identified by:

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

Notes, Discrepancies, & Resolutions: _____

General Chemistry

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577- 7222 Fax (360)636- 1068
www.alsglobal.com

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	K1905259
Project:	HS19060172	**Date Collected:**	06/4/19
Sample Matrix:	Water	**Date Received:**	06/6/19
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_060419	K1905259-001	**2.21**	0.50	0.20	0.07	1	06/16/19 06:15	
Method Blank	K1905259-MB	ND U	0.50	0.20	0.07	1	06/15/19 17:30	

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K1905259
Project	HS19060172	**Date Collected:**	06/04/19
Sample Matrix:	Water	**Date Received:**	06/06/19
		Date Analyzed:	06/16/19

Replicate Sample Summary
General Chemistry Parameters

Sample Name:	LH18/24-SP650_060419	**Units:**	mg/L
Lab Code:	K1905259-001	**Basis:**	NA

Analyte Name	Analysis Method	LOQ	LOD	MDL	Sample Result	Duplicate Sample K1905259-001DUP Result	Average	RPD	RPD Limit
Carbon, Total Organic	SM 5310 C	0.50	0.20	0.07	2.21	2.25	2.23	2	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:**	K1905259
Project:	HS19060172	**Date Analyzed:**	06/15/19
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:	639524

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K1905259-LCS	25.1	25.0	100	83-117

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US **Service Request:** K1905259
Project: HS19060172

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	639524	KQ1908381-01	06/15/19 21:44	25.0	24.5	98	90-110
CCV2	639524	KQ1908381-02	06/16/19 02:55	25.0	24.5	98	90-110
CCV3	639524	KQ1908381-03	06/16/19 07:11	25.0	24.1	96	90-110

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US **Service Request:**K1905259
Project: HS19060172

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	639524	KQ1908381-04	06/15/19 21:59	0.50	0.20	0.07	ND	U
CCB2	639524	KQ1908381-05	06/16/19 03:09	0.50	0.20	0.07	ND	U
CCB3	639524	KQ1908381-06	06/16/19 07:26	0.50	0.20	0.07	ND	U

Raw Data

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General Chemistry

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5361, 5369
III I

Work Request # (Original) (KI905246, 5084, 5126, 5198, 5259, 5259, 5249, 5339, 5126, 5262, 5277, 5278, 5279, 5305, 5360)

Tier: IV II III IV IV IV I II III IV IV III III II IV

Date Analyzed: 6/10/19

Analyst: JBCD

Run # TOC: 638808, 638810, 638815, 638817

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: KI905258-6, 5198-3 Sent for RA (Needs dilution)
KI905259-1 sent for RA due to high RSD% from sample carry over.
KI905126-2, 5198-4, 5277-2, 5279-1 Report a high % RSD. However, these samples are less than 5x the MRL.

Final Approved by: [signature] Date: 06/14/19

DQREPORT

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 638808 **Method/Testcode:** 9060/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K1905246-001	Carbon, Total Organic	N/A		Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/10/19 17:23:00	N	IV
K1905246-003	Carbon, Total Organic	N/A		Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/10/19 18:18:00	N	IV
K1905246-004	Carbon, Total Organic	N/A		Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/10/19 19:14:00	N	IV
K1905246-005	Carbon, Total Organic	N/A		Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/10/19 21:20:00	N	IV
KQ1908058-01	Carbon, Total Organic	CCV		Ground Water	25.15 mg/L	10 mL	25.2 mg/L	1			101		6/10/19 14:47:00	N	IV
KQ1908058-02	Carbon, Total Organic	CCV		Ground Water	27.51 mg/L	10 mL	27.5 mg/L	1			110		6/10/19 22:43:00	N	IV
KQ1908058-03	Carbon, Total Organic	CCB		Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/10/19 15:02:00	N	IV
KQ1908058-04	Carbon, Total Organic	CCB		Ground Water	0.19 mg/L	10 mL	0.19 mg/L J	1	0.07	0.50			6/10/19 22:58:00	N	IV
KQ1908058-05	Carbon, Total Organic	MB		Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/10/19 15:16:00	N	IV
KQ1908058-06	Carbon, Total Organic	MB		Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/10/19 15:16:00	N	IV
KQ1908058-07	Carbon, Total Organic	MB		Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/10/19 15:16:00	N	IV
KQ1908058-08	Carbon, Total Organic	MB		Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/10/19 15:16:00	N	IV
KQ1908058-09	Carbon, Total Organic	LCS		Ground Water	24.62 mg/L	10 mL	24.6 mg/L	1	0.07	0.50	98		6/10/19 16:12:00	N	IV
KQ1908058-10	Carbon, Total Organic	LCS		Ground Water	24.74 mg/L	10 mL	24.7 mg/L	1	0.07	0.50	99		6/10/19 16:12:00	N	IV
KQ1908058-11	Carbon, Total Organic	LCS		Ground Water	25.10 mg/L	10 mL	25.1 mg/L	1	0.07	0.50	100		6/10/19 16:12:00	N	IV
KQ1908058-12	Carbon, Total Organic	LCS		Ground Water	24.96 mg/L	10 mL	25.0 mg/L	1	0.07	0.50	100		6/10/19 16:12:00	N	IV
KQ1908058-13	Carbon, Total Organic	DUP	K1905246-001	Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	6/10/19 17:23:00	N	IV
KQ1908058-14	Carbon, Total Organic	TRP	K1905246-001	Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	6/10/19 17:23:00	N	IV
KQ1908058-15	Carbon, Total Organic	QUAD	K1905246-001	Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	6/10/19 17:23:00	N	IV
KQ1908058-16	Carbon, Total Organic	DUP	K1905246-003	Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	6/10/19 18:18:00	N	IV
KQ1908058-17	Carbon, Total Organic	TRP	K1905246-003	Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	6/10/19 18:18:00	N	IV
KQ1908058-18	Carbon, Total Organic	QUAD	K1905246-003	Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	6/10/19 18:18:00	N	IV
KQ1908058-19	Carbon, Total Organic	DUP	K1905246-004	Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	6/10/19 19:14:00	N	IV

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

06/14/19

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 638808 **Method/Testcode:** 9060/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ1908058-20	Carbon, Total Organic	TRP	K1905246-004	Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	6/10/19 19:14:00	N	IV
KQ1908058-21	Carbon, Total Organic	QUAD	K1905246-004	Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	6/10/19 19:14:00	N	IV
KQ1908058-22	Carbon, Total Organic	MS	K1905246-004	Ground Water	25.43 mg/L	10 mL	25.4 mg/L	1	0.07	0.50	102		6/10/19 20:10:00	N	IV
KQ1908058-23	Carbon, Total Organic	DUP	K1905246-005	Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	6/10/19 21:20:00	N	IV
KQ1908058-24	Carbon, Total Organic	TRP	K1905246-005	Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	6/10/19 21:20:00	N	IV
KQ1908058-25	Carbon, Total Organic	QUAD	K1905246-005	Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	6/10/19 21:20:00	N	IV
KQ1908058-26	Carbon, Total Organic	MS	K1905246-004	Ground Water	25.58 mg/L	10 mL	25.6 mg/L	1	0.07	0.50	102		6/10/19 20:10:00	N	IV
KQ1908058-27	Carbon, Total Organic	MS	K1905246-004	Ground Water	25.72 mg/L	10 mL	25.7 mg/L	1	0.07	0.50	103		6/10/19 20:10:00	N	IV
KQ1908058-28	Carbon, Total Organic	MS	K1905246-004	Ground Water	25.75 mg/L	10 mL	25.8 mg/L	1	0.07	0.50	103		6/10/19 20:10:00	N	IV

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

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 638810 **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
K1905084-004	Carbon, Total Organic	N/A		Water	7.86 mg/L	10 mL	786 mg/L	100	7	50			6/11/19 06:17:00	N	II
K1905084-005	Carbon, Total Organic	N/A		Water	6.52 mg/L	10 mL	652 mg/L	100	7	50			6/11/19 06:45:00	N	II
K1905126-001	Carbon, Total Organic	N/A		Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/11/19 07:41:00	N	III
K1905126-002	Carbon, Total Organic	N/A		Ground Water	0.13 mg/L	10 mL	0.13 mg/L J	1	0.07	0.50			6/11/19 08:09:00	Y	III
K1905126-003	Carbon, Total Organic	N/A		Ground Water	0.27 mg/L	10 mL	0.27 mg/L J	1	0.07	0.50			6/11/19 09:36:00	N	III
K1905126-004	Carbon, Total Organic	N/A		Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/11/19 10:04:00	N	III
K1905198-003	Carbon, Total Organic	N/A		Ground Water	-0.01 mg/L	10 mL	2.0 mg/L U	4	0.3	2.0			6/10/19 22:15:00	N	IV
K1905198-004	Carbon, Total Organic	N/A		Ground Water	1.55 mg/L	10 mL	1.55 mg/L	1	0.07	0.50			6/10/19 23:13:00	N	IV
K1905198-005	Carbon, Total Organic	N/A		Ground Water	47.30 mg/L	10 mL	94.6 mg/L	2	0.2	1.0			6/10/19 23:41:00	N	IV
K1905258-001	Carbon, Total Organic	N/A		Water	6.61 mg/L	10 mL	66.1 mg/L	10	0.7	5.0			6/11/19 00:37:00	N	IV
K1905258-002	Carbon, Total Organic	N/A		Water	30.64 mg/L	10 mL	306 mg/L	10	0.7	5.0			6/11/19 01:33:00	N	IV
K1905258-003	Carbon, Total Organic	N/A		Water	12.86 mg/L	10 mL	12.9 mg/L	1	0.07	0.50			6/11/19 02:30:00	N	IV
K1905258-004	Carbon, Total Organic	N/A		Water	4.69 mg/L	10 mL	4.69 mg/L	1	0.07	0.50			6/11/19 02:58:00	N	IV
K1905258-005	Carbon, Total Organic	N/A		Water	4.11 mg/L	10 mL	4.11 mg/L	1	0.07	0.50			6/11/19 03:26:00	N	IV
K1905258-006	Carbon, Total Organic	N/A		Water	63.63 mg/L	10 mL	318 mg/L	5	0.4	2.5			6/11/19 04:53:00	N	IV
K1905259-001	Carbon, Total Organic	N/A		Water	2.92 mg/L	10 mL	2.92 mg/L	1	0.07	0.50			6/11/19 05:21:00	N	IV
K1905298-001	Carbon, Total Organic	N/A		Drinking Water	0.12 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/11/19 07:13:00	N	I
K1905338-001	Carbon, Total Organic	N/A		Water	1.66 mg/L	10 mL	1.66 mg/L	1	0.07	0.50			6/11/19 05:49:00	N	II
KQ1908062-01	Carbon, Total Organic	CCV		Water	25.15 mg/L	10 mL	25.2 mg/L	1			101		6/10/19 14:47:00	N	IV
KQ1908062-02	Carbon, Total Organic	CCV		Water	27.51 mg/L	10 mL	27.5 mg/L	1			110		6/10/19 22:43:00	N	IV
KQ1908062-03	Carbon, Total Organic	CCV		Water	24.91 mg/L	10 mL	24.9 mg/L	1			100		6/11/19 03:54:00	N	IV
KQ1908062-04	Carbon, Total Organic	CCV		Water	24.86 mg/L	10 mL	24.9 mg/L	1			100		6/11/19 08:37:00	N	IV
KQ1908062-05	Carbon, Total Organic	CCV		Water	24.61 mg/L	10 mL	24.6 mg/L	1			98		6/11/19 13:35:00	N	IV
KQ1908062-06	Carbon, Total Organic	CCB		Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/10/19 15:02:00	N	IV
KQ1908062-07	Carbon, Total Organic	CCB		Water	0.19 mg/L	10 mL	0.19 mg/L J	1	0.07	0.50			6/10/19 22:58:00	N	IV
KQ1908062-08	Carbon, Total Organic	CCB		Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/11/19 04:09:00	N	IV
KQ1908062-09	Carbon, Total Organic	CCB		Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/11/19 08:52:00	N	IV
KQ1908062-10	Carbon, Total Organic	CCB		Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/11/19 13:50:00	N	IV
KQ1908062-11	Carbon, Total Organic	MB		Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/11/19 04:24:00	N	IV
KQ1908062-12	Carbon, Total Organic	LCS		Water	25.36 mg/L	10 mL	25.4 mg/L	1	0.07	0.50	101		6/11/19 04:38:00	N	IV
KQ1908062-13	Carbon, Total Organic	DUP	K1905258-001	Water	6.52 mg/L	10 mL	65.2 mg/L	10	0.7	5.0		1	6/11/19 00:37:00	N	IV
KQ1908062-14	Carbon, Total Organic	DUP	K1905258-002	Water	30.25 mg/L	10 mL	302 mg/L	10	0.7	5.0		1	6/11/19 01:33:00	N	IV

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

06/14/19
Freezer

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 638810 **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
KQ1908062-15	Carbon, Total Organic	DUP	K1905258-003	Water	12.98 mg/L	10 mL	13.0 mg/L	1	0.07	0.50		<1	6/11/19 02:30:00	N	IV
KQ1908062-16	Carbon, Total Organic	DUP	K1905258-004	Water	4.50 mg/L	10 mL	4.50 mg/L	1	0.07	0.50		4	6/11/19 02:58:00	N	IV
KQ1908062-17	Carbon, Total Organic	DUP	K1905258-005	Water	4.16 mg/L	10 mL	4.16 mg/L	1	0.07	0.50		1	6/11/19 03:26:00	N	IV
KQ1908062-18	Carbon, Total Organic	DUP	K1905258-006	Water	63.10 mg/L	10 mL	316 mg/L	5	0.4	2.5		<1	6/11/19 04:53:00	N	IV
KQ1908062-19	Carbon, Total Organic	DUP	K1905259-001	Water	2.60 mg/L	10 mL	2.60 mg/L	1	0.07	0.50		12*	6/11/19 05:21:00	N	IV
KQ1908062-20	Carbon, Total Organic	DUP	K1905338-001	Water	1.64 mg/L	10 mL	1.64 mg/L	1	0.07	0.50		1	6/11/19 05:49:00	N	II
KQ1908062-21	Carbon, Total Organic	DUP	K1905084-004	Water	7.95 mg/L	10 mL	795 mg/L	100	7	50		1	6/11/19 06:17:00	N	II
KQ1908062-22	Carbon, Total Organic	DUP	K1905084-005	Water	6.46 mg/L	10 mL	646 mg/L	100	7	50		<1	6/11/19 06:45:00	N	II
KQ1908062-23	Carbon, Total Organic	DUP	K1905298-001	Drinking Water	0.05 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	6/11/19 07:13:00	N	I
KQ1908062-24	Carbon, Total Organic	DUP	K1905126-001	Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	6/11/19 07:41:00	N	III
KQ1908062-25	Carbon, Total Organic	DUP	K1905126-002	Ground Water	0.18 mg/L	10 mL	0.18 mg/L J	1	0.07	0.50		33*	6/11/19 08:09:00	N	III
KQ1908062-26	Carbon, Total Organic	DUP	K1905126-003	Ground Water	0.25 mg/L	10 mL	0.25 mg/L J	1	0.07	0.50		7	6/11/19 09:36:00	N	III
KQ1908062-27	Carbon, Total Organic	DUP	K1905126-004	Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	6/11/19 10:04:00	N	III
KQ1908062-28	Carbon, Total Organic	MS	K1905126-002	Ground Water	25.89 mg/L	10 mL	25.9 mg/L	1	0.07	0.50	103		6/11/19 09:07:00	N	III
KQ1908062-29	Carbon, Total Organic	DUP	K1905198-003	Ground Water	-0.01 mg/L	10 mL	2.0 mg/L U	4	0.3	2.0		NC	6/10/19 22:15:00	N	IV
KQ1908062-30	Carbon, Total Organic	DUP	K1905198-004	Ground Water	1.28 mg/L	10 mL	1.28 mg/L	1	0.07	0.50		19*	6/10/19 23:13:00	N	IV
KQ1908062-31	Carbon, Total Organic	DUP	K1905198-005	Ground Water	47.09 mg/L	10 mL	94.2 mg/L	2	0.2	1.0		<1	6/10/19 23:41:00	N	IV

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

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 638815 **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
K1905126-005	Carbon, Total Organic	N/A		Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/11/19 10:32:00	N	III
K1905126-006	Carbon, Total Organic	N/A		Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/11/19 11:00:00	N	III
K1905126-007	Carbon, Total Organic	N/A		Ground Water	0.07 mg/L	10 mL	0.07 mg/L J	1	0.07	0.50			6/11/19 11:28:00	N	III
K1905126-008	Carbon, Total Organic	N/A		Ground Water	0.30 mg/L	10 mL	0.30 mg/L J	1	0.07	0.50			6/11/19 11:56:00	N	III
K1905126-009	Carbon, Total Organic	N/A		Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/11/19 12:24:00	N	III
K1905262-001	Carbon, Total Organic	N/A		Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/11/19 12:53:00	N	IV
K1905262-002	Carbon, Total Organic	N/A		Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/11/19 14:19:00	N	IV
K1905277-001	Carbon, Total Organic	N/A		Ground Water	0.33 mg/L	10 mL	0.33 mg/L J	1	0.07	0.50			6/11/19 14:48:00	Y	IV
K1905277-002	Carbon, Total Organic	N/A		Ground Water	0.36 mg/L	10 mL	0.36 mg/L J	1	0.07	0.50			6/11/19 15:15:00	N	IV
K1905277-003	Carbon, Total Organic	N/A		Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/11/19 16:13:00	N	IV
KQ1908063-01	Carbon, Total Organic	MS	K1905277-001	Ground Water	25.85 mg/L	10 mL	25.9 mg/L	1	0.07	0.50	102		6/11/19 15:16:00	N	IV
KQ1908063-02	Carbon, Total Organic	DUP	K1905277-001	Ground Water	0.30 mg/L	10 mL	0.30 mg/L J	1	0.07	0.50		9	6/11/19 14:48:00	N	IV
KQ1908063-03	Carbon, Total Organic	CCV		Ground Water	24.86 mg/L	10 mL	24.9 mg/L	1			100		6/11/19 08:37:00	N	III
KQ1908063-04	Carbon, Total Organic	CCV		Ground Water	24.61 mg/L	10 mL	24.6 mg/L	1			98		6/11/19 13:21:00	N	III
KQ1908063-05	Carbon, Total Organic	CCV		Ground Water	24.69 mg/L	10 mL	24.7 mg/L	1			99		6/11/19 17:24:00	N	III
KQ1908063-06	Carbon, Total Organic	CCB		Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/11/19 08:52:00	N	III
KQ1908063-07	Carbon, Total Organic	CCB		Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/11/19 13:35:00	N	III
KQ1908063-08	Carbon, Total Organic	CCB		Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/11/19 17:39:00	N	III
KQ1908063-09	Carbon, Total Organic	MB		Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/11/19 13:50:00	N	III
KQ1908063-10	Carbon, Total Organic	LCS		Ground Water	25.06 mg/L	10 mL	25.1 mg/L	1	0.07	0.50	100		6/11/19 14:05:00	N	III
KQ1908063-11	Carbon, Total Organic	DUP	K1905126-005	Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	6/11/19 10:32:00	N	III
KQ1908063-12	Carbon, Total Organic	DUP	K1905126-006	Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	6/11/19 11:00:00	N	III
KQ1908063-13	Carbon, Total Organic	DUP	K1905126-007	Ground Water	0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	6/11/19 11:28:00	N	III

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

06/14/19

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 638815 **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
KQ1908063-14	Carbon, Total Organic	DUP	K1905126-008	Ground Water	0.33 mg/L	10 mL	0.33 mg/L J	1	0.07	0.50		8	6/11/19 11:56:00	N	III
KQ1908063-15	Carbon, Total Organic	DUP	K1905126-009	Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	6/11/19 12:24:00	N	III
KQ1908063-16	Carbon, Total Organic	DUP	K1905262-001	Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	6/11/19 12:53:00	N	IV
KQ1908063-17	Carbon, Total Organic	DUP	K1905262-002	Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	6/11/19 14:19:00	N	IV
KQ1908063-18	Carbon, Total Organic	DUP	K1905277-002	Ground Water	0.32 mg/L	10 mL	0.32 mg/L J	1	0.07	0.50		12*	6/11/19 15:45:00	N	IV
KQ1908063-19	Carbon, Total Organic	DUP	K1905277-003	Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	6/11/19 16:13:00	N	IV

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

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 638817 **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
K1905278-001	Carbon, Total Organic	N/A		Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/11/19 16:41:00	Y	III
K1905278-002	Carbon, Total Organic	N/A		Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/11/19 17:54:00	N	III
K1905278-003	Carbon, Total Organic	N/A		Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/11/19 18:22:00	N	III
K1905279-001	Carbon, Total Organic	N/A		Ground Water	0.49 mg/L	10 mL	0.49 mg/L J	1	0.07	0.50			6/11/19 18:50:00	N	III
K1905305-001	Carbon, Total Organic	N/A		Water	5.67 mg/L	10 mL	5.67 mg/L	1	0.07	0.50			6/11/19 19:18:00	N	II
K1905360-001	Carbon, Total Organic	N/A		Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/11/19 19:46:00	N	IV
K1905361-001	Carbon, Total Organic	N/A		Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/11/19 20:14:00	N	III
K1905369-001	Carbon, Total Organic	N/A		Water	5.21 mg/L	10 mL	10.4 mg/L	2	0.2	1.0			6/11/19 20:42:00	N	I
K1905369-002	Carbon, Total Organic	N/A		Water	13.49 mg/L	10 mL	13.5 mg/L	1	0.07	0.50			6/11/19 21:10:00	N	I
K1905369-003	Carbon, Total Organic	N/A		Water	1.77 mg/L	10 mL	1.77 mg/L	1	0.07	0.50			6/11/19 21:38:00	N	I
K1905369-004	Carbon, Total Organic	N/A		Water	9.26 mg/L	10 mL	18.5 mg/L	2	0.2	1.0			6/11/19 22:06:00	N	I
K1905369-005	Carbon, Total Organic	N/A		Water	10.02 mg/L	10 mL	10.0 mg/L	1	0.07	0.50			6/11/19 23:33:00	N	I
K1905369-006	Carbon, Total Organic	N/A		Water	13.53 mg/L	10 mL	27.1 mg/L	2	0.2	1.0			6/12/19 00:01:00	N	I
K1905369-007	Carbon, Total Organic	N/A		Water	27.08 mg/L	10 mL	54.2 mg/L	2	0.2	1.0			6/12/19 00:29:00	N	I
K1905369-008	Carbon, Total Organic	N/A		Water	9.58 mg/L	10 mL	19.2 mg/L	2	0.2	1.0			6/12/19 00:58:00	N	I
K1905369-009	Carbon, Total Organic	N/A		Water	27.74 mg/L	10 mL	27.7 mg/L	1	0.07	0.50			6/12/19 01:26:00	N	I
KQ1908064-01	Carbon, Total Organic	CCV		Ground Water	24.61 mg/L	10 mL	24.6 mg/L	1			98		6/11/19 13:21:00	N	III
KQ1908064-02	Carbon, Total Organic	CCV		Ground Water	24.69 mg/L	10 mL	24.7 mg/L	1			99		6/11/19 17:24:00	N	III
KQ1908064-03	Carbon, Total Organic	CCV		Ground Water	24.59 mg/L	10 mL	24.6 mg/L	1			98		6/11/19 22:34:00	N	III
KQ1908064-04	Carbon, Total Organic	CCV		Ground Water	25.23 mg/L	10 mL	25.2 mg/L	1			101		6/12/19 01:54:00	N	III
KQ1908064-05	Carbon, Total Organic	CCB		Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/11/19 13:35:00	N	III
KQ1908064-06	Carbon, Total Organic	CCB		Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/11/19 17:39:00	N	III
KQ1908064-07	Carbon, Total Organic	CCB		Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/11/19 22:49:00	N	III
KQ1908064-08	Carbon, Total Organic	CCB		Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/12/19 02:08:00	N	III
KQ1908064-09	Carbon, Total Organic	MB		Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/11/19 23:04:00	N	III
KQ1908064-10	Carbon, Total Organic	LCS		Ground Water	25.08 mg/L	10 mL	25.1 mg/L	1	0.07	0.50	100		6/11/19 23:18:00	N	III
KQ1908064-11	Carbon, Total Organic	DUP	K1905278-001	Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	6/11/19 16:41:00	N	III

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

Printed 6/14/19 11:26

Results Summary

06/14/19

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 638817 **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
KQ1908064-12	Carbon, Total Organic	MS	K1905278-001	Ground Water	25.08 mg/L	10 mL	25.1 mg/L	1	0.07	0.50	100		6/11/19 17:10:00	N	III
KQ1908064-13	Carbon, Total Organic	DUP	K1905278-002	Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	6/11/19 17:54:00	N	III
KQ1908064-14	Carbon, Total Organic	DUP	K1905278-003	Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	6/11/19 18:22:00	N	III
KQ1908064-15	Carbon, Total Organic	DUP	K1905279-001	Ground Water	0.55 mg/L	10 mL	0.55 mg/L	1	0.07	0.50		11*	6/11/19 18:50:00	N	III
KQ1908064-16	Carbon, Total Organic	DUP	K1905305-001	Water	5.61 mg/L	10 mL	5.61 mg/L	1	0.07	0.50		1	6/11/19 19:18:00	N	II
KQ1908064-17	Carbon, Total Organic	DUP	K1905360-001	Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	6/11/19 19:46:00	N	III
KQ1908064-18	Carbon, Total Organic	DUP	K1905361-001	Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	6/11/19 20:14:00	N	III
KQ1908064-19	Carbon, Total Organic	DUP	K1905369-001	Water	5.20 mg/L	10 mL	10.4 mg/L	2	0.2	1.0		<1	6/11/19 20:42:00	N	I
KQ1908064-20	Carbon, Total Organic	DUP	K1905369-002	Water	13.23 mg/L	10 mL	13.2 mg/L	1	0.07	0.50		2	6/11/19 21:10:00	N	I
KQ1908064-21	Carbon, Total Organic	DUP	K1905369-003	Water	1.75 mg/L	10 mL	1.75 mg/L	1	0.07	0.50		1	6/11/19 21:38:00	N	I
KQ1908064-22	Carbon, Total Organic	DUP	K1905369-004	Water	9.13 mg/L	10 mL	18.3 mg/L	2	0.2	1.0		1	6/11/19 22:06:00	N	I
KQ1908064-23	Carbon, Total Organic	DUP	K1905369-005	Water	9.62 mg/L	10 mL	9.62 mg/L	1	0.07	0.50		4	6/11/19 23:33:00	N	I
KQ1908064-24	Carbon, Total Organic	DUP	K1905369-006	Water	13.51 mg/L	10 mL	27.0 mg/L	2	0.2	1.0		<1	6/12/19 00:01:00	N	I
KQ1908064-25	Carbon, Total Organic	DUP	K1905369-007	Water	26.81 mg/L	10 mL	53.6 mg/L	2	0.2	1.0		<1	6/12/19 00:29:00	N	I
KQ1908064-26	Carbon, Total Organic	DUP	K1905369-008	Water	9.35 mg/L	10 mL	18.7 mg/L	2	0.2	1.0		2	6/12/19 00:58:00	N	I
KQ1908064-27	Carbon, Total Organic	DUP	K1905369-009	Water	27.62 mg/L	10 mL	27.6 mg/L	1	0.07	0.50		<1	6/12/19 01:26:00	N	I

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

0.207	OBSERVATIONS 15	ABOVE
0.000	STD Deviation 0.05347	0
0.000	AVERAGE 0.01381	0
0.000	UCL 0.06728	0
0.000	LCL -0.03967	0
0.000		0
0.000		0
0.000	OBSERVATIONS 0	0
0.000	STD Deviation 0.00000	0
0.000	AVERAGE #DIV/0!	0
0.000	UCL #DIV/0!	0
0.000	LCL #DIV/0!	0
0.000		0
0.000		0
0.000	OBSERVATIONS 0	0
	STD Deviation 0.00000	0
	AVERAGE #DIV/0!	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

06/14/19

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	C] CCV 25 ppm [25 p	1	25.166	0.0138	25.1522	25.15219	25.2	6/10/2019
3	[TOC] CCB [0 ppm]	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/10/2019
4	MB1	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/10/2019
5	MB1d	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/10/2019
6	MB1t	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/10/2019
7	MB1q	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/10/2019
8	[TOC] LCS [24ppm]	1	24.636	0.0138	24.6226	24.62259	25	6/10/2019
9	TOC] LCS [24ppm]d	1	24.757	0.0138	24.7428	24.74279	24.74	6/10/2019
10	[TOC] LCS [24ppm]t	1	25.110	0.0138	25.0962	25.09619	25.10	6/10/2019
11	TOC] LCS [24ppm]q	1	24.975	0.0138	24.9613	24.96129	25.0	6/10/2019
12	K1905246-001	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/10/2019
13	K1905246-001d	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/10/2019
14	K1905246-001t	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/10/2019
15	K1905246-001q	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/10/2019
16	K1905246-003	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/10/2019
17	K1905246-003d	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/10/2019
18	K1905246-003t	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/10/2019
19	K1905246-003q	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/10/2019
20	K1905246-004	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/10/2019
21	K1905246-004d	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/10/2019
22	K1905246-004t	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/10/2019
23	K1905246-004q	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/10/2019
24	K1905246-004ms	1	25.447	0.0138	25.4335	25.43349	25.43	6/10/2019
25	K1905246-004msd	1	25.594	0.0138	25.5797	25.57969	25.58	6/10/2019

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: KD		Date Analyzed 6/10/19	
Reviewed By: [signature]		Date Reviewed 06/19/19	

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	K1905246-004	1	25.734	0.0138	25.7198	25.71979	25.72	6/10/2019
27	K1905246-004	1	25.764	0.0138	25.7504	25.75039	25.75	6/10/2019
28	K1905246-005	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/10/2019
29	K1905246-005d	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/10/2019
30	K1905246-005t	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/10/2019
31	K1905246-005q	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/10/2019
32	C] CCV 25 ppm [25 p	1	27.519	0.0138	27.5054	27.50539	27.5	6/10/2019
33	[TOC] CCB [0 ppm]	1	0.207	0.0138	0.1933	0.19329	<0.5	6/10/2019
34		1		0.0000	0.0000	0	<0.5	
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: BD Date Analyzed 6/10/19

Reviewed By: [signature] Date Reviewed 6/14/19

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	C] CCV 25 ppm [25 p	1	25.166	0.0138	25.1522	25.15219	25.2	6/10/2019
3	[TOC] CCB [0 ppm]	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/10/2019
4	K1905198-003	4	0.000	0.0138	-0.0138	-0.05524	<0.5	6/10/2019
5	K1905198-003d	4	0.000	0.0138	-0.0138	-0.05524	<0.5	6/10/2019
6	C] CCV 25 ppm [25 p	1	27.519	0.0138	27.5054	27.50539	27.51	6/10/2019
7	[TOC] CCB [0 ppm]	1	0.207	0.0138	0.1933	0.19329	<0.5	6/10/2019
8	K1905198-004	1	1.560	0.0138	1.5457	1.54569	2	6/10/2019
9	K1905198-004d	1	1.296	0.0138	1.2820	1.28199	1.28	6/10/2019
10	K1905198-005	2	47.316	0.0138	47.3022	94.60438	94.60	6/10/2019
11	K1905198-005d	2	47.104	0.0138	47.0906	94.18118	94.2	6/10/2019
12	K1905258-001	10	6.622	0.0138	6.6084	66.0839	66.08	6/11/2019
13	K1905258-001d	10	6.531	0.0138	6.5170	65.1699	65.17	6/11/2019
14	K1905258-002	10	30.649	0.0138	30.6355	306.3549	306.35	6/11/2019
15	K1905258-002d	10	30.260	0.0138	30.2457	302.4569	302.5	6/11/2019
16	K1905258-003	1	12.874	0.0138	12.8601	12.86009	12.9	6/11/2019
17	K1905258-003d	1	12.994	0.0138	12.9801	12.98009	12.98	6/11/2019
18	K1905258-004	1	4.703	0.0138	4.6889	4.68889	4.7	6/11/2019
19	K1905258-004d	1	4.518	0.0138	4.5042	4.50419	4.5	6/11/2019
20	K1905258-005	1	4.124	0.0138	4.1104	4.11039	4.11	6/11/2019
21	K1905258-005d	1	4.170	0.0138	4.1565	4.15649	4.16	6/11/2019
22	C] CCV 25 ppm [25 p	1	24.924	0.0138	24.9103	24.91029	24.9	6/11/2019
23	[TOC] CCB [0 ppm]	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/11/2019
24	MB2	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/11/2019
25	[TOC] LCS [24ppm]	1	25.379	0.0138	25.3648	25.36479	25.36	6/11/2019

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: BP	Date Analyzed 6/10/19	
Reviewed By: [signature]	Date Reviewed 06/14/19	

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	K1905258-006	5	63.641	0.0138	63.6273	318.13645	318.14	6/11/2019
27	K1905258-006d	5	63.117	0.0138	63.1030	315.51495	315.51	6/11/2019
28	K1905259-001	1	2.937	0.0138	2.9230	2.92299	2.9	6/11/2019
29	K1905259-001d	1	2.615	0.0138	2.6010	2.60099	2.6	6/11/2019
30	K1905338-001	1	1.671	0.0138	1.6567	1.65669	1.7	6/11/2019
31	K1905338-001d	1	1.650	0.0138	1.6360	1.63599	1.6	6/11/2019
32	K1905084-004	100	7.870	0.0138	7.8565	785.649	785.6	6/11/2019
33	K1905084-004d	100	7.963	0.0138	7.9490	794.899	794.9	6/11/2019
34	K1905084-005	100	6.537	0.0138	6.5231	652.309	652.3	6/11/2019
35	K1905084-005d	100	6.472	0.0138	6.4586	645.859	645.9	6/11/2019
36	K1905298-001	1	0.135	0.0138	0.1211	0.12109	<0.5	6/11/2019
37	K1905298-001d	1	0.067	0.0138	0.0532	0.05319	<0.5	6/11/2019
38	K1905126-001	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/11/2019
39	K1905126-001d	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/11/2019
40	K1905126-002	1	0.140	0.0138	0.1264	0.12639	<0.5	6/11/2019
41	K1905126-002d	1	0.190	0.0138	0.1762	0.17619	<0.5	6/11/2019
42	C] CCV 25 ppm [25 p	1	24.876	0.0138	24.8620	24.86199	24.9	6/11/2019
43	[TOC] CCB [0 ppm]	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/11/2019
44	K1905126-002ms	1	25.907	0.0138	25.8933	25.89329	25.9	6/11/2019
45	K1905126-003	1	0.280	0.0138	0.2660	0.26599	<0.5	6/11/2019
46	K1905126-003d	1	0.262	0.0138	0.2481	0.24809	<0.5	6/11/2019
47	K1905126-004	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/11/2019
48	K1905126-004d	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/11/2019
49	C] CCV 25 ppm [25 p	1	24.628	0.0138	24.6141	24.61409	24.6	6/11/2019
50	[TOC] CCB [0 ppm]	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/11/2019

Analyzed By: BCD	Date Analyzed 6/19/19
Reviewed By: [signature]	Date Reviewed 06/18/19 TH

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	CJ CCV 25 ppm [25 p	1	24.876	0.0138	24.8620	24.86199	24.9	6/11/2019
3	[TOC] CCB [0 ppm]	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/11/2019
4	K1905126-005	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/11/2019
5	K1905126-005d	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/11/2019
6	K1905126-006	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/11/2019
7	K1905126-006d	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/11/2019
8	K1905126-007	1	0.085	0.0138	0.0711	0.07109	<0.5	6/11/2019
9	K1905126-007d	1	0.023	0.0138	0.0095	0.00949	<0.5	6/11/2019
10	K1905126-008	1	0.314	0.0138	0.3000	0.29999	<0.5	6/11/2019
11	K1905126-008d	1	0.339	0.0138	0.3252	0.32519	<0.5	6/11/2019
12	K1905126-009	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/11/2019
13	K1905126-009d	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/11/2019
14	K1905262-001	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/11/2019
15	K1905262-001d	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/11/2019
16	CJ CCV 25 ppm [25 p	1	24.628	0.0138	24.6141	24.61409	24.6	6/11/2019
17	[TOC] CCB [0 ppm]	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/11/2019
18	MB3	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/11/2019
19	[TOC] LCS [25ppm]	1	25.069	0.0138	25.0556	25.05559	25.1	6/11/2019
20	K1905262-002	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/11/2019
21	K1905262-002d	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/11/2019
22	K1905277-001	1	0.344	0.0138	0.3302	0.33019	<0.5	6/11/2019
23	K1905277-001d	1	0.315	0.0138	0.3010	0.30099	<0.5	6/11/2019
24	K1905277-001ms	1	25.866	0.0138	25.8518	25.85179	25.85	6/11/2019
25	K1905277-002	1	0.375	0.0138	0.3611	0.36109	<0.5	6/11/2019

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: BD		Date Analyzed 6/10/19	
Reviewed By:		Date Reviewed 06/14/19	

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	K1905277-002d	1	0.333	0.0138	0.3193	0.31929	<0.5	6/11/2019
27	K1905277-003	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/11/2019
28	K1905277-003d	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/11/2019
29	C] CCV 25 ppm [25 p	1	24.708	0.0138	24.6941	24.69409	24.7	6/11/2019
30	[TOC] CCB [0 ppm]	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/11/2019
31		1		0.0000	0.0000	0	<0.5	
32		1		0.0000	0.0000	0	<0.5	
33		1		0.0000	0.0000	0	<0.5	
34		1		0.0000	0.0000	0	<0.5	
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:	BD	Date Analyzed	6/10/19
Reviewed By:		Date Reviewed	06/14/19

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	CJ CCV 25 ppm [25 p	1	24.628	0.0138	24.6141	24.61409	24.6	6/11/2019
3	[TOC] CCB [0 ppm]	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/11/2019
4	K1905278-001	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/11/2019
5	K1905278-001d	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/11/2019
6	K1905278-001ms	1	25.097	0.0138	25.0836	25.08359	25.08	6/11/2019
7	CJ CCV 25 ppm [25 p	1	24.708	0.0138	24.6941	24.69409	24.7	6/11/2019
8	[TOC] CCB [0 ppm]	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/11/2019
9	K1905278-002	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/11/2019
10	K1905278-002d	1	0.009	0.0138	-0.0050	-0.00501	<0.5	6/11/2019
11	K1905278-003	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/11/2019
12	K1905278-003d	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/11/2019
13	K1905279-001	1	0.506	0.0138	0.4918	0.49179	<0.5	6/11/2019
14	K1905279-001d	1	0.561	0.0138	0.5475	0.54749	0.55	6/11/2019
15	K1905305-001	1	5.683	0.0138	5.6692	5.66919	5.7	6/11/2019
16	K1905305-001d	1	5.625	0.0138	5.6109	5.61089	5.6	6/11/2019
17	K1905360-001	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/11/2019
18	K1905360-001d	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/11/2019
19	K1905361-001	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/11/2019
20	K1905361-001d	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/11/2019
21	K1905369-001	2	5.225	0.0138	5.2116	10.42318	10.42	6/11/2019
22	K1905369-001d	2	5.217	0.0138	5.2032	10.40638	10.4	6/11/2019
23	K1905369-002	1	13.506	0.0138	13.4921	13.49209	13.5	6/11/2019
24	K1905369-002d	1	13.245	0.0138	13.2307	13.23069	13.23	6/11/2019
25	K1905369-003	1	1.788	0.0138	1.7744	1.77439	1.77	6/11/2019

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: BCP	Date Analyzed	6/10/19	
Reviewed By: [signature]	Date Reviewed	06/14/19	

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	K1905369-003d	1	1.767	0.0138	1.7527	1.75269	1.75	6/11/2019
27	K1905369-004	2	9.272	0.0138	9.2581	18.51618	18.52	6/11/2019
28	K1905369-004d	2	9.143	0.0138	9.1287	18.25738	18.3	6/11/2019
29	C] CCV 25 ppm [25 p	1	24.605	0.0138	24.5909	24.59089	24.6	6/11/2019
30	[TOC] CCB [0 ppm]	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/11/2019
31	MB4	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/11/2019
32	[TOC] LCS [25ppm]	1	25.095	0.0138	25.0808	25.08079	25.1	6/11/2019
33	K1905369-005	1	10.033	0.0138	10.0194	10.01939	10.0	6/11/2019
34	K1905369-005d	1	9.637	0.0138	9.6227	9.62269	9.6	6/11/2019
35	K1905369-006	2	13.541	0.0138	13.5276	27.05518	27.1	6/12/2019
36	K1905369-006d	2	13.525	0.0138	13.5114	27.02278	27.0	6/12/2019
37	K1905369-007	2	27.089	0.0138	27.0756	54.15118	54.2	6/12/2019
38	K1905369-007d	2	26.827	0.0138	26.8130	53.62598	53.6	6/12/2019
39	K1905369-008	2	9.595	0.0138	9.5814	19.16278	19.2	6/12/2019
40	K1905369-008d	2	9.361	0.0138	9.3469	18.69378	18.7	6/12/2019
41	K1905369-009	1	27.755	0.0138	27.7409	27.74089	27.7	6/12/2019
42	K1905369-009d	1	27.636	0.0138	27.6218	27.62179	27.6	6/12/2019
43	C] CCV 25 ppm [25 p	1	25.243	0.0138	25.2287	25.22869	25.2	6/12/2019
44	[TOC] CCB [0 ppm]	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/12/2019
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: ZCD	Date Analyzed 6/10/19
Reviewed By:	Date Reviewed 06/19/19

TOC: 638808, 638810, 638815, 638817

Schedule: 06102019

Version: 8
Instrument: Fusion1
Last Saved by: Fusion1 (Fusion1)
Last Saved on: 2019/06/10 14:58 - 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	K1905246-001.08	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
4	Sample	K1905246-003.08	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
5	Sample	K1905246-004.08	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
6	Sample	K1905246-004.08 ms	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
7	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
8	Sample	K1905246-005.08	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
9	Sample	K1905198-003.01 4x	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	K1905198-004.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
11	Sample	K1905198-005.01 2x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
12	Sample	K1905258-001.01 5x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
13	Sample	K1905258-001.01 10x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
14	Sample	K1905258-002.01 5x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
15	Sample	K1905258-002.01 10x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
16	Sample	K1905258-002.01 20x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
17	Sample	K1905258-003.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
18	Sample	K1905258-004.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
19	Sample	K1905258-005.01	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	K1905258-006.01 5x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
22	Sample	K1905259-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
23	Sample	K1905338-001.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
24	Sample	K1905084-004.01 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
25	Sample	K1905084-005.01 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
26	Sample	K1905298-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
27	Sample	K1905126-001.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
28	Sample	K1905126-002.10	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	K1905126-002.10 ms	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
30	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
31	Sample	K1905126-003.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
32	Sample	K1905126-004.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
33	Sample	K1905126-005.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
34	Sample	K1905126-006.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
35	Sample	K1905126-007.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
36	Sample	K1905126-008.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
37	Sample	K1905126-009.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
38	Sample	K1905262-001.02	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

Printed on: June 12, 2019 09:05:55

06/14/19

Schedule: 06102019

Position	Sample Type	Sample ID	Method ID (Calibration ID)	Reps	Use	State
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
39	Sample	MB3	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
C	Check Standard	[TOC] LCS [25.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
40	Sample	K1905262-002.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
41	Sample	K1905277-001.07	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
42	Sample	K1905277-001.07 ms	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
43	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
44	Sample	K1905277-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
45	Sample	K1905277-003.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
46	Sample	K1905278-001.10	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
47	Sample	K1905278-001.10 ms	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
48	Sample	K1905278-002.04	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
49	Sample	K1905278-003.04	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
50	Sample	K1905279-001.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
51	Sample	K1905305-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
52	Sample	K1905360-001.04	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
53	Sample	K1905361-001.03	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
54	Sample	K1905369-001.02 2x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
55	Sample	K1905369-002.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
56	Sample	K1905369-003.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
57	Sample	K1905369-004.02 2x	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
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	K1905369-005.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
60	Sample	K1905369-006.02 2x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
61	Sample	K1905369-007.02 2x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
62	Sample	K1905369-008.02 2x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
63	Sample	K1905369-009.02	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
					False	

Fusion Report - 06102019
Monday, June 10, 2019 11:35 AM

(View - Reps, Unused Reps, Meta-Data, Signature, History)
Printed on 2019/06/12 09:06 - Wednesday

Report Summary Information

Company Location: Gen Chem Lab
Schedule Name: 06102019
Instrument Name: Fusion1
Report Version: 1 of 1
Report Creation by Operators (schedule version): Fusion1 (Fusion1) (v2), Fusion1 (Fusion1) (v3), Fusion1 (Fusion1) (v4), Fusion1 (Fusion1) (v5), Fusion1 (Fusion1) (v6), Fusion1 (Fusion1) (v7), Fusion1 (Fusion1) (v8)
Comment:

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

06/14/19

Report Results

Sample Type: Clean — From Schedule Version 2

	Pos	Analysis Type	Sample ID	Start Time
◆	(clean)		Clean	2019/06/10 11:35

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	13.10	19.05	5.96	49.89	08:00
2	TC Clean	10.04	13.22	3.18	49.69	07:17
3	TC Clean	2.58	5.76	3.18	49.62	07:02
4	TC Clean	1.54	4.74	3.19	49.82	07:02

Sample Type: Clean — From Schedule Version 3

	Pos	Analysis Type	Sample ID	Start Time
◆	(clean)		Clean	2019/06/10 12:10

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	12.40	15.52	3.12	49.83	07:59

2	TC Clean	4.03	7.15	3.12	49.77	07:17
3	TC Clean	1.73	4.78	3.05	49.80	07:02
4	TC Clean	1.09	4.26	3.17	49.70	07:01

Sample Type: Clean — From Schedule Version 4

	Pos	Analysis Type	Sample ID	Start Time
◉	(clean)		Clean	2019/06/10 12:44

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	0.96	3.91	2.95	49.91	07:58
2	TC Clean	3.32	6.45	3.13	49.77	07:17
3	TC Clean	1.69	4.71	3.02	49.76	07:02
4	TC Clean	1.63	4.45	2.82	49.80	07:03

Sample Type: Blank (Creating v1265) — From Schedule Version 5

	Pos	Analysis Type	Sample ID	Start Time
◉	(blank)		Reagent/Acid Blank	2019/06/10 13:42

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	9.85	12.74	2.90	49.71	05:29
2	TC Clean	4.64	7.74	3.11	49.84	07:16
3	TC Clean	1.95	4.81	2.86	49.87	07:01
4	TC Clean	1.13	4.26	3.13	49.92	07:01
5	Reagent Blank	3.40	6.47	3.07	49.91	08:12
6	Acid Blank	1.23	4.37	3.15	49.64	05:26

Sample Type: Sample — From Schedule Version 6

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◉	D	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/10 14:29

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.17	11.31	3.15	50.09	10:33

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

1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm — From Schedule Version 7

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
*	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	25.1660 ppm (PASS)	0.0000 ppm	0%	2019/06/10 14:47

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	25.1660	251.6603	180.29	183.46	3.17	50.15	10:31

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

Sample Type: Check Standard --> CCB — From Schedule Version 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%	2019/06/10 15:02

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	6.10	9.37	3.28	50.13	10:32

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

Sample Type: Sample — From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	1	TOC	MB1	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/10 15:16

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.40	8.57	3.16	50.26	10:29
2	TOC	0.0000	0.0000	5.08	8.36	3.28	50.19	10:25
3	TOC	0.0000	0.0000	5.33	8.40	3.07	50.22	10:30
4	TOC	0.0000	0.0000	5.16	8.35	3.19	50.30	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

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 [24.0 ppm]	0 / infinity (NA / NA)	24.8397 ppm (PASS)	0.2130 ppm	0.86%	2019/06/10 16:12

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	24.6364	246.3641	176.69	179.76	3.07	50.27	10:25
C	TOC	25.0 ppm	2	24.7566	247.5663	177.51	180.80	3.29	50.27	10:26
C	TOC	25.0 ppm	3	25.1100	251.1005	179.91	183.15	3.25	50.32	10:32
C	TOC	25.0 ppm	4	24.9751	249.7510	178.99	182.08	3.09	50.33	10:26

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

Sample Type: Sample

From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	2	TOC	ICS	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/10 17:08

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.78	10.84	3.05	50.31	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	3	TOC	K1905246-001.08	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/10 17:23

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.88	9.87	2.99	50.34	10:30
2	TOC	0.0000	0.0000	6.85	9.83	2.98	50.34	10:24
3	TOC	0.0000	0.0000	7.00	9.95	2.96	50.22	10:31
4	TOC	0.0000	0.0000	6.68	9.85	3.17	50.20	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	4	TOC	K1905246-003.08	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/10 18:18

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.81	10.84	3.03	50.19	10:25
2	TOC	0.0000	0.0000	7.77	11.00	3.23	50.18	10:30

3	TOC	0.0000	0.0000	7.38	10.64	3.26	50.24	10:27
4	TOC	0.0000	0.0000	7.53	10.65	3.12	50.25	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	5	TOC	K1905246-004.08	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/10 19:14

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.37	9.43	3.07	50.18	10:27
2	TOC	0.0000	0.0000	6.56	9.77	3.21	50.20	10:26
3	TOC	0.0000	0.0000	5.94	9.20	3.25	50.20	10:27
4	TOC	0.0000	0.0000	6.33	9.39	3.06	50.18	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	6	TOC	K1905246-004.08 ms	25.6346 ppm	0.1453 ppm	0.5700%	2019/06/10 20:10

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	25.4473	254.4733	181.48	184.54	3.06	50.12	10:27
2	TOC	25.5935	255.9347	182.47	185.60	3.13	50.10	10:29
3	TOC	25.7336	257.3357	183.42	186.56	3.14	50.14	10:27
4	TOC	25.7642	257.6421	183.63	186.71	3.08	50.06	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	7	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/10 21:05

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.17	9.16	2.99	50.09	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	8	TOC	K1905246-005.08	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/10 21:20

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.16	10.27	3.10	50.11	10:27
2	TOC	0.0000	0.0000	7.54	10.56	3.02	50.18	10:30
3	TOC	0.0000	0.0000	7.57	10.61	3.04	50.11	10:29

4	TOC	0.0000	0.0000	7.27	10.27	3.00	50.07	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	9	TOC	K1905198-003.01 4x	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/10 22:15

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	-42248.80	-42245.72	3.08	50.08	10:28
2	TOC	0.0000	0.0000	-15736.81	-15732.85	3.96	50.00	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

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)	27.5192 ppm (PASS)	0.0000 ppm	0%	2019/06/10 22:43

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	27.5192	275.1917	196.26	200.18	3.92	50.00	10:33

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

Sample Type: Check Standard --> CCB — From Schedule Version 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)	0.2071 ppm (PASS)	0.0000 ppm	0%	2019/06/10 22:58

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.2071	2.0706	10.87	14.15	3.28	50.01	10:33

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

Sample Type: Sample — From Schedule Version 8

	Analysis	Std. Dev.

	Pos	Type	Sample ID	Result (ppmC)	(ppmC)	RSD	Start Time
◆	10	TOC	K1905198-004.01	1.4277 ppm	0.1865 ppm	13.0600%	2019/06/10 23:13

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.5595	15.5952	19.33	22.57	3.24	50.12	10:29
2	TOC	1.2958	12.9582	17.54	20.47	2.93	50.01	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	11	TOC	K1905198-005.01 2x	47.2102 ppm	0.1496 ppm	0.3200%	2019/06/10 23:41

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	47.3160	473.1596	329.92	333.00	3.08	50.05	10:27
2	TOC	47.1044	471.0441	328.48	331.58	3.10	50.15	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	12	TOC	K1905258-001.01 5x	13.9756 ppm	0.3591 ppm	2.5700%	2019/06/11 00:09

NR, using other dilution BEP 6/14/19

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	14.2295	142.2949	105.33	108.53	3.20	50.02	10:28
2	TOC	13.7217	137.2168	101.88	105.03	3.15	50.09	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	13	TOC	K1905258-001.01 10x	6.5765 ppm	0.0646 ppm	0.9800%	2019/06/11 00:37

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	6.6222	66.2218	53.69	57.01	3.31	50.05	10:30
2	TOC	6.5308	65.3084	53.07	56.35	3.28	50.06	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	14	TOC	K1905258-002.01 5x	52.5986 ppm	0.3332 ppm	0.6300%	2019/06/11 01:05

NR using other dilution BEP 6/14/19

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	52.3630	523.6300	364.18	367.44	3.26	50.11	10:29
2	TOC	52.8343	528.3428	367.38	370.92	3.54	50.05	10:27

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	15	TOC	K1905258-002.01 10x	30.4544 ppm	0.2756 ppm	0.9100%	2019/06/11 01:33

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	30.6493	306.4935	216.79	220.32	3.53	50.12	10:28
2	TOC	30.2595	302.5954	214.14	217.47	3.33	50.04	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	16	TOC	K1905258-002.01 20x	15.5532 ppm	0.1910 ppm	1.2300%	2019/06/11 02:02

NR using other dilution

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	15.6883	156.8826	115.23	118.48	3.25	49.98	10:32
2	TOC	15.4181	154.1807	113.40	116.42	3.02	50.07	10:30

BCD 6/13/19

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	17	TOC	K1905258-003.01	12.9339 ppm	0.0849 ppm	0.6600%	2019/06/11 02:30

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	12.8739	128.7385	96.13	99.19	3.06	49.97	10:32
2	TOC	12.9939	129.9392	96.94	100.08	3.13	49.93	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	18	TOC	K1905258-004.01	4.6104 ppm	0.1306 ppm	2.8300%	2019/06/11 02:58

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.7027	47.0275	40.66	43.80	3.13	49.99	10:32
2	TOC	4.5180	45.1801	39.41	42.59	3.17	49.89	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	19	TOC	K1905258-005.01	4.1473 ppm	0.0326 ppm	0.7900%	2019/06/11 03:26

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.1242	41.2422	36.74	39.97	3.24	49.96	10:27
2	TOC	4.1703	41.7033	37.05	40.04	2.99	49.88	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

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)	24.9241 ppm (PASS)	0.0000 ppm	0%	2019/06/11 03:54

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.9241	249.2413	178.65	181.87	3.23	49.88	10:28

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

Sample Type: Check Standard --> CCB — From Schedule Version 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%	2019/06/11 04:09

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	6.93	10.05	3.12	49.87	10:33

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

Sample Type: Sample — From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	20	TOC	MB2	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/11 04:24

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.44	8.60	3.16	49.87	10:34

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC)	CAS_salt_010711	CAS_salt_010711

(v1265) (v4) (v30)

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 [24.0 ppm]	0 / infinity (NA / NA)	25.3786 ppm (PASS)	0.0000 ppm	0%	2019/06/11 04:38

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	25.3786	253.7861	181.73	185.02	3.29	49.87	10:33

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

Sample Type: Sample

From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	21	TOC	K1905258-006.01 5x	63.3789 ppm	0.3707 ppm	0.5800%	2019/06/11 04:53

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	63.6411	636.4109	440.73	443.84	3.10	49.87	10:29
2	TOC	63.1168	631.1678	437.18	440.33	3.16	49.86	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	22	TOC	K1905259-001.01	2.7758 ppm	0.2277 ppm	8.2000%	2019/06/11 05:21

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.9368	29.3682	28.68	31.83	3.15	49.89	10:28
2	TOC	2.6148	26.1478	26.49	29.47	2.97	49.91	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	23	TOC	K1905338-001.02	1.6601 ppm	0.0146 ppm	0.8800%	2019/06/11 05:49

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.6705	16.7046	20.08	23.26	3.17	49.90	10:29
2	TOC	1.6498	16.4983	19.94	23.11	3.17	49.90	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	24	TOC	K1905084-004.01 100x	7.9165 ppm	0.0654 ppm	0.8300%	2019/06/11 06:17

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	7.8703	78.7027	62.17	65.29	3.13	49.92	10:26
2	TOC	7.9628	79.6279	62.79	65.86	3.06	49.90	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	25	TOC	K1905084-005.01 100x	6.5046 ppm	0.0456 ppm	0.7000%	2019/06/11 06:45

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	6.5369	65.3688	53.12	56.34	3.23	49.91	10:29
2	TOC	6.4724	64.7235	52.68	55.85	3.17	49.89	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	26	TOC	K1905298-001.01	0.1010 ppm	0.0480 ppm	47.5600%	2019/06/11 07:13

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.1349	1.3494	9.66	12.79	3.13	49.88	10:29
2	TOC	0.0670	0.6702	9.20	12.36	3.16	49.86	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	27	TOC	K1905126-001.02	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/11 07:41

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.52	10.68	3.17	49.88	10:26
2	TOC	0.0000	0.0000	7.37	10.62	3.25	49.79	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	28	TOC	K1905126-002.10	0.1651 ppm	0.0352 ppm	21.3200%	2019/06/11 08:09

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.1402	1.4024	9.70	12.66	2.97	49.76	10:25
2	TOC	0.1900	1.9004	10.03	13.12	3.09	49.72	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

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)	24.8758 ppm (PASS)	0.0000 ppm	0%	2019/06/11 08:37

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.8758	248.7581	178.32	181.28	2.96	49.78	10:29

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

Sample Type: Check Standard --> CCB — From Schedule Version 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%	2019/06/11 08:52

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.34	8.50	3.16	49.80	10:31

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

Sample Type: Sample — From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	29	TOC	K1905126-002.10 ms	25.9071 ppm	0.0000 ppm	0.0000%	2019/06/11 09:07

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	25.9071	259.0711	184.60	187.66	3.06	49.82	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC)	CAS_salt_010711	CAS_salt_010711

(v1265) (v4) (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◉	30	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/11 09:21

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.60	8.68	3.08	49.73	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◉	31	TOC	K1905126-003.02	0.2708 ppm	0.0126 ppm	4.6500%	2019/06/11 09:36

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.2798	2.7975	10.64	13.76	3.11	49.80	10:25
2	TOC	0.2619	2.6193	10.52	13.75	3.23	50.09	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◉	32	TOC	K1905126-004.02	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/11 10:04

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.77	9.83	3.06	50.02	10:27
2	TOC	0.0000	0.0000	6.91	10.04	3.13	50.08	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◉	33	TOC	K1905126-005.02	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/11 10:32

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.11	10.12	3.01	50.09	10:28
2	TOC	0.0000	0.0000	7.04	10.12	3.08	50.06	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◉	34	TOC	K1905126-006.02	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/11 11:00

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time

1	TOC	0.0000	0.0000	6.72	9.66	2.95	50.15	10:28
2	TOC	0.0000	0.0000	6.57	9.54	2.97	50.15	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◉	35	TOC	K1905126-007.02	0.0541 ppm	0.0435 ppm	80.5500%	2019/06/11 11:28

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0849	0.8485	9.32	12.30	2.99	50.12	10:26
2	TOC	0.0233	0.2327	8.90	11.94	3.04	50.12	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◉	36	TOC	K1905126-008.02	0.3264 ppm	0.0178 ppm	5.4600%	2019/06/11 11:56

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.3138	3.1379	10.87	13.83	2.96	50.14	10:27
2	TOC	0.3390	3.3898	11.04	13.97	2.93	50.14	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◉	37	TOC	K1905126-009.02	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/11 12:24

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.58	9.74	3.16	50.11	10:29
2	TOC	0.0000	0.0000	7.04	9.97	2.93	50.09	10:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◉	38	TOC	K1905262-001.02	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/11 12:53

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.96	9.96	3.00	50.07	10:28
2	TOC	0.0000	0.0000	7.17	10.25	3.08	50.19	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

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)	24.6279 ppm (PASS)	0.0000 ppm	0%	2019/06/11 13:21

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.6279	246.2787	176.64	179.77	3.13	50.13	10:34

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

Sample Type: Check Standard --> CCB — From Schedule Version 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)	0.0003 ppm (PASS)	0.0000 ppm	0%	2019/06/11 13:35

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.08	8.29	3.21	50.13	10:33

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

Sample Type: Sample — From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	39	TOC	MB3	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/11 13:50

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	4.60	7.58	2.97	50.20	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

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)	25.0694 ppm (PASS)	0.0000 ppm	0%	2019/06/11 14:05

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	25.0694	250.6939	179.63	182.89	3.25	50.13	10:28

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

Sample Type: Sample — From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	40	TOC	K1905262-002.02	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/11 14:19

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.44	10.67	3.23	50.15	10:28
2	TOC	0.0000	0.0000	6.64	9.86	3.22	50.26	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	41	TOC	K1905277-001.07	0.3294 ppm	0.0206 ppm	6.2600%	2019/06/11 14:48

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.3440	3.4399	11.08	14.27	3.19	50.25	10:27
2	TOC	0.3148	3.1482	10.88	14.02	3.14	50.23	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	42	TOC	K1905277-001.07 ms	25.8656 ppm	0.0000 ppm	0.0000%	2019/06/11 15:16

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	25.8656	258.6557	184.32	187.54	3.22	50.18	10:34

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	43	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/11 15:31

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.11	8.29	3.18	50.20	10:34

Dilution	Blank Contribution	Method	Calibration

1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	44	TOC	K1905277-002.01	0.3540 ppm	0.0296 ppm	8.3600%	2019/06/11 15:45

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.3749	3.7492	11.29	14.27	2.98	50.20	10:28
2	TOC	0.3331	3.3308	11.00	14.29	3.28	50.24	10:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	45	TOC	K1905277-003.01	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/11 16:13

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.55	8.75	3.20	50.22	10:28
2	TOC	0.0000	0.0000	5.35	8.66	3.30	50.24	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	46	TOC	K1905278-001.10	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/11 16:41

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.70	10.85	3.15	50.27	10:29
2	TOC	0.0000	0.0000	7.96	10.95	2.99	50.28	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	47	TOC	K1905278-001.10 ms	25.0974 ppm	0.0000 ppm	0.0000%	2019/06/11 17:10

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	25.0974	250.9744	179.10	182.07	2.97	50.26	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

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)	24.7079 ppm (PASS)	0.0000 ppm	0%	2019/06/11 17:24

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.7079	247.0786	177.18	180.31	3.13	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 (v30)	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%	2019/06/11 17:39

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	4.96	8.18	3.22	50.27	10:31

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

Sample Type: Sample

From Schedule Version 8

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
48	TOC	K1905278-002.04	0.0044 ppm	0.0062 ppm	141.4200%	2019/06/11 17:54

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.50	11.63	3.13	50.27	10:29
2	TOC	0.0088	0.0883	8.80	11.88	3.08	50.29	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
49	TOC	K1905278-003.04	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/11 18:22

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.59	8.67	3.08	50.30	10:28
2	TOC	0.0000	0.0000	5.15	8.27	3.12	50.23	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	50	TOC	K1905279-001.02	0.5334 ppm	0.0394 ppm	7.3800%	2019/06/11 18:50

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5056	5.0560	12.18	15.23	3.05	50.16	10:26
2	TOC	0.5613	5.6128	12.55	15.66	3.11	50.22	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	51	TOC	K1905305-001.01	5.6538 ppm	0.0413 ppm	0.7300%	2019/06/11 19:18

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	5.6830	56.8301	47.32	50.44	3.12	50.18	10:25
2	TOC	5.6247	56.2467	46.92	50.07	3.14	50.14	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	52	TOC	K1905360-001.04	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/11 19:46

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.84	10.08	3.23	50.17	10:27
2	TOC	0.0000	0.0000	7.02	10.14	3.12	50.21	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	53	TOC	K1905361-001.03	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/11 20:14

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.81	10.97	3.16	50.17	10:30
2	TOC	0.0000	0.0000	7.96	11.25	3.29	50.19	10:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	54	TOC	K1905369-001.02 2x	5.2212 ppm	0.0059 ppm	0.1100%	2019/06/11 20:42

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	5.2254	52.2544	44.21	47.40	3.19	50.19	10:27

2	TOC	5.2170	52.1704	44.16	47.37	3.21	50.23	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	55	TOC	K1905369-002.02	13.3752 ppm	0.1848 ppm	1.3800%	2019/06/11 21:10

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	13.5059	135.0586	100.42	103.57	3.15	50.19	10:26
2	TOC	13.2445	132.4451	98.65	101.86	3.22	50.16	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	56	TOC	K1905369-003.02	1.7773 ppm	0.0153 ppm	0.8600%	2019/06/11 21:38

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.7882	17.8817	20.88	24.25	3.37	50.24	10:26
2	TOC	1.7665	17.6651	20.73	23.96	3.22	50.16	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	57	TOC	K1905369-004.02 2x	9.2072 ppm	0.0915 ppm	0.9900%	2019/06/11 22:06

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	9.2719	92.7188	71.68	74.77	3.09	50.16	10:29
2	TOC	9.1425	91.4253	70.80	73.97	3.17	50.12	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

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)	24.6047 ppm (PASS)	0.0000 ppm	0%	2019/06/11 22:34

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.6047	246.0474	176.48	179.71	3.24	50.04	10:29

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

Sample Type: Check Standard --> CCB — From Schedule Version 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%	2019/06/11 22:49

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.11	8.22	3.11	50.05	10:32

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

Sample Type: Sample — From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	58	TOC	MB4	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/11 23:04

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	4.45	7.48	3.03	50.06	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

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)	25.0946 ppm (PASS)	0.0000 ppm	0%	2019/06/11 23:18

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	25.0946	250.9458	179.80	182.94	3.14	49.93	10:28

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

Sample Type: Sample — From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◉	59	TOC	K1905369-005.02	9.8349 ppm	0.2805 ppm	2.8500%	2019/06/11 23:33

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	10.0332	100.3323	76.85	79.77	2.92	49.96	10:28
2	TOC	9.6365	96.3650	74.16	77.34	3.19	49.86	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◉	60	TOC	K1905369-006.02 2x	13.5333 ppm	0.0115 ppm	0.0800%	2019/06/12 00:01

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	13.5414	135.4136	100.66	103.97	3.31	49.94	10:29
2	TOC	13.5252	135.2516	100.55	103.66	3.11	49.86	10:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◉	61	TOC	K1905369-007.02 2x	26.9581 ppm	0.1856 ppm	0.6900%	2019/06/12 00:29

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	27.0894	270.8936	192.62	195.65	3.03	49.97	10:31
2	TOC	26.8268	268.2683	190.84	193.78	2.94	49.88	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◉	62	TOC	K1905369-008.02 2x	9.4780 ppm	0.1658 ppm	1.7500%	2019/06/12 00:58

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	9.5952	95.9525	73.88	76.92	3.05	49.80	10:29
2	TOC	9.3607	93.6071	72.28	75.31	3.02	49.79	10:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◉	63	TOC	K1905369-009.02	27.6951 ppm	0.0842 ppm	0.3000%	2019/06/12 01:26

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	27.7547	277.5466	197.14	200.30	3.16	49.74	10:29

2	TOC	27.6356	276.3562	196.33	199.36	3.02	49.76	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

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)	25.2425 ppm (PASS)	0.0000 ppm	0%	2019/06/12 01:54

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	25.2425	252.4249	180.81	183.95	3.14	49.75	10:34

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

Sample Type: Check Standard --> CCB — From Schedule Version 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%	2019/06/12 02:08

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	6.01	8.98	2.97	49.73	10:31

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

Meta Data Used in this Report

Blanks

Version	Reagent (Abs)	Acid (Abs)	DI IC (Abs)	DI TC (Abs)	DI TOC (Abs)	Save Time	Operator
v1264	1.3990	1.2110	0.0000	0.0000	0.0000	2019/06/06 15:32	Fusion1 (Fusion1)
v1265	1.1340	1.2260	0.0000	0.0000	0.0000	2019/06/10 14:28	Fusion1 (Fusion1)

Calibrations

Name: CAS_salt_010711 (TOC)

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

Basic Analysis Type: TOC

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

Methods

Name: CAS_salt_010711 (TOC)

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

Parameter	Value
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	2019/06/12 02:26

ALS Environmental

StarLIMS Run: 638808, 638810, 638815, 638817

Analysis: TOC/DOC

Method: 415.1, SM 5310 C, 9060, 9060A

CCV: 11-GEN-05-77K 50 ppm LCS: 11-GEN-05-77D 25.0 ppm

ICAL Date: 3/6/19

ICAL ID: 11-GEN-05-76H

ICS ID: 11-GEN-05-74A

ICS TV: 25.0 ppm ICS % R = 2

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

Sodium Persulfate: 11-GEN-05-78F

21 % H3PO4: 11-GEN-05-78G

Equipment ID: K-TOC-03

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

FILTER ID: FE1165

Analyzed By:	BD	Date Analyzed:	6/10/19
Reviewed By:	[signature]	Date Reviewed:	06/14/19

Work Request # Original ( ) KP1105114-6, 5498, 5298, 5420, 5440, 5449, 5451, 5478, 5589, 5498, 5409, 5449, 5422, 5558, 5589, 5595, 5625, 5295, 5517
Tier: IV IV IV II II II II II II IV I II I II II II
Date Analyzed: 6/16/19
Analyst: BCD/HLM
Analysis: TOC/DOC
TOC: 639522, 639523, 639524
Run # DOC: 639525

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: KP1105420-1/1d, KP1105515-2/2d Sent for RA due to being overdiluted.
KP1105497-1/1d, 5478-6 report a high %RSD, but these samples are less than 5x the MRL.
KP1105114-6/6d reports a high %RSD due to non-homogenous, dirty sample.

Final Approved by: [signature] Date: 06/18/19

DQREPORT

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 639522 **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
K1905114-006	Carbon, Total Organic	N/A		Ground Water	5.41 mg/L	10 mL	54.1 mg/L	10	0.7	5.0			6/15/19 03:35:00	N	IV
K1905198-003	Carbon, Total Organic	N/A		Ground Water	13.60 mg/L	10 mL	1360 mg/L	100	7	50			6/15/19 02:11:00	N	IV
K1905258-006	Carbon, Total Organic	N/A		Water	3.31 mg/L	10 mL	331 mg/L	100	7	50			6/15/19 01:13:00	N	IV
K1905420-001	Carbon, Total Organic	N/A		Water	0.38 mg/L	10 mL	50 mg/L U	100	7	50			6/15/19 13:58:00	N	II
K1905440-001	Carbon, Total Organic	N/A		Water	21.35 mg/L	10 mL	21.3 mg/L	1	0.07	0.50			6/15/19 04:03:00	N	II
K1905440-002	Carbon, Total Organic	N/A		Water	21.51 mg/L	10 mL	21.5 mg/L	1	0.07	0.50			6/15/19 04:31:00	N	II
K1905440-003	Carbon, Total Organic	N/A		Water	20.63 mg/L	10 mL	20.6 mg/L	1	0.07	0.50			6/15/19 04:59:00	N	II
K1905440-004	Carbon, Total Organic	N/A		Water	20.85 mg/L	10 mL	20.8 mg/L	1	0.07	0.50			6/15/19 05:27:00	N	II
K1905449-001	Carbon, Total Organic	N/A		Water	1.54 mg/L	10 mL	1.54 mg/L	1	0.07	0.50			6/15/19 14:40:00	N	II
K1905451-001	Carbon, Total Organic	N/A		Water	6.46 mg/L	10 mL	646 mg/L	100	7	50			6/15/19 11:35:00	N	II
K1905451-002	Carbon, Total Organic	N/A		Water	5.83 mg/L	10 mL	583 mg/L	100	7	50			6/15/19 12:33:00	N	II
K1905478-001	Carbon, Total Organic	N/A		Ground Water	28.06 mg/L	10 mL	28.1 mg/L	1	0.07	0.50			6/15/19 05:55:00	N	II
K1905478-002	Carbon, Total Organic	N/A		Ground Water	9.82 mg/L	10 mL	9.82 mg/L	1	0.07	0.50			6/15/19 06:23:00	N	II
K1905478-003	Carbon, Total Organic	N/A		Ground Water	18.57 mg/L	10 mL	18.6 mg/L	1	0.07	0.50			6/15/19 07:50:00	N	II
K1905478-004	Carbon, Total Organic	N/A		Ground Water	9.86 mg/L	10 mL	9.86 mg/L	1	0.07	0.50			6/15/19 08:18:00	Y	II
K1905478-005	Carbon, Total Organic	N/A		Ground Water	7.89 mg/L	10 mL	7.89 mg/L	1	0.07	0.50			6/15/19 09:29:00	N	II
K1905478-006	Carbon, Total Organic	N/A		Ground Water	0.67 mg/L	10 mL	0.67 mg/L	1	0.07	0.50			6/15/19 10:11:00	N	II
K1905478-007	Carbon, Total Organic	N/A		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/15/19 10:59:00	N	II
K1905589-001	Carbon, Total Organic	N/A		Water	3.74 mg/L	10 mL	3.74 mg/L	1	0.07	0.50			6/15/19 13:01:00	N	II
K1905589-003	Carbon, Total Organic	N/A		Water	2.59 mg/L	10 mL	2.59 mg/L	1	0.07	0.50			6/15/19 13:30:00	N	II
KQ1908379-01	Carbon, Total Organic	CCV		Water	24.94 mg/L	10 mL	24.9 mg/L	1					6/14/19 18:11:00	N	IV
KQ1908379-02	Carbon, Total Organic	CCV		Water	24.59 mg/L	10 mL	24.6 mg/L	1					6/15/19 01:13:00	N	IV
KQ1908379-03	Carbon, Total Organic	CCV		Water	25.46 mg/L	10 mL	25.5 mg/L	1					6/15/19 06:51:00	N	IV
KQ1908379-04	Carbon, Total Organic	CCV		Water	24.96 mg/L	10 mL	25.0 mg/L	1					6/15/19 12:03:00	N	IV
KQ1908379-05	Carbon, Total Organic	CCV		Water	24.89 mg/L	10 mL	24.9 mg/L	1					6/15/19 17:01:00	N	IV
KQ1908379-06	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/14/19 18:26:00	N	IV
KQ1908379-07	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/15/19 01:56:00	N	IV
KQ1908379-08	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/15/19 07:06:00	N	IV
KQ1908379-09	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/15/19 12:18:00	N	IV
KQ1908379-10	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/15/19 17:15:00	N	IV
KQ1908379-11	Carbon, Total Organic	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/14/19 18:41:00	N	IV
KQ1908379-12	Carbon, Total Organic	LCS		Water	25.40 mg/L	10 mL	25.4 mg/L	1	0.07	0.50	102		6/14/19 19:37:00	N	IV

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

Printed 6/18/19 10:35

Results Summary

06/18/19

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 639522 **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
KQ1908379-13	Carbon, Total Organic	MS	K1905478-004	Ground Water	29.95 mg/L	10 mL	59.9 mg/L	2	0.2	1.0	100		6/15/19 08:46:00	N	II
KQ1908379-14	Carbon, Total Organic	DUP	K1905258-006	Water	3.33 mg/L	10 mL	333 mg/L	100	7	50		<1	6/15/19 01:13:00	N	IV
KQ1908379-15	Carbon, Total Organic	DUP	K1905198-003	Ground Water	13.59 mg/L	10 mL	1360 mg/L	100	7	50		<1	6/15/19 02:11:00	N	IV
KQ1908379-17	Carbon, Total Organic	DUP	K1905114-006	Ground Water	6.29 mg/L	10 mL	62.9 mg/L	10	0.7	5.0		15*	6/15/19 03:35:00	N	IV
KQ1908379-18	Carbon, Total Organic	DUP	K1905440-001	Water	21.00 mg/L	10 mL	21.0 mg/L	1	0.07	0.50		2	6/15/19 04:03:00	N	II
KQ1908379-19	Carbon, Total Organic	DUP	K1905440-002	Water	21.25 mg/L	10 mL	21.2 mg/L	1	0.07	0.50		1	6/15/19 04:31:00	N	II
KQ1908379-20	Carbon, Total Organic	DUP	K1905440-003	Water	20.93 mg/L	10 mL	20.9 mg/L	1	0.07	0.50		1	6/15/19 04:59:00	N	II
KQ1908379-21	Carbon, Total Organic	DUP	K1905440-004	Water	20.80 mg/L	10 mL	20.8 mg/L	1	0.07	0.50		<1	6/15/19 05:27:00	N	II
KQ1908379-22	Carbon, Total Organic	DUP	K1905478-001	Ground Water	28.39 mg/L	10 mL	28.4 mg/L	1	0.07	0.50		1	6/15/19 05:55:00	N	II
KQ1908379-23	Carbon, Total Organic	DUP	K1905478-002	Ground Water	9.35 mg/L	10 mL	9.35 mg/L	1	0.07	0.50		5	6/15/19 06:23:00	N	II
KQ1908379-24	Carbon, Total Organic	DUP	K1905478-003	Ground Water	18.70 mg/L	10 mL	18.7 mg/L	1	0.07	0.50		<1	6/15/19 07:50:00	N	II
KQ1908379-25	Carbon, Total Organic	DUP	K1905478-004	Ground Water	9.86 mg/L	10 mL	9.86 mg/L	1	0.07	0.50		<1	6/15/19 08:18:00	N	II
KQ1908379-26	Carbon, Total Organic	DUP	K1905478-005	Ground Water	7.97 mg/L	10 mL	7.97 mg/L	1	0.07	0.50		<1	6/15/19 09:29:00	N	II
KQ1908379-27	Carbon, Total Organic	DUP	K1905478-006	Ground Water	0.59 mg/L	10 mL	0.59 mg/L	1	0.07	0.50		12*	6/15/19 10:11:00	N	II
KQ1908379-28	Carbon, Total Organic	DUP	K1905478-007	Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	6/15/19 10:59:00	N	II
KQ1908379-29	Carbon, Total Organic	DUP	K1905451-001	Water	6.46 mg/L	10 mL	646 mg/L	100	7	50		<1	6/15/19 11:35:00	N	II
KQ1908379-30	Carbon, Total Organic	DUP	K1905451-002	Water	5.90 mg/L	10 mL	590 mg/L	100	7	50		1	6/15/19 12:33:00	N	II
KQ1908379-31	Carbon, Total Organic	DUP	K1905589-001	Water	3.64 mg/L	10 mL	3.64 mg/L	1	0.07	0.50		3	6/15/19 13:01:00	N	II
KQ1908379-32	Carbon, Total Organic	DUP	K1905589-003	Water	2.58 mg/L	10 mL	2.58 mg/L	1	0.07	0.50		<1	6/15/19 13:30:00	N	II
KQ1908379-33	Carbon, Total Organic	DUP	K1905420-001	Water	0.39 mg/L	10 mL	39 mg/L J	100	7	50		NC	6/15/19 13:58:00	N	II
KQ1908379-34	Carbon, Total Organic	DUP	K1905449-001	Water	1.47 mg/L	10 mL	1.47 mg/L	1	0.07	0.50		5	6/15/19 14:40:00	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:** 639523 **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
K1905198-006	Carbon, Total Organic	N/A		Ground Water	3.96 mg/L	10 mL	3.96 mg/L	1	0.07	0.50			6/15/19 03:07:00	N	IV
K1905409-001	Carbon, Total Organic	N/A		Reagent Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/15/19 20:48:00	N	I
K1905409-002	Carbon, Total Organic	N/A		Reagent Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/15/19 21:16:00	N	I
K1905449-002	Carbon, Total Organic	N/A		Water	0.56 mg/L	10 mL	0.56 mg/L	1	0.07	0.50			6/15/19 15:08:00	N	II
K1905477-001	Carbon, Total Organic	N/A		Water	1.72 mg/L	10 mL	1.72 mg/L	1	0.07	0.50			6/15/19 15:36:00	N	I
K1905477-002	Carbon, Total Organic	N/A		Water	19.94 mg/L	10 mL	19.9 mg/L	1	0.07	0.50			6/15/19 16:04:00	N	I
K1905477-003	Carbon, Total Organic	N/A		Water	2.68 mg/L	10 mL	2.68 mg/L	1	0.07	0.50			6/15/19 16:32:00	N	I
K1905477-004	Carbon, Total Organic	N/A		Water	1.23 mg/L	10 mL	1.23 mg/L	1	0.07	0.50			6/15/19 17:59:00	N	I
K1905482-001	Carbon, Total Organic	N/A		Water	0.40 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/15/19 18:27:00	N	II
K1905482-002	Carbon, Total Organic	N/A		Water	1.54 mg/L	10 mL	1.54 mg/L	1	0.07	0.50			6/15/19 18:56:00	N	II
K1905482-003	Carbon, Total Organic	N/A		Water	0.62 mg/L	10 mL	0.62 mg/L	1	0.07	0.50			6/15/19 19:24:00	N	II
K1905482-004	Carbon, Total Organic	N/A		Water	0.87 mg/L	10 mL	0.87 mg/L	1	0.07	0.50			6/15/19 19:52:00	N	II
K1905482-005	Carbon, Total Organic	N/A		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/15/19 20:20:00	N	II
K1905558-001	Carbon, Total Organic	N/A		Water	1.48 mg/L	10 mL	1.48 mg/L	1	0.07	0.50			6/15/19 22:14:00	N	II
K1905558-002	Carbon, Total Organic	N/A		Water	1.64 mg/L	10 mL	1.64 mg/L	1	0.07	0.50			6/15/19 22:42:00	N	II
K1905558-003	Carbon, Total Organic	N/A		Water	1.07 mg/L	10 mL	1.07 mg/L	1	0.07	0.50			6/15/19 23:10:00	N	II
K1905558-004	Carbon, Total Organic	N/A		Water	1.59 mg/L	10 mL	1.59 mg/L	1	0.07	0.50			6/15/19 23:38:00	N	II
K1905558-005	Carbon, Total Organic	N/A		Water	1.53 mg/L	10 mL	1.53 mg/L	1	0.07	0.50			6/16/19 00:06:00	N	II
K1905586-001	Carbon, Total Organic	N/A		Water	0.69 mg/L	10 mL	0.69 mg/L	1	0.07	0.50			6/16/19 00:34:00	N	II
K1905586-002	Carbon, Total Organic	N/A		Water	0.19 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/16/19 01:02:00	N	II
KQ1908380-01	Carbon, Total Organic	MS	K1905198-006	Ground Water	25.56 mg/L	10 mL	25.6 mg/L	1	0.07	0.50	86		6/16/19 10:45:00	N	IV
KQ1908380-02	Carbon, Total Organic	CCV		Ground Water	24.59 mg/L	10 mL	24.6 mg/L	1					6/15/19 01:41:00	N	IV
KQ1908380-03	Carbon, Total Organic	CCV		Ground Water	25.46 mg/L	10 mL	25.5 mg/L	1					6/15/19 06:51:00	N	IV
KQ1908380-04	Carbon, Total Organic	CCV		Ground Water	24.96 mg/L	10 mL	25.0 mg/L	1					6/15/19 12:03:00	N	IV
KQ1908380-05	Carbon, Total Organic	CCV		Ground Water	24.89 mg/L	10 mL	24.9 mg/L	1					6/15/19 17:01:00	N	IV
KQ1908380-06	Carbon, Total Organic	CCB		Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/15/19 01:56:00	N	IV
KQ1908380-07	Carbon, Total Organic	CCB		Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/15/19 07:06:00	N	IV
KQ1908380-08	Carbon, Total Organic	CCB		Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/15/19 12:18:00	N	IV
KQ1908380-09	Carbon, Total Organic	CCB		Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/15/19 17:15:00	N	IV

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

06/18/19

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 639523 **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
KQ1908380-10	Carbon, Total Organic	MB		Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/15/19 07:21:00	N	IV
KQ1908380-11	Carbon, Total Organic	LCS		Ground Water	25.44 mg/L	10 mL	25.4 mg/L	1	0.07	0.50	102		6/15/19 07:35:00	N	IV
KQ1908380-12	Carbon, Total Organic	DUP	K1905198-006	Ground Water	3.83 mg/L	10 mL	3.83 mg/L	1	0.07	0.50		3	6/15/19 03:07:00	N	IV
KQ1908380-13	Carbon, Total Organic	DUP	K1905449-002	Water	0.53 mg/L	10 mL	0.53 mg/L	1	0.07	0.50		5	6/15/19 15:08:00	N	II
KQ1908380-14	Carbon, Total Organic	DUP	K1905477-001	Water	1.75 mg/L	10 mL	1.75 mg/L	1	0.07	0.50		2	6/15/19 15:36:00	N	I
KQ1908380-15	Carbon, Total Organic	DUP	K1905477-002	Water	19.70 mg/L	10 mL	19.7 mg/L	1	0.07	0.50		1	6/15/19 16:04:00	N	I
KQ1908380-16	Carbon, Total Organic	DUP	K1905477-003	Water	2.56 mg/L	10 mL	2.56 mg/L	1	0.07	0.50		5	6/15/19 16:32:00	N	I
KQ1908380-17	Carbon, Total Organic	DUP	K1905477-004	Water	1.13 mg/L	10 mL	1.13 mg/L	1	0.07	0.50		9	6/15/19 17:59:00	N	I
KQ1908380-18	Carbon, Total Organic	DUP	K1905482-001	Water	0.46 mg/L	10 mL	0.46 mg/L J	1	0.07	0.50		NC	6/15/19 18:27:00	N	II
KQ1908380-19	Carbon, Total Organic	DUP	K1905482-002	Water	1.52 mg/L	10 mL	1.52 mg/L	1	0.07	0.50		<1	6/15/19 18:56:00	N	II
KQ1908380-20	Carbon, Total Organic	DUP	K1905482-003	Water	0.63 mg/L	10 mL	0.63 mg/L	1	0.07	0.50		2	6/15/19 19:24:00	N	II
KQ1908380-21	Carbon, Total Organic	DUP	K1905482-004	Water	0.82 mg/L	10 mL	0.82 mg/L	1	0.07	0.50		6	6/15/19 19:52:00	N	II
KQ1908380-22	Carbon, Total Organic	DUP	K1905482-005	Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	6/15/19 20:20:00	N	II
KQ1908380-23	Carbon, Total Organic	DUP	K1905409-001	Reagent Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	6/15/19 20:48:00	N	I
KQ1908380-24	Carbon, Total Organic	DUP	K1905409-002	Reagent Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	6/15/19 21:16:00	N	I
KQ1908380-25	Carbon, Total Organic	DUP	K1905558-001	Water	1.41 mg/L	10 mL	1.41 mg/L	1	0.07	0.50		5	6/15/19 22:14:00	N	II
KQ1908380-26	Carbon, Total Organic	DUP	K1905558-002	Water	1.61 mg/L	10 mL	1.61 mg/L	1	0.07	0.50		2	6/15/19 22:42:00	N	II
KQ1908380-27	Carbon, Total Organic	DUP	K1905558-003	Water	1.06 mg/L	10 mL	1.06 mg/L	1	0.07	0.50		1	6/15/19 23:10:00	N	II
KQ1908380-28	Carbon, Total Organic	DUP	K1905558-004	Water	1.54 mg/L	10 mL	1.54 mg/L	1	0.07	0.50		3	6/15/19 23:38:00	N	II
KQ1908380-29	Carbon, Total Organic	DUP	K1905558-005	Water	1.48 mg/L	10 mL	1.48 mg/L	1	0.07	0.50		3	6/16/19 00:06:00	N	II
KQ1908380-30	Carbon, Total Organic	DUP	K1905586-001	Water	0.67 mg/L	10 mL	0.67 mg/L	1	0.07	0.50		4	6/16/19 00:34:00	N	II
KQ1908380-31	Carbon, Total Organic	DUP	K1905586-002	Water	0.16 mg/L	10 mL	0.16 mg/L J	1	0.07	0.50		NC	6/16/19 01:02:00	N	II
KQ1908380-32	Carbon, Total Organic	CCB		Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/15/19 21:59:00	N	IV
KQ1908380-33	Carbon, Total Organic	CCB		Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/16/19 03:09:00	N	IV
KQ1908380-34	Carbon, Total Organic	CCV		Ground Water	24.50 mg/L	10 mL	24.5 mg/L	1					6/15/19 21:44:00	N	IV
KQ1908380-35	Carbon, Total Organic	CCV		Ground Water	24.52 mg/L	10 mL	24.5 mg/L	1					6/16/19 02:55:00	N	IV
KQ1908380-36	Carbon, Total Organic	CCV		Ground Water	24.12 mg/L	10 mL	24.1 mg/L	1					6/16/19 07:11:00	N	IV
KQ1908380-37	Carbon, Total Organic	CCV		Ground Water	25.11 mg/L	10 mL	25.1 mg/L	1					6/16/19 11:00:00	N	IV
KQ1908380-38	Carbon, Total Organic	CCB		Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/16/19 07:26:00	N	IV

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

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 639523 **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
KQ1908380-39	Carbon, Total Organic	CCB		Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/16/19 11:14:00	N	IV

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

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 639524 **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
K1905259-001	Carbon, Total Organic	N/A		Water	2.21 mg/L	10 mL	2.21 mg/L	1	0.07	0.50			6/16/19 06:15:00	N	IV
K1905597-001	Carbon, Total Organic	N/A		Water	0.61 mg/L	10 mL	0.61 mg/L	1	0.07	0.50			6/16/19 01:30:00	N	IV
K1905597-002	Carbon, Total Organic	N/A		Water	2.79 mg/L	10 mL	11.2 mg/L	4	0.3	2.0			6/16/19 01:58:00	N	IV
K1905597-003	Carbon, Total Organic	N/A		Water	2.72 mg/L	10 mL	10.9 mg/L	4	0.3	2.0			6/16/19 02:27:00	N	IV
K1905597-004	Carbon, Total Organic	N/A		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/16/19 03:53:00	N	IV
K1905597-005	Carbon, Total Organic	N/A		Water	0.32 mg/L	10 mL	0.32 mg/L J	1	0.07	0.50			6/16/19 04:22:00	N	IV
K1905597-006	Carbon, Total Organic	N/A		Water	2.34 mg/L	10 mL	2.34 mg/L	1	0.07	0.50			6/16/19 04:50:00	Y	IV
K1905597-007	Carbon, Total Organic	N/A		Water	1.43 mg/L	10 mL	1.43 mg/L	1	0.07	0.50			6/16/19 05:47:00	N	IV
KQ1908381-01	Carbon, Total Organic	CCV		Water	24.50 mg/L	10 mL	24.5 mg/L	1					6/15/19 21:44:00	N	IV
KQ1908381-02	Carbon, Total Organic	CCV		Water	24.52 mg/L	10 mL	24.5 mg/L	1					6/16/19 02:55:00	N	IV
KQ1908381-03	Carbon, Total Organic	CCV		Water	24.12 mg/L	10 mL	24.1 mg/L	1					6/16/19 07:11:00	N	IV
KQ1908381-04	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/15/19 21:59:00	N	IV
KQ1908381-05	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/16/19 03:09:00	N	IV
KQ1908381-06	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/16/19 07:26:00	N	IV
KQ1908381-07	Carbon, Total Organic	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/15/19 17:30:00	N	IV
KQ1908381-08	Carbon, Total Organic	LCS		Water	25.11 mg/L	10 mL	25.1 mg/L	1	0.07	0.50	100		6/15/19 17:45:00	N	IV
KQ1908381-09	Carbon, Total Organic	MS	K1905597-006	Water	26.78 mg/L	10 mL	53.6 mg/L	2	0.2	1.0	102		6/16/19 05:18:00	N	IV
KQ1908381-10	Carbon, Total Organic	DUP	K1905597-001	Water	0.50 mg/L	10 mL	0.50 mg/L J	1	0.07	0.50		20*	6/16/19 01:30:00	N	IV
KQ1908381-11	Carbon, Total Organic	DUP	K1905597-002	Water	2.79 mg/L	10 mL	11.2 mg/L	4	0.3	2.0		<1	6/16/19 01:58:00	N	IV
KQ1908381-12	Carbon, Total Organic	DUP	K1905597-003	Water	2.70 mg/L	10 mL	10.8 mg/L	4	0.3	2.0		<1	6/16/19 02:27:00	N	IV
KQ1908381-13	Carbon, Total Organic	DUP	K1905597-004	Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	6/16/19 03:53:00	N	IV
KQ1908381-14	Carbon, Total Organic	DUP	K1905597-005	Water	0.30 mg/L	10 mL	0.30 mg/L J	1	0.07	0.50		8	6/16/19 04:22:00	N	IV
KQ1908381-15	Carbon, Total Organic	DUP	K1905597-006	Water	2.37 mg/L	10 mL	2.37 mg/L	1	0.07	0.50		1	6/16/19 04:50:00	N	IV
KQ1908381-16	Carbon, Total Organic	DUP	K1905597-007	Water	1.41 mg/L	10 mL	1.41 mg/L	1	0.07	0.50		2	6/16/19 05:47:00	N	IV
KQ1908381-17	Carbon, Total Organic	DUP	K1905259-001	Water	2.25 mg/L	10 mL	2.25 mg/L	1	0.07	0.50		2	6/16/19 06:15:00	N	IV

06/18/19

# 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:** 639525 **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
K1905589-002	Carbon, Dissolved Organic (DOC)	N/A		Water	3.12 mg/L	10 mL	3.12 mg/L	1	0.07	0.50			6/16/19 06:43:00	N	II
K1905589-004	Carbon, Dissolved Organic (DOC)	N/A		Water	2.29 mg/L	10 mL	2.29 mg/L	1	0.07	0.50			6/16/19 07:41:00	N	II
K1905595-001	Carbon, Dissolved Organic (DOC)	N/A		Water	0.57 mg/L	10 mL	0.57 mg/L	1	0.07	0.50			6/16/19 09:49:00	N	I
K1905595-002	Carbon, Dissolved Organic (DOC)	N/A		Water	0.00 mg/L	10 mL	50 mg/L U	100	7	50			6/16/19 10:17:00	N	I
K1905625-001	Carbon, Dissolved Organic (DOC)	N/A		Effluent	1.22 mg/L	10 mL	1.22 mg/L	1	0.07	0.50			6/16/19 08:09:00	N	II
K1905625-002	Carbon, Dissolved Organic (DOC)	N/A		Effluent	1.21 mg/L	10 mL	1.21 mg/L	1	0.07	0.50			6/16/19 09:06:00	N	II
KQ1908382-01	Carbon, Dissolved Organic (DOC)	CCV		Water	24.52 mg/L	10 mL	24.5 mg/L	1					6/16/19 02:55:00	N	II
KQ1908382-02	Carbon, Dissolved Organic (DOC)	CCV		Water	24.12 mg/L	10 mL	24.1 mg/L	1					6/16/19 07:11:00	N	II
KQ1908382-03	Carbon, Dissolved Organic (DOC)	CCV		Water	25.11 mg/L	10 mL	25.1 mg/L	1					6/16/19 11:00:00	N	II
KQ1908382-04	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/16/19 03:09:00	N	II
KQ1908382-05	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/16/19 07:26:00	N	II
KQ1908382-06	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/16/19 11:14:00	N	II
KQ1908382-07	Carbon, Dissolved Organic (DOC)	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/16/19 03:24:00	N	II
KQ1908382-08	Carbon, Dissolved Organic (DOC)	LCS		Water	25.10 mg/L	10 mL	25.1 mg/L	1	0.07	0.50	100		6/16/19 03:39:00	N	II
KQ1908382-09	Carbon, Dissolved Organic (DOC)	MS	K1905625-001	Effluent	26.86 mg/L	10 mL	26.9 mg/L	1	0.07	0.50	103		6/16/19 08:37:00	N	II
KQ1908382-10	Carbon, Dissolved Organic (DOC)	DUP	K1905589-002	Water	3.13 mg/L	10 mL	3.13 mg/L	1	0.07	0.50		<1	6/16/19 06:43:00	N	II
KQ1908382-11	Carbon, Dissolved Organic (DOC)	DUP	K1905589-004	Water	2.30 mg/L	10 mL	2.30 mg/L	1	0.07	0.50		<1	6/16/19 07:41:00	N	II
KQ1908382-12	Carbon, Dissolved Organic (DOC)	DUP	K1905625-001	Effluent	1.28 mg/L	10 mL	1.28 mg/L	1	0.07	0.50		5	6/16/19 08:09:00	N	II
KQ1908382-13	Carbon, Dissolved Organic (DOC)	DUP	K1905625-002	Effluent	1.21 mg/L	10 mL	1.21 mg/L	1	0.07	0.50		<1	6/16/19 09:06:00	N	II
KQ1908382-14	Carbon, Dissolved Organic (DOC)	DUP	K1905595-001	Water	0.58 mg/L	10 mL	0.58 mg/L	1	0.07	0.50		2	6/16/19 09:49:00	N	I
KQ1908382-15	Carbon, Dissolved Organic (DOC)	DUP	K1905595-002	Water	0.00 mg/L	10 mL	50 mg/L U	100	7	50		NC	6/16/19 10:17:00	N	I

# 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	C] CCV 25 ppm [25 p	1	24.937	0.0000	24.9374	24.9374	24.9	6/14/2019
3	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	6/14/2019
4	MB1	1	0.000	0.0000	0.0000	0	<0.5	6/14/2019
5	[TOC] LCS [24ppm]	1	25.401	0.0000	25.4009	25.4009	25.4	6/14/2019
6	K1905258-006	100	3.314	0.0000	3.3140	331.4	331.40	6/15/2019
7	K1905258-006d	100	3.327	0.0000	3.3271	332.71	332.7	6/15/2019
8	C] CCV 25 ppm [25 p	1	24.590	0.0000	24.5900	24.59	25	6/15/2019
9	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	6/15/2019
10	K1905198-003	100	13.598	0.0000	13.5984	1359.84	1359.84	6/15/2019
11	K1905198-003d	100	13.590	0.0000	13.5897	1358.97	1359.0	6/15/2019
12	K1905114-006	10	5.412	0.0000	5.4117	54.117	54.12	6/15/2019
13	K1905114-006d	10	6.290	0.0000	6.2895	62.895	62.90	6/15/2019
14	K1905440-001	1	21.348	0.0000	21.3480	21.348	21.35	6/15/2019
15	K1905440-001d	1	21.002	0.0000	21.0020	21.002	21.0	6/15/2019
16	K1905440-002	1	21.512	0.0000	21.5121	21.5121	21.5	6/15/2019
17	K1905440-002d	1	21.247	0.0000	21.2469	21.2469	21.25	6/15/2019
18	K1905440-003	1	20.626	0.0000	20.6264	20.6264	20.6	6/15/2019
19	K1905440-003d	1	20.933	0.0000	20.9333	20.9333	20.9	6/15/2019
20	K1905440-004	1	20.849	0.0000	20.8493	20.8493	20.85	6/15/2019
21	K1905440-004d	1	20.795	0.0000	20.7951	20.7951	20.80	6/15/2019
22	K1905478-001	1	28.056	0.0000	28.0558	28.0558	28.1	6/15/2019
23	K1905478-001d	1	28.385	0.0000	28.3853	28.3853	28.4	6/15/2019
24	K1905478-002	1	9.821	0.0000	9.8214	9.8214	9.82	6/15/2019
25	K1905478-002d	1	9.348	0.0000	9.3476	9.3476	9.35	6/15/2019

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:		Date Analyzed	6/16/19
Reviewed By:		Date Reviewed	06/18/19

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	C] CCV 25 ppm [25 p	1	25.464	0.0000	25.4635	25.4635	25.46	6/15/2019
27	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	6/15/2019
28	K1905478-003	1	18.571	0.0000	18.5707	18.5707	18.6	6/15/2019
29	K1905478-003d	1	18.705	0.0000	18.7046	18.7046	18.7	6/15/2019
30	K1905478-004	1	9.865	0.0000	9.8646	9.8646	9.9	6/15/2019
31	K1905478-004d	1	9.856	0.0000	9.8560	9.856	9.9	6/15/2019
32	K1905478-004ms	2	29.953	0.0000	29.9530	59.906	59.9	6/15/2019
33	K1905478-005	1	7.894	0.0000	7.8940	7.894	7.9	6/15/2019
34	K1905478-005d	1	7.970	0.0000	7.9703	7.9703	8.0	6/15/2019
35	K1905478-006	1	0.673	0.0000	0.6731	0.6731	0.7	6/15/2019
36	K1905478-006d	1	0.595	0.0000	0.5947	0.5947	0.6	6/15/2019
37	K1905478-007	1	0.000	0.0000	0.0000	0	<0.5	6/15/2019
38	K1905478-007d	1	0.000	0.0000	0.0000	0	<0.5	6/15/2019
39	K1905451-001	100	6.462	0.0000	6.4621	646.21	646.2	6/15/2019
40	K1905451-001d	100	6.461	0.0000	6.4610	646.1	646.1	6/15/2019
41	C] CCV 25 ppm [25 p	1	24.963	0.0000	24.9627	24.9627	25.0	6/15/2019
42	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	6/15/2019
43	K1905451-002	100	5.830	0.0000	5.8303	583.03	583.0	6/15/2019
44	K1905451-002d	100	5.902	0.0000	5.9022	590.22	590.2	6/15/2019
45	K1905589-001	1	3.741	0.0000	3.7412	3.7412	3.7	6/15/2019
46	K1905589-001d	1	3.637	0.0000	3.6370	3.637	3.6	6/15/2019
47	K1905589-003	1	2.586	0.0000	2.5861	2.5861	2.6	6/15/2019
48	K1905589-003d	1	2.583	0.0000	2.5834	2.5834	2.6	6/15/2019
49	K1905420-001	100	0.378	0.0000	0.3783	37.83	37.8	6/15/2019
50	K1905420-001d	100	0.387	0.0000	0.3867	38.67	38.7	6/15/2019

Analyzed By:	BCD	Date Analyzed	6/16/19
Reviewed By:	[signature]	Date Reviewed	06/18/19

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	K1905449-001	1	1.539	0.0000	1.5389	1.5389	1.54	6/15/2019
52	K1905449-001d	1	1.469	0.0000	1.4688	1.4688	1.5	6/15/2019
53	C] CCV 25 ppm [25 p	1	24.894	0.0000	24.8939	24.8939	24.9	6/15/2019
54	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	6/15/2019
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: [illegible]	Date Analyzed 6/16/19
Reviewed By:	Date Reviewed

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	C] CCV 25 ppm [25 p	1	24.590	0.0000	24.5900	24.59	24.6	6/15/2019
3	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	6/15/2019
4	K1905198-006	1	3.957	0.0000	3.9572	3.9572	4.0	6/15/2019
5	K1905198-006d	1	3.834	0.0000	3.8337	3.8337	3.8	6/15/2019
6	C] CCV 25 ppm [25 p	1	25.464	0.0000	25.4635	25.4635	25.46	6/15/2019
7	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	6/15/2019
8	MB2	1	0.000	0.0000	0.0000	0	<0.5	6/15/2019
9	[TOC] LCS [24ppm]	1	25.436	0.0000	25.4355	25.4355	25.44	6/15/2019
10	C] CCV 25 ppm [25 p	1	24.963	0.0000	24.9627	24.9627	24.96	6/15/2019
11	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	6/15/2019
12	K1905449-002	1	0.558	0.0000	0.5581	0.5581	0.56	6/15/2019
13	K1905449-002d	1	0.529	0.0000	0.5290	0.529	0.53	6/15/2019
14	K1905477-001	1	1.722	0.0000	1.7217	1.7217	1.72	6/15/2019
15	K1905477-001d	1	1.754	0.0000	1.7538	1.7538	1.8	6/15/2019
16	K1905477-002	1	19.942	0.0000	19.9421	19.9421	19.9	6/15/2019
17	K1905477-002d	1	19.696	0.0000	19.6957	19.6957	19.70	6/15/2019
18	K1905477-003	1	2.685	0.0000	2.6845	2.6845	2.7	6/15/2019
19	K1905477-003d	1	2.556	0.0000	2.5556	2.5556	2.6	6/15/2019
20	C] CCV 25 ppm [25 p	1	24.894	0.0000	24.8939	24.8939	24.89	6/15/2019
21	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	6/15/2019
22	K1905477-004	1	1.231	0.0000	1.2310	1.231	1.2	6/15/2019
23	K1905477-004d	1	1.126	0.0000	1.1263	1.1263	1.1	6/15/2019
24	K1905482-001	1	0.404	0.0000	0.4040	0.404	<0.5	6/15/2019
25	K1905482-001d	1	0.464	0.0000	0.4636	0.4636	<0.5	6/15/2019

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:		Date Analyzed	6/16/19
Reviewed By:		Date Reviewed	06/18/19

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	K1905482-002	1	1.537	0.0000	1.5366	1.5366	1.54	6/15/2019
27	K1905482-002d	1	1.522	0.0000	1.5215	1.5215	1.52	6/15/2019
28	K1905482-003	1	0.620	0.0000	0.6196	0.6196	0.6	6/15/2019
29	K1905482-003d	1	0.632	0.0000	0.6317	0.6317	0.6	6/15/2019
30	K1905482-004	1	0.870	0.0000	0.8701	0.8701	0.9	6/15/2019
31	K1905482-004d	1	0.818	0.0000	0.8181	0.8181	0.8	6/15/2019
32	K1905482-005	1	0.000	0.0000	0.0000	0	<0.5	6/15/2019
33	K1905482-005d	1	0.000	0.0000	0.0000	0	<0.5	6/15/2019
34	K1905409-001	1	0.000	0.0000	0.0000	0	<0.5	6/15/2019
35	K1905409-001d	1	0.000	0.0000	0.0000	0	<0.5	6/15/2019
36	K1905409-002	1	0.000	0.0000	0.0000	0	<0.5	6/15/2019
37	K1905409-002d	1	0.000	0.0000	0.0000	0	<0.5	6/15/2019
38	C] CCV 25 ppm [25 p	1	24.499	0.0000	24.4988	24.4988	24.5	6/15/2019
39	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	6/15/2019
40	K1905558-001	1	1.482	0.0000	1.4823	1.4823	1.5	6/15/2019
41	K1905558-001d	1	1.412	0.0000	1.4121	1.4121	1.4	6/15/2019
42	K1905558-002	1	1.642	0.0000	1.6423	1.6423	1.6	6/15/2019
43	K1905558-002d	1	1.608	0.0000	1.6080	1.608	1.6	6/15/2019
44	K1905558-003	1	1.073	0.0000	1.0728	1.0728	1.1	6/15/2019
45	K1905558-003d	1	1.061	0.0000	1.0610	1.061	1.1	6/15/2019
46	K1905558-004	1	1.588	0.0000	1.5881	1.5881	1.6	6/15/2019
47	K1905558-004d	1	1.543	0.0000	1.5426	1.5426	1.5	6/15/2019
48	K1905558-005	1	1.526	0.0000	1.5259	1.5259	1.5	6/16/2019
49	K1905558-005d	1	1.484	0.0000	1.4841	1.4841	1.5	6/16/2019
50	K1905586-001	1	0.693	0.0000	0.6929	0.6929	0.7	6/16/2019

Analyzed By: KCP	Date Analyzed 6/16/19
Reviewed By: [signature]	Date Reviewed 06/18/19

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	K1905586-001d	1	0.666	0.0000	0.6657	0.6657	0.67	6/16/2019
52	K1905586-002	1	0.189	0.0000	0.1892	0.1892	<0.5	6/16/2019
53	K1905586-002d	1	0.160	0.0000	0.1601	0.1601	<0.5	6/16/2019
54	C] CCV 25 ppm [25 p	1	24.518	0.0000	24.5184	24.5184	24.5	6/16/2019
55	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	6/16/2019
56	C] CCV 25 ppm [25 p	1	24.117	0.0000	24.1171	24.1171	24.1	6/16/2019
57	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	6/16/2019
58	K1905198-006ms	1	25.561	0.0000	25.5611	25.5611	25.6	6/16/2019
59	C] CCV 25 ppm [25 p	1	25.111	0.0000	25.1105	25.1105	25.1	6/16/2019
60	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	6/16/2019
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:	BCB	Date Analyzed	6/16/19
Reviewed By:		Date Reviewed	06/18/19

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	MB3	1	0.000	0.0000	0.0000	0	<0.5	6/15/2019
3	[TOC] LCS [25ppm]	1	25.114	0.0000	25.1136	25.1136	25.1	6/15/2019
4	C] CCV 25 ppm [25 p	1	24.499	0.0000	24.4988	24.4988	24.5	6/15/2019
5	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	6/15/2019
6	K1905597-001	1	0.607	0.0000	0.6073	0.6073	0.61	6/16/2019
7	K1905597-001d	1	0.496	0.0000	0.4957	0.4957	<0.5	6/16/2019
8	K1905597-002	4	2.794	0.0000	2.7938	11.1752	11	6/16/2019
9	K1905597-002d	4	2.791	0.0000	2.7914	11.1656	11.17	6/16/2019
10	K1905597-003	4	2.724	0.0000	2.7238	10.8952	10.90	6/16/2019
11	K1905597-003d	4	2.704	0.0000	2.7035	10.814	10.8	6/16/2019
12	C] CCV 25 ppm [25 p	1	24.518	0.0000	24.5184	24.5184	24.52	6/16/2019
13	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	6/16/2019
14	K1905597-004	1	0.000	0.0000	0.0000	0	<0.5	6/16/2019
15	K1905597-004d	1	0.000	0.0000	0.0000	0	<0.5	6/16/2019
16	K1905597-005	1	0.325	0.0000	0.3247	0.3247	<0.5	6/16/2019
17	K1905597-005d	1	0.301	0.0000	0.3007	0.3007	<0.5	6/16/2019
18	K1905597-006	1	2.345	0.0000	2.3445	2.3445	2.3	6/16/2019
19	K1905597-006d	1	2.369	0.0000	2.3694	2.3694	2.4	6/16/2019
20	K1905597-006ms	2	26.784	0.0000	26.7837	53.5674	53.57	6/16/2019
21	K1905597-007	1	1.434	0.0000	1.4339	1.4339	1.43	6/16/2019
22	K1905597-007d	1	1.412	0.0000	1.4118	1.4118	1.4	6/16/2019
23	K1905259-001	1	2.214	0.0000	2.2135	2.2135	2.2	6/16/2019
24	K1905259-001d	1	2.252	0.0000	2.2524	2.2524	2.25	6/16/2019
25	C] CCV 25 ppm [25 p	1	24.117	0.0000	24.1171	24.1171	24.12	6/16/2019

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: KC	Date Analyzed	6/16/19
Reviewed By:	Date Reviewed	6/18/19

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	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	6/16/2019
27		1		0.0000	0.0000	0	<0.5	
28		1		0.0000	0.0000	0	<0.5	
29		1		0.0000	0.0000	0	<0.5	
30		1		0.0000	0.0000	0	<0.5	
31		1		0.0000	0.0000	0	<0.5	
32		1		0.0000	0.0000	0	<0.5	
33		1		0.0000	0.0000	0	<0.5	
34		1		0.0000	0.0000	0	<0.5	
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: RP	Date Analyzed 6/16/19
Reviewed By: [signature]	Date Reviewed 06/18/19

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	C] CCV 25 ppm [25 p	1	24.518	0.0000	24.5184	24.5184	24.5	6/16/2019
3	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	6/16/2019
4	MB4	1	0.000	0.0000	0.0000	0	<0.5	6/16/2019
5	[TOC] LCS [25ppm]	1	25.100	0.0000	25.1000	25.1	25.1	6/16/2019
6	K1905589-002	1	3.123	0.0000	3.1233	3.1233	3.12	6/16/2019
7	K1905589-002d	1	3.128	0.0000	3.1282	3.1282	3.1	6/16/2019
8	C] CCV 25 ppm [25 p	1	24.117	0.0000	24.1171	24.1171	24	6/16/2019
9	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	6/16/2019
10	K1905589-004	1	2.294	0.0000	2.2935	2.2935	2.29	6/16/2019
11	K1905589-004d	1	2.303	0.0000	2.3031	2.3031	2.3	6/16/2019
12	K1905625-001	1	1.221	0.0000	1.2211	1.2211	1.22	6/16/2019
13	K1905625-001d	1	1.285	0.0000	1.2848	1.2848	1.28	6/16/2019
14	K1905625-001ms	1	26.865	0.0000	26.8649	26.8649	26.86	6/16/2019
15	K1905625-002	1	1.214	0.0000	1.2136	1.2136	1.2	6/16/2019
16	K1905625-002d	1	1.207	0.0000	1.2073	1.2073	1.2	6/16/2019
17	K1905595-001	1	0.568	0.0000	0.5675	0.5675	0.57	6/16/2019
18	K1905595-001d	1	0.578	0.0000	0.5782	0.5782	0.6	6/16/2019
19	K1905595-002 100X	100	0.000	0.0000	0.0000	0	<0.5	6/16/2019
20	K1905595-002 100Xd	100	0.000	0.0000	0.0000	0	<0.5	6/16/2019
21	C] CCV 25 ppm [25 p	1	25.111	0.0000	25.1105	25.1105	25.11	6/16/2019
22	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	6/16/2019
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: KP		Date Analyzed 6/16/19	
Reviewed By: [signature]		Date Reviewed 06/18/19	

TOC: 639522, 639523, 639524, DOC: 639525

Schedule: 06142019

Version: 8
Instrument: Fusion1
Last Saved by: Fusion1 (Fusion1)
Last Saved on: 2019/06/15 16:20 - 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)	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	K1905436-001.01	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
4	Sample	K1905436-001.01 ms	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
5	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
6	Sample	K1905436-002.01 100x	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
7	Sample	K1905436-003.01 100x	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
8	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
9	Sample	K1905258-006.01 100x	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	K1905198-003.01 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
11	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
12	Sample	K1905198-006.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
13	Sample	K1905114-006.01 10x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
14	Sample	K1905440-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
15	Sample	K1905440-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
16	Sample	K1905440-003.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
17	Sample	K1905440-004.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
18	Sample	K1905478-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
19	Sample	K1905478-002.01	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	K1905478-003.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
22	Sample	K1905478-004.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
23	Sample	K1905478-004.01 ms 2x	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
24	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
25	Sample	K1905478-005.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
26	Sample	K1905478-006.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
27	Sample	K1905478-007.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
28	Sample	K1905451-001.01 100x	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	K1905451-002.01 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
30	Sample	K1905589-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
31	Sample	K1905589-003.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
32	Sample	K1905420-001.02 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
33	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
34	Sample	K1905449-001.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
35	Sample	K1905449-002.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
36	Sample	K1905477-001.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
37	Sample	K1905477-002.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
38	Sample	K1905477-003.02	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

NR
NR

06/18/19

Schedule: 06142019

Position	Sample Type	Sample ID	Method ID (Calibration ID)	Reps	Use	State
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
39	Sample	MB3	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
C	Check Standard	[TOC] LCS [25.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
40	Sample	K1905477-004.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
41	Sample	K1905482-001.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
42	Sample	K1905482-002.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
43	Sample	K1905482-003.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
44	Sample	K1905482-004.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
45	Sample	K1905482-005.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
46	Sample	K1905409-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
47	Sample	K1905409-002.01	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
48	Sample	K1905558-001.14	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
49	Sample	K1905558-002.14	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
50	Sample	K1905558-003.14	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
51	Sample	K1905558-004.14	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
52	Sample	K1905558-005.14	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
53	Sample	K1905586-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
54	Sample	K1905586-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
55	Sample	K1905597-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
56	Sample	K1905597-002.01 4x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
57	Sample	K1905597-003.01 4x	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
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	K1905597-004.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
60	Sample	K1905597-005.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
61	Sample	K1905597-006.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
62	Sample	K1905597-006.01 ms 2x	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
63	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
64	Sample	K1905597-007.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
65	Sample	K1905259-001.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
66	Sample	K1905589-002.02 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
67	Sample	K1905589-004.02 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
68	Sample	K1905625-001.03 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
69	Sample	K1905625-001.03 ms doc	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
70	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
71	Sample	K1905625-002.03 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
72	Sample	FB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
73	Sample	K1905595-001.03 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
74	Sample	K1905595-002.03 100x doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
75	Sample	K1905198-006.01 ms	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	

00939709

Fusion Report - 06142019
Friday, June 14, 2019 03:25 PM

(View - Reps, Unused Reps, Meta-Data, Signature, History)
Printed on 2019/06/18 08:56 - Tuesday

Report Summary Information

Company Location:	Gen Chem Lab		
Schedule Name:	06142019	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) (v5) Fusion1 (Fusion1) (v6) Fusion1 (Fusion1) (v7) Fusion1 (Fusion1) (v8)		
Comment:			

Report Results

06/18/19

Sample Type: Clean — From Schedule Version 2

	Pos	Analysis Type	Sample ID	Start Time
◆	(clean)		Clean	2019/06/14 15:25

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	13.34	18.06	4.72	49.88	07:58
2	TC Clean	14.48	17.60	3.12	49.67	07:18
3	TC Clean	3.52	6.54	3.02	49.90	07:04
4	TC Clean	2.44	5.68	3.24	49.76	07:02

Sample Type: Clean — From Schedule Version 3

	Pos	Analysis Type	Sample ID	Start Time
◆	(clean)		Clean	2019/06/14 16:04

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	12.04	15.23	3.18	49.96	07:59

2	TC Clean	5.88	9.04	3.16	49.75	07:16
3	TC Clean	2.16	5.37	3.21	49.79	07:02
4	TC Clean	1.43	4.65	3.22	49.90	07:02

Sample Type: Clean — From Schedule Version 3

	Pos	Analysis Type	Sample ID	Start Time
*	(clean)		Clean	2019/06/14 16:39

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	1.06	4.16	3.09	49.78	05:26
2	TC Clean	4.34	7.40	3.05	49.94	07:19
3	TC Clean	2.36	5.45	3.10	49.86	07:02
4	TC Clean	1.88	4.87	2.98	49.79	07:00

Sample Type: Blank (Creating v1266) — From Schedule Version 3

	Pos	Analysis Type	Sample ID	Start Time
*	(blank)		Reagent/Acid Blank	2019/06/14 17:10

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	1.16	4.21	3.05	49.68	05:25
2	TC Clean	4.58	7.72	3.15	49.84	07:16
3	TC Clean	2.49	5.59	3.10	49.83	07:00
4	TC Clean	1.81	4.95	3.14	49.94	07:01
5	Reagent Blank	6.66	9.83	3.17	49.86	08:11
6	Acid Blank	1.49	4.73	3.24	49.69	05:29

Sample Type: Sample — From Schedule Version 3

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	D	TOC	RB	0.3200 ppm	0.0000 ppm	0.0000%	2019/06/14 17:57

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.3200	3.1998	11.13	14.35	3.22	50.07	10:29

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

1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

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)	24.9374 ppm (PASS)	0.0000 ppm	0%	2019/06/14 18:11

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.9374	249.3739	178.74	181.86	3.12	50.09	10:31

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

Sample Type: Check Standard --> CCB — From Schedule Version 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%	2019/06/14 18:26

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	7.93	11.23	3.30	50.20	10:29

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

Sample Type: Sample — From Schedule Version 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%	2019/06/14 18:41

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.04	10.20	3.16	50.08	10:28
2	TOC	0.0000	0.0000	7.38	10.54	3.17	49.99	10:29
3	TOC	0.0000	0.0000	7.03	10.13	3.09	49.96	10:27
4	TOC	0.0000	0.0000	7.13	10.13	3.00	49.92	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

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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)	25.4375 ppm (PASS)	0.1009 ppm	0.40%	2019/06/14 19:37

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	25.4009	254.0086	181.88	184.97	3.09	49.87	10:27
C	TOC	25.0 ppm	2	25.5837	255.8368	183.12	186.21	3.08	49.84	10:25
C	TOC	25.0 ppm	3	25.4128	254.1279	181.96	185.20	3.24	49.89	10:27
C	TOC	25.0 ppm	4	25.3525	253.5254	181.55	184.86	3.30	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 (v30)	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	0.2434 ppm	0.0000 ppm	0.0000%	2019/06/14 20:33

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.2434	2.4338	10.61	13.81	3.20	49.81	10:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

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	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	3	TOC	K1905436-001.01	0.7283 ppm	0.0388 ppm	5.3200%	2019/06/14 20:48

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.7857	7.8566	14.29	17.55	3.25	49.80	10:27
2	TOC	0.7089	7.0891	13.77	17.02	3.25	49.80	10:30
3	TOC	0.7017	7.0169	13.72	16.97	3.25	49.80	10:28
4	TOC	0.7169	7.1686	13.83	16.98	3.15	49.83	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

NR human

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	4	TOC	K1905436-001.01 ms	27.4897 ppm	0.0961 ppm	0.3500%	2019/06/14 21:44

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	27.5876	275.8760	196.22	199.32	3.10	49.83	10:28
2	TOC	27.3697	273.6972	194.74	198.12	3.38	49.84	10:28

3	TOC	27.5424	275.4238	195.92	199.07	3.15	49.85	10:30
4	TOC	27.4591	274.5914	195.35	198.50	3.14	49.87	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	5	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/14 22:39

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.54	10.78	3.24	49.89	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	6	TOC	K1905436-002.01 100x	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/14 22:54

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.04	11.07	3.02	49.89	10:31
2	TOC	0.0000	0.0000	7.57	10.75	3.19	49.89	10:27
3	TOC	0.0000	0.0000	7.71	10.95	3.24	49.91	10:27
4	TOC	0.0000	0.0000	7.76	10.87	3.11	49.94	10:27

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Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	7	TOC	K1905436-003.01 100x	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/14 23:49

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.52	10.65	3.13	49.96	10:24
2	TOC	0.0000	0.0000	7.59	10.61	3.02	49.96	10:24
3	TOC	0.0000	0.0000	7.36	10.42	3.05	49.95	10:31
4	TOC	0.0000	0.0000	7.66	10.79	3.12	49.97	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	8	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/15 00:45

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.48	9.62	3.14	49.96	10:29
2	TOC	0.0000	0.0000	6.84	9.91	3.07	49.98	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	9	TOC	K1905258-006.01 100x	3.3205 ppm	0.0093 ppm	0.2800%	2019/06/15 01:13

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.3140	33.1397	31.46	34.50	3.05	49.99	10:28
2	TOC	3.3271	33.2708	31.54	34.86	3.31	50.00	10:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

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)	24.5900 ppm (PASS)	0.0000 ppm	0%	2019/06/15 01:41

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.5900	245.9001	176.38	179.52	3.14	50.01	10:31

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

Sample Type: Check Standard --> CCB — From Schedule Version 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%	2019/06/15 01:56

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	7.08	10.33	3.25	50.01	10:33

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

Sample Type: Sample — From Schedule Version 3

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time

10	TOC	K1905198-003.01 100x	13.5940 ppm	0.0061 ppm	0.0500%	2019/06/15 02:11

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	13.5984	135.9838	101.26	104.50	3.24	49.97	10:27
2	TOC	13.5897	135.8969	101.21	104.44	3.23	49.98	10:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
11	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/15 02:39

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.99	10.12	3.13	49.99	10:30
2	TOC	0.0000	0.0000	6.59	9.86	3.27	50.00	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
12	TOC	K1905198-006.01	3.8954 ppm	0.0873 ppm	2.2400%	2019/06/15 03:07

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.9572	39.5717	35.82	39.04	3.22	50.00	10:29
2	TOC	3.8337	38.3371	34.98	38.07	3.09	50.02	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
13	TOC	K1905114-006.01 10x	5.8506 ppm	0.6208 ppm	10.6100%	2019/06/15 03:35

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	5.4117	54.1166	45.69	49.02	3.32	50.01	10:31
2	TOC	6.2895	62.8954	51.65	54.78	3.12	50.01	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
14	TOC	K1905440-001.01	21.1750 ppm	0.2447 ppm	1.1600%	2019/06/15 04:03

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	21.3480	213.4801	153.87	157.12	3.25	50.03	10:28
2	TOC	21.0020	210.0196	151.52	154.86	3.34	50.02	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	15	TOC	K1905440-002.01	21.3795 ppm	0.1875 ppm	0.8800%	2019/06/15 04:31

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	21.5121	215.1212	154.98	158.24	3.25	50.02	10:26
2	TOC	21.2469	212.4695	153.18	156.37	3.19	50.02	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	16	TOC	K1905440-003.01	20.7799 ppm	0.2170 ppm	1.0400%	2019/06/15 04:59

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	20.6264	206.2644	148.97	152.17	3.19	50.04	10:26
2	TOC	20.9333	209.3330	151.05	154.23	3.17	50.04	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	17	TOC	K1905440-004.01	20.8222 ppm	0.0383 ppm	0.1800%	2019/06/15 05:27

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	20.8493	208.4933	150.48	153.72	3.23	50.03	10:28
2	TOC	20.7951	207.9512	150.12	153.41	3.29	50.04	10:23

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	18	TOC	K1905478-001.01	28.2206 ppm	0.2330 ppm	0.8300%	2019/06/15 05:55

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	28.0558	280.5579	199.40	202.57	3.17	50.01	10:27
2	TOC	28.3853	283.8534	201.64	204.78	3.14	50.03	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	19	TOC	K1905478-002.01	9.5845 ppm	0.3350 ppm	3.5000%	2019/06/15 06:23

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	9.8214	98.2139	75.63	78.90	3.28	50.03	10:31
2	TOC	9.3476	93.4761	72.41	75.52	3.11	50.02	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

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)	25.4635 ppm (PASS)	0.0000 ppm	0%	2019/06/15 06:51

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	25.4635	254.6347	182.31	185.62	3.32	50.02	10:31

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

Sample Type: Check Standard --> CCB — From Schedule Version 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%	2019/06/15 07:06

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	11.67	3.25	50.01	10:31

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

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%	2019/06/15 07:21

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.06	10.22	3.16	50.01	10:36

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC)	CAS_salt_010711	CAS_salt_010711

(v1266)	(v4)	(v30)

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)	25.4355 ppm (PASS)	0.0000 ppm	0%	2019/06/15 07:35

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	25.4355	254.3548	182.12	185.25	3.13	50.02	10:31

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

Sample Type: Sample — From Schedule Version 3

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	21	TOC	K1905478-003.01	18.6377 ppm	0.0947 ppm	0.5100%	2019/06/15 07:50

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	18.5707	185.7073	135.02	138.21	3.19	50.04	10:30
2	TOC	18.7046	187.0465	135.93	139.24	3.32	50.00	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	22	TOC	K1905478-004.01	9.8603 ppm	0.0060 ppm	0.0600%	2019/06/15 08:18

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	9.8646	98.6456	75.92	79.15	3.23	50.00	10:27
2	TOC	9.8560	98.5601	75.86	79.06	3.19	49.99	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	23	TOC	K1905478-004.01 ms 2x	29.9530 ppm	0.0000 ppm	0.0000%	2019/06/15 08:46

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	29.9530	299.5298	212.28	215.36	3.08	50.01	10:31

Dilution	Blank Contribution	Method	Calibration

1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◉	24	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/15 09:01

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.77	11.03	3.26	49.99	10:28
2	TOC	0.0000	0.0000	6.82	10.06	3.24	49.98	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Sample — From Schedule Version 4

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◉	25	TOC	K1905478-005.01	7.9322 ppm	0.0540 ppm	0.6800%	2019/06/15 09:29

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	7.8940	78.9400	62.54	65.71	3.16	49.95	10:31
2	TOC	7.9703	79.7032	63.06	66.27	3.21	49.94	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Sample — From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◉	26	TOC	K1905478-006.01	0.6339 ppm	0.0554 ppm	8.7400%	2019/06/15 10:11

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.6731	6.7311	13.53	16.69	3.16	49.87	10:27
2	TOC	0.5947	5.9474	13.00	16.22	3.22	49.86	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Sample — From Schedule Version 6

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◉	27	TOC	K1905478-007.01	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/15 10:59

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time

1	TOC	0.0000	0.0000	7.39	10.50	3.11	49.81	10:29
2	TOC	0.0000	0.0000	7.27	10.48	3.21	49.79	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Sample — From Schedule Version 7

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	28	TOC	K1905451-001.01 100x	6.4615 ppm	0.0007 ppm	0.0100%	2019/06/15 11:35

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	6.4621	64.6205	52.82	55.88	3.05	49.78	10:28
2	TOC	6.4610	64.6102	52.82	55.95	3.14	49.76	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm — From Schedule Version 7

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
*	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.9627 ppm (PASS)	0.0000 ppm	0%	2019/06/15 12:03

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.9627	249.6273	178.91	182.18	3.27	49.76	10:33

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

Sample Type: Check Standard --> CCB — From Schedule Version 7

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
*	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/06/15 12:18

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	7.39	10.62	3.23	49.80	10:30

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

Sample Type: Sample — From Schedule Version 7

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	29	TOC	K1905451-002.01 100x	5.8663 ppm	0.0508 ppm	0.8700%	2019/06/15 12:33

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	5.8303	58.3034	48.54	51.75	3.21	49.80	10:30
2	TOC	5.9022	59.0224	49.02	52.16	3.13	49.81	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	30	TOC	K1905589-001.01	3.6891 ppm	0.0736 ppm	2.0000%	2019/06/15 13:01

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.7412	37.4120	34.35	37.49	3.13	49.77	10:27
2	TOC	3.6370	36.3704	33.65	36.75	3.10	49.81	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	31	TOC	K1905589-003.01	2.5847 ppm	0.0019 ppm	0.0700%	2019/06/15 13:30

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.5861	25.8606	26.51	29.58	3.06	49.93	10:26
2	TOC	2.5834	25.8341	26.50	29.65	3.15	49.88	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	32	TOC	K1905420-001.02 100x	0.3825 ppm	0.0059 ppm	1.5500%	2019/06/15 13:58

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.3783	3.7832	11.53	14.74	3.21	49.85	10:31
2	TOC	0.3867	3.8672	11.58	14.76	3.18	49.89	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	33	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/15 14:26

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.91	9.10	3.19	50.00	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	34	TOC	K1905449-001.02	1.5038 ppm	0.0496 ppm	3.3000%	2019/06/15 14:40

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.5389	15.3891	19.41	22.54	3.14	49.92	10:26
2	TOC	1.4688	14.6879	18.93	22.03	3.10	49.91	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	35	TOC	K1905449-002.02	0.5435 ppm	0.0205 ppm	3.7800%	2019/06/15 15:08

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5581	5.5805	12.75	15.85	3.10	49.96	10:28
2	TOC	0.5290	5.2903	12.55	15.63	3.08	49.95	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	36	TOC	K1905477-001.02	1.7378 ppm	0.0227 ppm	1.3100%	2019/06/15 15:36

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.7217	17.2173	20.65	23.75	3.10	49.91	10:25
2	TOC	1.7538	17.5385	20.86	23.98	3.11	50.02	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	37	TOC	K1905477-002.02	19.8189 ppm	0.1743 ppm	0.8800%	2019/06/15 16:04

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	19.9421	199.4213	144.33	147.57	3.25	49.94	10:29
2	TOC	19.6957	196.9567	142.65	145.86	3.21	50.03	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Sample — From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	38	TOC	K1905477-003.02	2.6200 ppm	0.0911 ppm	3.4800%	2019/06/15 16:32

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.6845	26.8447	27.18	30.31	3.13	49.99	10:30
2	TOC	2.5556	25.5557	26.31	29.38	3.08	50.03	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

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)	24.8939 ppm (PASS)	0.0000 ppm	0%	2019/06/15 17:01

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.8939	248.9393	178.44	181.45	3.01	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 (v30)	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%	2019/06/15 17:15

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	6.72	9.73	3.01	50.03	10:34

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

Sample Type: Sample — From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	39	TOC	MB3	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/15 17:30

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.76	8.85	3.09	50.09	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

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)	25.1136 ppm (PASS)	0.0000 ppm	0%	2019/06/15 17:45

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	25.1136	251.1358	179.93	183.18	3.24	50.06	10:30

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

Sample Type: Sample — From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	40	TOC	K1905477-004.02	1.1786 ppm	0.0741 ppm	6.2800%	2019/06/15 17:59

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.2310	12.3101	17.32	20.63	3.31	49.99	10:27
2	TOC	1.1263	11.2627	16.60	19.84	3.24	50.03	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	41	TOC	K1905482-001.02	0.4338 ppm	0.0422 ppm	9.7300%	2019/06/15 18:27

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.4040	4.0396	11.70	15.00	3.30	50.06	10:28
2	TOC	0.4636	4.6362	12.11	15.22	3.11	49.96	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	42	TOC	K1905482-002.02	1.5290 ppm	0.0106 ppm	0.6900%	2019/06/15 18:56

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.5366	15.3655	19.39	22.43	3.04	49.99	10:27
2	TOC	1.5215	15.2153	19.29	22.48	3.19	50.05	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	43	TOC	K1905482-003.02	0.6257 ppm	0.0085 ppm	1.3700%	2019/06/15 19:24

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.6196	6.1963	13.17	16.27	3.10	49.95	10:29
2	TOC	0.6317	6.3171	13.25	16.32	3.07	50.04	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	44	TOC	K1905482-004.02	0.8441 ppm	0.0368 ppm	4.3600%	2019/06/15 19:52

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.8701	8.7008	14.87	17.98	3.11	49.92	10:25
2	TOC	0.8181	8.1807	14.51	17.78	3.27	49.86	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	45	TOC	K1905482-005.02	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/15 20:20

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.83	9.01	3.18	49.83	10:31
2	TOC	0.0000	0.0000	6.27	9.49	3.21	49.80	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	46	TOC	K1905409-001.01	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/15 20:48

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.61	8.78	3.17	49.79	10:29
2	TOC	0.0000	0.0000	5.86	8.91	3.05	49.77	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC)	CAS_salt_010711	CAS_salt_010711

(v1266) (v4) (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	47	TOC	K1905409-002.01	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/15 21:16

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.33	8.57	3.25	49.78	10:30
2	TOC	0.0000	0.0000	5.75	9.02	3.27	49.77	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

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)	24.4988 ppm (PASS)	0.0000 ppm	0%	2019/06/15 21:44

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.4988	244.9882	175.76	178.90	3.14	49.76	10:32

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

Sample Type: Check Standard --> CCB — From Schedule Version 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%	2019/06/15 21:59

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	6.20	9.37	3.17	49.80	10:34

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

Sample Type: Sample — From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	48	TOC	K1905558-001.14	1.4472 ppm	0.0497 ppm	3.4300%	2019/06/15 22:14

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Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.4823	14.8234	19.02	22.22	3.20	49.82	10:28
2	TOC	1.4121	14.1207	18.54	21.65	3.11	49.81	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	49	TOC	K1905558-002.14	1.6252 ppm	0.0243 ppm	1.4900%	2019/06/15 22:42

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.6423	16.4233	20.11	23.32	3.21	49.84	10:29
2	TOC	1.6080	16.0800	19.88	23.13	3.26	49.85	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	50	TOC	K1905558-003.14	1.0669 ppm	0.0083 ppm	0.7800%	2019/06/15 23:10

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.0728	10.7279	16.24	19.41	3.17	49.88	10:27
2	TOC	1.0610	10.6100	16.16	19.31	3.15	49.89	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	51	TOC	K1905558-004.14	1.5654 ppm	0.0322 ppm	2.0600%	2019/06/15 23:38

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.5881	15.8811	19.74	22.67	2.93	49.90	10:30
2	TOC	1.5426	15.4259	19.43	22.58	3.15	49.90	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	52	TOC	K1905558-005.14	1.5050 ppm	0.0296 ppm	1.9700%	2019/06/16 00:06

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.5259	15.2595	19.32	22.36	3.05	49.93	10:29
2	TOC	1.4841	14.8411	19.03	22.23	3.20	49.94	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC)	CAS_salt_010711	CAS_salt_010711

(v1266) (v4) (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	53	TOC	K1905586-001.01	0.6793 ppm	0.0192 ppm	2.8200%	2019/06/16 00:34

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.6929	6.9285	13.66	16.86	3.20	49.93	10:30
2	TOC	0.6657	6.6574	13.48	16.66	3.18	49.89	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	54	TOC	K1905586-002.01	0.1747 ppm	0.0205 ppm	11.7500%	2019/06/16 01:02

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.1892	1.8916	10.24	13.54	3.30	49.89	10:28
2	TOC	0.1601	1.6014	10.05	13.18	3.13	49.89	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	55	TOC	K1905597-001.01	0.5515 ppm	0.0789 ppm	14.3000%	2019/06/16 01:30

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.6073	6.0726	13.08	16.24	3.16	49.89	10:28
2	TOC	0.4957	4.9574	12.32	15.62	3.29	49.89	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	56	TOC	K1905597-002.01 4x	2.7926 ppm	0.0017 ppm	0.0600%	2019/06/16 01:58

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.7938	27.9378	27.92	31.16	3.24	49.92	10:28
2	TOC	2.7914	27.9142	27.91	31.03	3.12	49.92	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	57	TOC	K1905597-003.01 4x	2.7136 ppm	0.0144 ppm	0.5300%	2019/06/16 02:27

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

#	Analysis Type			(Abs)			(Abs)	(psig)	Time
1	TOC	2.7238	27.2380	27.45	30.52	3.08	49.91	10:29
2	TOC	2.7035	27.0347	27.31	30.44	3.13	49.91	10:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

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)	24.5184 ppm (PASS)	0.0000 ppm	0%	2019/06/16 02:55

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.5184	245.1841	175.89	178.91	3.01	49.91	10:31

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

Sample Type: Check Standard --> CCB — From Schedule Version 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%	2019/06/16 03:09

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.87	9.03	3.16	49.90	10:32

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

Sample Type: Sample — From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	58	TOC	MB4	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/16 03:24

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.10	8.27	3.17	49.91	10:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

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)	25.1000 ppm (PASS)	0.0000 ppm	0%	2019/06/16 03:39

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	25.1000	251.0003	179.84	182.99	3.15	49.93	10:34

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

Sample Type: Sample

From Schedule Version 8

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
59	TOC	K1905597-004.01	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/16 03:53

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.74	11.82	3.08	49.93	10:32
2	TOC	0.0000	0.0000	7.73	10.91	3.18	49.95	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
60	TOC	K1905597-005.01	0.3127 ppm	0.0170 ppm	5.4300%	2019/06/16 04:22

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.3247	3.2470	11.16	14.33	3.17	49.96	10:27
2	TOC	0.3007	3.0068	11.00	14.19	3.18	49.96	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
61	TOC	K1905597-006.01	2.3569 ppm	0.0176 ppm	0.7500%	2019/06/16 04:50

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.3445	23.4446	24.87	27.92	3.05	49.98	10:25
2	TOC	2.3694	23.6935	25.04	28.05	3.01	49.98	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	62	TOC	K1905597-006.01 ms 2x	26.7837 ppm	0.0000 ppm	0.0000%	2019/06/16 05:18

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	26.7837	267.8368	190.77	193.77	3.00	49.99	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	63	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/16 05:32

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.96	9.15	3.19	49.99	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	64	TOC	K1905597-007.01	1.4228 ppm	0.0156 ppm	1.1000%	2019/06/16 05:47

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.4339	14.3387	18.69	21.73	3.04	50.01	10:29
2	TOC	1.4118	14.1177	18.54	21.56	3.02	50.02	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	65	TOC	K1905259-001.02	2.2329 ppm	0.0275 ppm	1.2300%	2019/06/16 06:15

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.2135	22.1349	23.99	27.17	3.18	50.02	10:28
2	TOC	2.2524	22.5238	24.25	27.32	3.08	50.04	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	66	TOC	K1905589-002.02 doc	3.1258 ppm	0.0034 ppm	0.1100%	2019/06/16 06:43

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.1233	31.2334	30.16	33.36	3.20	50.06	10:28
2	TOC	3.1282	31.2820	30.19	33.30	3.10	50.06	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

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)	24.1171 ppm (PASS)	0.0000 ppm	0%	2019/06/16 07:11

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.1171	241.1711	173.17	176.46	3.30	50.07	10:31

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

Sample Type: Check Standard --> CCB — From Schedule Version 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%	2019/06/16 07:26

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.56	8.74	3.18	50.07	10:35

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

Sample Type: Sample — From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	67	TOC	K1905589-004.02 doc	2.2983 ppm	0.0068 ppm	0.2900%	2019/06/16 07:41

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.2935	22.9348	24.53	27.49	2.96	50.06	10:30
2	TOC	2.3031	23.0306	24.59	27.60	3.01	50.06	10:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time

68	TOC	K1905625-001.03 doc	1.2530 ppm	0.0450 ppm	3.5900%	2019/06/16 08:09

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.2211	12.2114	17.25	20.44	3.19	50.03	10:26
2	TOC	1.2848	12.8478	17.68	20.58	2.90	50.04	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
	69	TOC	K1905625-001.03 ms doc	26.8649 ppm	0.0000 ppm	0.0000%	2019/06/16 08:37

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	26.8649	268.6485	191.32	194.50	3.18	50.03	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
	70	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/16 08:52

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.07	9.21	3.14	50.02	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
	71	TOC	K1905625-002.03 doc	1.2105 ppm	0.0045 ppm	0.3700%	2019/06/16 09:06

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.2136	12.1363	17.20	20.50	3.30	50.02	10:32
2	TOC	1.2073	12.0729	17.16	20.43	3.28	50.00	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
	72	TOC	FB	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/16 09:34

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.63	8.73	3.10	50.00	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◉	73	TOC	K1905595-001.03 doc	0.5729 ppm	0.0076 ppm	1.3300%	2019/06/16 09:49

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5675	5.6748	12.81	15.96	3.15	49.99	10:30
2	TOC	0.5782	5.7824	12.89	16.02	3.14	50.02	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◉	74	TOC	K1905595-002.03 100x doc	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/16 10:17

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.91	10.07	3.16	49.97	10:28
2	TOC	0.0000	0.0000	6.95	10.10	3.15	49.95	10:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◉	75	TOC	K1905198-006.01 ms	25.5611 ppm	0.0000 ppm	0.0000%	2019/06/16 10:45

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	25.5611	255.6107	182.47	185.58	3.12	49.91	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

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)	25.1105 ppm (PASS)	0.0000 ppm	0%	2019/06/16 11:00

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	25.1105	251.1049	179.91	183.10	3.19	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 (v30)	50 ppmC

Sample Type: Check Standard --> CCB — From Schedule Version 8

00939735

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/06/16 11:14

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.98	9.18	3.20	49.85	10:34

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

Meta Data Used in this Report

Blanks

Version	Reagent (Abs)	Acid (Abs)	DI IC (Abs)	DI TC (Abs)	DI TOC (Abs)	Save Time	Operator
v1265	1.1340	1.2260	0.0000	0.0000	0.0000	2019/06/10 14:28	Fusion1 (Fusion1)
v1266	2.2187	1.4940	0.0000	0.0000	0.0000	2019/06/14 17:57	Fusion1 (Fusion1)

Calibrations

Name: CAS_salt_010711 (TOC)

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

Basic Analysis Type: TOC

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

Methods

00939736

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

00939737

1	Fusion1 (Fusion1)	Schedule completed	Schedule completed	2019/06/16 11:32

StarLIMS Run: 639522, 639523, 639524, 639525

Analysis: TOC/DOC

Method: 415.1, SM 5310 C, 9060, 9060A

CCV: 11-GEN-05-77K 50 ppm LCS: 11-GEN-05-77D 25.0 ppm

ICAL Date: 3/6/19

ICAL ID: 11-GEN-05-76H

ICS ID: 11-GEN-05-74A

ICS TV: 25.0 ppm ICS % R = 2

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

Sodium Persulfate: 11-GEN-05-78I

21 % H3PO4: 11-GEN-05-78H

Equipment ID: K-TOC-03

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

FILTER ID: FE1165 6/15/19

Analyzed By:	BCD / HLM	Date Analyzed:	6/16/19
Reviewed By:	[signature]	Date Reviewed:	06/18/19

Case Narrative

Method: 6850
Analysis: Perchlorate
Analysis SOP: LC-MS-CLO4
ALS WO ID(s): 1915802, 1915803, 1915852, 1916229; 1916231; 1916232

Client: ALS Laboratories (Houston, TX)
Matrix: Water
ELMS Batch (HBN): 2261 (241120)

General Set Information: There were six 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 samples 1915852001 and 1916229001 were analyzed and reported from 1:1,000 dilutions. The reporting limits have been adjusted accordingly.

Method QC data: The method blank (LMB 657797) was less than 1/2 the CRDL. The recovery for the LCS (657798) was within acceptable parameters.

MS/MSD Analysis: MS/MSD was performed on sample 1915802001 (Client ID: LH18/24-SP650_052919_BIX). 4.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. The spike target was 4.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 – 657795) is reported from the analysis of the Laboratory Control Sample (LCS – 657798) at a level of 4.0µg/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: 19MARI03).

Thomas Bosch June 12, 2019
Analyst Date

ANALYTICAL REPORT

Report Date: June 13, 2019

RJ Modashia
ALS Environmental (Houston)
10450 Stancliff Road
Suite 210
Houston, TX 77099

Phone: 281 530-5656

E-mail: RJ.Modashia@ALSGlobal.com

Workorder: **34-1916232**
Project ID: HS19060172
Purchase Order: HS19060172
Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
LH18/24-SP650_060419_BIX	1916232001	06/04/19	06/06/19	

ANALYTICAL REPORT

Workorder: 34-1916232
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **LH18/24-SP650_060419_BIX**	Sampling Site: NA	Collected: 06/04/2019
Lab ID: 1916232001	Media: 125 mL Nalgene	Received: 06/06/2019
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/2261 (HBN: 241120)	**Percent Solid:** NA
	Analyzed: 06/11/2019 11:19	**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 06/12/2019 12:46	/S/ Stephen Brose 06/13/2019 10:59

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: 34-1916232
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
	Nevada (TNI)	UT00953201-1	https://ndep.nv.gov/water/lab-certification
	Iowa (TNI)	IA# 376	http://www.shl.uiowa.edu/labcert/idnr/
	Kansas	E-10416	http://www.kdheks.gov/envlab/disclaimer.html
	Oklahoma (TNI)	IJ# 9980	http://www.deq.state.ok.us/CSDnew/labcert.htm
	Texas (TNI)	T104704456-18-9	https://www.tceq.texas.gov/assets/public/compliance/compliance_support/qa/txnelap_lab_list.pdf
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: 1916232

Limits:	Client SOW/Contract Specified	**Preparation:**	NA	**Analysis:**	EPA 6850, DoD QSM
Basis:	DoD QSM	**Batch:**	NA	**Batch:**	ELMS/2261 (HBN: 241120)
		Prepared By:	NA	**Analyzed By:**	Thomas Bosch

Blank

LMB: 657797
Analyzed: 06/11/2019 09:31
Units: ug/L

Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 657798
Analyzed: 06/11/2019 09:04
Dilution: 1
Units: ug/L

Analyte	Result	Target	% Rec	QC Limits	
Perchlorate	4.34	4.00	109	78.8	123.8

Matrix Spike - Matrix Spike Duplicate

Sample:	1915802001	**MS:**	657799
Analyzed:	06/11/2019 09:45	**Analyzed:**	06/11/2019 09:58
Dilution:	1	**Dilution:**	1
Units:	ug/L	**Units:**	ug/L

	MSD:	657800
	Analyzed:	06/11/2019 10:12
	Dilution:	1
	Units:	ug/L

Analyte	Result	Result	Target	% Rec	QC Limits		Result	% Rec	RPD	QC Limits	
Perchlorate	ND	4.57	4	114	78.8	123.8	4.78	120	4.65	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 06/12/2019 12:47	/S/ Stephen Brose 06/13/2019 10:59

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

1916232

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
1916232

SAMPLING STATE: **Dept of Defense** **COC ID:** **11520**

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:	HS19060172
TSR:	Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS19060172-02**	**LH18/24-SP650_060419_BIX**	**Water**	**04 Jun 2019 14:00**
	SUB_Perch-6850			19 Jun 2019

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

QC Level: DOD IV (DoD Data Package)

Relinquished By: _____ Date/Time: 6/5/19 1800

Received By: _____ Date/Time: 6-6-19 0955

Cooler ID(s): _____ Temperature(s): _____

ALS Environmental

CHAIN-OF-CUSTODY

Project / Job / Task: HS19060172	***Split:***	**Workorder ID:** 1916232	**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	06/04/2019 14:00	LH18/24-SP650_060419_BIX	1916232001		Water	A	1	A
2								
3								
4								
5								
6								
7								
8								
9								
10								

135 of 209

ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location
Cooles, Gaileen	06/06/2019 09:55	ALS Sample Receiving	Sample Login
	6.6.19 1425	3B	STORAGE
R.33.1	6-11-19/08:00	T. Bazal	6850

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

00939746

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: 6-6-19 0955

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	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.
1	C19 9676	1 °C	4	C19	°C	7	C19	°C
2	C19	°C	5	C19	°C	8	C19	°C
3	C19	°C	6	C19	°C	9	C19	°C

Taken By: _____ (Signature) GAYLEEN COATES (Printed Name) 6-6-19 (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: _____

CRIR.doc

Revised 01/01/2018

Must Deliver Next Business Day
Time and Tempature Sensitive!

ALS

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

SHIP DATE: 05JUN19
ACTWGT: 10.85 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: HS1906016B/172/174 - RJ

FedEx Express

TRK# 0201 **4609 7834 7670**

THU - 06 JUN 3:00P
STANDARD OVERNIGHT

AX BTFA

84123
UT-US **SLC**

Batch Worklist

Batch: ELMS/ 2261 **Created:** 6/11/2019 07:45 **Instrument:** **HBN:** 241120

Rule: EPA 6850, DoD QSM Water **Analyst:** T. Bosch **Status:** WP

Workorder: 1915802 [ENV_LVL4]
Workorder: 1915803 [ENV_LVL4]
Workorder: 1915852 [ENV_LVL4]
Workorder: 1916229 [ENV_LVL4]
Workorder: 1916231 [ENV_LVL4]
Workorder: 1916232 [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	657794	CCV for HBN 241120 [ELMS/2261]				CCV	3		E685041C3Q	5311		6/13/2019	
2	657795	RLVS for HBN 241120 [ELMS/2261				RLVS	3		E685041C3Q	5311		6/13/2019	
3	657796	ICS for HBN 241120 [ELMS/2261]				ICS	3		E6850..D3Q	5311		6/13/2019	
4	657797	LMB for HBN 241120 [ELMS/2261]				LMB	3		E6850Q413Q	5311		6/13/2019	
5	657798	LCS for HBN 241120 [ELMS/2261]				LCS	3		E6850Q413Q	5311		6/13/2019	
6	1915802001	LH18/24-SP650_052919_BIX				SAMPLE	3	1915802001-A	E6850Q41.3	5480	6/26/2019	6/13/2019	
7	657799	LH18/24-SP650...(1915802001MS)				MS	3		E6850Q413Q	5311		6/13/2019	
8	657800	LH18/24-SP65...(1915802001MSD)				MSD	3		E6850Q413Q	5311		6/13/2019	
9	1915803001	LH18/24-SP650_052919_BIX				SAMPLE	3	1915803001-A	E6850Q41.3	5480	6/26/2019	6/13/2019	
10	1915852001	LH18/24-SP140_052919				SAMPLE	3	1915852001-A	E6850Q41.3	5480	6/26/2019	6/13/2019	
11	1916229001	LH18/24-SP140_060419				SAMPLE	3	1916229001-A	E6850Q41.3	5480	7/2/2019	6/19/2019	
12	1916231001	LH18/24-SP650_060419_BIX				SAMPLE	3	1916231001-A	E6850Q41.3	5480	7/2/2019	6/19/2019	
13	1916232001	LH18/24-SP650_060419_BIX				SAMPLE	3	1916232001-A	E6850Q41.3	5480	7/2/2019	6/19/2019	
14	657801	CCV for HBN 241120 [ELMS/2261]				CCV	3		E685041C3Q	5311		6/13/2019	



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

ALS Work Order #'s & Sample #( )'s: 1915802 (001), 1915803 (001), 1915852 (001), 1916229 (001); 1916231 (001); 1916232 (001) ELMS Batch/HBN ID: 2261 (241120)
Prep Date: 06/11/2019 Analysis Date: 06/11/2019 Analyst: T. Bosch
Analyte: **Perchlorate** Matrix: **Water** Method: **6850**
Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2019\JUN\11JUN19D.s
Reported DL: **1.0µg/L** Reported LOD: **2.0µg/L** Reported LOQ: **4.0µg/L**

SAMPLE PREPARATION/ANALYSIS:

Water: Samples were prepared by Thomas 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 AH015-4)/0.1% glacial acetic acid (JT-Baker Lot 04802).
Eluent B1: 95% ACN (B&J Lot AH015-4)/ 5% ASTM Type II water (ALS)/0.1% glacial acetic acid (JT-Baker Lot 04802).

STANDARDS: Internal Standard Spiking Solution Horizon# 43730. Dilutions of Working Standard Solution ID 43702 used for CCV's, LODV's, RLVS and IPC.

CALIBRATION CURVE: Used curve from 03/19/2019, sequence 19MAR19D.s Offline Quantitation Method: CLO4-DP2.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: 7 Injection Volume: 35µL
Column: KP-RPPX C8 separator, 250mm Mobile Phase: 70% Eluent A1; 30% Eluent B1

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: 4.0µL of QC Solution Horizon ID 47516 was used for LCS 657798; Target = 4.0µg/L. ASTM type II water was used for LMB 657797.

MS/MSD: The Matrix Spike and duplicate (MS/MSD) were performed on sample 1915802001 (Client ID: LH18/24-SP650_052919_BIX). 4.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. Spike target = 4.0µg/L.

COMMENTS:

1) Results reported in µg/L. Field samples 1915852001 and 1916229001 were analyzed and reported from 1:1,000 dilutions. The reporting limits have been adjusted accordingly.
2) All QC, Blank, CCV, and MS/MSD results were within method parameters.
3) Sample data can be viewed at two directories within the ALS system: \\ALSLTWS013\LCMS\LCMS04\2019\JUN\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
4) Notebook: \\alsltws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2019\241120-DoD-ALS-Hstn LCMS4 or through \\ALSLTWS013\DATAREVIEW\HBN#
5) The Reporting Limit Verification Standard (RLVS – 657795) is reported from the analysis of the Laboratory Control Sample (LCS – 657798) at a level of 4.0µg/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: 19MARI03).

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: 2261 HBN: 241120 1915802/1915803/1915852 Sample Set IDs if Applicable: 1916229/1916231/1916232	Analyst Initials	Reviewer Initials
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
Method Blanks 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 flags applied on QC reports; LCSs analyzed and meet acceptance criteria when performed	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 checked	TB	SB
Preparation and analysis calculations checked	TB	SB
NCRs are completed as necessary NC/CAR#		
Report forms are complete and accurate	TB	SB
Manual integrations checked	TB	SB

STANDARD REPORT

Working Standard - CLO4 WRK

CLO4 WRK — Description - 6850 WKG Std 100.ug/L

Standard: 43702
MFG: ALS/SLC
MFG Lot: TNB: 09/18/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/18/2018 02:09PM

Amount: 10 mL
Expires: 09/18/2019
Usable: Yes
Lab Lot: CLO4 WRK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	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
43701	CLO4 INT	6850 Intermdt AccStd 10.ug/mL	CLO4 INT	0.1 mL	09/18/2019

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: No
Lab Lot: CLO4 STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	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: 43701
MFG: ALS/SLC
MFG Lot: TNB: 09/18/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/18/2018 02:09PM

Amount: 10 mL
Expires: 09/18/2019
Usable: Yes
Lab Lot: CLO4 INT

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
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
MFG: Ultra Scientific
MFG Lot: CP-0860
Part ID: ICC-013

Created By: Thomas Bosch
Create Date: 05/11/2017 01:05PM

Amount: 100 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL

STANDARD REPORT

Constituent

Working Standard - CLO4 QC INT

CLO4 QC INT — Description - 6850 QC Intrmdt Std-QC 10ug/mL

Standard: 47515
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

STANDARD REPORT

Working Standard - CLO4ISTDWRK

CLO4ISTDWRK — Description - Perchlorate ISTD Wrk 1,000ug/L

Standard: 43730
MFG: ALS/SLC
MFG Lot: TNB: 05/09/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/20/2018 09:09AM
Verified By: Thomas Bosch
Verify Date:

Amount: 25 mL
Expires: 09/20/2019
Usable: Yes
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
43729	CLO4ISTDSTK	Perchlorate ISTD Stock	CLO4ISTDSTK	0.25 mL	04/28/2026

STANDARD REPORT

Constituent

Stock Standard - CLO4ISTDSTK

CLO4ISTDSTK		Description - Perchlorate ISTD Stock
Standard: 43729	Created By: Thomas Bosch	Amount: 1 mL
MFG: Cambridge Isotope	Create Date: 09/20/2018 09:09AM	Expires: 04/28/2026
MFG Lot: SDFF-012A	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

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

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.

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

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.

Cambridge Isotope Laboratories, Inc.

Certificate of Analysis

Quality Standards:
ISO Guide 34 • ISO/IEC 17025 • ISO 13485 • cGMP

23118

Product Name: (Isotopic Label & Enrichment Specification)	PERCHLORIC ACID, SODIUM SALT (18O4, 90%+) 100 UG/ML IN WATER
Lot Number:	SDDG-013
Catalog Number:	OLM-7310-S

Product Information

Chemical Purity Specification:	≥98%
Labeled CAS Number:	NA
Unlabeled CAS Number:	7601-89-0
MW*:	130.4
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.

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.

* *For isotopically labeled compounds, MW listed is for the fully enriched product.*

Approved by: T. J. Eckersley

Timothy J. Eckersley, Ph.D., Quality Assurance

Quality Control Tests and Results

QC Release Date	2/27/2014
Expiration Date	2/27/2024
Concentration Based on Gravimetry	102 µg/mL
Chemical Purity of Neat Material(s)	98%
LC/MS for Concentration	109.4 ± 2.8 µg/mL (k=2)



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

00939768

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP2.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
*	657794 CCV@25	Vial 71	1	Control	1	1.90258e6	8.986	26.94929
*	657798 QC@4.0	Vial 72	1	Control	2	3.85542e5	8.884	4.34115
*	657796 ICS@4.0	Vial 73	1	Control	3	2.32261e5	8.623	3.98229
*	657797 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	1915802001	Vial 75	1	Sample	5	0.00000	0.000	0.00000
*	657799 158021S	Vial 76	1	Sample	6	1.46622e5	8.522	4.56740
*	657800 158021D	Vial 77	1	Sample	7	1.54646e5	8.528	4.78474
*	1915803001	Vial 78	1	Sample	8	0.00000	0.000	0.00000
*	1915852001 1K	Vial 79	1	Sample	9	3.32187e5	9.077	4885.02369
*	1916229001 1K	Vial 80	1	Sample	10	4.13979e5	9.091	6820.05588
*	1916231001	Vial 81	1	Sample	11	0.00000	0.000	0.00000
*	1916232001	Vial 82	1	Sample	12	0.00000	0.000	0.00000
*	657801 CCV@25	Vial 71	1	Control	13	1.42334e6	9.028	25.98075

#	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
*	657794 CCV@25	Vial 71	1	Control	1	5.56917e5	9.003	26.60911
*	657798 QC@4.0	Vial 72	1	Control	2	1.22598e5	8.893	4.50107
*	657796 ICS@4.0	Vial 73	1	Control	3	7.62920e4	8.637	4.24932
*	657797 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	1915802001	Vial 75	1	Sample	5	0.00000	0.000	0.00000
*	657799 158021S	Vial 76	1	Sample	6	5.01097e4	8.545	5.09575
*	657800 158021D	Vial 77	1	Sample	7	5.24358e4	8.548	5.30516
*	1915803001	Vial 78	1	Sample	8	0.00000	0.000	0.00000
*	1915852001 1K	Vial 79	1	Sample	9	1.07205e5	9.093	5161.49233
*	1916229001 1K	Vial 80	1	Sample	10	1.30297e5	9.110	7096.69575
*	1916231001	Vial 81	1	Sample	11	0.00000	0.000	0.00000
*	1916232001	Vial 82	1	Sample	12	0.00000	0.000	0.00000
*	657801 CCV@25	Vial 71	1	Control	13	4.26237e5	9.042	26.20612

#	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
*	657794 CCV@25	Vial 71	1	Control	1	2.13798e5	9.004	5.00000
*	657798 QC@4.0	Vial 72	1	Control	2	2.91481e5	8.904	5.00000
*	657796 ICS@4.0	Vial 73	1	Control	3	1.92225e5	8.645	5.00000
*	657797 LMB	Vial 74	1	Control	4	3.01884e5	9.082	5.00000
*	1915802001	Vial 75	1	Sample	5	1.12941e5	8.589	5.00000
*	657799 158021S	Vial 76	1	Sample	6	1.05110e5	8.545	5.00000
*	657800 158021D	Vial 77	1	Sample	7	1.05604e5	8.552	5.00000
*	1915803001	Vial 78	1	Sample	8	1.14182e5	8.546	5.00000
*	1915852001 1K	Vial 79	1	Sample	9	2.21981e5	9.097	5000.00000
*	1916229001 1K	Vial 80	1	Sample	10	1.95450e5	9.116	5000.00000
*	1916231001	Vial 81	1	Sample	11	1.33828e5	8.518	5.00000
*	1916232001	Vial 82	1	Sample	12	1.27034e5	8.502	5.00000
*	657801 CCV@25	Vial 71	1	Control	13	1.66287e5	9.054	5.00000

*** End of Report ***

Sequence Table:

Method and Injection Info Part:

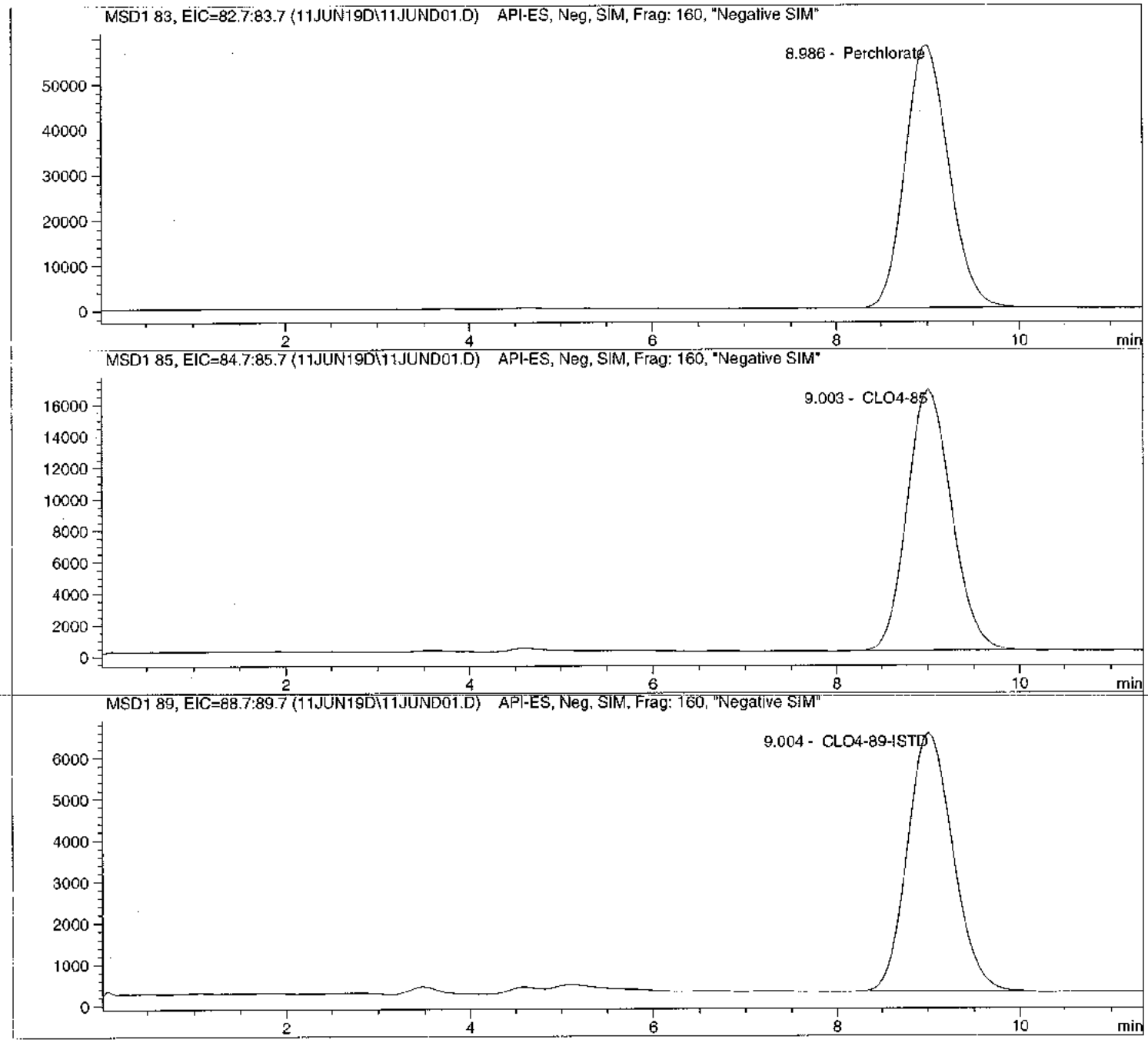
Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	657794 CCV@25	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	657798 QC@4.0	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	657796 ICS@4.0	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	657797 LMB	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	1915802001	CLO4-AQN	1	Sample		
6	Vial 76	657799 158021S	CLO4-AQN	1	Sample		
7	Vial 77	657800 158021D	CLO4-AQN	1	Sample		
8	Vial 78	1915803001	CLO4-AQN	1	Sample		
9	Vial 79	1915852001 1K	CLO4-AQN	1	Sample		
10	Vial 80	1916229001 1K	CLO4-AQN	1	Sample		
11	Vial 81	1916231001	CLO4-AQN	1	Sample		
12	Vial 82	1916232001	CLO4-AQN	1	Sample		
13	Vial 71	657801 CCV@25	CLO4-AQN	1	Ctrl Samp		

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND01.D Sample Name: 657794 CCV@25

Injection Date:	6/11/2019 08:44:35	Seq Line:	1
Sample Name:	657794 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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND01.D Sample Name: 657794 CCV@25

Injection Date:	6/11/2019 08:44:35	Seq Line:	1
Sample Name:	657794 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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.986	PBA	1902575.4	26.9493	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.003	PBA	556916.8	26.6091	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.004	PBA	213798.0	5.0000	CLO4-89-ISTD

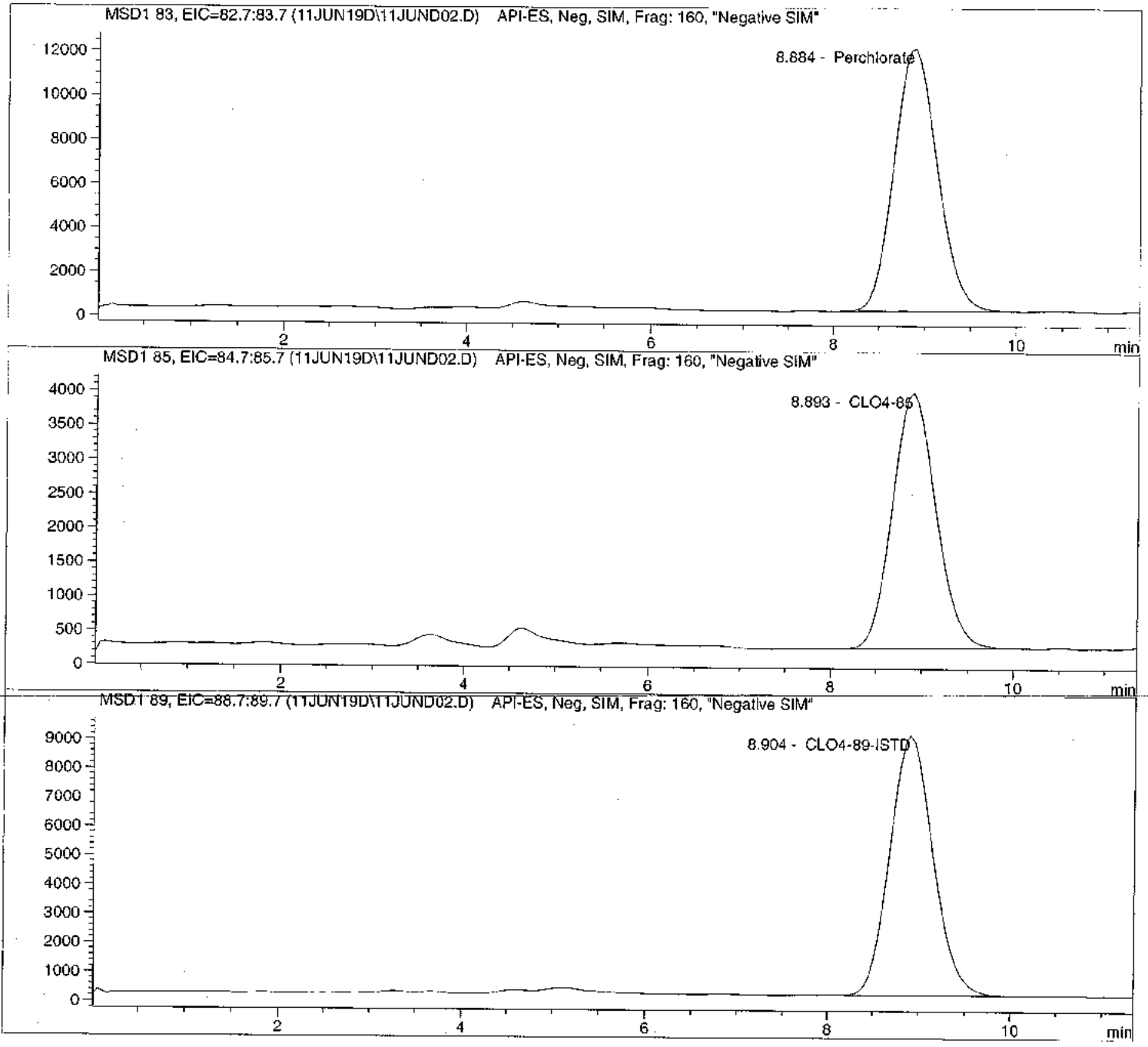
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND02.D Sample Name: 657798 QC@4.0

Injection Date:	6/11/2019 09:04:55	Seq Line:	2
Sample Name:	657798 QC@4.0	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND02.D Sample Name: 657798 QC@4.0

Injection Date:	6/11/2019 09:04:55	Seq Line:	2
Sample Name:	657798 QC@4.0	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.884	PBA	385541.7	4.3412	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.893	BBA	122598.4	4.5011	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.904	BBA	291480.6	5.0000	CLO4-89-ISTD

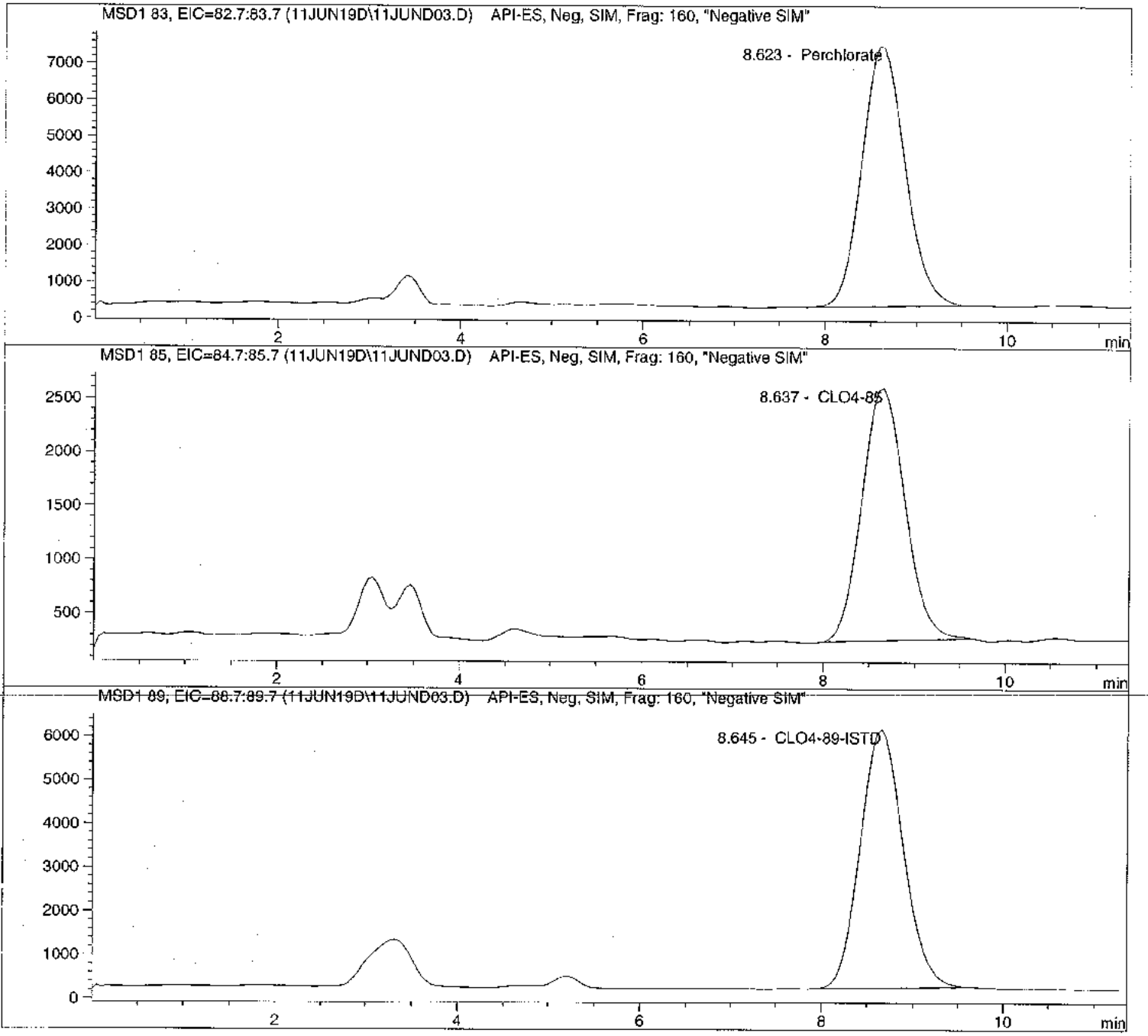
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND03.D Sample Name: 657796 ICS@4.0

Injection Date:	6/11/2019 09:18:21	Seq Line:	3
Sample Name:	657796 ICS@4.0	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND03.D Sample Name: 657796 ICS@4.0

Injection Date:	6/11/2019 09:18:21	Seq Line:	3
Sample Name:	657796 ICS@4.0	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.623	PBA	232261.2	3.9823	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.637	PBA	76292.0	4.2493	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.645	PBA	192224.9	5.0000	CLO4-89-ISTD

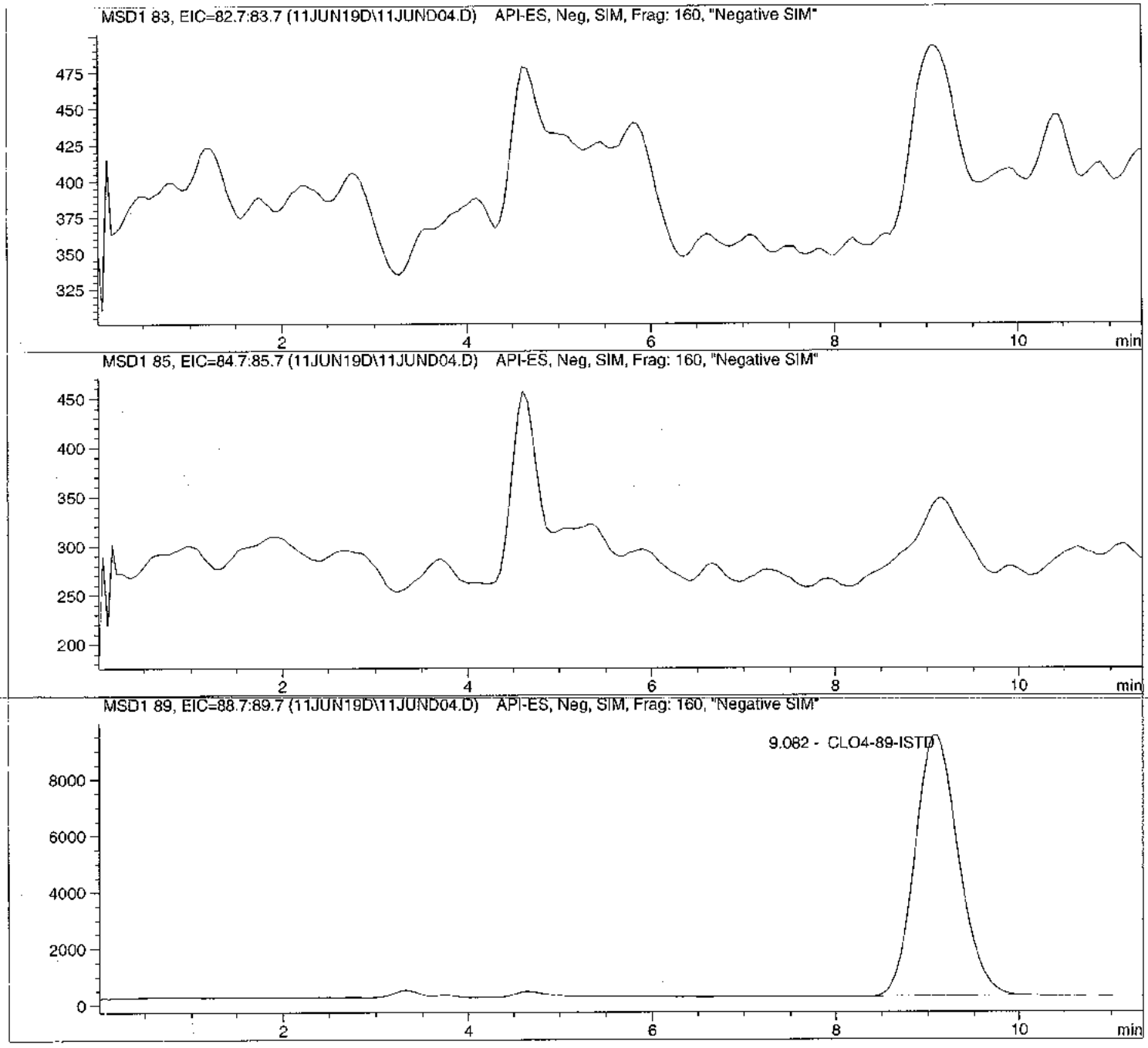
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND04.D Sample Name: 657797 LMB

Injection Date:	6/11/2019 09:31:47	Seq Line:	4
Sample Name:	657797 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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND04.D Sample Name: 657797 LMB

Injection Date:	6/11/2019 09:31:47	Seq Line:	4
Sample Name:	657797 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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
9.082	PBA	301883.5	5.0000	CLO4-89-ISTD

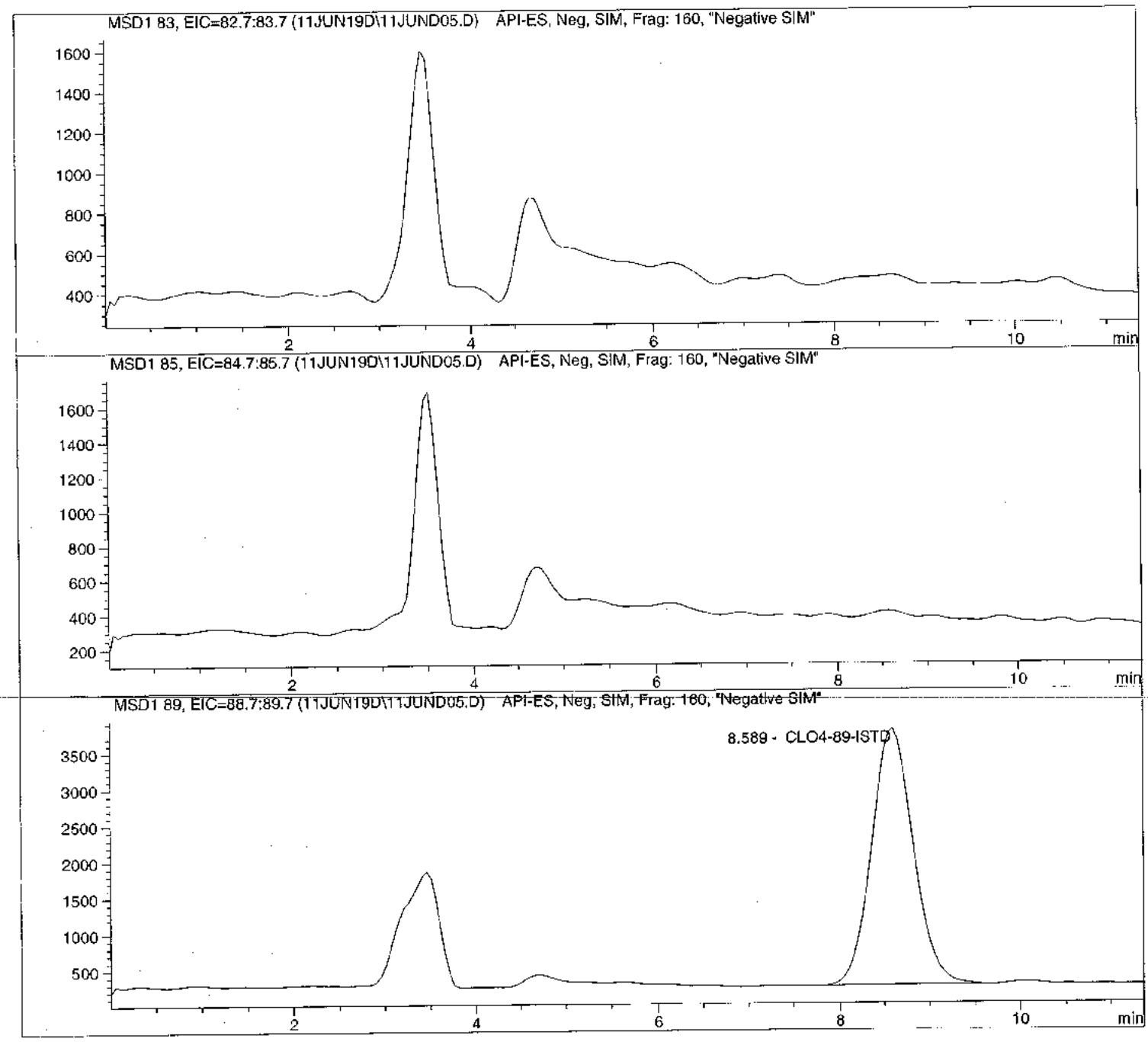
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND05.D Sample Name: 1915802001

Injection Date:	6/11/2019 09:45:13	Seq Line:	5
Sample Name:	1915802001	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND05.D Sample Name: 1915802001

Injection Date:	6/11/2019 09:45:13	Seq Line:	5
Sample Name:	1915802001	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.589	PBA	112941.5	5.0000	CLO4-89-ISTD

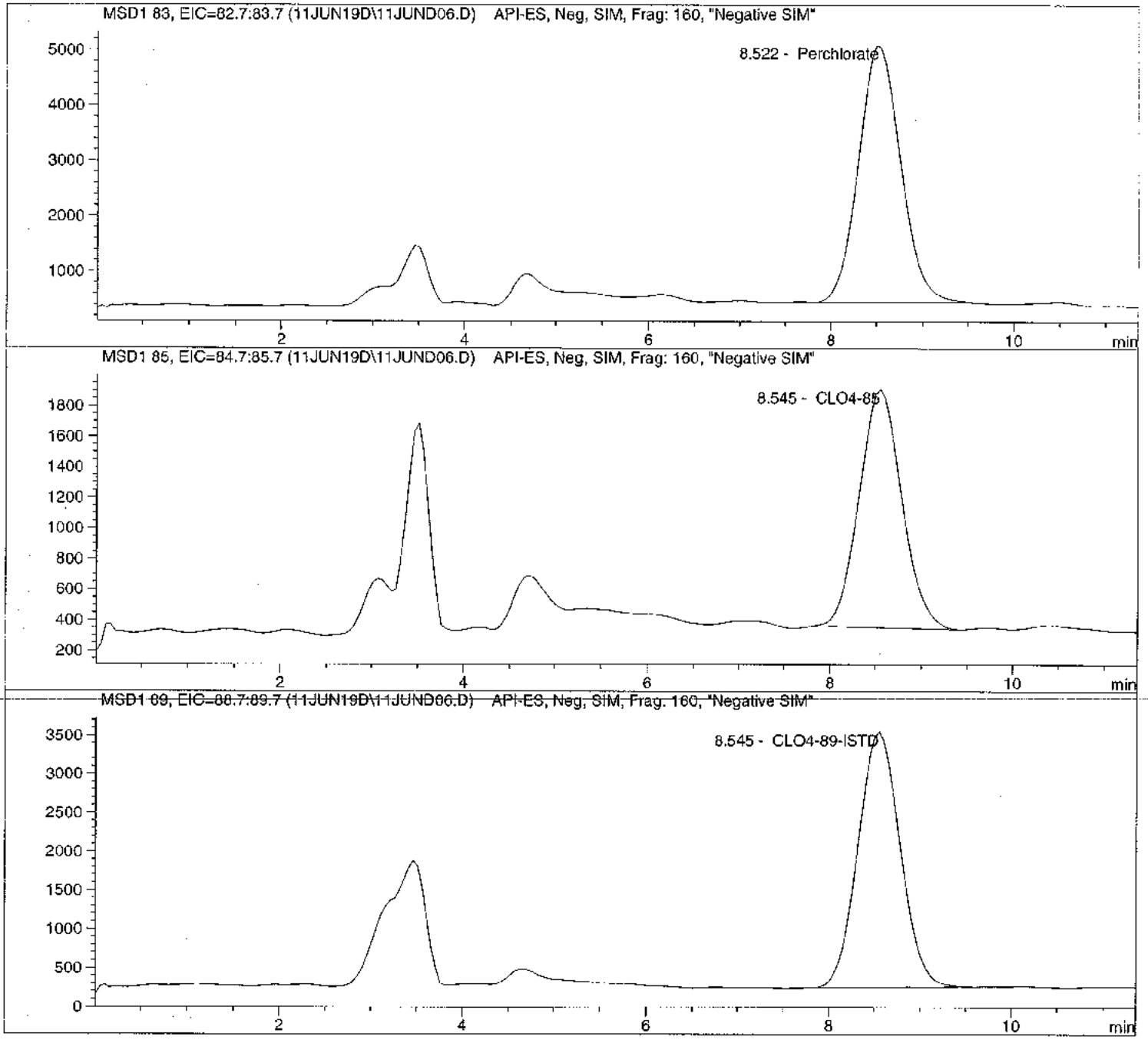
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND06.D Sample Name: 657799 158021S

Injection Date:	6/11/2019 09:58:38	Seq Line:	6
Sample Name:	657799 158021S	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND06.D Sample Name: 657799 158021S

Injection Date:	6/11/2019 09:58:38	Seq Line:	6
Sample Name:	657799 158021S	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Fri, 12. Apr. 2019,07:52:58 am
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
8.522	BBA	146622.1	4.5674	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.545	PBA	50109.7	5.0958	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.545	PBA	105110.4	5.0000	CLO4-89-ISTD

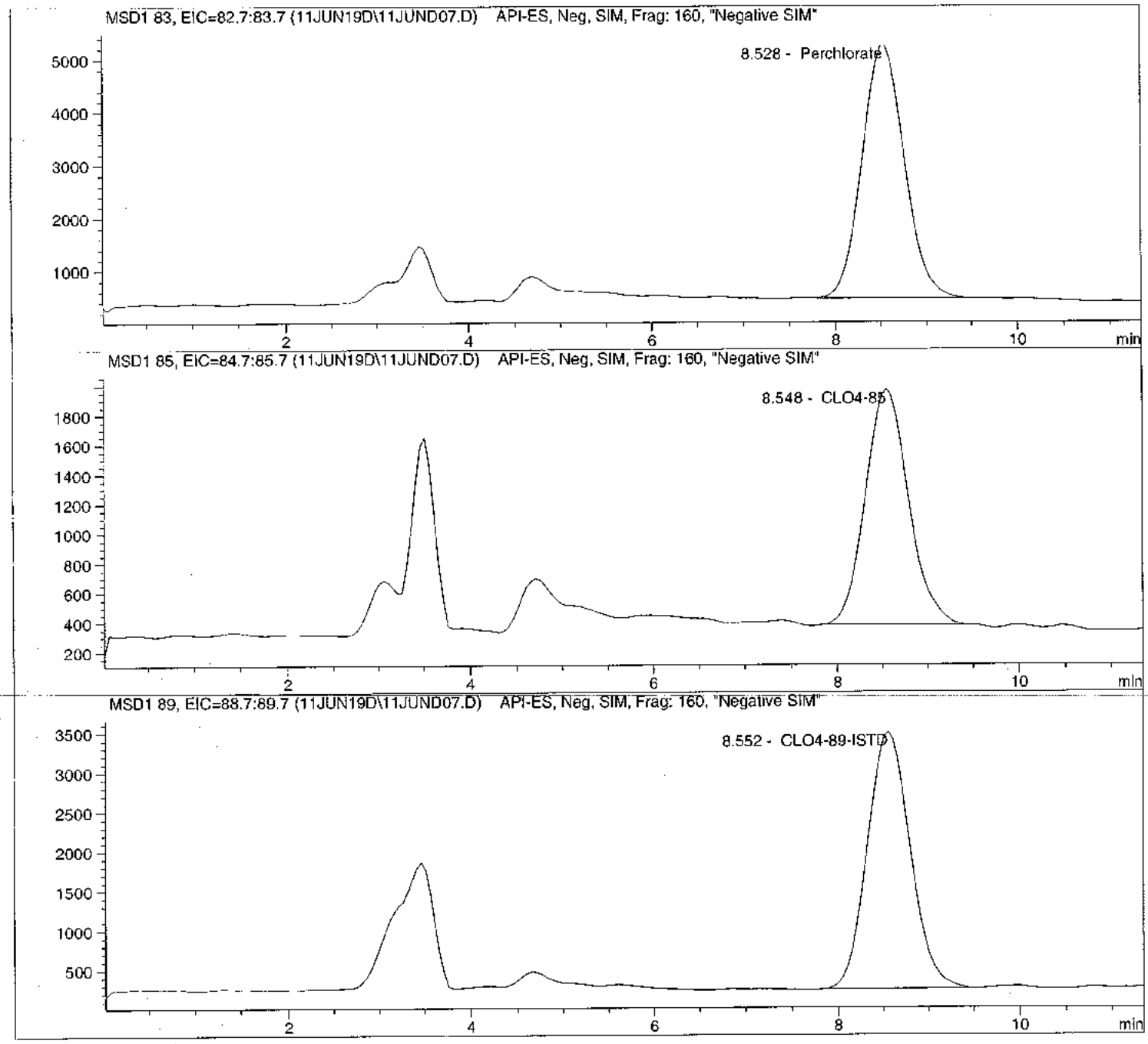
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND07.D Sample Name: 657800 158021D

Injection Date:	6/11/2019 10:12:09	Seq Line:	7
Sample Name:	657800 158021D	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Injection Date:	6/11/2019 10:12:09	Seq Line:	7
Sample Name:	657800 158021D	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-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.528	BBA	154645.8	4.7847	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.548	PBA	52435.8	5.3052	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.552	PBA	105604.1	5.0000	CLO4-89-ISTD

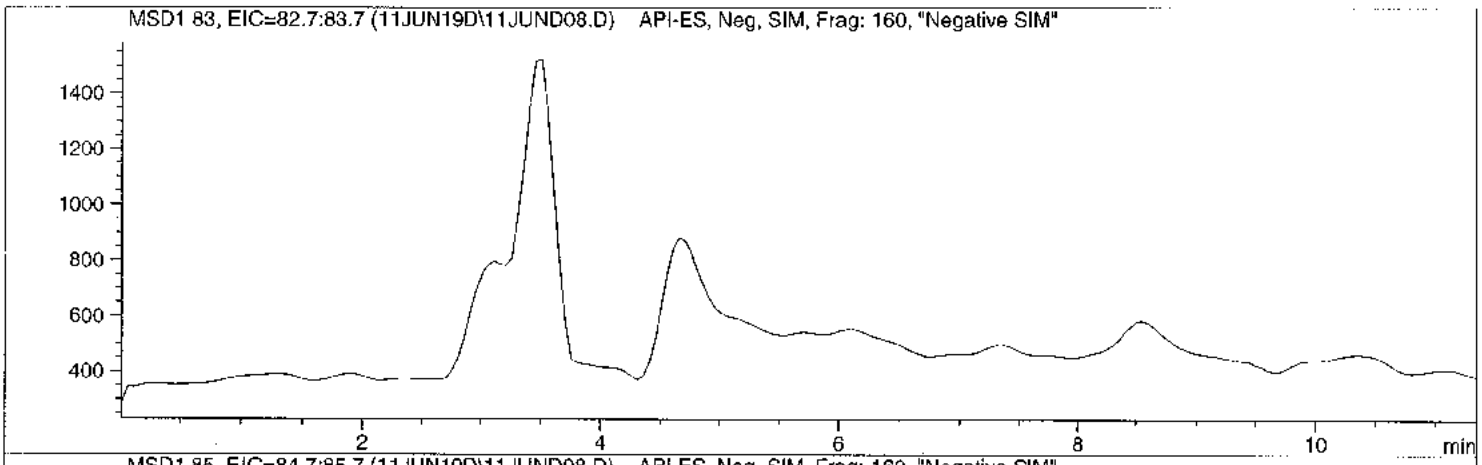
*** End of Report ***

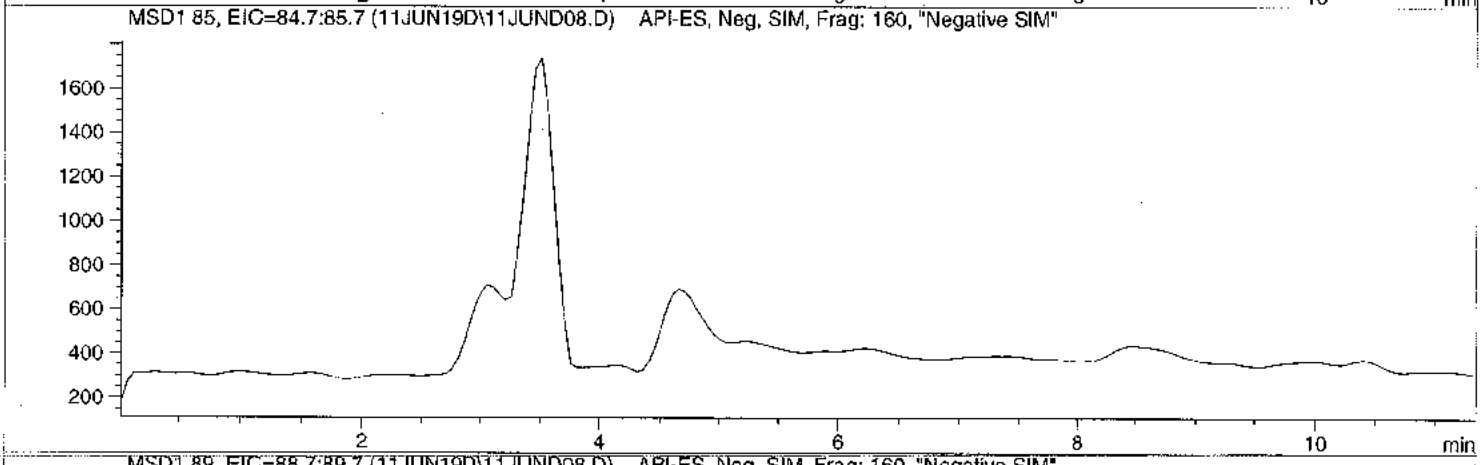
Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND08.D Sample Name: 1915803001

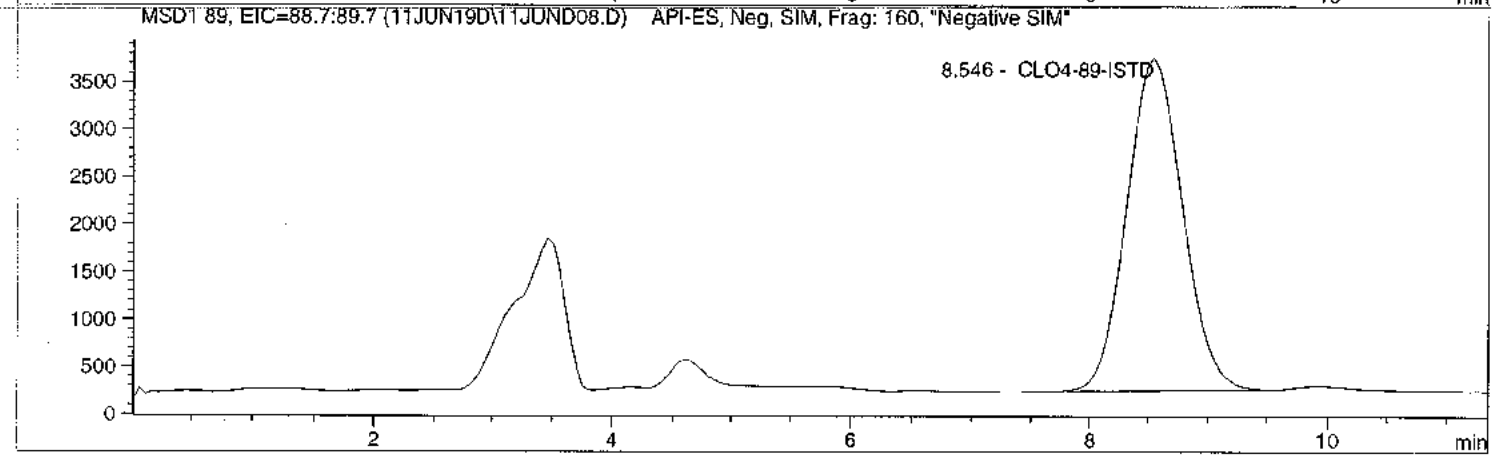
Injection Date:	6/11/2019 10:25:32	Seq Line:	8
Sample Name:	1915803001	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND08.D Sample Name: 1915803001

Injection Date:	6/11/2019 10:25:32	Seq Line:	8
Sample Name:	1915803001	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.546	BBA	114182.4	5.0000	CLO4-89-ISTD

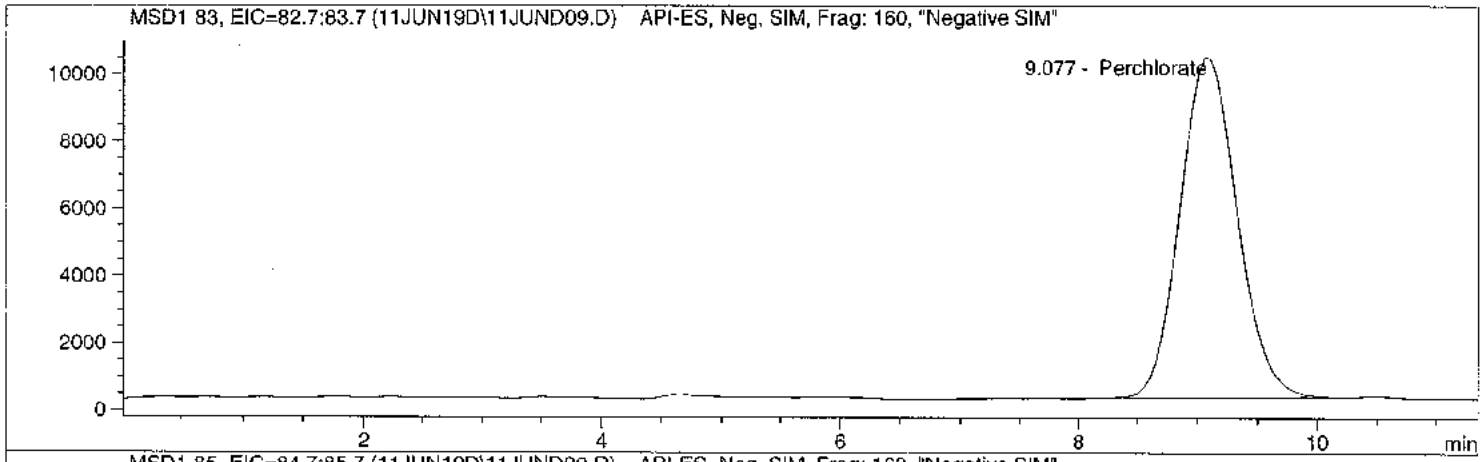
*** End of Report ***

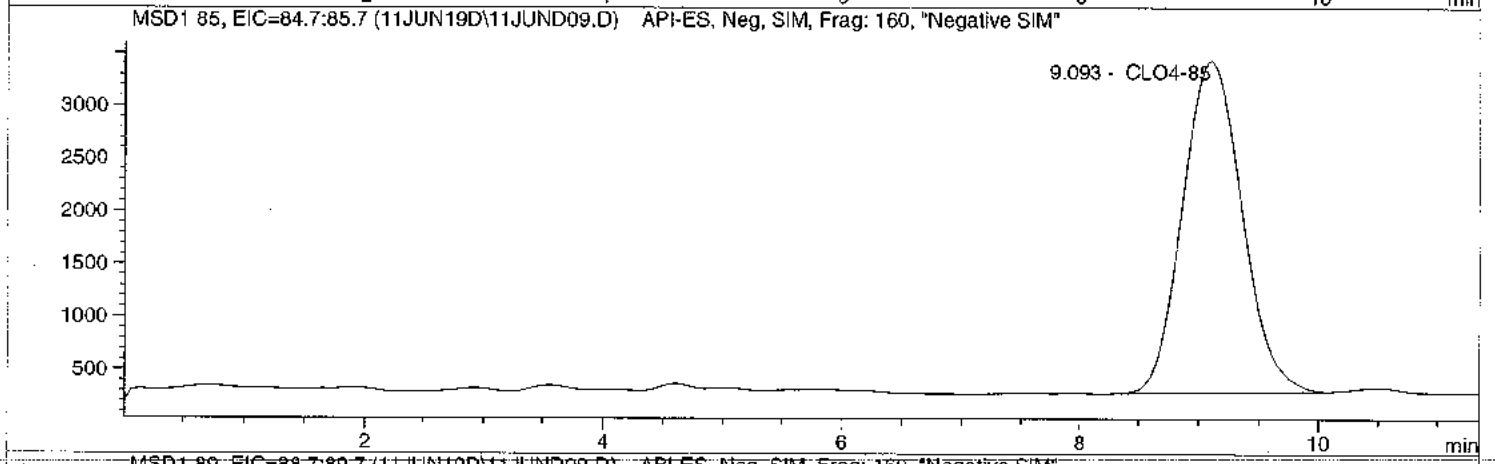
Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND09.D Sample Name: 1915852001 1K

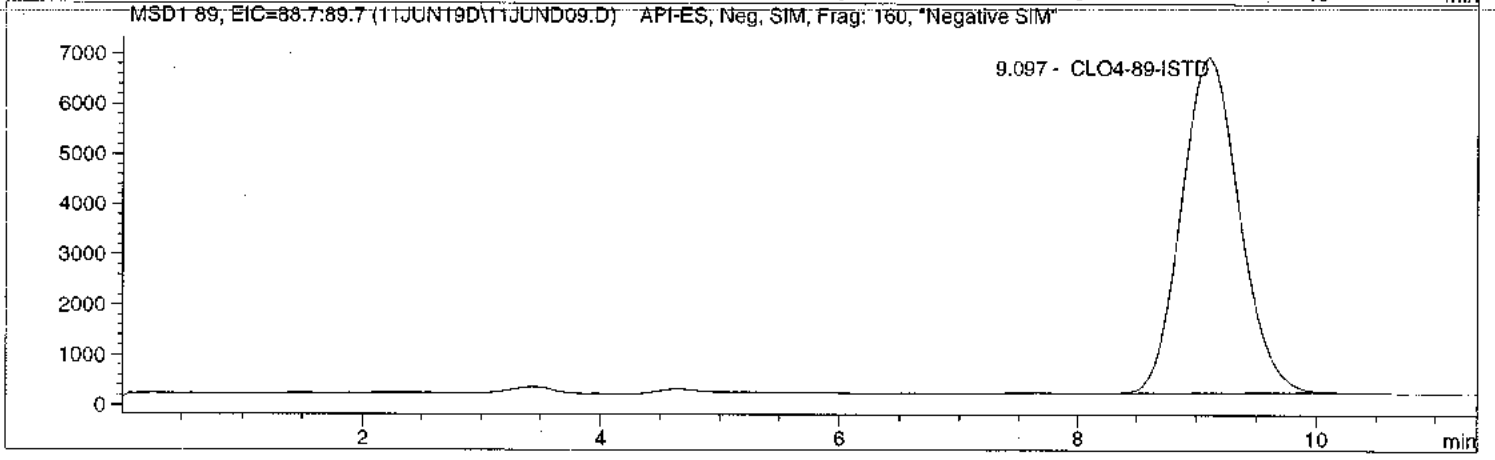
Injection Date:	6/11/2019 10:38:54	Seq Line:	9
Sample Name:	1915852001 1K	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND09.D Sample Name: 1915852001 1K

Injection Date:	6/11/2019 10:38:54	Seq Line:	9
Sample Name:	1915852001 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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
9.077	BBA	332187.1	4885.0237	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.093	PBA	107205.2	5161.4923	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.097	PBA	221981.4	5000.0000	CLO4-89-ISTD

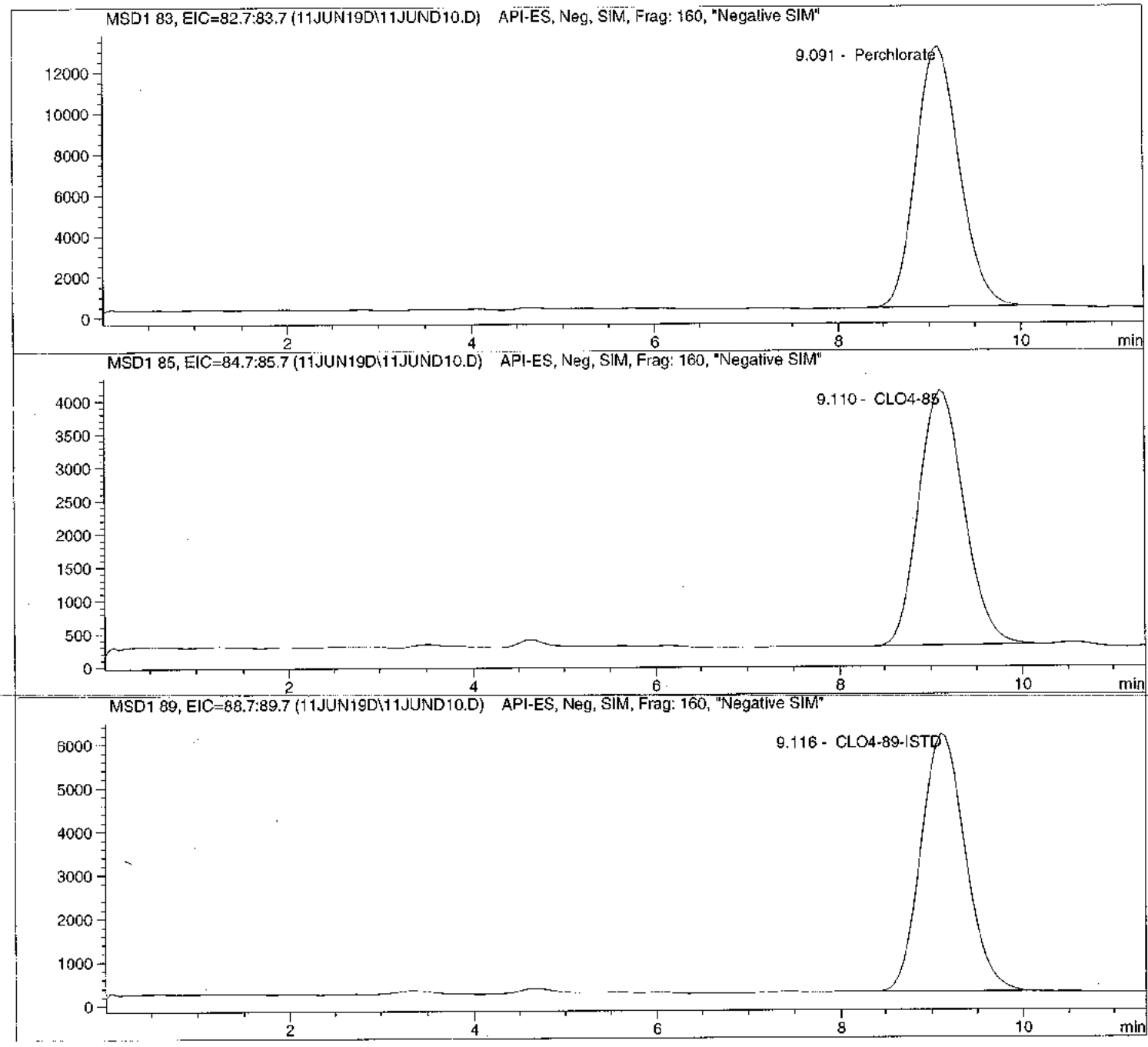
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND10.D Sample Name: 1916229001 1K

Injection Date:	6/11/2019 10:52:22	Seq Line:	10
Sample Name:	1916229001 1K	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND10.D Sample Name: 1916229001 1K

Injection Date:	6/11/2019 10:52:22	Seq Line:	10
Sample Name:	1916229001 1K	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
9.091	BBA	413978.8	6820.0559	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.110	PBA	130297.0	7096.6957	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.116	BBA	195449.6	5000.0000	CLO4-89-ISTD

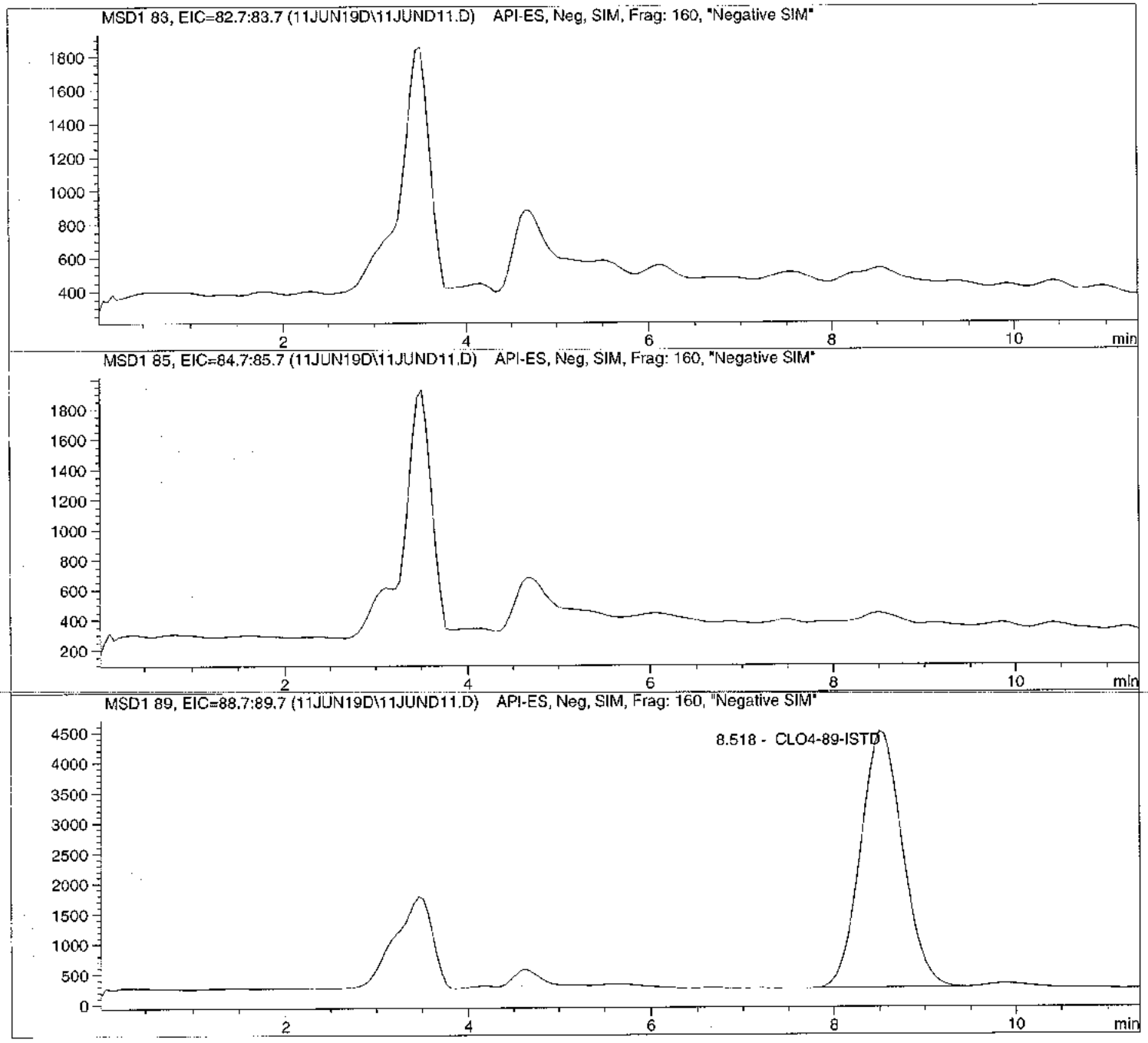
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND11.D Sample Name: 1916231001

Injection Date:	6/11/2019 11:05:44	Seq Line:	11
Sample Name:	1916231001	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND11.D Sample Name: 1916231001

Injection Date:	6/11/2019 11:05:44	Seq Line:	11
Sample Name:	1916231001	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.518	PBA	133827.9	5.0000	CLO4-89-ISTD

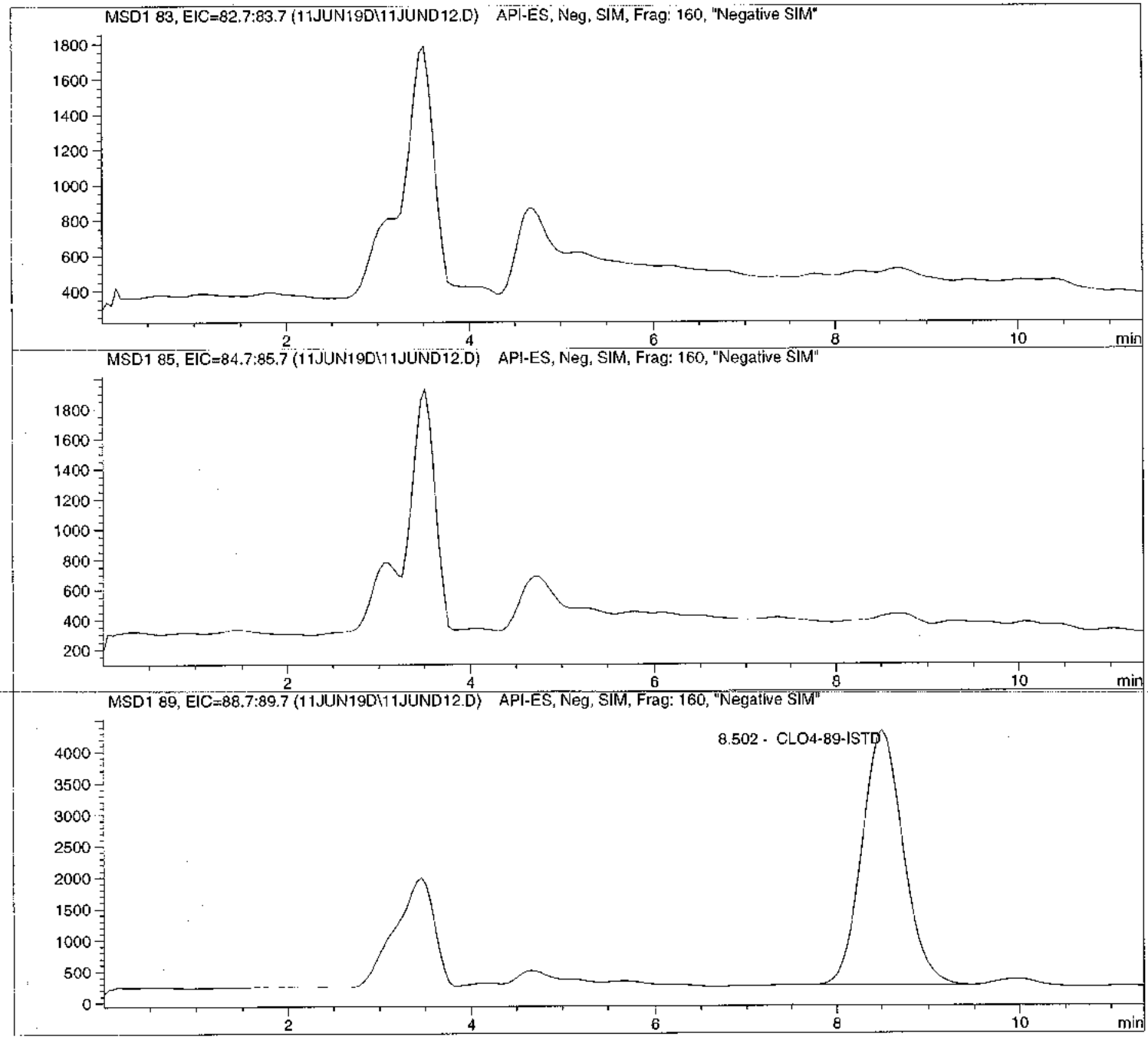
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND12.D Sample Name: 1916232001

Injection Date:	6/11/2019 11:19:06	Seq Line:	12
Sample Name:	1916232001	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND12.D Sample Name: 1916232001

Injection Date:	6/11/2019 11:19:06	Seq Line:	12
Sample Name:	1916232001	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-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.502	BBA	127033.7	5.0000	CLO4-89-ISTD

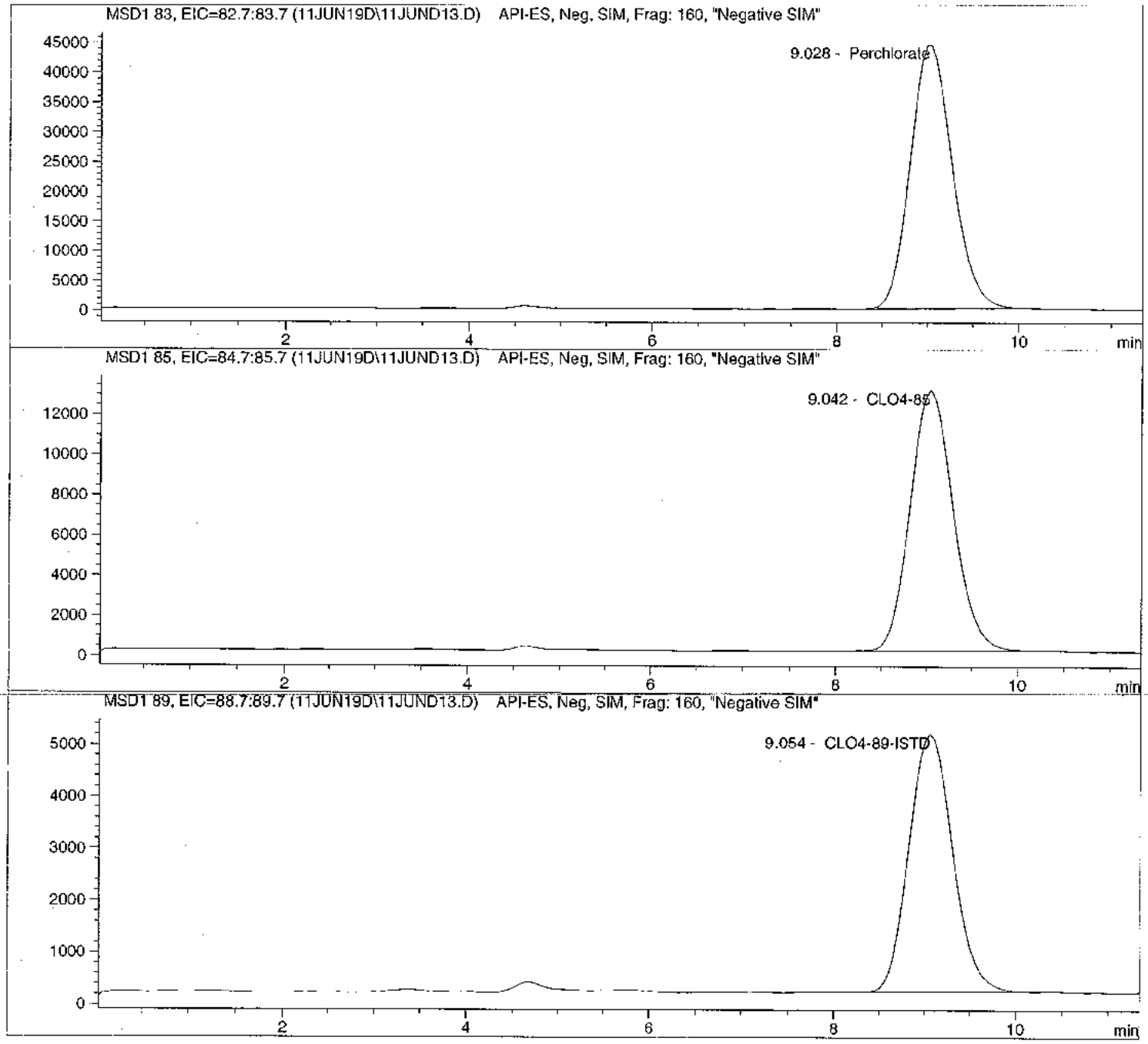
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND13.D Sample Name: 657801 CCV@25

Injection Date:	6/11/2019 11:34:17	Seq Line:	13
Sample Name:	657801 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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND13.D Sample Name: 657801 CCV@25

Injection Date:	6/11/2019 11:34:17	Seq Line:	13
Sample Name:	657801 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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
9.028	PBA	1423337.3	25.9807	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.042	BBA	426236.8	26.2061	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.054	BBA	166286.8	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 : 3/19/2019 2:35:19 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
8.744	1	1	1.00000	7.76074e4	1.28854e-5		1	Perchlorate
		2	2.00000	1.35273e5	1.47849e-5			
		3	5.00000	3.37764e5	1.48033e-5			
		4	10.00000	6.83454e5	1.46316e-5			
		5	25.00000	2.08433e6	1.19943e-5			
		6	50.00000	4.13334e6	1.20968e-5			
		7	75.00000	5.99313e6	1.25143e-5			
8.755	2	1	1.00000	2.36780e4	4.22333e-5		1	CLO4-85
		2	2.00000	4.69486e4	4.25998e-5			
		3	5.00000	1.06124e5	4.71147e-5			
		4	10.00000	2.13523e5	4.68335e-5			
		5	25.00000	6.14295e5	4.06971e-5			
		6	50.00000	1.19814e6	4.17315e-5			
		7	75.00000	1.78355e6	4.20509e-5			
8.766	3	1	5.00000	2.73208e5	1.83011e-5	+I1		CLO4-89-ISTD
		2	5.00000	2.24886e5	2.22335e-5			
		3	5.00000	2.33196e5	2.14412e-5			
		4	5.00000	2.34454e5	2.13262e-5			
		5	5.00000	2.50568e5	1.99547e-5			
		6	5.00000	2.30977e5	2.16472e-5			

RetTime [min]	Sig	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
		7	5.00000	2.21504e5	2.25729e-5			

More compound-specific settings:

Compound: Perchlorate
- Time Window : From 6.654 min To 12.544 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 0.5
  - Level 3 : 0.2
  - Level 4 : 0.1
  - Level 5 : 0.04
  - Level 6 : 0.02
  - Level 7 : 0.013333

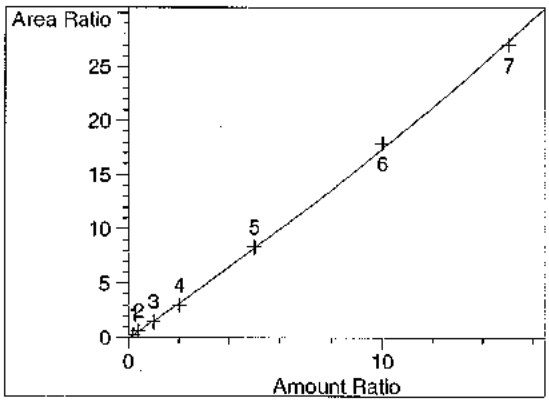
Compound: CLO4-85
- Time Window : From 6.650 min To 12.505 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 0.5
  - Level 3 : 0.2
  - Level 4 : 0.1
  - Level 5 : 0.04
  - Level 6 : 0.02
  - Level 7 : 0.013333

Compound: CLO4-89-ISTD
- Time Window : From 6.659 min To 12.466 min
- Curve Type : Linear
- Origin : Included
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 1
  - Level 3 : 1
  - Level 4 : 1
  - Level 5 : 1
  - Level 6 : 1
  - Level 7 : 1

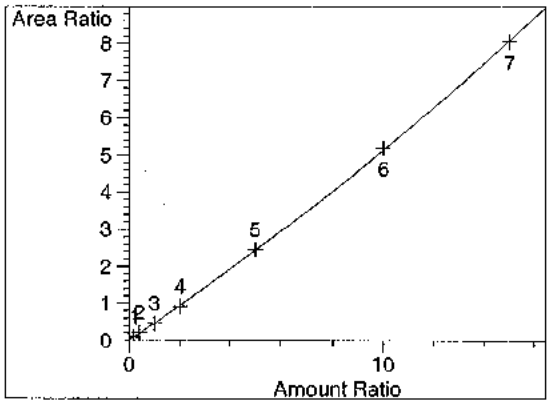
Peak Sum Table

No Entries in table

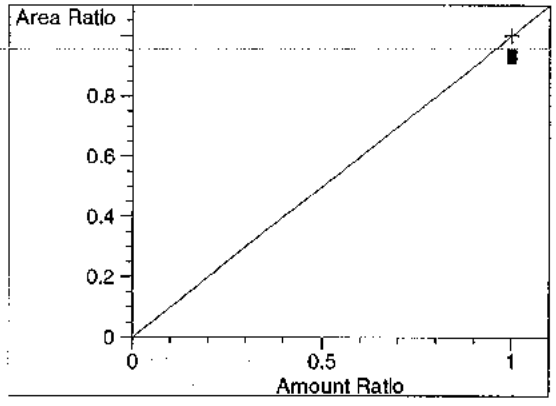
Calibration Curves



Perchlorate at exp. RT: 8.744
MSD1 83, EIC=82.7:83.7
Correlation: 0.99957
Residual Std. Dev.: 0.30744
Formula: $y = ax^2 + bx + c$
a: 1.76988e-2
b: 1.56480
c: -4.92430e-2
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.5
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.013333



CLO4-85 at exp. RT: 8.755
MSD1 85, EIC=84.7:85.7
Correlation: 0.99983
Residual Std. Dev.: 0.03473
Formula: $y = ax^2 + bx + c$
a: 5.13396e-3
b: 4.62055e-1
c: 4.97209e-4
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.5
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.013333



CLO4-89-ISTD at exp. RT: 8.766
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 1 : 1
Level 2 : 1
Level 3 : 1
Level 4 : 1
Level 5 : 1
Level 6 : 1
Level 7 : 1

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP2.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	7.76074e4	8.744	1.06245
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	1.35273e5	8.992	2.06969
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	3.37764e5	8.586	4.73474
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	6.83454e5	8.698	9.27727
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.08433e6	8.451	25.29036
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	4.13334e6	8.810	51.36844
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	5.99313e6	8.586	74.16754
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	7.34719e5	8.702	9.25940

#	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.36780e4	8.755	9.30535e-1
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	4.69486e4	9.012	2.24255
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	1.06124e5	8.602	4.86656
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.13523e5	8.713	9.64312
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	6.14295e5	8.468	25.12159
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	1.19814e6	8.825	50.46721
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	1.78355e6	8.603	74.72019
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.27495e5	8.721	9.54024

#	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	2.73208e5	8.766	5.00000
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	2.24886e5	9.012	5.00000
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	2.33196e5	8.609	5.00000
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.34454e5	8.716	5.00000
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.50568e5	8.472	5.00000
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	2.30977e5	8.825	5.00000
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	2.21504e5	8.610	5.00000
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.52544e5	8.725	5.00000

*** End of Report ***

Sequence Table:

Method and Injection Info Part:

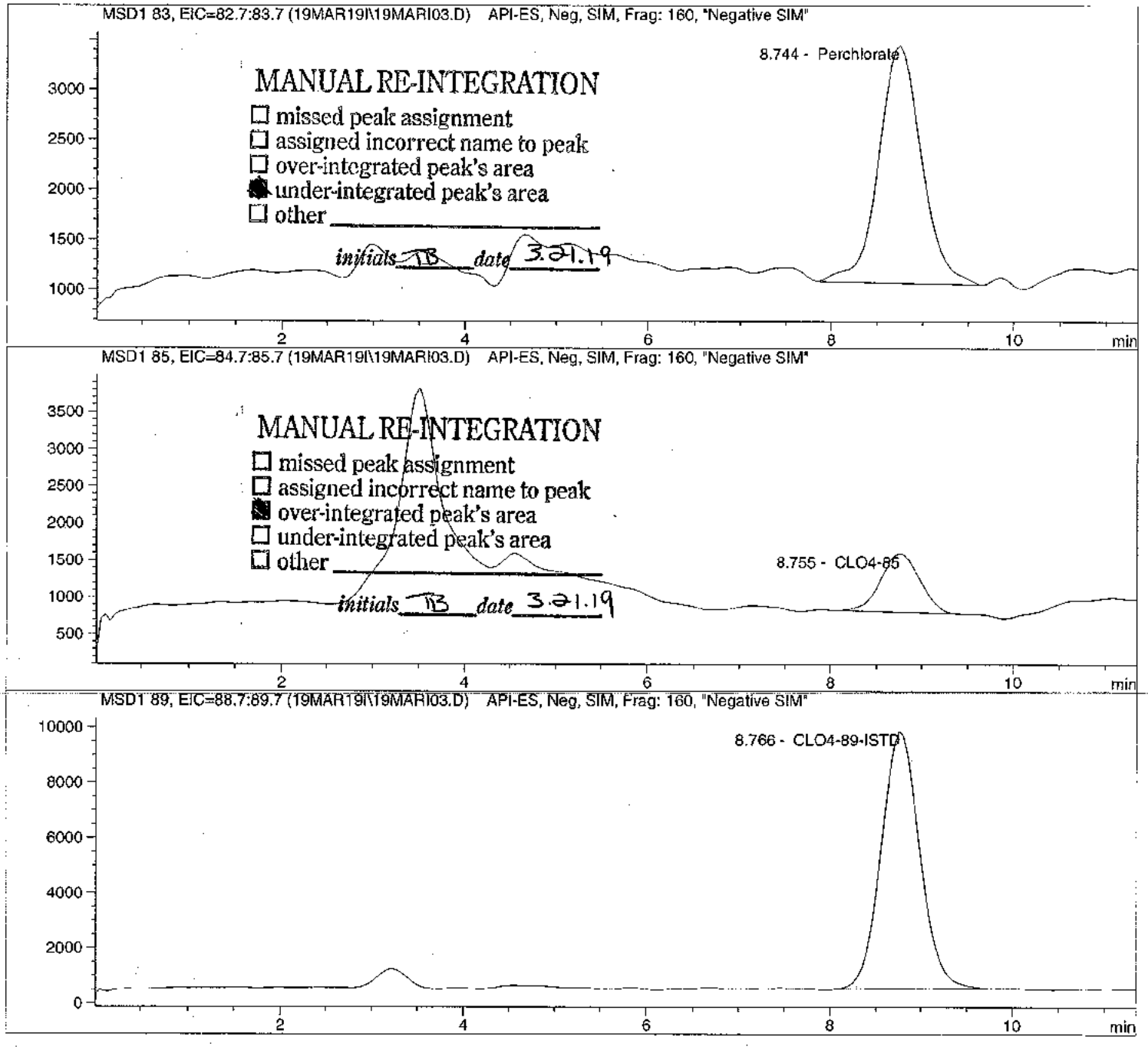
Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	CLO4@ 0.2ug/L	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	CLO4@ 0.5ug/L	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	CLO4@ 1.0ug/L	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	CLO4@ 2.0ug/L	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	CLO4@ 5.0ug/L	CLO4-AQN	1	Ctrl Samp		
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 80	ICAL Verf@10ug/L	CLO4-AQN	1	Ctrl Samp		

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 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
8.744	MM	77607.4	1.0625	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	MM	23678.0	0.9305	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

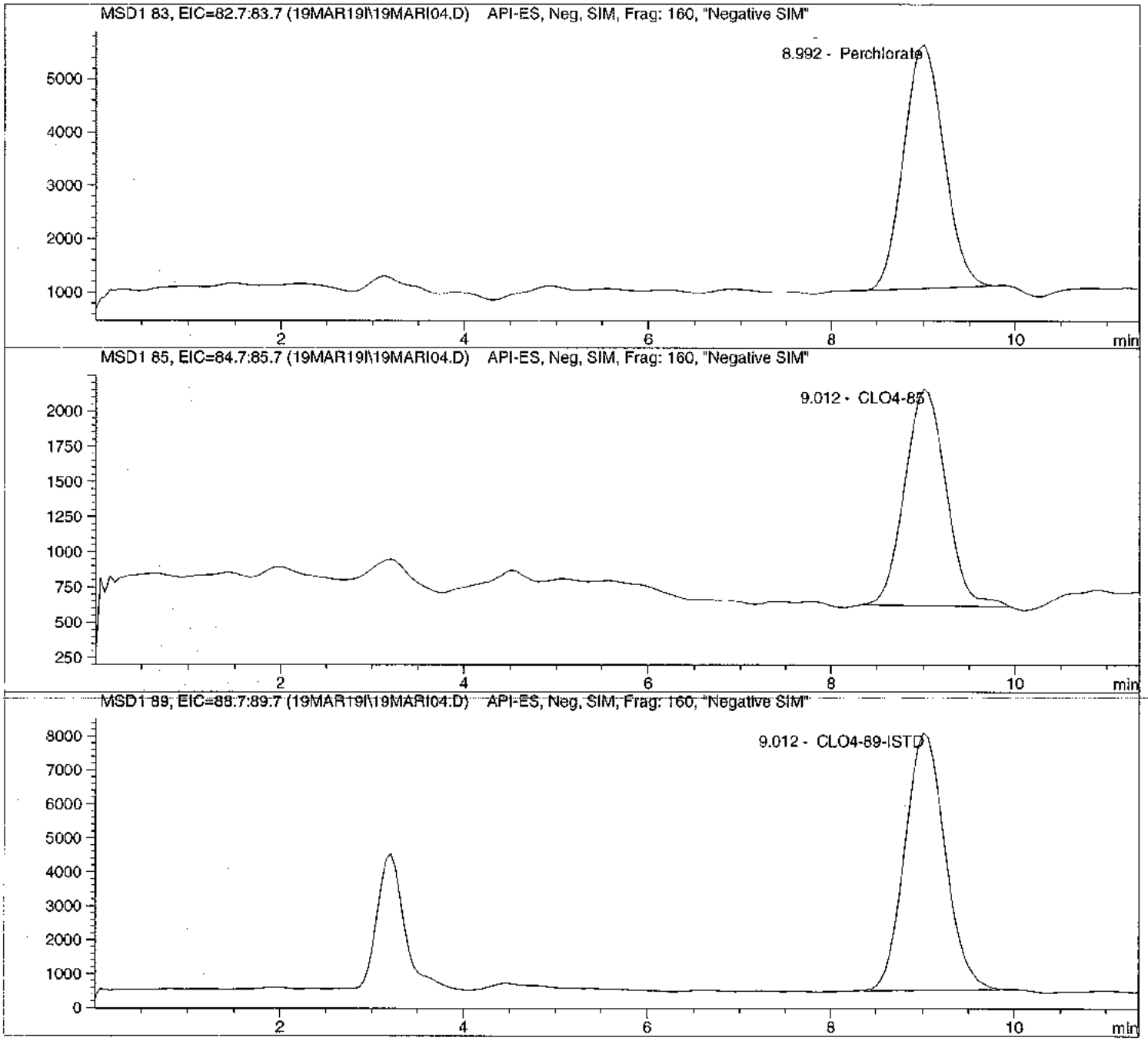
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	3/19/2019 09:53:00	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	3/19/2019 09:53:00	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 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
8.992	BBA	135272.8	2.0697	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	46948.6	2.2425	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	224885.9	5.0000	CLO4-89-ISTD

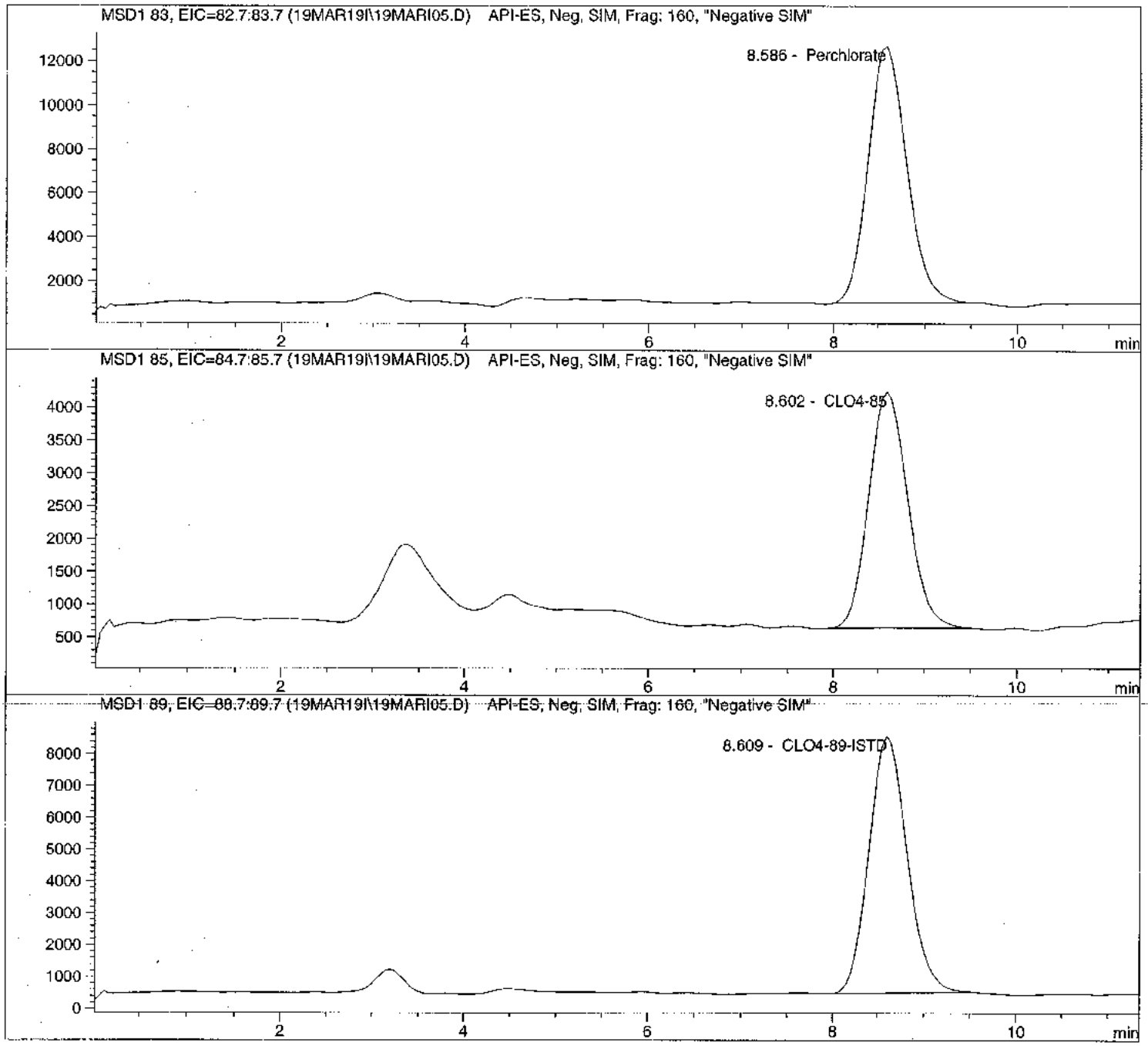
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	3/19/2019 10:06:16	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	3/19/2019 10:06:16	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 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
8.586	PBA	337763.6	4.7347	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.602	PBA	106124.0	4.8666	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.609	PBA	233196.3	5.0000	CLO4-89-ISTD

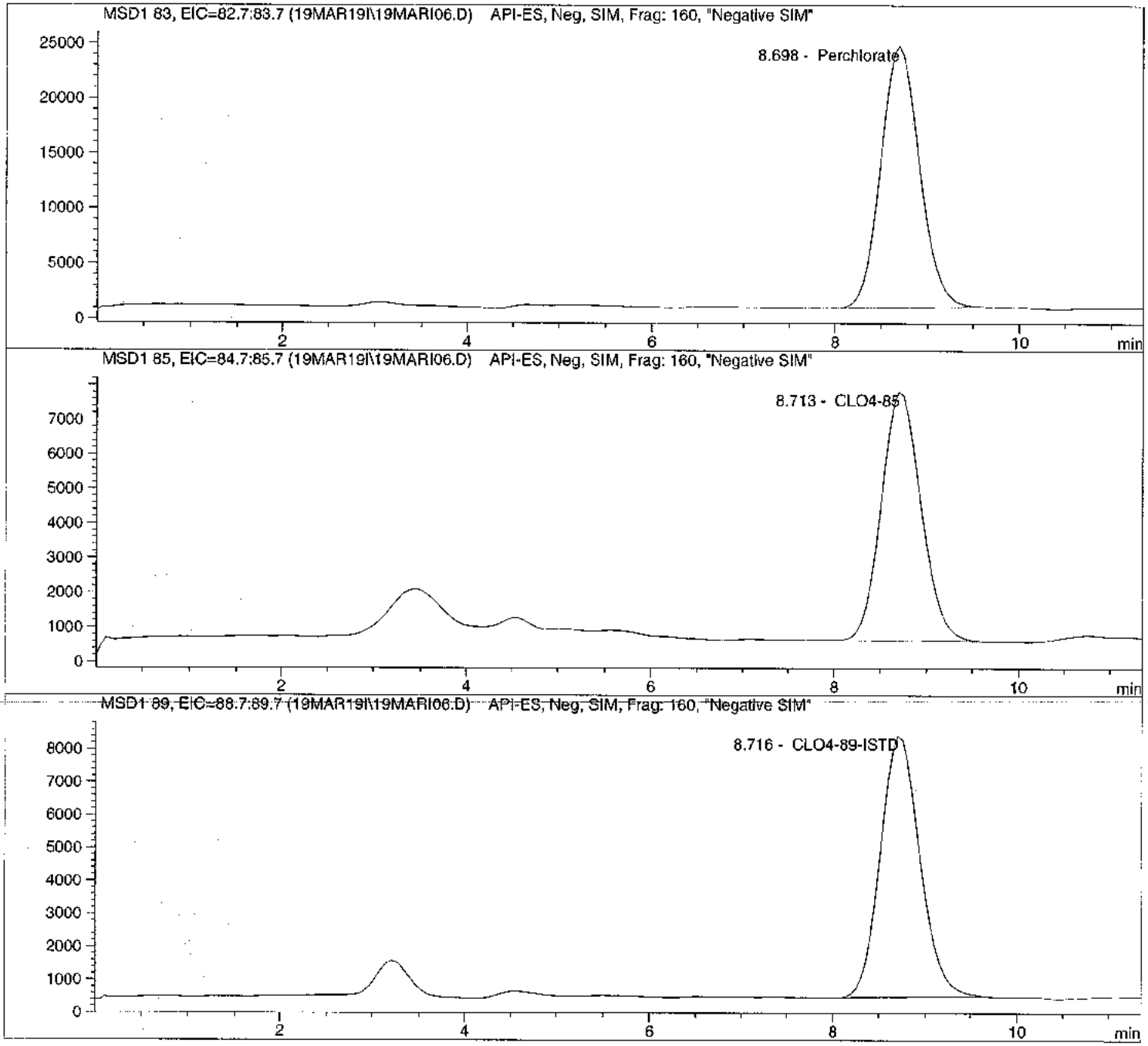
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	3/19/2019 10:19:32	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	3/19/2019 10:19:32	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 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
8.698	PBA	683454.4	9.2773	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.713	BBA	213522.6	9.6431	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.716	PBA	234453.6	5.0000	CLO4-89-ISTD

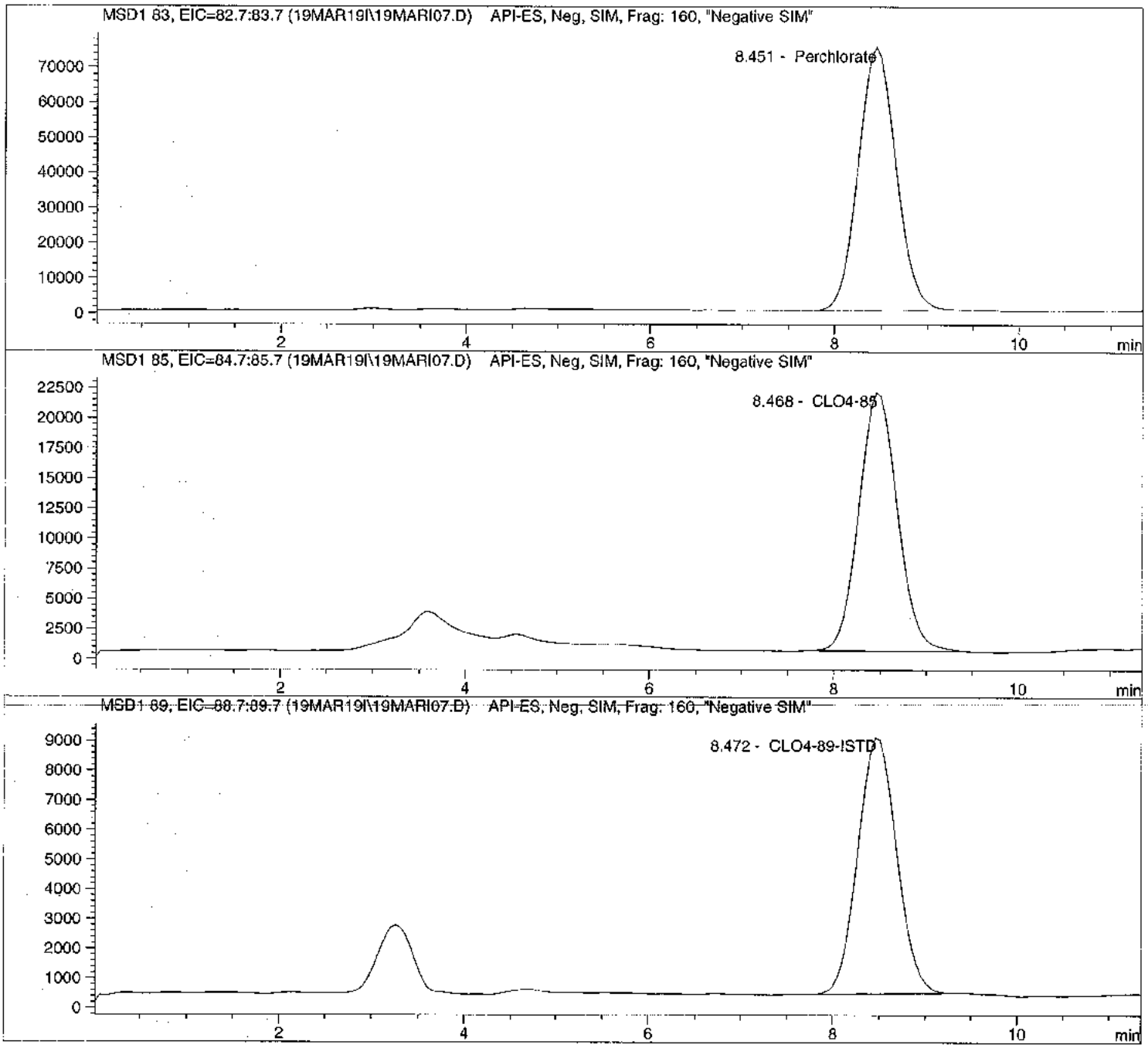
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	3/19/2019 10:32:49	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	3/19/2019 10:32:49	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 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
8.451	PBA	2084327.4	25.2904	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.468	BBA	614294.8	25.1216	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.472	BBA	250568.0	5.0000	CLO4-89-ISTD

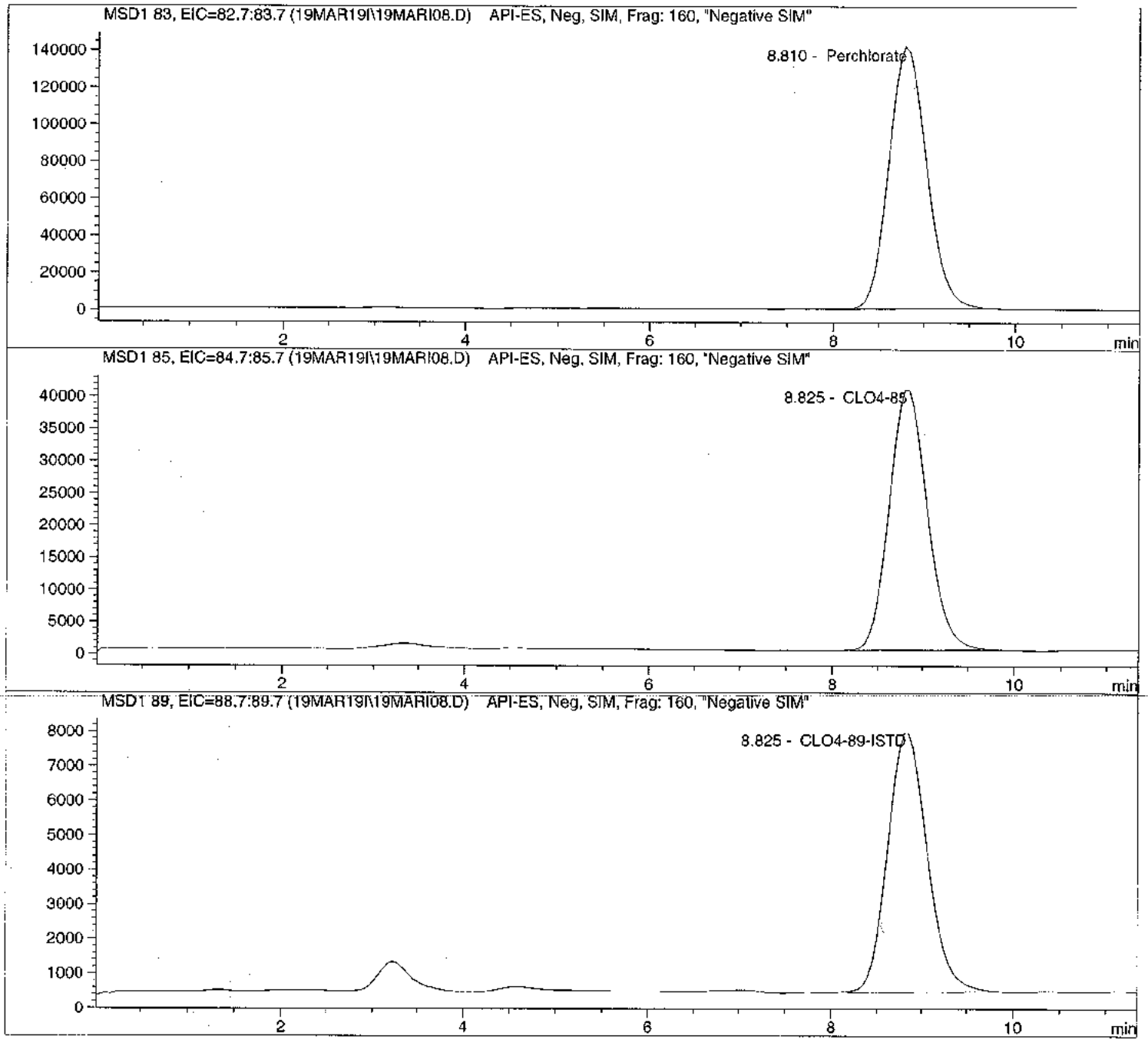
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	3/19/2019 10:46:05	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	3/19/2019 10:46:05	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 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
8.810	PBA	4133340.5	51.3684	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	1198135.6	50.4672	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	230976.7	5.0000	CLO4-89-ISTD

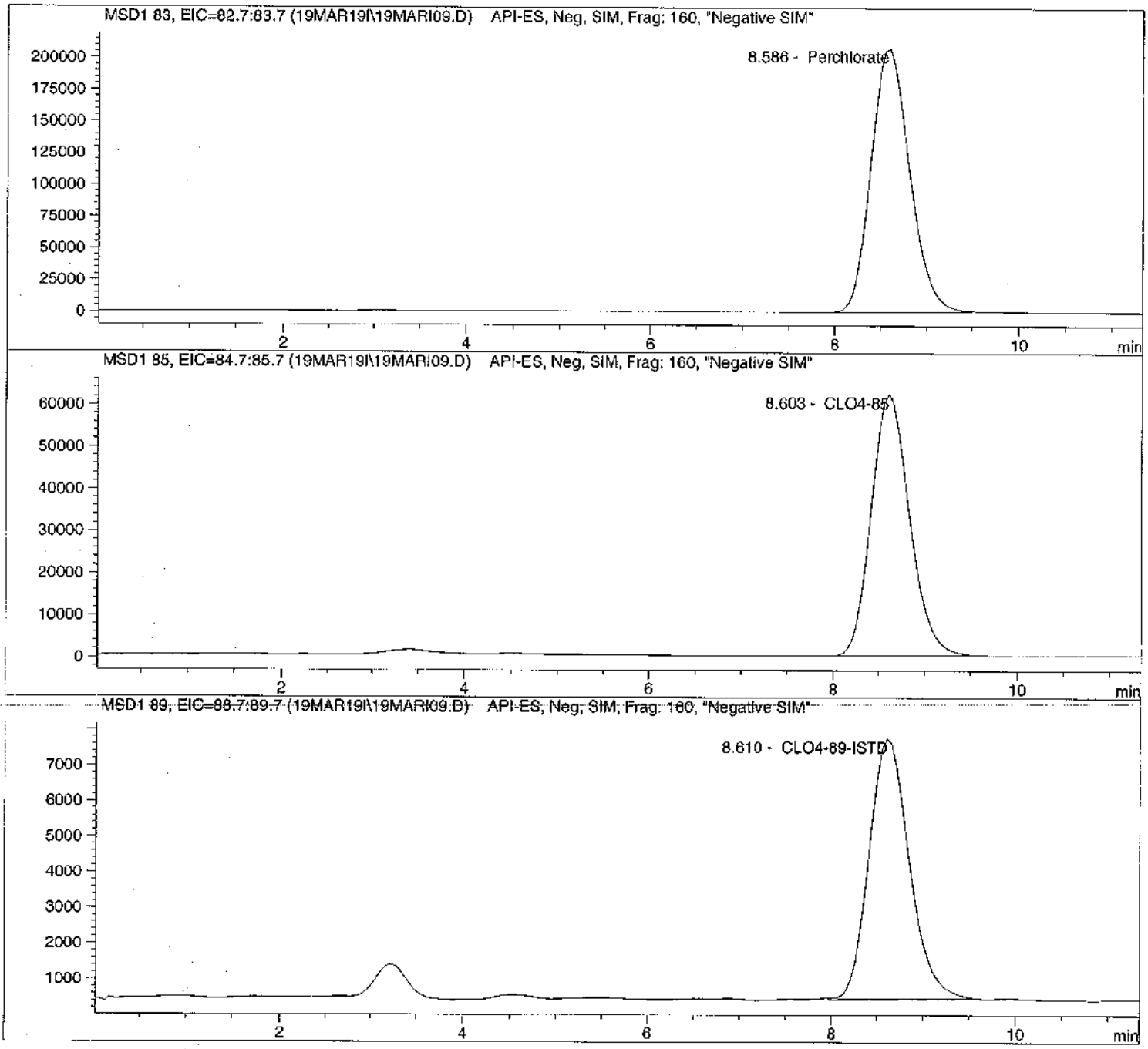
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	3/19/2019 10:59:22	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	3/19/2019 10:59:22	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 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
8.586	PBA	5993128.0	74.1675	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.603	PBA	1783554.4	74.7202	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.610	BBA	221504.5	5.0000	CLO4-89-ISTD

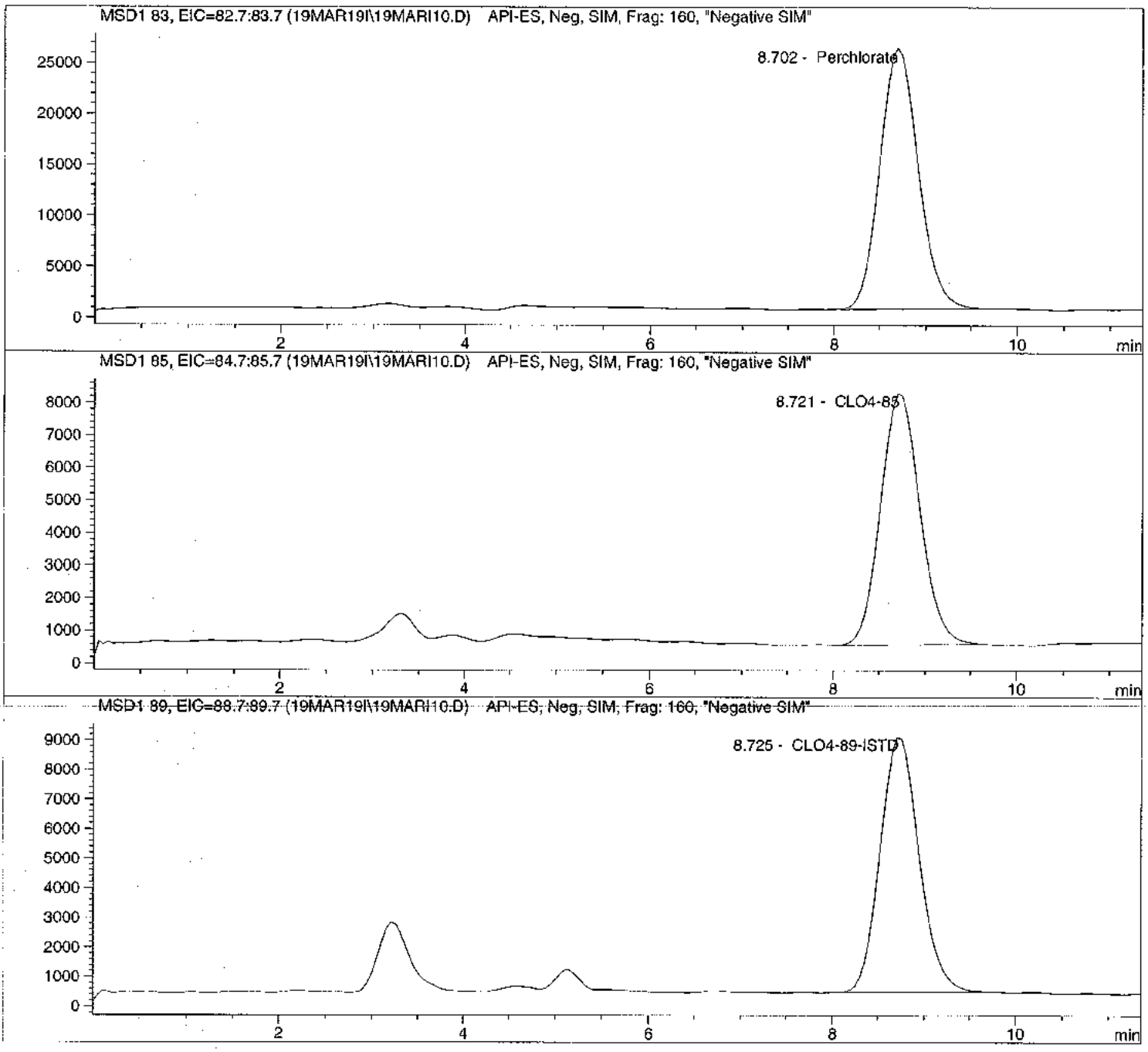
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L

Injection Date:	3/19/2019 11:12:42	Seq Line:	10
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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L

Injection Date:	3/19/2019 11:12:42	Seq Line:	10
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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 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
8.702	PBA	734718.7	9.2594	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.721	PBA	227494.7	9.5402	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.725	BBA	252544.4	5.0000	CLO4-89-ISTD

*** End of Report ***



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

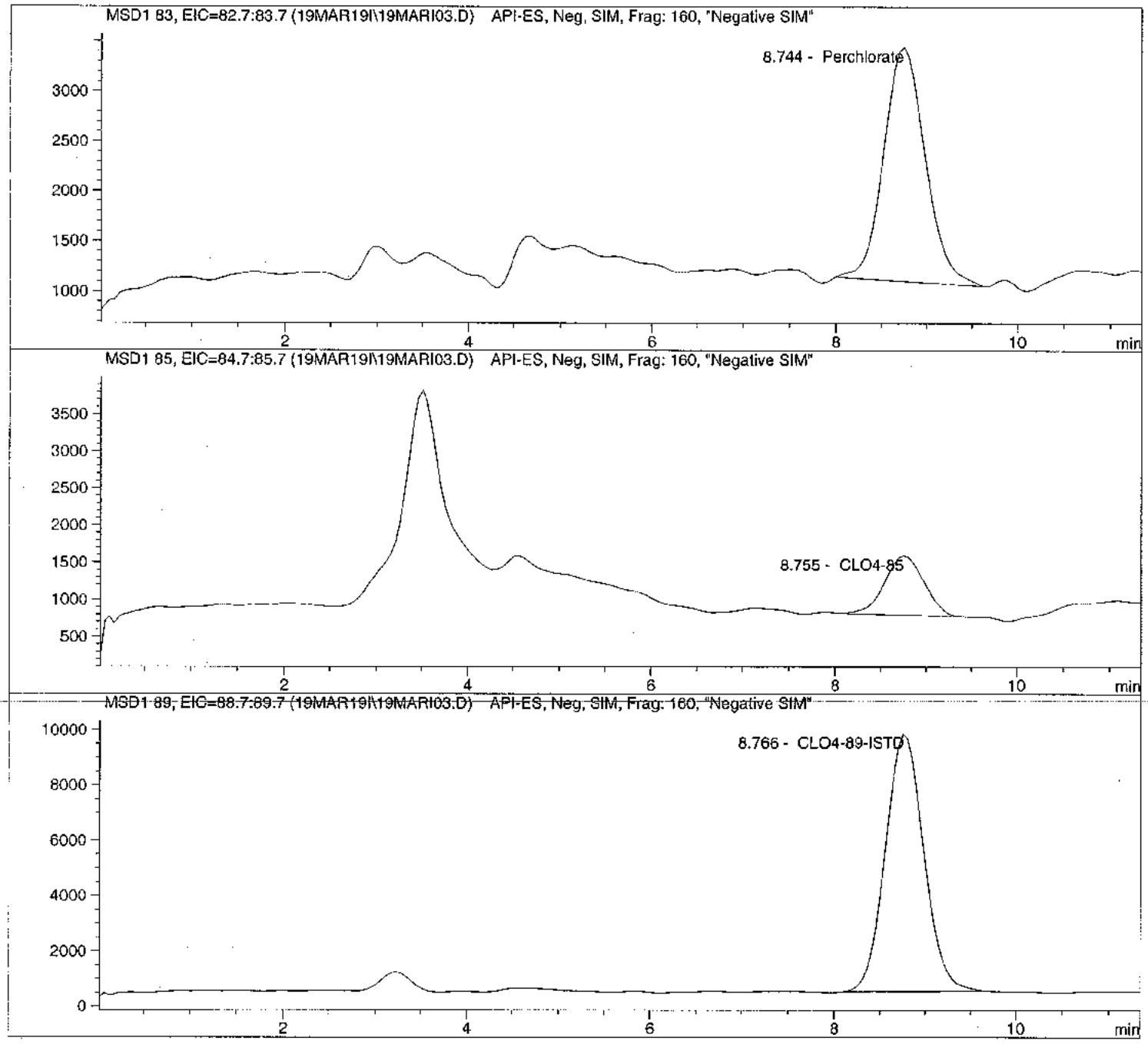
Unmodified

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	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-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	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-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 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
8.744	BBA	74166.3	1.0224	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	BBA	24138.1	0.9487	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	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

June 18, 2019

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

Work Order: **HS19060174**

Laboratory Results for: **LH18/24 GW Treatment Plant Monthly Influent Samples**

Dear Marcia,

ALS Environmental received 1 sample(s) on Jun 05, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
RJ Modashia
Project Manager

ALS Houston, US Date: 18-jun-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 GW Treatment Plant Monthly Influent Samples
Work Order: HS19060174

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19060174-01	LH18/24-SP140_060419	Water		04-Jun-2019 14:00	05-Jun-2019 09:50	☐

ALS Houston, US Date: 18-Jun-19

Client: Bhate Environmental Associates, Inc. **CASE NARRATIVE**
Project: LH18/24 GW Treatment Plant Monthly Influent Samples
Work Order:

Work Order Comments

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

Metals by Method SW6020

Batch ID: 141628

Sample ID: HS19060168-01MS

- MS and MSD are for an unrelated sample

WetChemistry by Method SW7196

Batch ID: R339970

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

ALS Houston, US Date: 18-Jun-19

Client: Bhate Environmental Associates, Inc.
ANALYTICAL REPORT
Project: LH18/24 GW Treatment Plant Monthly Influent Samples
WorkOrder:HS19060174
Sample ID: LH18/24-SP140_060419
Lab ID:HS19060174-01
Collection Date: 04-Jun-2019 14:00
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 05-Jun-2019		Analyst: JHD
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	05-Jun-2019 22:35
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	05-Jun-2019 22:35
HEXAVALENT CHROMIUM BY SW7196A		**Method:SW7196**						Analyst: MZD
Chromium, Hexavalent	0.0100	U	0.00600	0.0100	0.0100	mg/L	1	05-Jun-2019 12:00
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	17-Jun-2019 18:06

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

WEIGHT LOG

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 GW Treatment Plant Monthly Influent Samples
WorkOrder: HS19060174

Batch ID: 141628 **Method:** METALS BY ICPMS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19060174-01	1	10	10 (mL)	1

ALS Houston, US Date: 18-jun-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 GW Treatment Plant Monthly Influent Samples
WorkOrder: HS19060174

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 141628	**Test Name :** METALS BY ICPMS BY SW6020A			**Matrix:** Water		
HS19060174-01	LH18/24-SP140_060419	04 Jun 2019 14:00		05 Jun 2019 14:21	05 Jun 2019 22:35	1
Batch ID R339970	**Test Name :** HEXAVALENT CHROMIUM BY SW7196A			**Matrix:** Water		
HS19060174-01	LH18/24-SP140_060419	04 Jun 2019 14:00			05 Jun 2019 12:00	1
Batch ID R340666	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			**Matrix:** Water		
HS19060174-01	LH18/24-SP140_060419	04 Jun 2019 14:00			17 Jun 2019 18:06	1

ALS Houston, US Date: 18-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 GW Treatment Plant Monthly Influent Samples
WorkOrder: HS19060174

QC BATCH REPORT

Batch ID: 141628 (0) **Instrument: ICPMS06** **Method: ICP-MS METALS BY SW6020A**

MBLK Sample ID: **MBLK-141628** Units: **mg/L** Analysis Date: **05-Jun-2019 22:04**
Client ID: Run ID: **ICPMS06_339849** SeqNo: **5108740** PrepDate: **05-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Selenium	0.00250	0.00200								U
Silver	0.000500	0.00200								U

LCS Sample ID: **LCS-141628** Units: **mg/L** Analysis Date: **05-Jun-2019 22:05**
Client ID: Run ID: **ICPMS06_339849** SeqNo: **5108741** PrepDate: **05-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Selenium	0.05646	0.00200	0.05	0	113	80 - 120				
Silver	0.04978	0.00200	0.05	0	99.6	80 - 120				

LCSD Sample ID: **LCSD-141628** Units: **mg/L** Analysis Date: **05-Jun-2019 22:07**
Client ID: Run ID: **ICPMS06_339849** SeqNo: **5108742** PrepDate: **05-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Selenium	0.05732	0.00200	0.05	0	115	80 - 120	0.05646	1.52	20	
Silver	0.04954	0.00200	0.05	0	99.1	80 - 120	0.04978	0.491	20	

MS Sample ID: **HS19060168-01MS** Units: **mg/L** Analysis Date: **05-Jun-2019 22:13**
Client ID: Run ID: **ICPMS06_339849** SeqNo: **5108745** PrepDate: **05-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Selenium	0.02727	0.00200	0.05	0.00018	54.2	80 - 120				S
Silver	0.04571	0.00200	0.05	-0.000008	91.4	80 - 120				

MSD Sample ID: **HS19060168-01MSD** Units: **mg/L** Analysis Date: **05-Jun-2019 22:14**
Client ID: Run ID: **ICPMS06_339849** SeqNo: **5108746** PrepDate: **05-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Selenium	0.02972	0.00200	0.05	0.00018	59.1	80 - 120	0.02727	8.59	20	S
Silver	0.04632	0.00200	0.05	-0.000008	92.6	80 - 120	0.04571	1.31	20	

ALS Houston, US Date: 18-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 GW Treatment Plant Monthly Influent Samples
WorkOrder: HS19060174

QC BATCH REPORT

Batch ID: 141628 (0) **Instrument: ICPMS06** **Method: ICP-MS METALS BY SW6020A**

PDS Sample ID: **HS19060168-01PDS** Units: **mg/L** Analysis Date: **05-Jun-2019 22:16**
Client ID: Run ID: **ICPMS06_339849** SeqNo: **5108747** PrepDate: **05-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Selenium	0.1059	0.00200	0.1	0.00018	106	75 - 125				
Silver	0.08679	0.00200	0.1	-0.000008	86.8	75 - 125				

SD Sample ID: **HS19060168-01SD** Units: **mg/L** Analysis Date: **05-Jun-2019 22:11**
Client ID: Run ID: **ICPMS06_339849** SeqNo: **5108744** PrepDate: **05-Jun-2019** DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Selenium	0.0125	0.0100					0.00018	0	10	U
Silver	0.00250	0.0100					-0.000008	0	10	U

The following samples were analyzed in this batch: HS19060174-01

ALS Houston, US Date: 18-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 GW Treatment Plant Monthly Influent Samples
WorkOrder: HS19060174

QC BATCH REPORT

Batch ID: R339970 (0) **Instrument: UV-2450** **Method: HEXAVALENT CHROMIUM BY SW7196A**

MBLK Sample ID: **MBLK-339970** Units: **mg/L** Analysis Date: **05-Jun-2019 12:00**
Client ID: Run ID: **UV-2450_339970** SeqNo: **5110287** 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-339970** Units: **mg/L** Analysis Date: **05-Jun-2019 12:00**
Client ID: Run ID: **UV-2450_339970** SeqNo: **5110288** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	0.23	0.0100	0.25	0	92.0	90 - 111				

MS Sample ID: **HS19060177-01MS** Units: **mg/L** Analysis Date: **05-Jun-2019 12:00**
Client ID: Run ID: **UV-2450_339970** SeqNo: **5110290** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	0.268	0.0100	0.25	-0.004	109	90 - 111				

MSD Sample ID: **HS19060177-01MSD** Units: **mg/L** Analysis Date: **05-Jun-2019 12:00**
Client ID: Run ID: **UV-2450_339970** SeqNo: **5110291** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	0.265	0.0100	0.25	-0.004	108	90 - 111	0.268	1.13	20	

The following samples were analyzed in this batch: HS19060174-01

ALS Houston, US Date: 18-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 GW Treatment Plant Monthly Influent Samples
WorkOrder: **HS19060174**

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
Dept of Defense	ANAB L2231	20-Dec-2021
Illinois	004438	29-Jun-2019
Kansas	E-10352 2018-2019	31-Jul-2019
Louisiana	03087	30-Jun-2019
Maryland	343, 2018-2019	30-Jun-2019
North Carolina	624-2019	31-Dec-2019
Oklahoma	2018-156	31-Aug-2019
Texas	TX104704231-19-23	30-Apr-2020

ALS Houston, US Date: 18-jun-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 GW Treatment Plant Monthly Influent Samples
Work Order: HS19060174

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19060174-01	LH18/24-SP140_060419	Login	05/06/2019 11:04:34	NDR	Sub
HS19060174-01	LH18/24-SP140_060419	Login	05/06/2019 11:04:34	NDR	WET250
HS19060174-01	LH18/24-SP140_060419	Login	05/06/2019 11:04:34	NDR	MET053

ALS Houston, US Date: 18-Jun-19

Sample Receipt Checklist

Client Name: Bhate Environmental
Work Order: HS19060174
Date/Time Received: **05-Jun-2019 09:50**
Received by: **RPG**

Checklist completed by: *Nilesh D. Ranchod* eSignature — 5-Jun-2019 Date
Reviewed by: *RJ Modashia* eSignature — 5-Jun-2019 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):	4.1c uc/c	IR 25
Cooler(s)/Kit(s):	43593	
Date/Time sample(s) sent to storage:	06/04/2019 11:30	

Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

CHAIN OF CUSTODY

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

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

HS19060174

Bhate Environmental Associates, Inc.
18/24 GW Treatment Plant Monthly Influent Samples

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_060419	Water	06/04/19 / 14:00		1	X			HNO3	
LH18/24-SP140_060419	Water	06/04/19 / 14:00		2		X	X	NONE	

Analyses

Additional Remarks: **STANDARD TURN AROUND TIME**

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	06/04/19	14:30	R Ciga	6/5/19	07:30						

For Lab Use Only

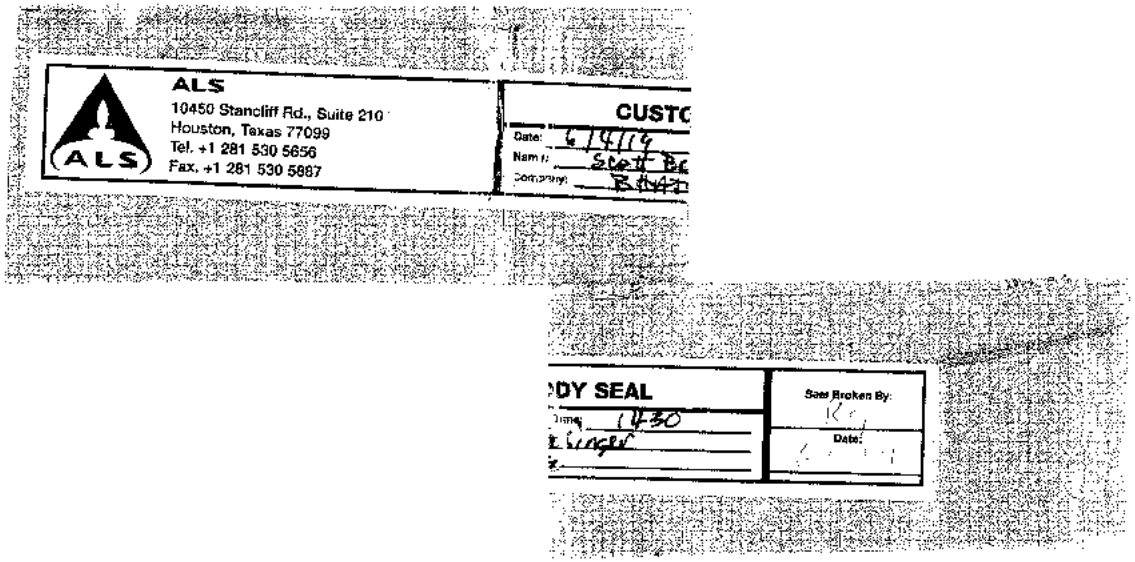
Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition
				R Ciga	6/5/19	07:30	4.1c	–	cooler # 43593 IR#25 CF0

Remarks:

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

TRK# [0221] 4380 9532 8304

RETURNS MON – SAT
PRIORITY OVERNIGHT



Case Narrative

Method: 6850
Analysis: Perchlorate
Analysis SOP: LC-MS-CLO4
ALS WO ID(s): 1915802, 1915803, 1915852, 1916229; 1916231; 1916232

Client: ALS Laboratories (Houston, TX)
Matrix: Water
ELMS Batch (HBN): 2261 (241120)

General Set Information: There were six 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 samples 1915852001 and 1916229001 were analyzed and reported from 1:1,000 dilutions. The reporting limits have been adjusted accordingly.

Method QC data: The method blank (LMB 657797) was less than 1/2 the CRDL. The recovery for the LCS (657798) was within acceptable parameters.

MS/MSD Analysis: MS/MSD was performed on sample 1915802001 (Client ID: LH18/24-SP650_052919_BIX). 4.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. The spike target was 4.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 – 657795) is reported from the analysis of the Laboratory Control Sample (LCS – 657798) at a level of 4.0µg/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: 19MARI03).

Thomas Bosch June 12, 2019
Analyst Date

ANALYTICAL REPORT

Report Date: June 13, 2019

RJ Modashia
ALS Environmental (Houston)
10450 Stancliff Road
Suite 210
Houston, TX 77099

Phone: 281 530-5656

E-mail: RJ.Modashia@ALSGlobal.com

Workorder: **34-1916229**
Project ID: HS19060174
Purchase Order: HS19060174
Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
LH18/24-SP140_060419	1916229001	06/04/19	06/06/19	

ANALYTICAL REPORT

Workorder: 34-1916229
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **LH18/24-SP140_060419**	Sampling Site: NA	Collected: 06/04/2019
Lab ID: 1916229001	Media: 125 mL Nalgene	Received: 06/06/2019
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/2261 (HBN: 241120)	**Percent Solid:** NA
	Analyzed: 06/11/2019 10:52	**Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	**6800**	1000	2000	4000	1000	

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 06/12/2019 12:46	/S/ Stephen Brose 06/13/2019 10:59

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: 34-1916229
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
	Nevada (TNI)	UT00953201-1	https://ndep.nv.gov/water/lab-certification
	Iowa (TNI)	IA# 376	http://www.shl.uiowa.edu/labcert/idnr/
	Kansas	E-10416	http://www.kdheks.gov/envlab/disclaimer.html
	Oklahoma (TNI)	IJ# 9980	http://www.deq.state.ok.us/CSDnew/labcert.htm
	Texas (TNI)	T104704456-18-9	https://www.tceq.texas.gov/assets/public/compliance/compliance_support/qa/txnelap_lab_list.pdf
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: 1916229

Limits:	Client SOW/Contract Specified	**Preparation:**	NA	**Analysis:**	EPA 6850, DoD QSM
Basis:	DoD QSM	**Batch:**	NA	**Batch:**	ELMS/2261 (HBN: 241120)
		Prepared By:	NA	**Analyzed By:**	Thomas Bosch

Blank

LMB: 657797
Analyzed: 06/11/2019 09:31
Units: ug/L

Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 657798
Analyzed: 06/11/2019 09:04
Dilution: 1
Units: ug/L

Analyte	Result	Target	% Rec	QC Limits	
Perchlorate	4.34	4.00	109	78.8	123.8

Matrix Spike - Matrix Spike Duplicate

Sample:	1915802001	**MS:**	657799
Analyzed:	06/11/2019 09:45	**Analyzed:**	06/11/2019 09:58
Dilution:	1	**Dilution:**	1
Units:	ug/L	**Units:**	ug/L

	MSD:	657800
	Analyzed:	06/11/2019 10:12
	Dilution:	1
	Units:	ug/L

Analyte	Result	Result	Target	% Rec	QC Limits		Result	% Rec	RPD	QC Limits	
Perchlorate	ND	4.57	4	114	78.8	123.8	4.78	120	4.65	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 06/12/2019 12:47	/S/ Stephen Brose 06/13/2019 10:59

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

1916229

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
19/6229

SAMPLING STATE: **Dept of Defense**

COC ID: **11521**

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:	HS19060174
TSR:	Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS19060174-01**	**LH18/24-SP140_060419**	**Water**	**04 Jun 2019 14:00**
	SUB_Perch-6850			19 Jun 2019

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

QC Level: DOD IV (DoD Data Package)

Relinquished By: _____ Date/Time: 6/5/19 1800

Received By: _____ Date/Time: 6.6.19 0955

Cooler ID(s): _____ Temperature(s): _____

ALS Environmental

CHAIN-OF-CUSTODY

Project / Job / Task: HS19060174	***Split:***	**Workorder ID:** 1916229	**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	COOL	Requested Analysis: EPA 6850, DoD QSM
1	06/04/2019 14:00	LH18/24-SP140_060419	1916229001		Water	A	1		A
2									
3									
4									
5									
6									
7									
8									
9									
10									

23 of 27

ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location
Coates, Gayleen	06/06/2019 09:55	ALS Sample Receiving	Sample Login
R.331	6.6.19 1420	3B	STORAGE
	6.11.19/08.00	T. Bush	6850

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

00939843

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: 6.6.19 0955

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	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.
1	C19 9676	1 °C	4	C19	°C	7	C19	°C
2	C19	°C	5	C19	°C	8	C19	°C
3	C19	°C	6	C19	°C	9	C19	°C

Taken By: [signature] GAYLEEN COATES 6.6.19

(Signature / Printed Name / 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: _____

CRIR.doc Revised 01/01/2018

Must Deliver Next Business Day
Time and Tempature Sensitive!

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

SHIP DATE: 05JUN19
ACTWGT: 10.85 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: HS19060168/172/174-RJ

551C1/8210/104C

FedEx Express

J181119B0505U1uv

TRK# 0201 4809 7834 7670

THU - 06 JUN 3:00P
STANDARD OVERNIGHT

AX BTFA

84123
UT-US SLC

Batch Worklist

Batch: ELMS/ 2261 **Created:** 6/11/2019 07:45 **Instrument:** **HBN:** 241120

Rule: EPA 6850, DoD QSM Water **Analyst:** T. Bosch **Status:** WP

Workorder: 1915802 [ENV_LVL4]
Workorder: 1915803 [ENV_LVL4]
Workorder: 1915852 [ENV_LVL4]
Workorder: 1916229 [ENV_LVL4]
Workorder: 1916231 [ENV_LVL4]
Workorder: 1916232 [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	657794	CCV for HBN 241120 [ELMS/2261]				CCV	3		E685041C3Q	5311		6/13/2019	
2	657795	RLVS for HBN 241120 [ELMS/2261				RLVS	3		E685041C3Q	5311		6/13/2019	
3	657796	ICS for HBN 241120 [ELMS/2261]				ICS	3		E6850..D3Q	5311		6/13/2019	
4	657797	LMB for HBN 241120 [ELMS/2261]				LMB	3		E6850Q413Q	5311		6/13/2019	
5	657798	LCS for HBN 241120 [ELMS/2261]				LCS	3		E6850Q413Q	5311		6/13/2019	
6	1915802001	LH18/24-SP650_052919_BIX				SAMPLE	3	1915802001-A	E6850Q41.3	5480	6/26/2019	6/13/2019	
7	657799	LH18/24-SP650...(1915802001MS)				MS	3		E6850Q413Q	5311		6/13/2019	
8	657800	LH18/24-SP65...(1915802001MSD)				MSD	3		E6850Q413Q	5311		6/13/2019	
9	1915803001	LH18/24-SP650_052919_BIX				SAMPLE	3	1915803001-A	E6850Q41.3	5480	6/26/2019	6/13/2019	
10	1915852001	LH18/24-SP140_052919				SAMPLE	3	1915852001-A	E6850Q41.3	5480	6/26/2019	6/13/2019	
11	1916229001	LH18/24-SP140_060419				SAMPLE	3	1916229001-A	E6850Q41.3	5480	7/2/2019	6/19/2019	
12	1916231001	LH18/24-SP650_060419_BIX				SAMPLE	3	1916231001-A	E6850Q41.3	5480	7/2/2019	6/19/2019	
13	1916232001	LH18/24-SP650_060419_BIX				SAMPLE	3	1916232001-A	E6850Q41.3	5480	7/2/2019	6/19/2019	
14	657801	CCV for HBN 241120 [ELMS/2261]				CCV	3		E685041C3Q	5311		6/13/2019	

00939846

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

ALS Work Order #'s & Sample #( )'s: 1915802 (001), 1915803 (001), 1915852 (001), 1916229 (001); 1916231 (001); 1916232 (001) ELMS Batch/HBN ID: 2261 (241120)
Prep Date: 06/11/2019 Analysis Date: 06/11/2019 Analyst: T. Bosch
Analyte: **Perchlorate** Matrix: **Water** Method: **6850**
Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2019\JUN\11JUN19D.s
Reported DL: **1.0µg/L** Reported LOD: **2.0µg/L** Reported LOQ: **4.0µg/L**

SAMPLE PREPARATION/ANALYSIS:

Water: Samples were prepared by Thomas 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 AH015-4)/0.1% glacial acetic acid (JT-Baker Lot 04802).
Eluent B1: 95% ACN (B&J Lot AH015-4)/ 5% ASTM Type II water (ALS)/0.1% glacial acetic acid (JT-Baker Lot 04802).

STANDARDS: Internal Standard Spiking Solution Horizon# 43730. Dilutions of Working Standard Solution ID 43702 used for CCV's, LODV's, RLVS and IPC.

CALIBRATION CURVE: Used curve from 03/19/2019, sequence 19MAR19D.s Offline Quantitation Method: CLO4-DP2.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: 7 Injection Volume: 35µL
Column: KP-RPPX C8 separator, 250mm Mobile Phase: 70% Eluent A1; 30% Eluent B1

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: 4.0µL of QC Solution Horizon ID 47516 was used for LCS 657798; Target = 4.0µg/L. ASTM type II water was used for LMB 657797.

MS/MSD: The Matrix Spike and duplicate (MS/MSD) were performed on sample 1915802001 (Client ID: LH18/24-SP650_052919_BIX). 4.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. Spike target = 4.0µg/L.

COMMENTS:

1) Results reported in µg/L. Field samples 1915852001 and 1916229001 were analyzed and reported from 1:1,000 dilutions. The reporting limits have been adjusted accordingly.
2) All QC, Blank, CCV, and MS/MSD results were within method parameters.
3) Sample data can be viewed at two directories within the ALS system: \\ALSLTWS013\LCMS\LCMS04\2019\JUN\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
4) Notebook: \\alsltws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2019\241120-DoD-ALS-Hstn LCMS4 or through \\ALSLTWS013\DATAREVIEW\HBN#
5) The Reporting Limit Verification Standard (RLVS – 657795) is reported from the analysis of the Laboratory Control Sample (LCS – 657798) at a level of 4.0µg/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: 19MARI03).

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: 2261 HBN: 241120 1915802/1915803/1915852 Sample Set IDs if Applicable: 1916229/1916231/1916232	Analyst Initials	Reviewer Initials
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
Method Blanks 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 flags applied on QC reports; LCSs analyzed and meet acceptance criteria when performed	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 checked	TB	SB
Preparation and analysis calculations checked	TB	SB
NCRs are completed as necessary NC/CAR#		
Report forms are complete and accurate	TB	SB
Manual integrations checked	TB	SB

STANDARD REPORT

Working Standard - CLO4 WRK

CLO4 WRK — Description - 6850 WKG Std 100.ug/L

Standard: 43702
MFG: ALS/SLC
MFG Lot: TNB: 09/18/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/18/2018 02:09PM

Amount: 10 mL
Expires: 09/18/2019
Usable: Yes
Lab Lot: CLO4 WRK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	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
43701	CLO4 INT	6850 Intermdt AccStd 10.ug/mL	CLO4 INT	0.1 mL	09/18/2019

STANDARD REPORT

Constituent

Stock Standard - CLO4 STOCK

CLO4 STOCK	Description - 6850 Stock AccStd 1,000ug/mL
Standard: 43659	Created By: Thomas Bosch
MFG: AccuStandard	Create Date: 09/17/2018 09:09AM
MFG Lot: 218065075	Amount: 100 mL
Part ID: IC-PER-10X-1	Expires: 07/25/2020
	Usable: No
	Lab Lot: CLO4 STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	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: 43701
MFG: ALS/SLC
MFG Lot: TNB: 09/18/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/18/2018 02:09PM

Amount: 10 mL
Expires: 09/18/2019
Usable: Yes
Lab Lot: CLO4 INT

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
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
MFG: Ultra Scientific
MFG Lot: CP-0860
Part ID: ICC-013

Created By: Thomas Bosch
Create Date: 05/11/2017 01:05PM

Amount: 100 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL

STANDARD REPORT

Constituent

Working Standard - CLO4 QC INT

CLO4 QC INT — Description - 6850 QC Intrmdt Std-QC 10ug/mL

Standard: 47515
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

STANDARD REPORT

Working Standard - CLO4ISTDWRK

CLO4ISTDWRK — Description - Perchlorate ISTD Wrk 1,000ug/L

Standard: 43730	**Created By:** Thomas Bosch	**Amount:** 25 mL
MFG: ALS/SLC	**Create Date:** 09/20/2018 09:09AM	**Expires:** 09/20/2019
MFG Lot: TNB: 05/09/2018	**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
43729	CLO4ISTDSTK	Perchlorate ISTD Stock	CLO4ISTDSTK	0.25 mL	04/28/2026

STANDARD REPORT

Constituent

Stock Standard - CLO4ISTDSTK

CLO4ISTDSTK		Description - Perchlorate ISTD Stock
Standard: 43729	Created By: Thomas Bosch	Amount: 1 mL
MFG: Cambridge Isotope	Create Date: 09/20/2018 09:09AM	Expires: 04/28/2026
MFG Lot: SOFF-012A	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

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

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 REFERENCE MATERIAL PRODUCER
ANAB ACCREDITED TESTING LABORATORY

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

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*

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

GHS

Signal Word: None

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.

Cambridge Isotope Laboratories, Inc.

Certificate of Analysis

Quality Standards:
ISO Guide 34 • ISO/IEC 17025 • ISO 13485 • cGMP

23118

Product Name: (Isotopic Label & Enrichment Specification)	PERCHLORIC ACID, SODIUM SALT (18O4, 90%+) 100 UG/ML IN WATER
Lot Number:	SDDG-013
Catalog Number:	OLM-7310-S

Product Information

Chemical Purity Specification:	≥98%
Labeled CAS Number:	NA
Unlabeled CAS Number:	7601-89-0
MW*:	130.4
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.

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/NCSL 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.

* *For isotopically labeled compounds, MW listed is for the fully enriched product.*

Approved by: T. J. Eckersley

Timothy J. Eckersley, Ph.D., Quality Assurance

Quality Control Tests and Results

QC Release Date	2/27/2014
Expiration Date	2/27/2024
Concentration Based on Gravimetry	102 µg/mL
Chemical Purity of Neat Material(s)	98%
LC/MS for Concentration	109.4 ± 2.8 µg/mL (k=2)



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP2.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
*	657794 CCV@25	Vial 71	1	Control	1	1.90258e6	8.986	26.94929
*	657798 QC@4.0	Vial 72	1	Control	2	3.85542e5	8.884	4.34115
*	657796 ICS@4.0	Vial 73	1	Control	3	2.32261e5	8.623	3.98229
*	657797 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	1915802001	Vial 75	1	Sample	5	0.00000	0.000	0.00000
*	657799 158021S	Vial 76	1	Sample	6	1.46622e5	8.522	4.56740
*	657800 158021D	Vial 77	1	Sample	7	1.54646e5	8.528	4.78474
*	1915803001	Vial 78	1	Sample	8	0.00000	0.000	0.00000
*	1915852001 1K	Vial 79	1	Sample	9	3.32187e5	9.077	4885.02369
*	1916229001 1K	Vial 80	1	Sample	10	4.13979e5	9.091	6820.05588
*	1916231001	Vial 81	1	Sample	11	0.00000	0.000	0.00000
*	1916232001	Vial 82	1	Sample	12	0.00000	0.000	0.00000
*	657801 CCV@25	Vial 71	1	Control	13	1.42334e6	9.028	25.98075

#	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
*	657794 CCV@25	Vial 71	1	Control	1	5.56917e5	9.003	26.60911
*	657798 QC@4.0	Vial 72	1	Control	2	1.22598e5	8.893	4.50107
*	657796 ICS@4.0	Vial 73	1	Control	3	7.62920e4	8.637	4.24932
*	657797 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	1915802001	Vial 75	1	Sample	5	0.00000	0.000	0.00000
*	657799 158021S	Vial 76	1	Sample	6	5.01097e4	8.545	5.09575
*	657800 158021D	Vial 77	1	Sample	7	5.24358e4	8.548	5.30516
*	1915803001	Vial 78	1	Sample	8	0.00000	0.000	0.00000
*	1915852001 1K	Vial 79	1	Sample	9	1.07205e5	9.093	5161.49233
*	1916229001 1K	Vial 80	1	Sample	10	1.30297e5	9.110	7096.69575
*	1916231001	Vial 81	1	Sample	11	0.00000	0.000	0.00000
*	1916232001	Vial 82	1	Sample	12	0.00000	0.000	0.00000
*	657801 CCV@25	Vial 71	1	Control	13	4.26237e5	9.042	26.20612

#	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
*	657794 CCV@25	Vial 71	1	Control	1	2.13798e5	9.004	5.00000
*	657798 QC@4.0	Vial 72	1	Control	2	2.91481e5	8.904	5.00000
*	657796 ICS@4.0	Vial 73	1	Control	3	1.92225e5	8.645	5.00000
*	657797 LMB	Vial 74	1	Control	4	3.01884e5	9.082	5.00000
*	1915802001	Vial 75	1	Sample	5	1.12941e5	8.589	5.00000
*	657799 158021S	Vial 76	1	Sample	6	1.05110e5	8.545	5.00000
*	657800 158021D	Vial 77	1	Sample	7	1.05604e5	8.552	5.00000
*	1915803001	Vial 78	1	Sample	8	1.14182e5	8.546	5.00000
*	1915852001 1K	Vial 79	1	Sample	9	2.21981e5	9.097	5000.00000
*	1916229001 1K	Vial 80	1	Sample	10	1.95450e5	9.116	5000.00000
*	1916231001	Vial 81	1	Sample	11	1.33828e5	8.518	5.00000
*	1916232001	Vial 82	1	Sample	12	1.27034e5	8.502	5.00000
*	657801 CCV@25	Vial 71	1	Control	13	1.66287e5	9.054	5.00000

*** End of Report ***

Sequence Table:

Method and Injection Info Part:

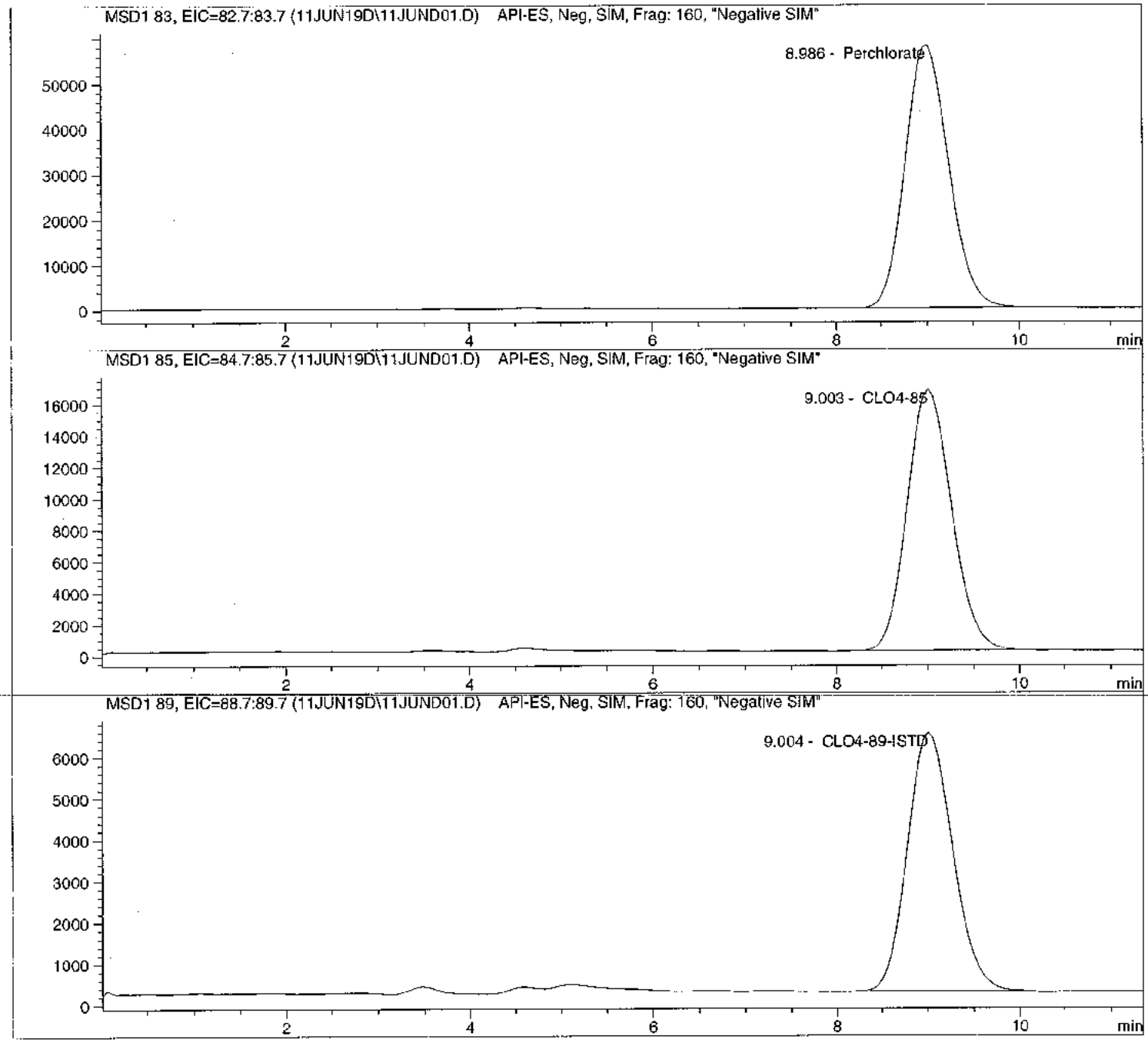
Line	Location	SampleName		Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	657794	CCV@25	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	657798	QC@4.0	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	657796	ICS@4.0	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	657797	LMB	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	1915802001		CLO4-AQN	1	Sample		
6	Vial 76	657799	158021S	CLO4-AQN	1	Sample		
7	Vial 77	657800	158021D	CLO4-AQN	1	Sample		
8	Vial 78	1915803001		CLO4-AQN	1	Sample		
9	Vial 79	1915852001	1K	CLO4-AQN	1	Sample		
10	Vial 80	1916229001	1K	CLO4-AQN	1	Sample		
11	Vial 81	1916231001		CLO4-AQN	1	Sample		
12	Vial 82	1916232001		CLO4-AQN	1	Sample		
13	Vial 71	657801	CCV@25	CLO4-AQN	1	Ctrl Samp		

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND01.D Sample Name: 657794 CCV@25

Injection Date:	6/11/2019 08:44:35	Seq Line:	1
Sample Name:	657794 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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND01.D Sample Name: 657794 CCV@25

Injection Date:	6/11/2019 08:44:35	Seq Line:	1
Sample Name:	657794 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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.986	PBA	1902575.4	26.9493	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.003	PBA	556916.8	26.6091	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.004	PBA	213798.0	5.0000	CLO4-89-ISTD

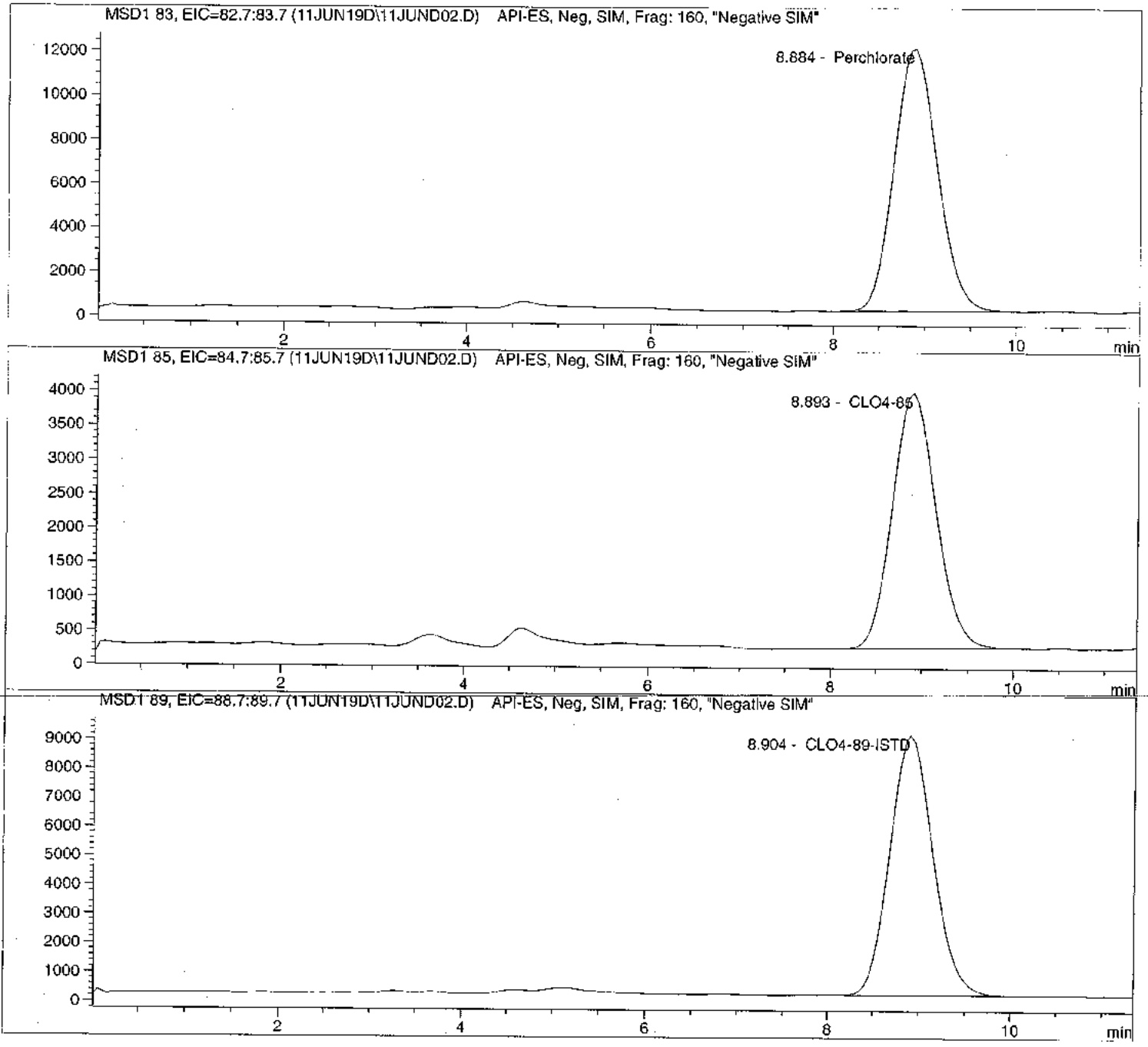
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND02.D Sample Name: 657798 QC@4.0

Injection Date:	6/11/2019 09:04:55	Seq Line:	2
Sample Name:	657798 QC@4.0	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND02.D Sample Name: 657798 QC@4.0

Injection Date:	6/11/2019 09:04:55	Seq Line:	2
Sample Name:	657798 QC@4.0	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.884	PBA	385541.7	4.3412	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.893	BBA	122598.4	4.5011	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.904	BBA	291480.6	5.0000	CLO4-89-ISTD

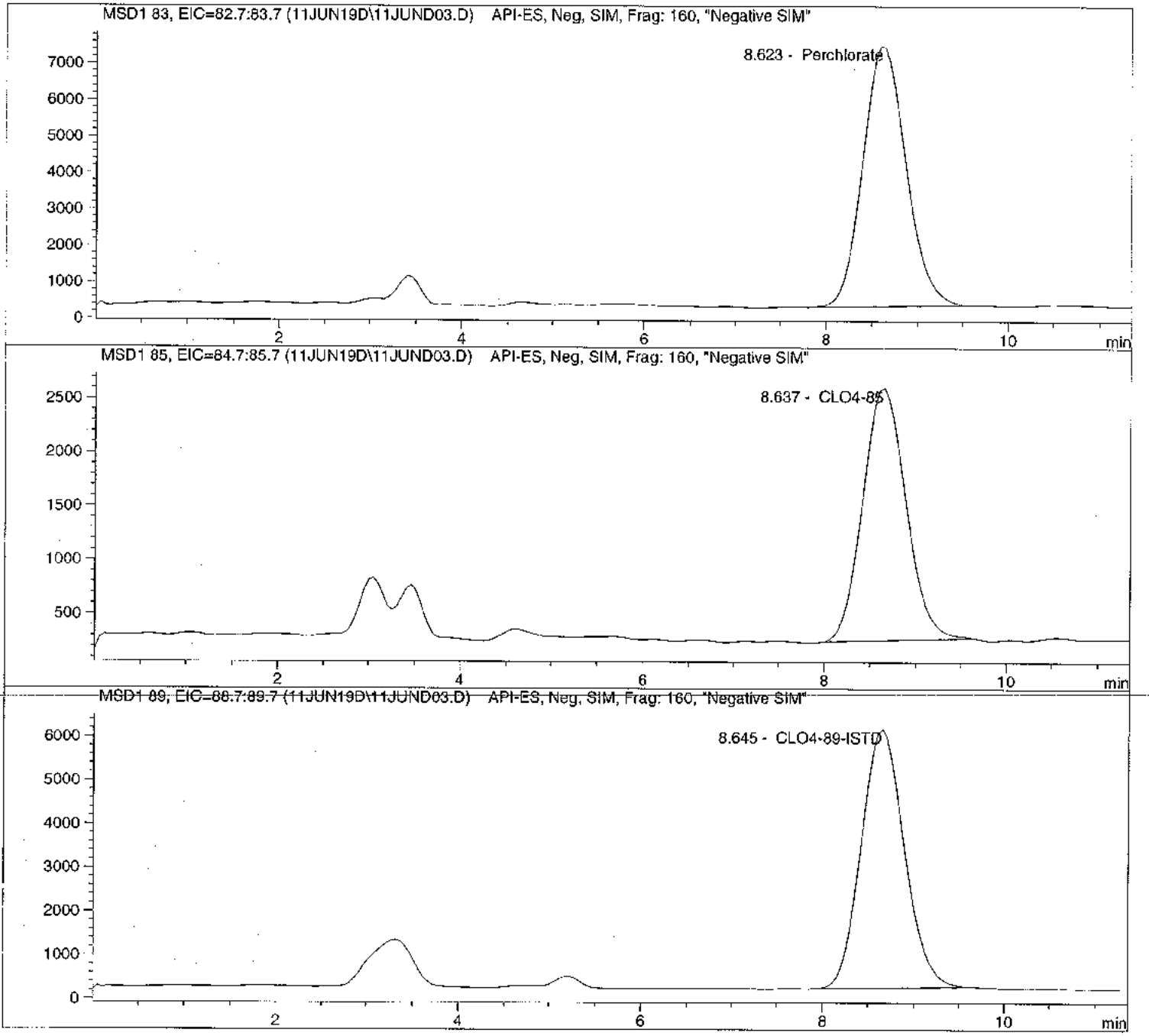
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND03.D Sample Name: 657796 ICS@4.0

Injection Date:	6/11/2019 09:18:21	Seq Line:	3
Sample Name:	657796 ICS@4.0	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND03.D Sample Name: 657796 ICS@4.0

Injection Date:	6/11/2019 09:18:21	Seq Line:	3
Sample Name:	657796 ICS@4.0	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.623	PBA	232261.2	3.9823	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.637	PBA	76292.0	4.2493	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.645	PBA	192224.9	5.0000	CLO4-89-ISTD

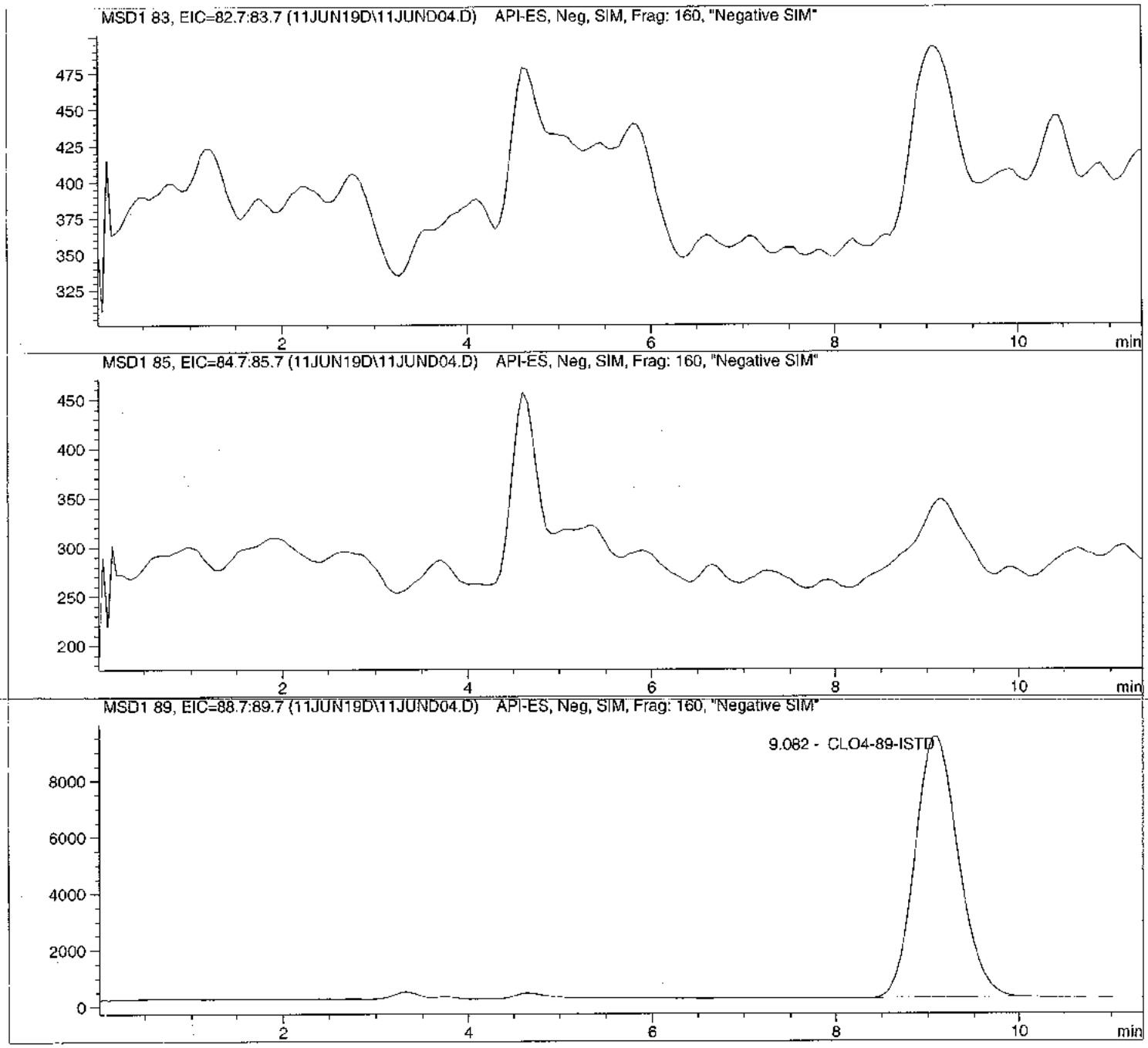
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND04.D Sample Name: 657797 LMB

Injection Date:	6/11/2019 09:31:47	Seq Line:	4
Sample Name:	657797 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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND04.D Sample Name: 657797 LMB

Injection Date:	6/11/2019 09:31:47	Seq Line:	4
Sample Name:	657797 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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
9.082	PBA	301883.5	5.0000	CLO4-89-ISTD

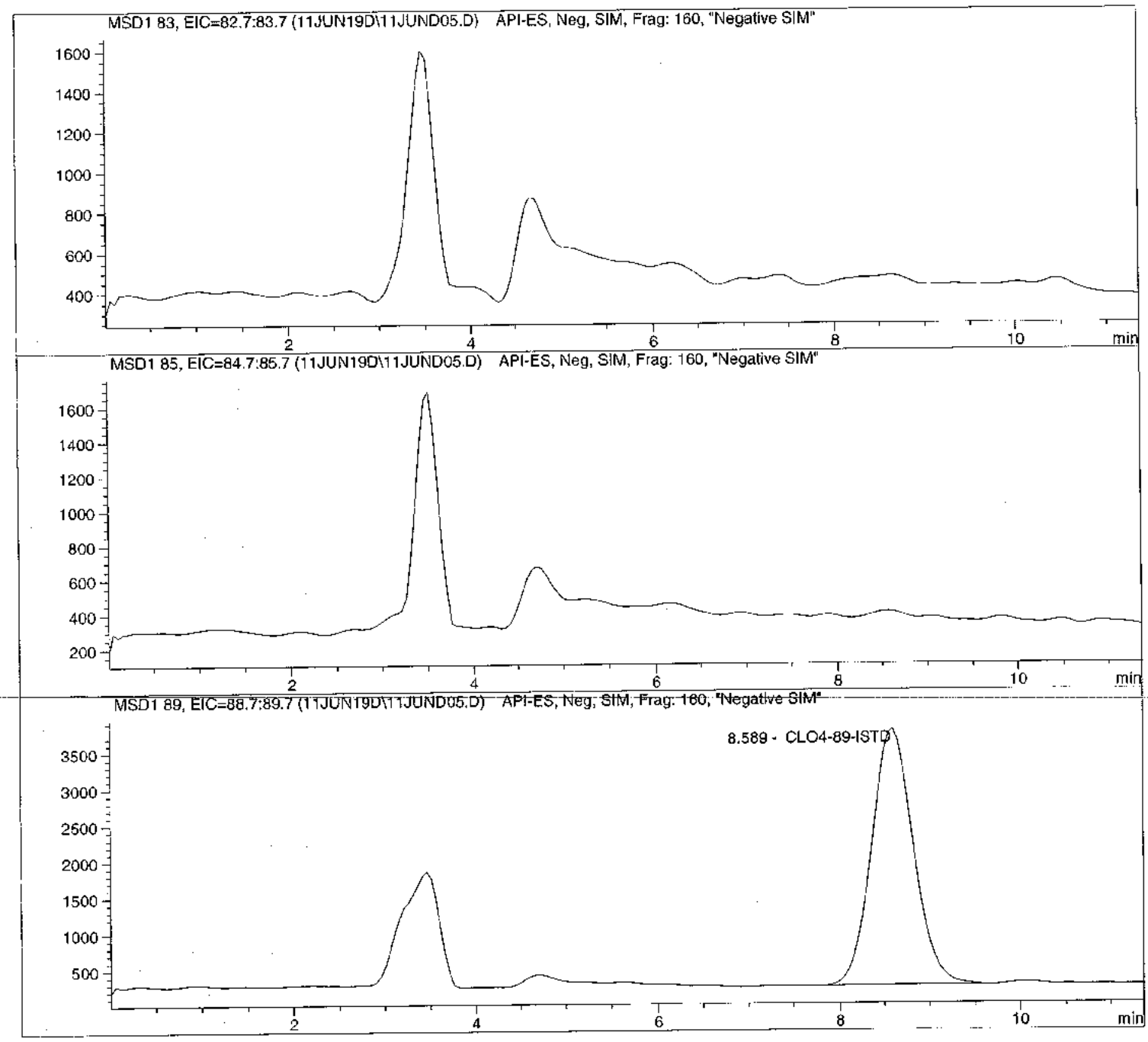
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND05.D Sample Name: 1915802001

Injection Date:	6/11/2019 09:45:13	Seq Line:	5
Sample Name:	1915802001	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND05.D Sample Name: 1915802001

Injection Date:	6/11/2019 09:45:13	Seq Line:	5
Sample Name:	1915802001	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.589	PBA	112941.5	5.0000	CLO4-89-ISTD

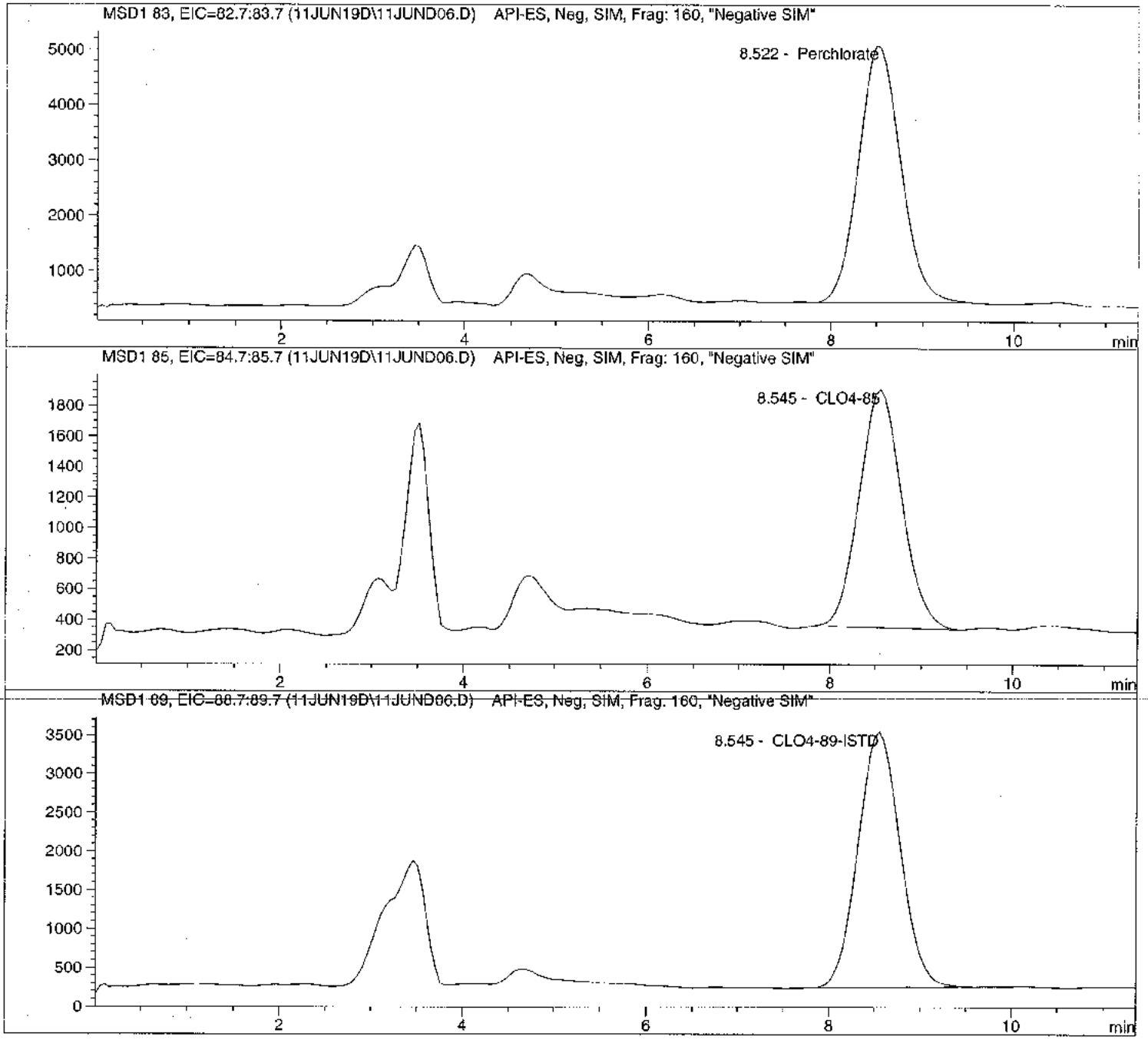
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND06.D Sample Name: 657799 158021S

Injection Date:	6/11/2019 09:58:38	Seq Line:	6
Sample Name:	657799 158021S	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND06.D Sample Name: 657799 158021S

Injection Date:	6/11/2019 09:58:38	Seq Line:	6
Sample Name:	657799 158021S	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Fri, 12. Apr. 2019,07:52:58 am
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
8.522	BBA	146622.1	4.5674	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.545	PBA	50109.7	5.0958	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.545	PBA	105110.4	5.0000	CLO4-89-ISTD

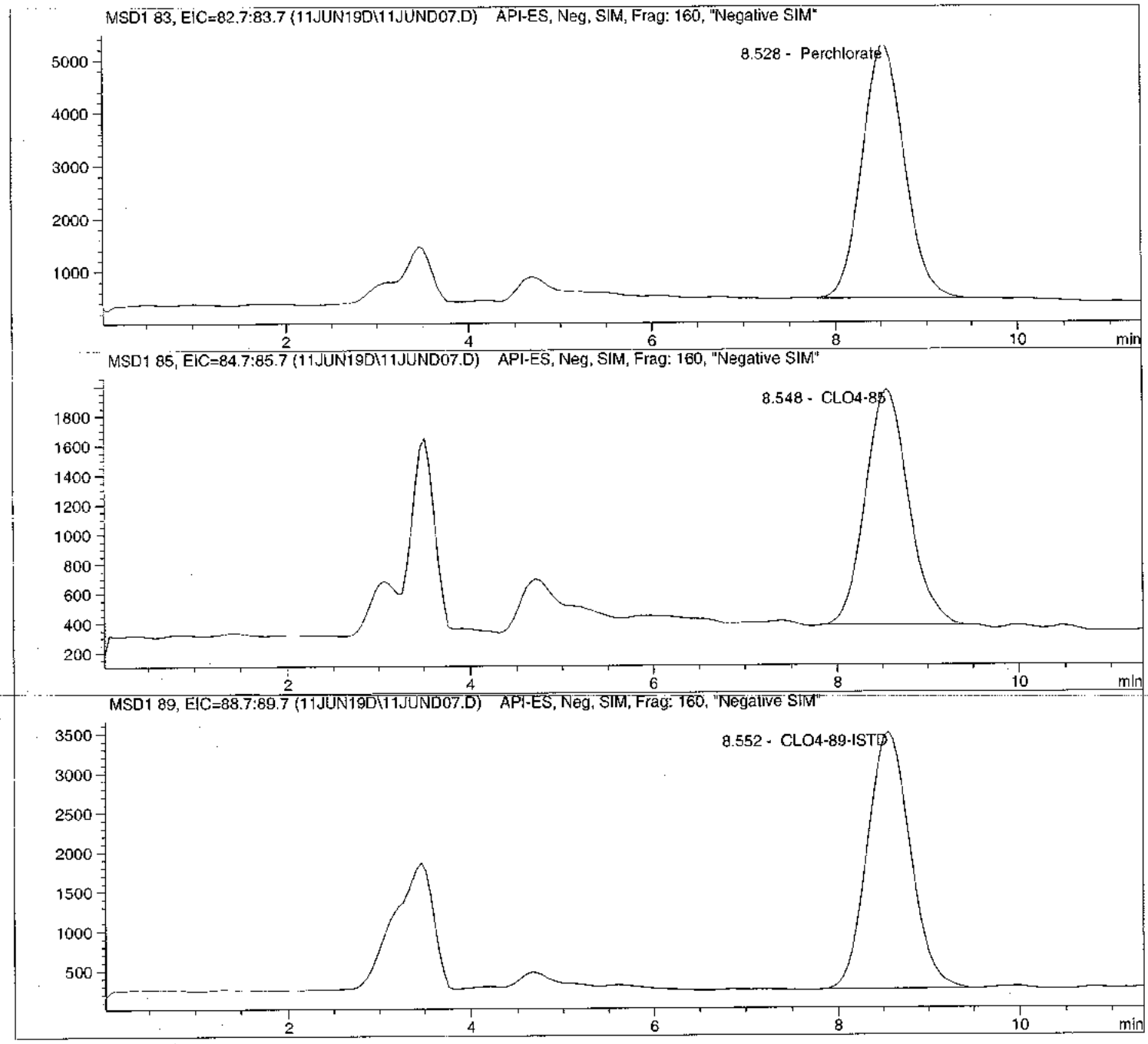
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND07.D Sample Name: 657800 158021D

Injection Date:	6/11/2019 10:12:09	Seq Line:	7
Sample Name:	657800 158021D	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Injection Date:	6/11/2019 10:12:09	Seq Line:	7
Sample Name:	657800 158021D	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-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.528	BBA	154645.8	4.7847	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.548	PBA	52435.8	5.3052	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.552	PBA	105604.1	5.0000	CLO4-89-ISTD

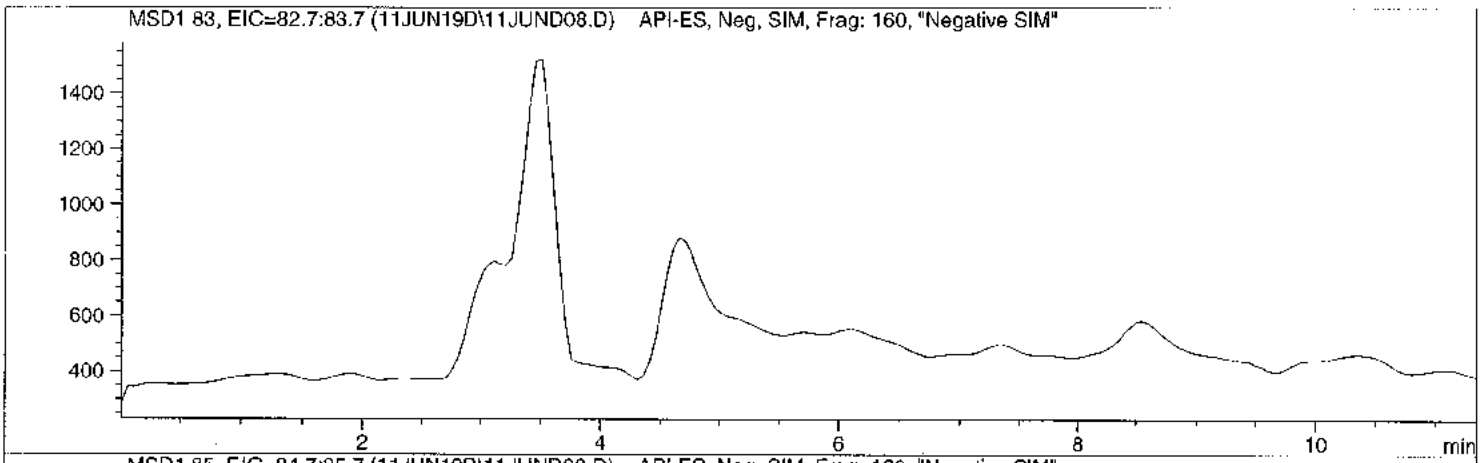
*** End of Report ***

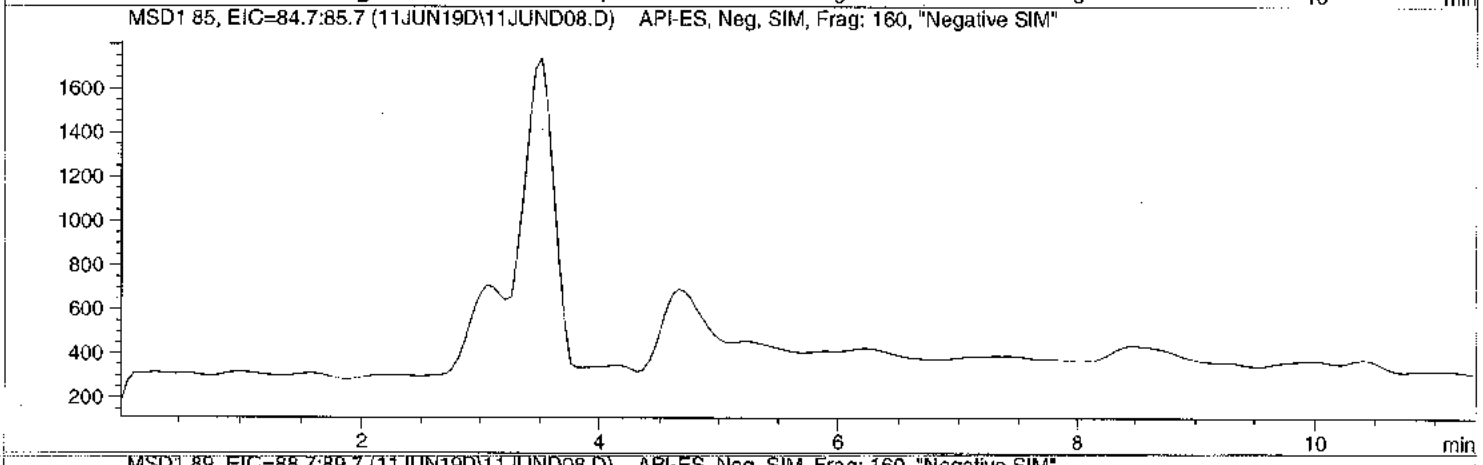
Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND08.D Sample Name: 1915803001

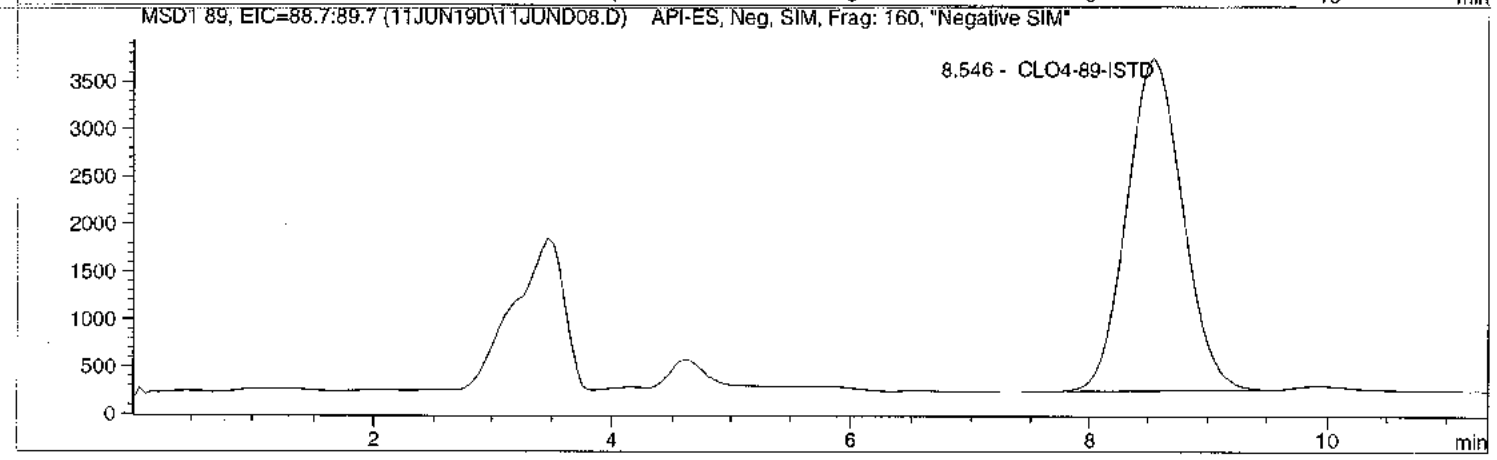
Injection Date:	6/11/2019 10:25:32	Seq Line:	8
Sample Name:	1915803001	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND08.D Sample Name: 1915803001

Injection Date:	6/11/2019 10:25:32	Seq Line:	8
Sample Name:	1915803001	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.546	BBA	114182.4	5.0000	CLO4-89-ISTD

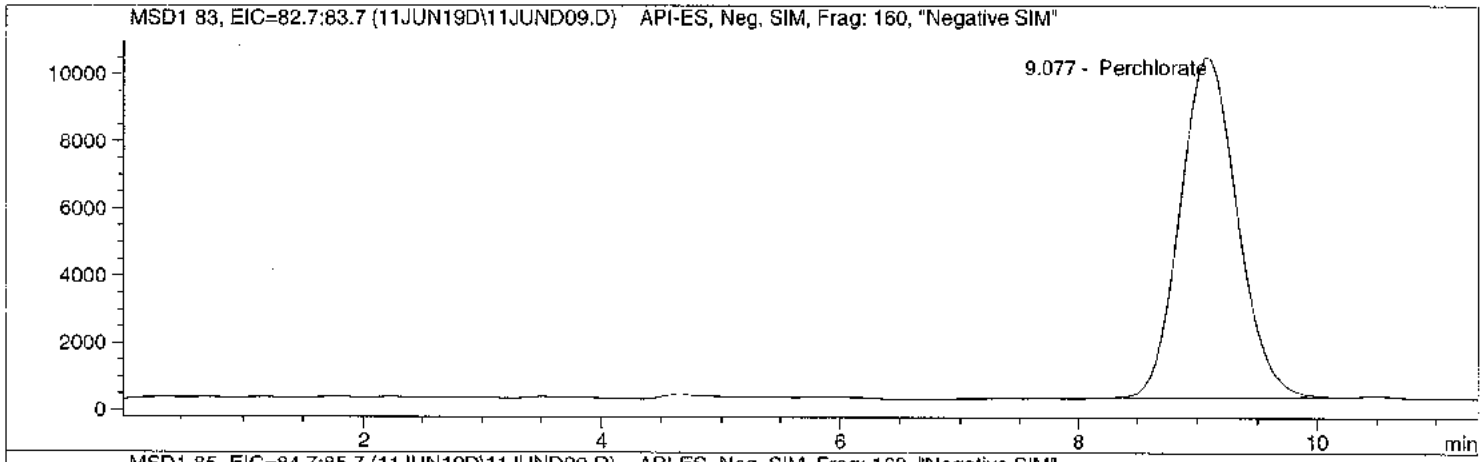
*** End of Report ***

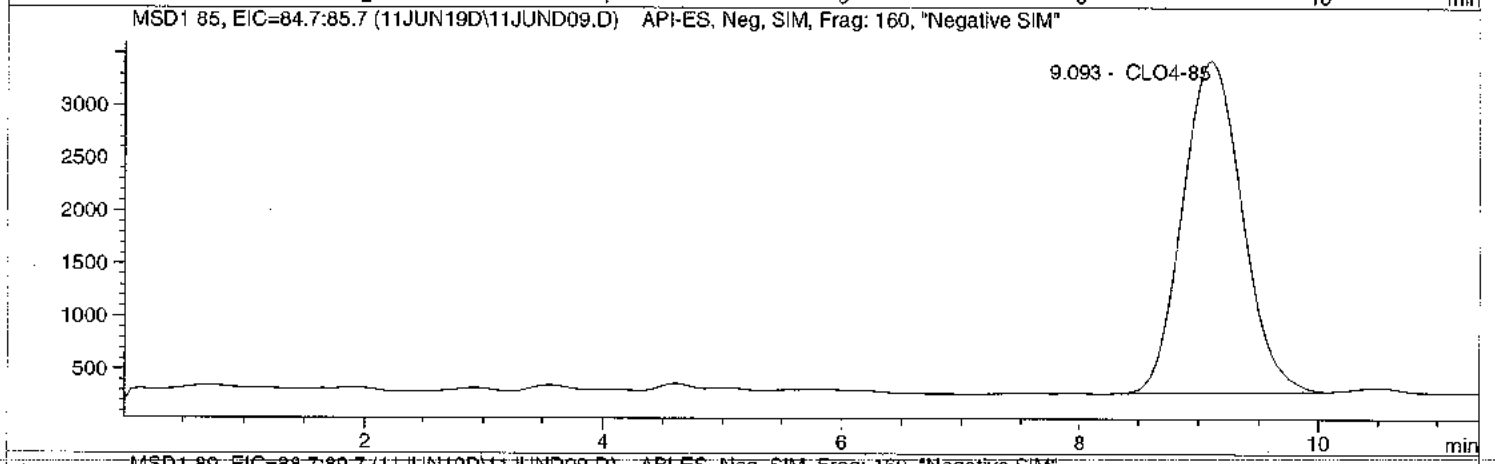
Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND09.D Sample Name: 1915852001 1K

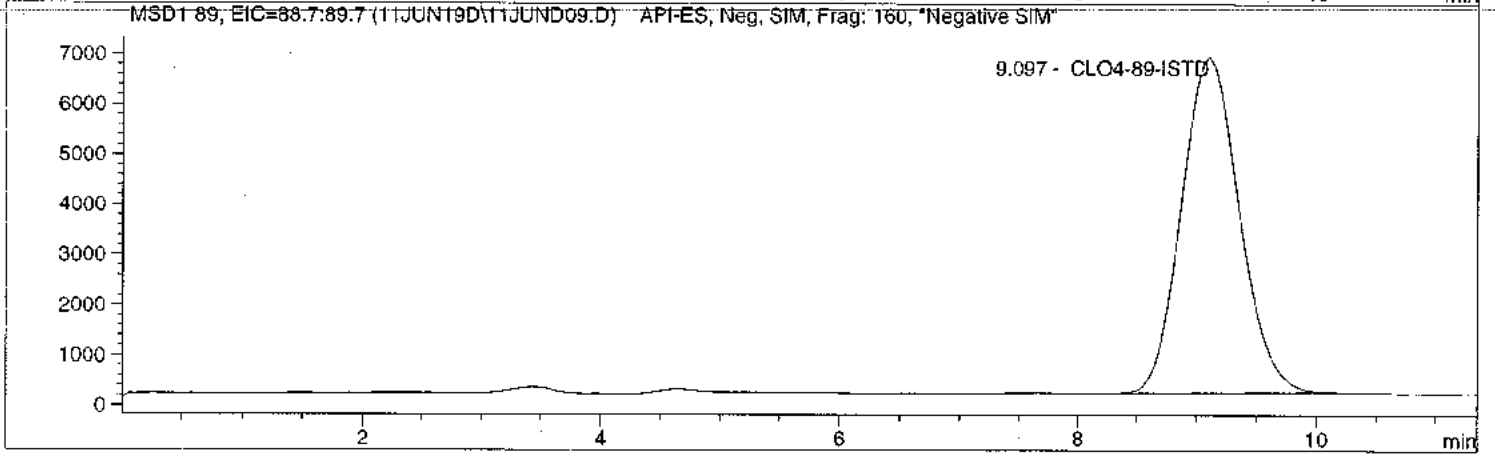
Injection Date:	6/11/2019 10:38:54	Seq Line:	9
Sample Name:	1915852001 1K	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND09.D Sample Name: 1915852001 1K

Injection Date:	6/11/2019 10:38:54	Seq Line:	9
Sample Name:	1915852001 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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
9.077	BBA	332187.1	4885.0237	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.093	PBA	107205.2	5161.4923	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.097	PBA	221981.4	5000.0000	CLO4-89-ISTD

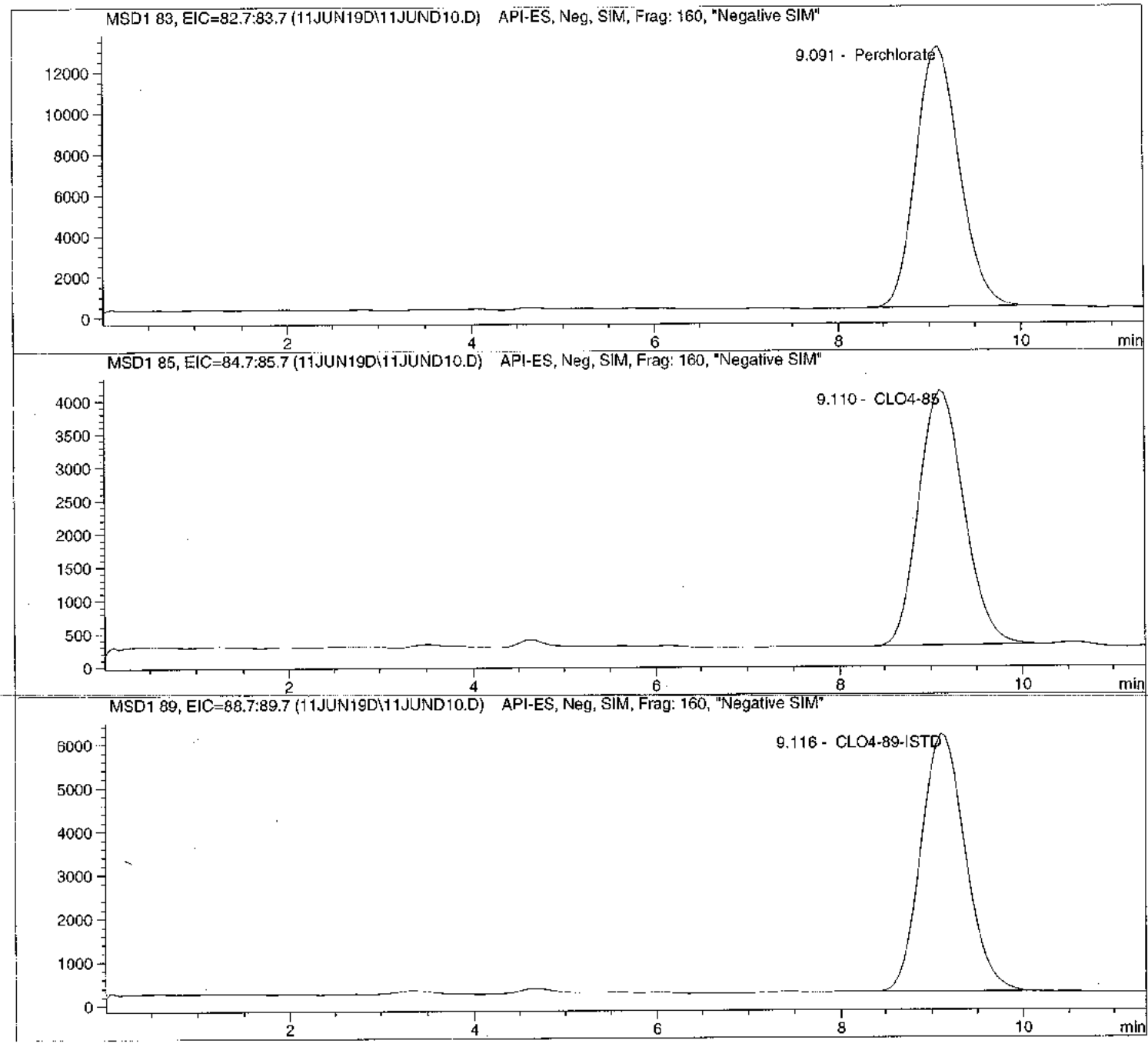
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND10.D Sample Name: 1916229001 1K

Injection Date:	6/11/2019 10:52:22	Seq Line:	10
Sample Name:	1916229001 1K	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND10.D Sample Name: 1916229001 1K

Injection Date:	6/11/2019 10:52:22	Seq Line:	10
Sample Name:	1916229001 1K	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
9.091	BBA	413978.8	6820.0559	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.110	PBA	130297.0	7096.6957	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.116	BBA	195449.6	5000.0000	CLO4-89-ISTD

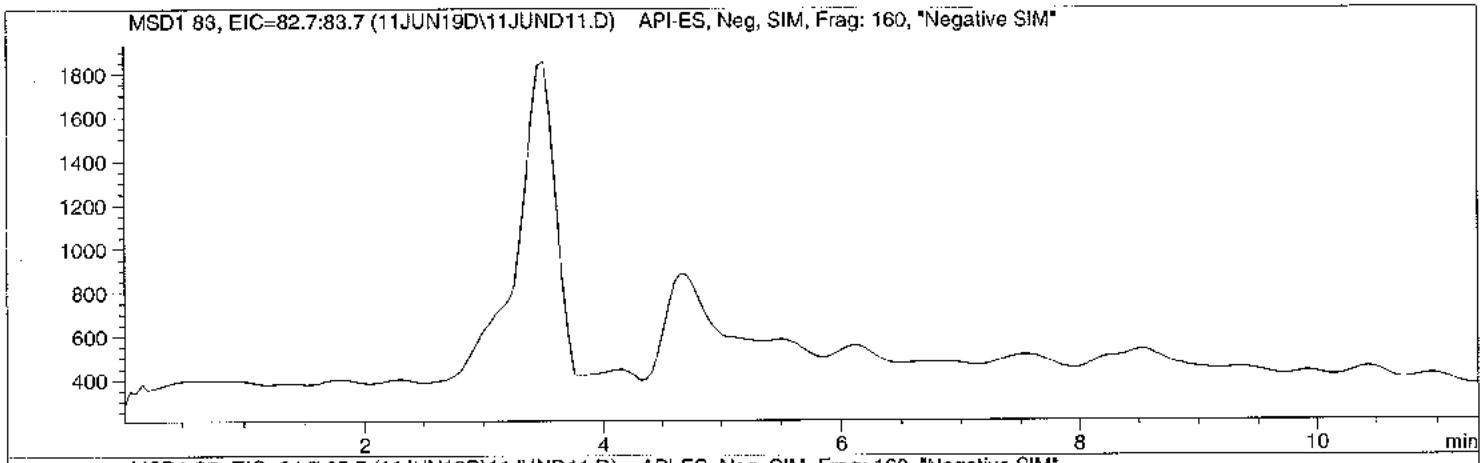
*** End of Report ***

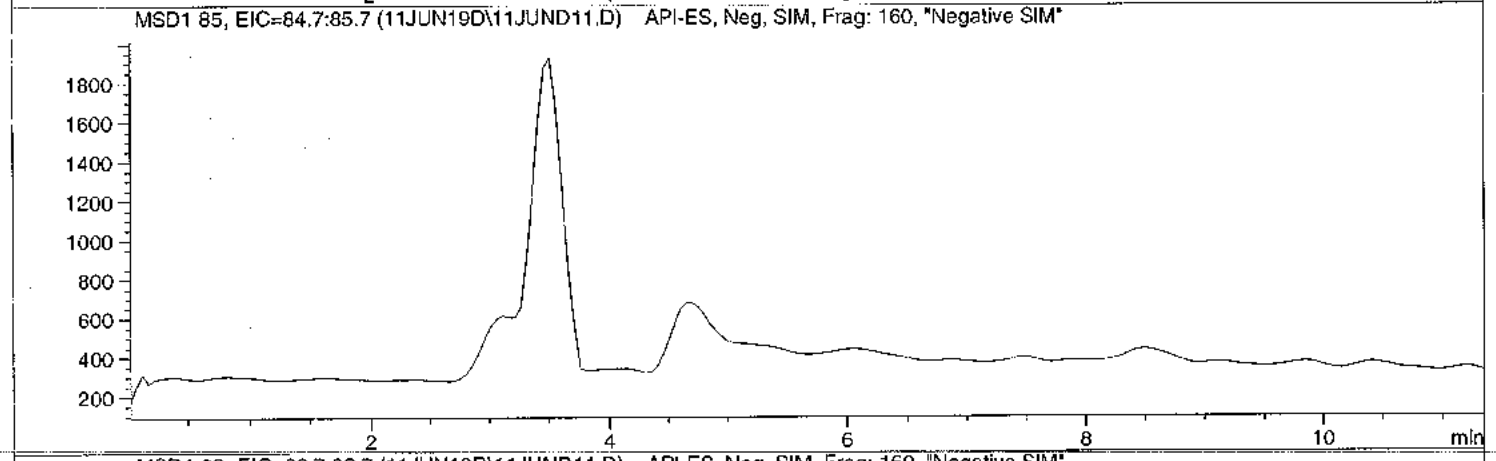
Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND11.D Sample Name: 1916231001

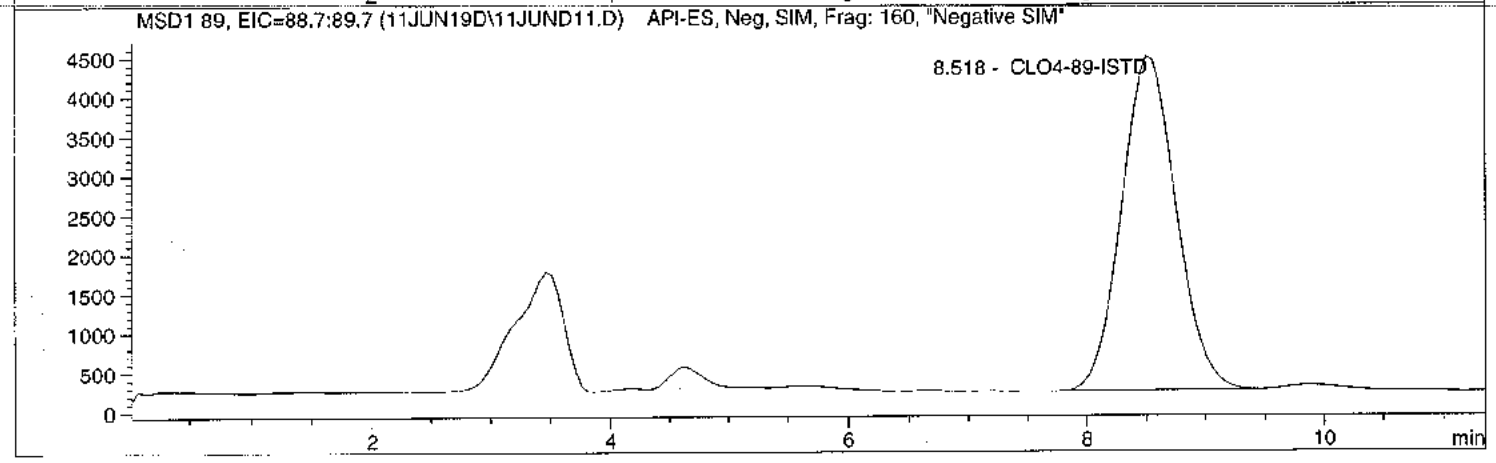
Injection Date:	6/11/2019 11:05:44	Seq Line:	11
Sample Name:	1916231001	Location:	Vial 81
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND11.D Sample Name: 1916231001

Injection Date:	6/11/2019 11:05:44	Seq Line:	11
Sample Name:	1916231001	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.518	PBA	133827.9	5.0000	CLO4-89-ISTD

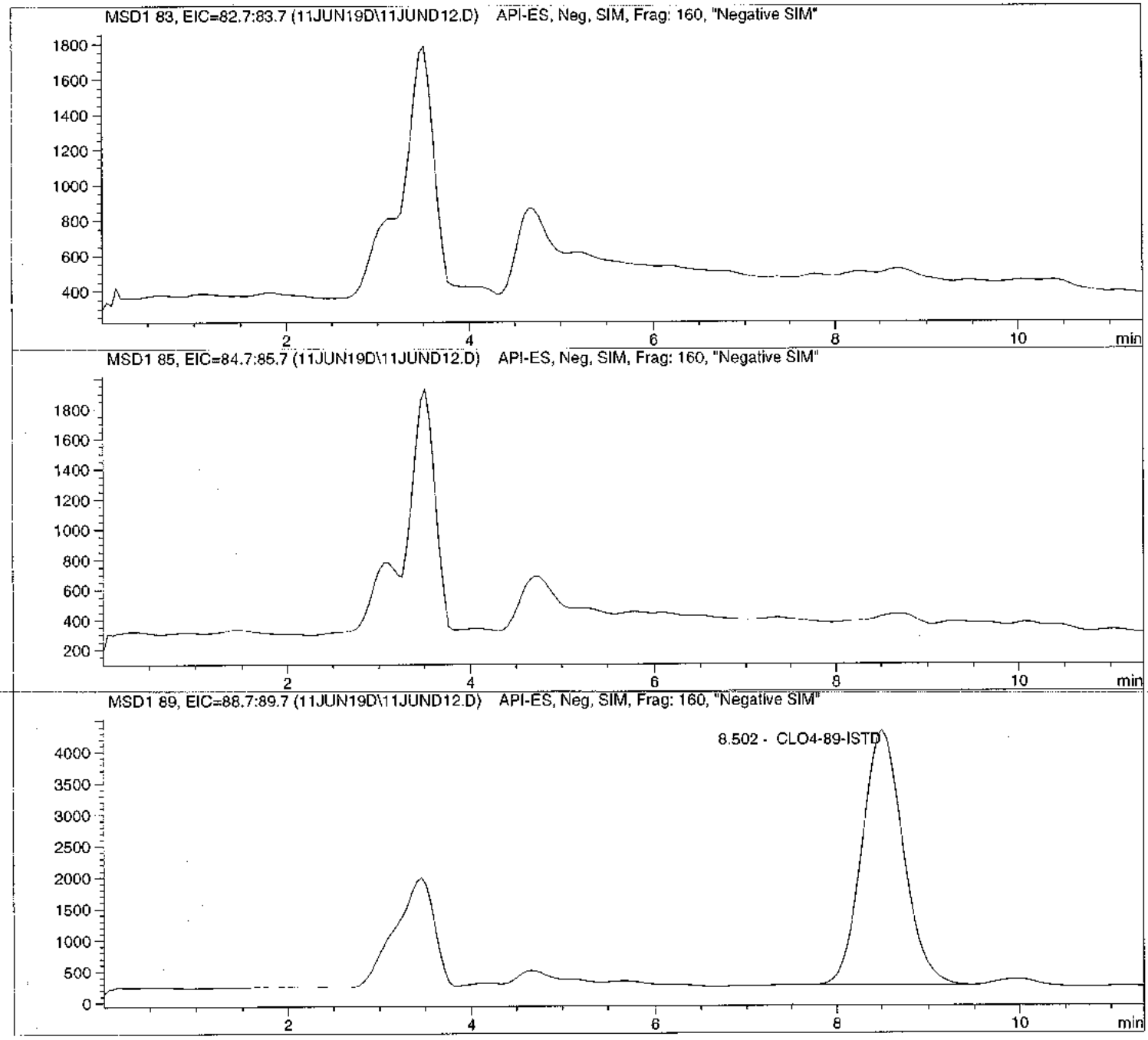
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND12.D Sample Name: 1916232001

Injection Date:	6/11/2019 11:19:06	Seq Line:	12
Sample Name:	1916232001	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND12.D Sample Name: 1916232001

Injection Date:	6/11/2019 11:19:06	Seq Line:	12
Sample Name:	1916232001	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.502	BBA	127033.7	5.0000	CLO4-89-ISTD

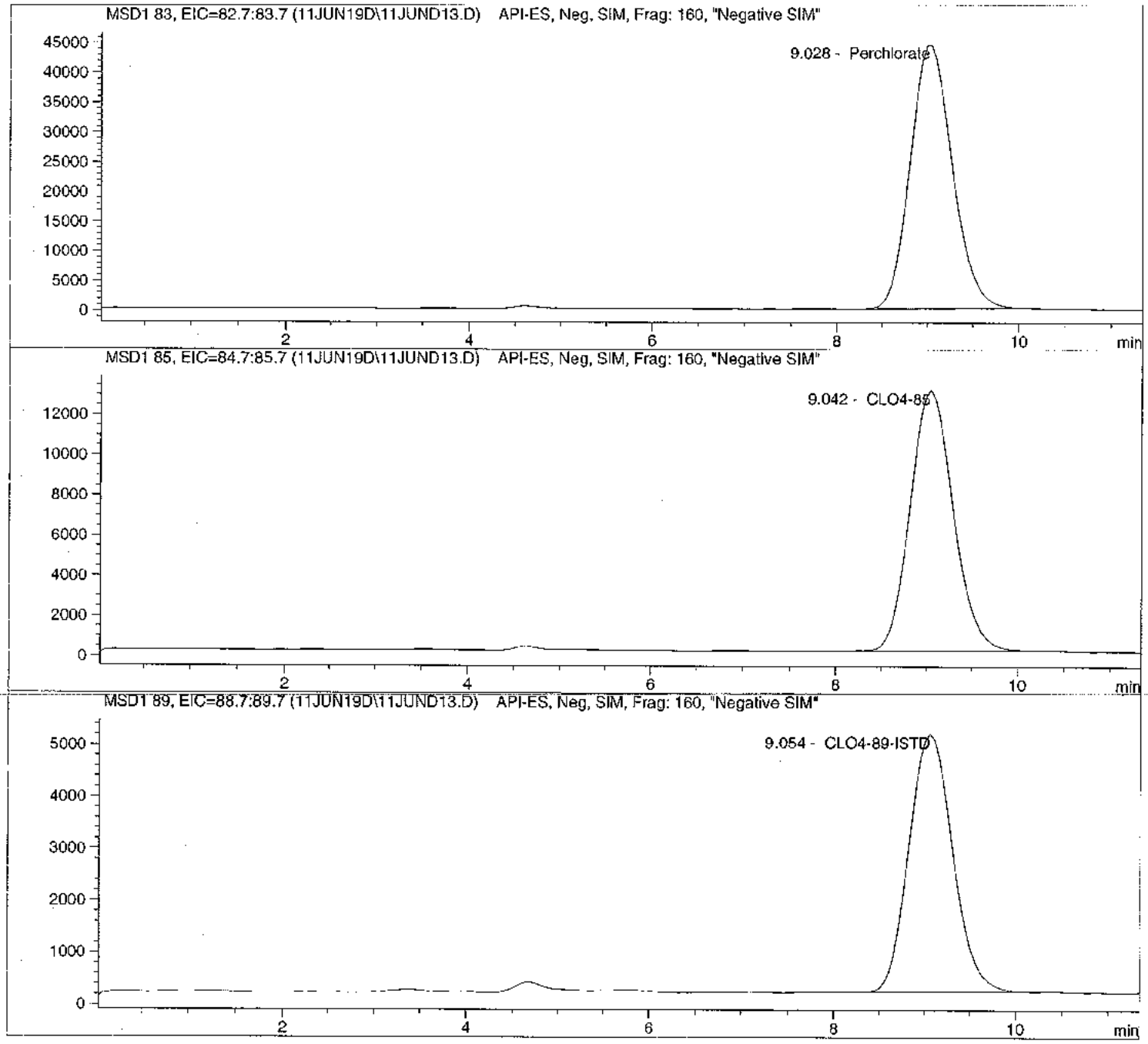
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND13.D Sample Name: 657801 CCV@25

Injection Date:	6/11/2019 11:34:17	Seq Line:	13
Sample Name:	657801 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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND13.D Sample Name: 657801 CCV@25

Injection Date:	6/11/2019 11:34:17	Seq Line:	13
Sample Name:	657801 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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
9.028	PBA	1423337.3	25.9807	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.042	BBA	426236.8	26.2061	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.054	BBA	166286.8	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 : 3/19/2019 2:35:19 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
8.744	1	1	1.00000	7.76074e4	1.28854e-5		1	Perchlorate
		2	2.00000	1.35273e5	1.47849e-5			
		3	5.00000	3.37764e5	1.48033e-5			
		4	10.00000	6.83454e5	1.46316e-5			
		5	25.00000	2.08433e6	1.19943e-5			
		6	50.00000	4.13334e6	1.20968e-5			
		7	75.00000	5.99313e6	1.25143e-5			
8.755	2	1	1.00000	2.36780e4	4.22333e-5		1	CLO4-85
		2	2.00000	4.69486e4	4.25998e-5			
		3	5.00000	1.06124e5	4.71147e-5			
		4	10.00000	2.13523e5	4.68335e-5			
		5	25.00000	6.14295e5	4.06971e-5			
		6	50.00000	1.19814e6	4.17315e-5			
		7	75.00000	1.78355e6	4.20509e-5			
8.766	3	1	5.00000	2.73208e5	1.83011e-5	+I1		CLO4-89-ISTD
		2	5.00000	2.24886e5	2.22335e-5			
		3	5.00000	2.33196e5	2.14412e-5			
		4	5.00000	2.34454e5	2.13262e-5			
		5	5.00000	2.50568e5	1.99547e-5			
		6	5.00000	2.30977e5	2.16472e-5			

RetTime [min]	Sig	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
		7	5.00000	2.21504e5	2.25729e-5			

More compound-specific settings:

Compound: Perchlorate
- Time Window : From 6.654 min To 12.544 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 0.5
  - Level 3 : 0.2
  - Level 4 : 0.1
  - Level 5 : 0.04
  - Level 6 : 0.02
  - Level 7 : 0.013333

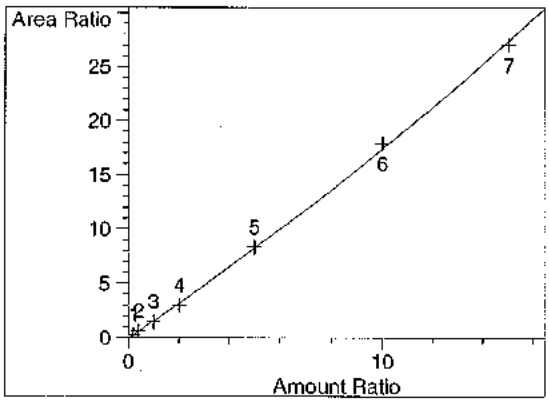
Compound: CLO4-85
- Time Window : From 6.650 min To 12.505 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 0.5
  - Level 3 : 0.2
  - Level 4 : 0.1
  - Level 5 : 0.04
  - Level 6 : 0.02
  - Level 7 : 0.013333

Compound: CLO4-89-ISTD
- Time Window : From 6.659 min To 12.466 min
- Curve Type : Linear
- Origin : Included
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 1
  - Level 3 : 1
  - Level 4 : 1
  - Level 5 : 1
  - Level 6 : 1
  - Level 7 : 1

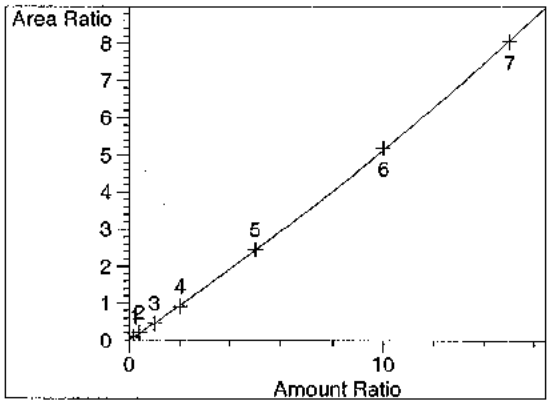
Peak Sum Table

No Entries in table

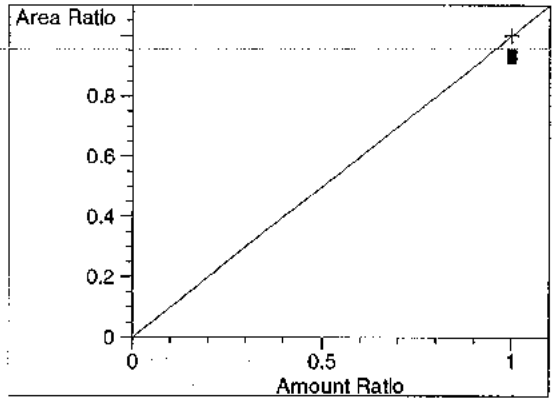
Calibration Curves



Perchlorate at exp. RT: 8.744
MSD1 83, EIC=82.7:83.7
Correlation: 0.99957
Residual Std. Dev.: 0.30744
Formula: $y = ax^2 + bx + c$
a: 1.76988e-2
b: 1.56480
c: -4.92430e-2
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.5
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.013333



CLO4-85 at exp. RT: 8.755
MSD1 85, EIC=84.7:85.7
Correlation: 0.99983
Residual Std. Dev.: 0.03473
Formula: $y = ax^2 + bx + c$
a: 5.13396e-3
b: 4.62055e-1
c: 4.97209e-4
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.5
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.013333



CLO4-89-ISTD at exp. RT: 8.766
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 1 : 1
Level 2 : 1
Level 3 : 1
Level 4 : 1
Level 5 : 1
Level 6 : 1
Level 7 : 1

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP2.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	7.76074e4	8.744	1.06245
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	1.35273e5	8.992	2.06969
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	3.37764e5	8.586	4.73474
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	6.83454e5	8.698	9.27727
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.08433e6	8.451	25.29036
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	4.13334e6	8.810	51.36844
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	5.99313e6	8.586	74.16754
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	7.34719e5	8.702	9.25940

#	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.36780e4	8.755	9.30535e-1
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	4.69486e4	9.012	2.24255
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	1.06124e5	8.602	4.86656
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.13523e5	8.713	9.64312
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	6.14295e5	8.468	25.12159
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	1.19814e6	8.825	50.46721
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	1.78355e6	8.603	74.72019
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.27495e5	8.721	9.54024

#	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	2.73208e5	8.766	5.00000
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	2.24886e5	9.012	5.00000
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	2.33196e5	8.609	5.00000
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.34454e5	8.716	5.00000
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.50568e5	8.472	5.00000
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	2.30977e5	8.825	5.00000
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	2.21504e5	8.610	5.00000
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.52544e5	8.725	5.00000

*** End of Report ***

Sequence Table:

Method and Injection Info Part:

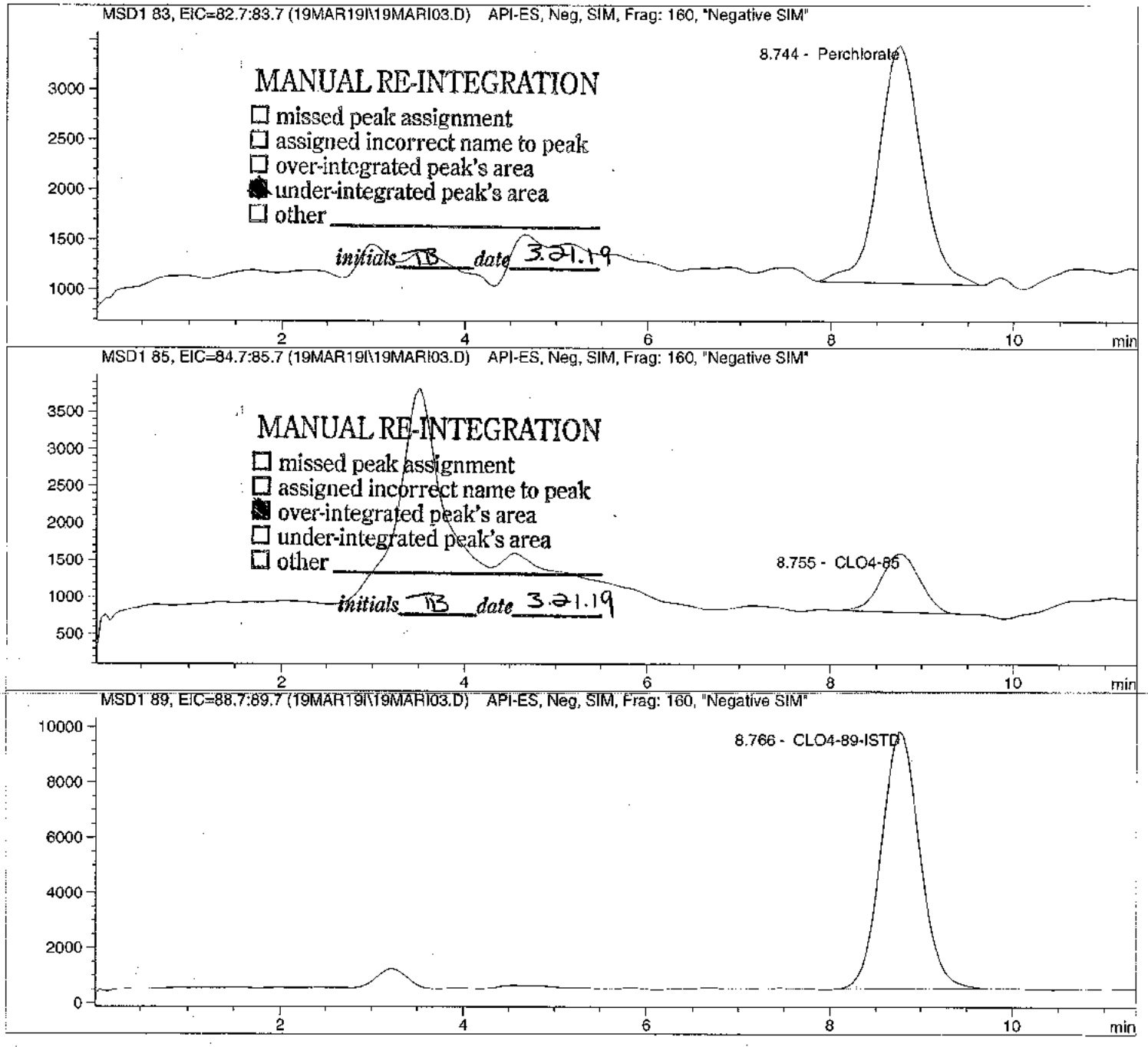
Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	CLO4@ 0.2ug/L	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	CLO4@ 0.5ug/L	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	CLO4@ 1.0ug/L	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	CLO4@ 2.0ug/L	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	CLO4@ 5.0ug/L	CLO4-AQN	1	Ctrl Samp		
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 80	ICAL Verf@10ug/L	CLO4-AQN	1	Ctrl Samp		

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 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
8.744	MM	77607.4	1.0625	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	MM	23678.0	0.9305	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

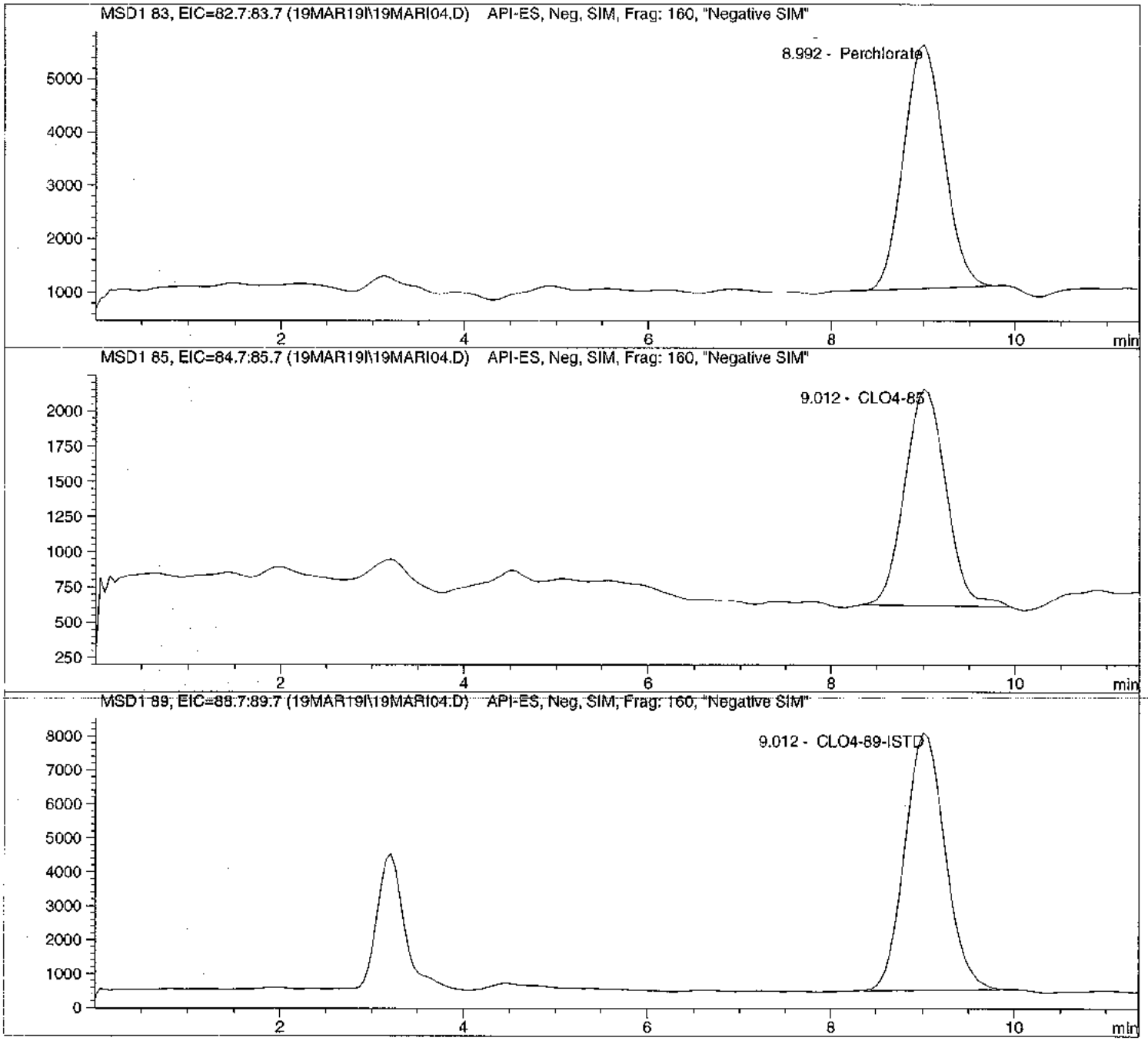
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	3/19/2019 09:53:00	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	3/19/2019 09:53:00	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 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
8.992	BBA	135272.8	2.0697	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	46948.6	2.2425	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	224885.9	5.0000	CLO4-89-ISTD

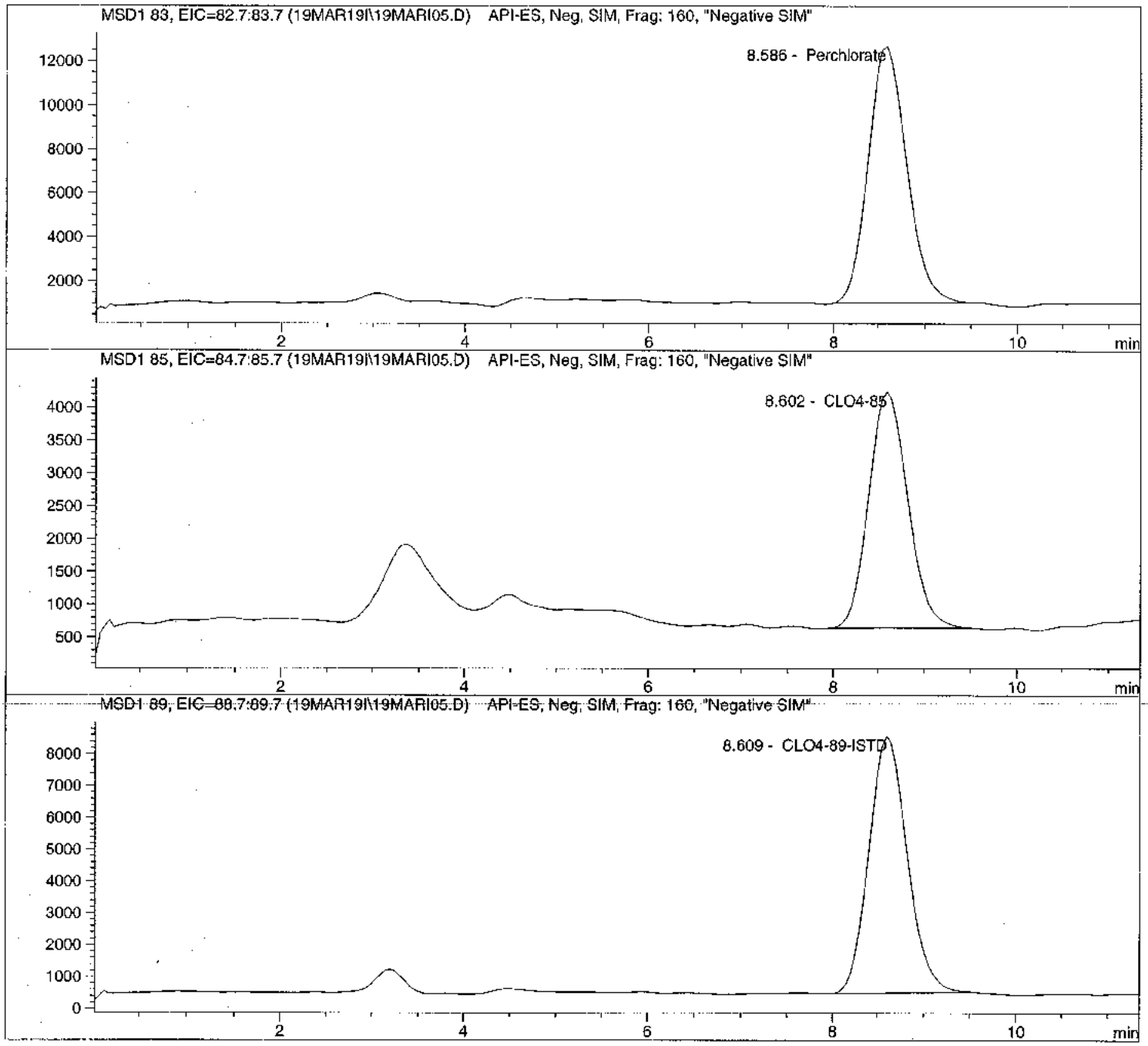
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	3/19/2019 10:06:16	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	3/19/2019 10:06:16	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 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
8.586	PBA	337763.6	4.7347	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.602	PBA	106124.0	4.8666	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.609	PBA	233196.3	5.0000	CLO4-89-ISTD

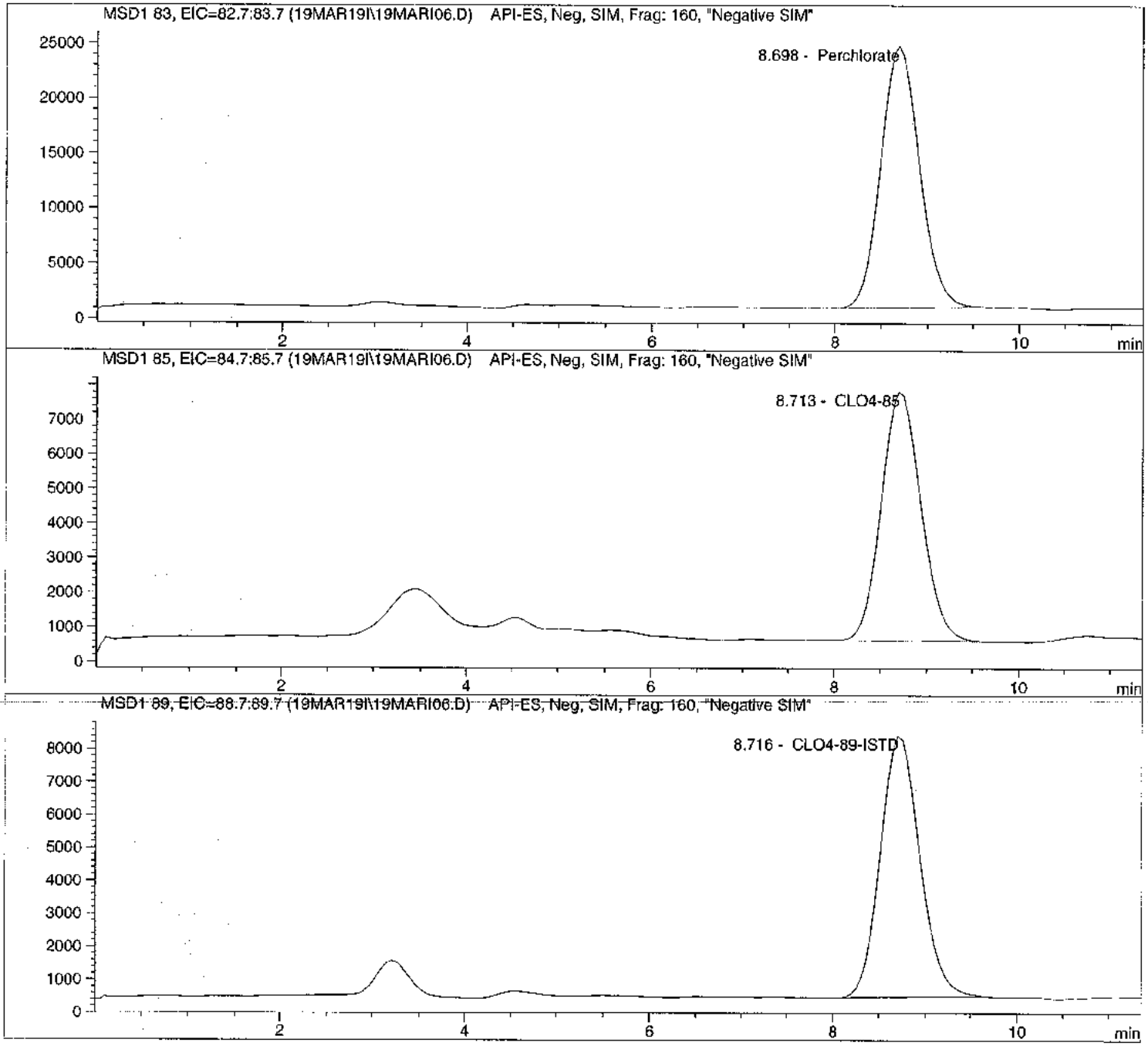
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	3/19/2019 10:19:32	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	3/19/2019 10:19:32	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 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
8.698	PBA	683454.4	9.2773	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.713	BBA	213522.6	9.6431	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.716	PBA	234453.6	5.0000	CLO4-89-ISTD

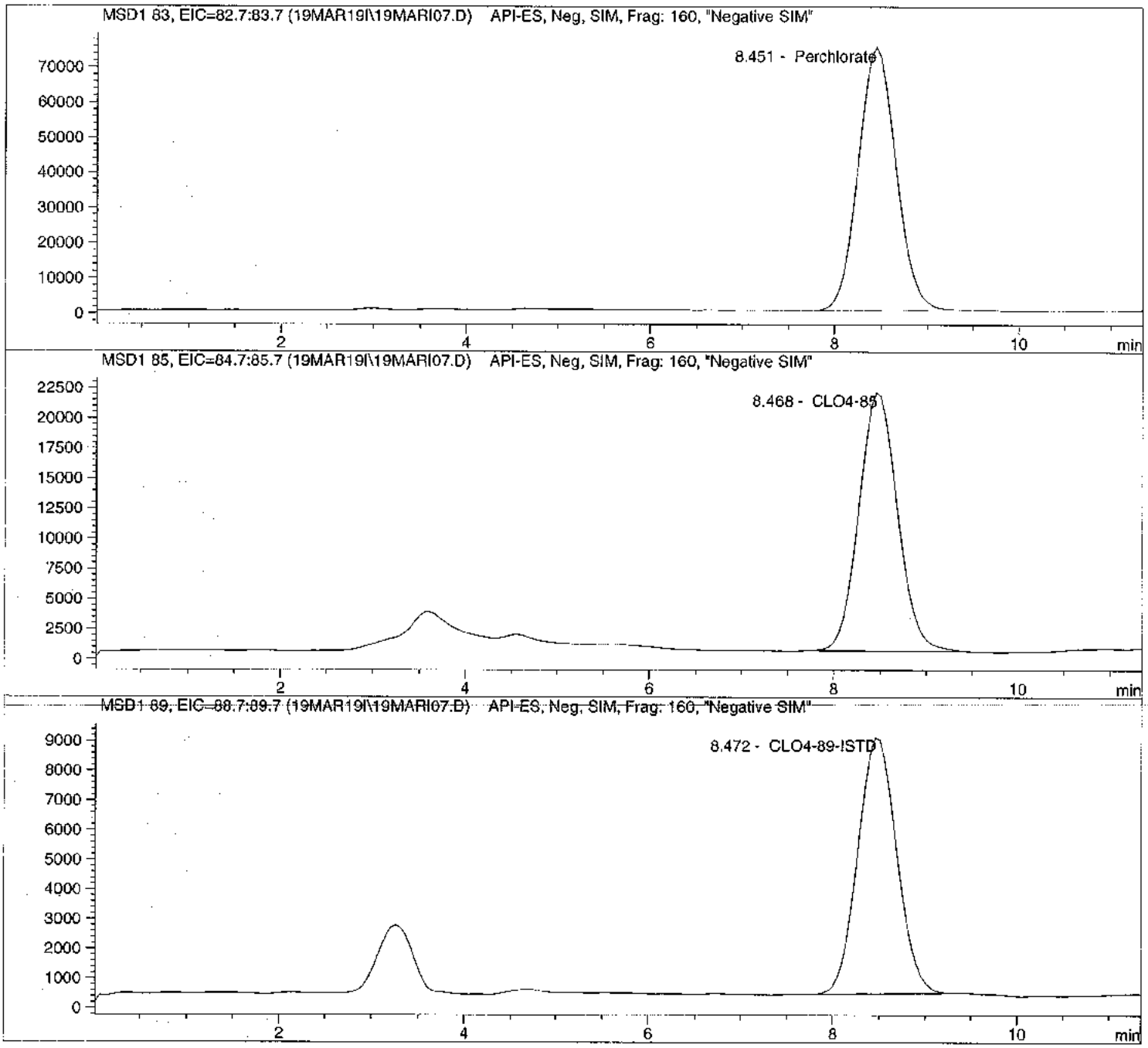
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	3/19/2019 10:32:49	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	3/19/2019 10:32:49	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 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
8.451	PBA	2084327.4	25.2904	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.468	BBA	614294.8	25.1216	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.472	BBA	250568.0	5.0000	CLO4-89-ISTD

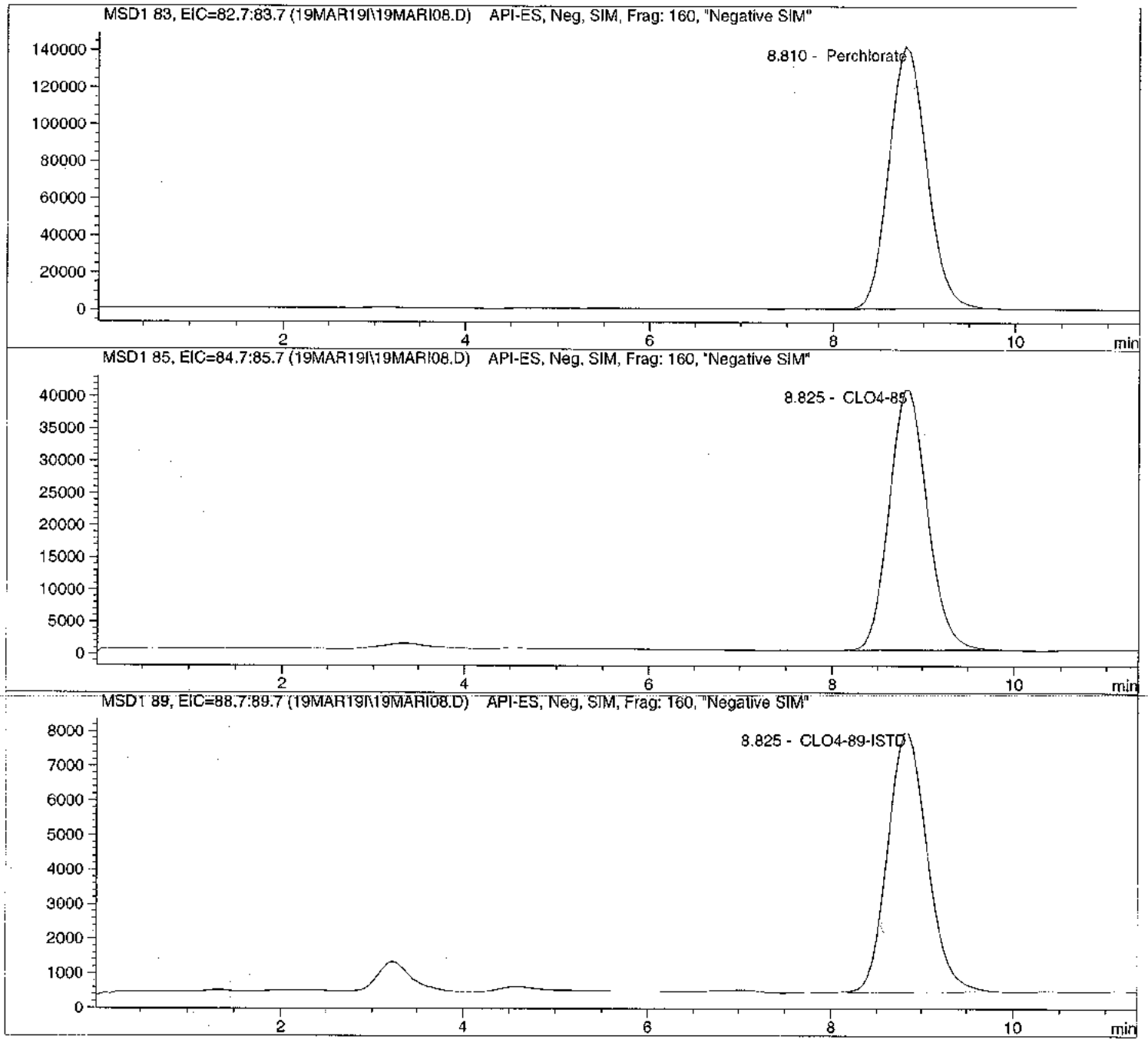
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	3/19/2019 10:46:05	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	3/19/2019 10:46:05	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 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
8.810	PBA	4133340.5	51.3684	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	1198135.6	50.4672	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	230976.7	5.0000	CLO4-89-ISTD

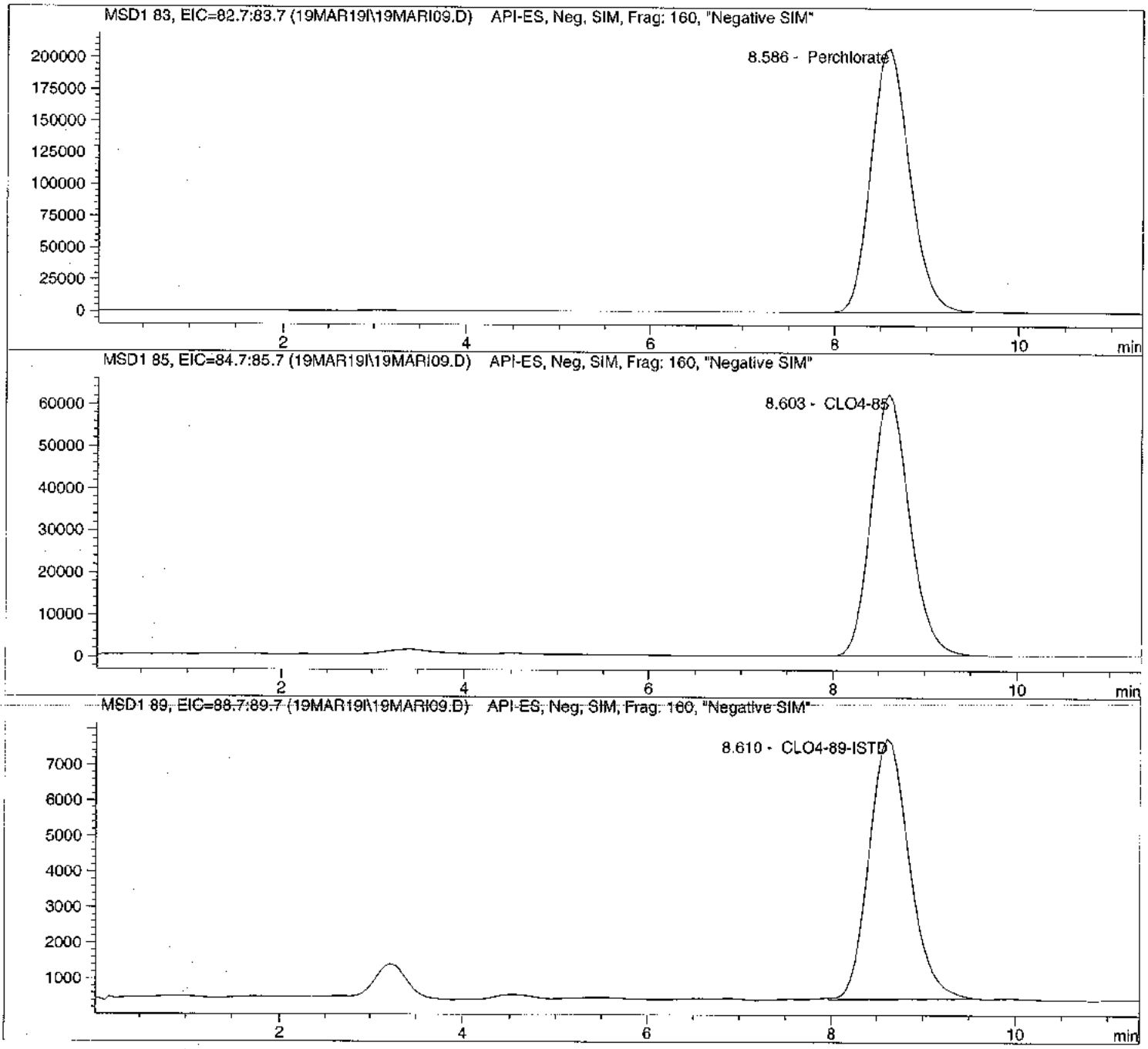
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	3/19/2019 10:59:22	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	3/19/2019 10:59:22	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 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
8.586	PBA	5993128.0	74.1675	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.603	PBA	1783554.4	74.7202	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.610	BBA	221504.5	5.0000	CLO4-89-ISTD

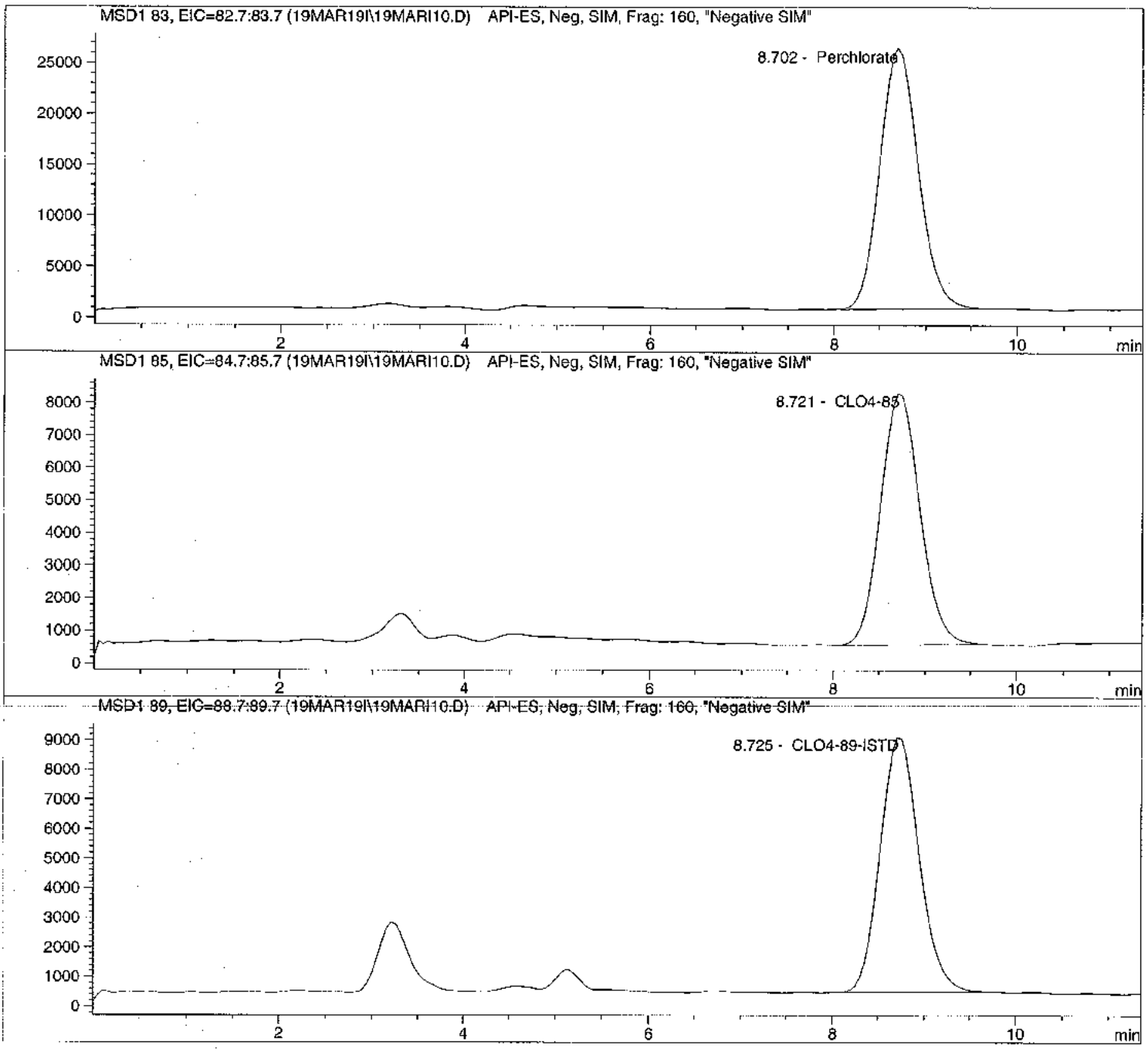
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L

Injection Date:	3/19/2019 11:12:42	Seq Line:	10
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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L

Injection Date:	3/19/2019 11:12:42	Seq Line:	10
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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 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
8.702	PBA	734718.7	9.2594	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.721	PBA	227494.7	9.5402	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.725	BBA	252544.4	5.0000	CLO4-89-ISTD

*** End of Report ***



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

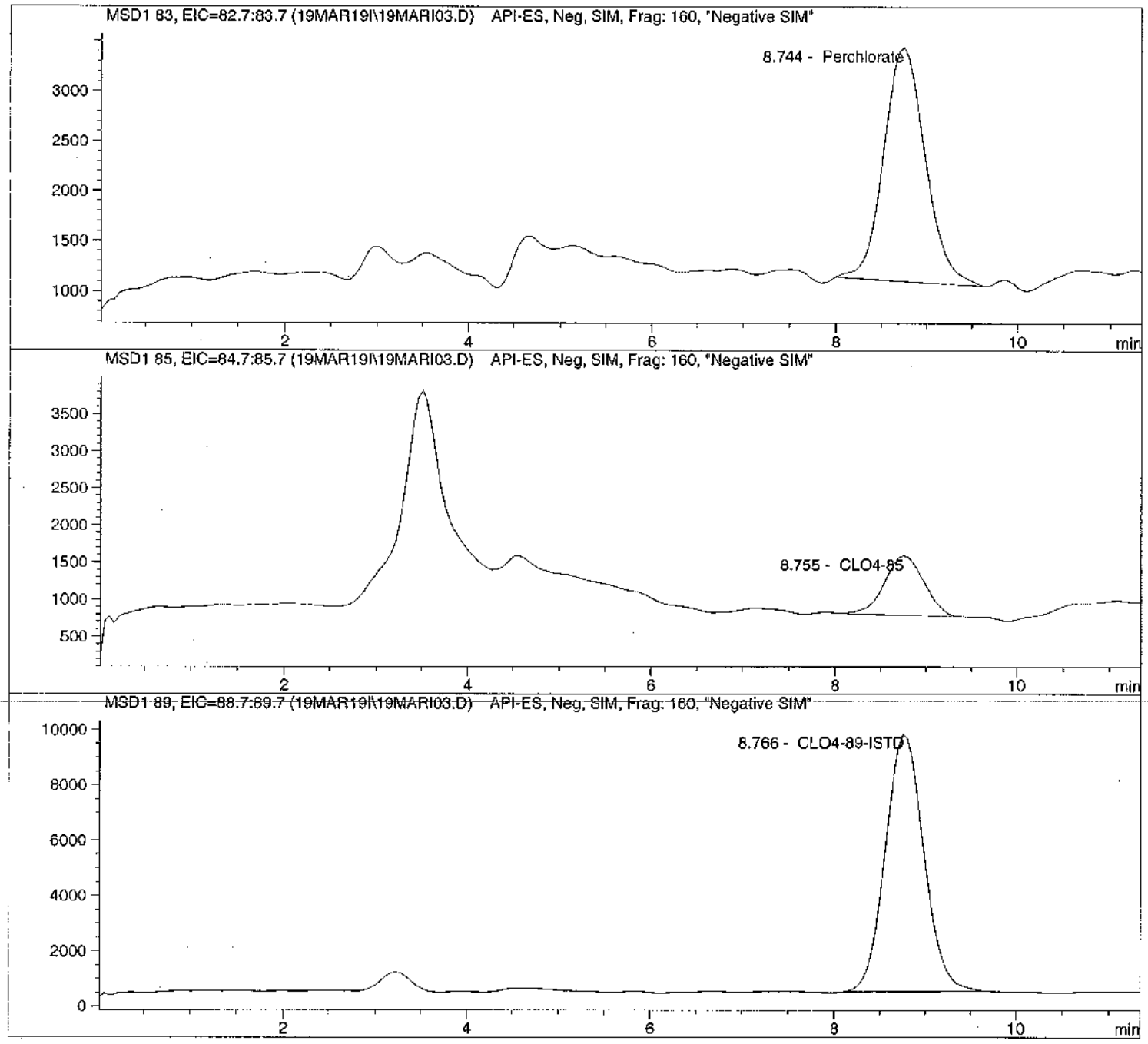
Unmodified

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	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-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	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-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 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
8.744	BBA	74166.3	1.0224	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	BBA	24138.1	0.9487	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	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

July 03, 2019

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

Work Order: **HS19060672**

Laboratory Results for: **LH18/24 Longhorn GW Treatment Plant Weekly Samples**

Dear Marcia,

ALS Environmental received 2 sample(s) on Jun 13, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
RJ Modashia
Project Manager

ALS Houston, US Date: 03-jul-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples
Work Order: HS19060672

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19060672-01	LH18/24-SP650_061219	Water		12-Jun-2019 14:00	13-Jun-2019 08:45	☐
HS19060672-02	LH18/24-SP650_061219_BIX	Water		12-Jun-2019 14:00	13-Jun-2019 08:45	☐

ALS Houston, US Date: 03-Jul-19

Client: Bhate Environmental Associates, Inc. **CASE NARRATIVE**
Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples
Work Order:

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: R340700

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

WetChemistry by Method E365.3

Batch ID: R340526

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

ALS Houston, US Date: 03-Jul-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**

Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples WorkOrder:HS19060672

Sample ID: LH18/24-SP650_061219 Lab ID:HS19060672-01

Collection Date: 12-Jun-2019 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)	**10.0**		**0.20**	**0.10**	**0.20**	**mg/L**	1	18-Jun-2019 11:15
ORTHO PHOSPHATE (PO4) AS P BY E365.3		**Method:E365.3**						Analyst: MZD
Phosphorus, Total Orthophosphate (As P)	**2.37**		**0.100**	**0.200**	**0.250**	**mg/L**	10	14-Jun-2019 11:52
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	27-Jun-2019 12:27

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

ALS Houston, US Date: 03-Jul-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**

Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples WorkOrder:HS19060672

Sample ID: LH18/24-SP650_061219_BIX Lab ID:HS19060672-02

Collection Date: 12-Jun-2019 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	03-Jul-2019 09:32

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

ALS Houston, US Date: 03-jul-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples
WorkOrder: HS19060672

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID R340526	**Test Name :** ORTHO PHOSPHATE (PO4) AS P BY E365.3			**Matrix:** Water		
HS19060672-01	LH18/24-SP650_061219	12 Jun 2019 14:00			14 Jun 2019 11:52	10
Batch ID R340700	**Test Name :** AMMONIA AS N BY E350.3(ISE)			**Matrix:** Water		
HS19060672-01	LH18/24-SP650_061219	12 Jun 2019 14:00			18 Jun 2019 11:15	1
Batch ID R341377	**Test Name :** SUBCONTRACT ANALYSIS - TOC ANALYSIS			**Matrix:** Water		
HS19060672-01	LH18/24-SP650_061219	12 Jun 2019 14:00			27 Jun 2019 12:27	1
Batch ID R341759	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			**Matrix:** Water		
HS19060672-02	LH18/24-SP650_061219_BIX	12 Jun 2019 14:00			03 Jul 2019 09:32	1

ALS Houston, US Date: 03-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples
WorkOrder: HS19060672

QC BATCH REPORT

Batch ID: R340526 (0) **Instrument:** UV-2450 **Method:** ORTHO PHOSPHATE (PO4) AS P BY E365.3

MBLK Sample ID: **MBLK-340526** Units: **mg/L** Analysis Date: **14-Jun-2019 11:52**
Client ID: Run ID: **UV-2450_340526** SeqNo: **5122835** 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)	0.0200	0.0250								U

LCS Sample ID: **LCS-340526** Units: **mg/L** Analysis Date: **14-Jun-2019 11:52**
Client ID: Run ID: **UV-2450_340526** SeqNo: **5122836** 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)	0.238	0.0250	0.25	0	95.2	85 - 115				

MS Sample ID: **HS19060672-01MS** Units: **mg/L** Analysis Date: **14-Jun-2019 11:52**
Client ID: **LH18/24-SP650_061219** Run ID: **UV-2450_340526** SeqNo: **5122838** 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)	4.55	0.250	2.5	2.37	87.2	80 - 120				

MSD Sample ID: **HS19060672-01MSD** Units: **mg/L** Analysis Date: **14-Jun-2019 11:52**
Client ID: **LH18/24-SP650_061219** Run ID: **UV-2450_340526** SeqNo: **5122839** 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)	4.63	0.250	2.5	2.37	90.4	80 - 120	4.55	1.74	20	

The following samples were analyzed in this batch: HS19060672-01

ALS Houston, US Date: 03-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples
WorkOrder: HS19060672

QC BATCH REPORT

Batch ID: R340700 (0) **Instrument: WetChem_HS** **Method: AMMONIA AS N BY E350.3(ISE)**

MBLK Sample ID: **MBLK-R340700** Units: **mg/L** Analysis Date: **18-Jun-2019 11:15**
Client ID: Run ID: **WetChem_HS_340700** SeqNo: **5127307** 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-R340700** Units: **mg/L** Analysis Date: **18-Jun-2019 11:15**
Client ID: Run ID: **WetChem_HS_340700** SeqNo: **5127306** 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)	10.17	0.20	10	0	102	80 - 120				

MS Sample ID: **HS19060356-01MS** Units: **mg/L** Analysis Date: **18-Jun-2019 11:15**
Client ID: Run ID: **WetChem_HS_340700** SeqNo: **5127309** 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	0.2194	99.6	80 - 120				

MSD Sample ID: **HS19060356-01MSD** Units: **mg/L** Analysis Date: **18-Jun-2019 11:15**
Client ID: Run ID: **WetChem_HS_340700** SeqNo: **5127308** 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)	10.28	0.20	10	0.2194	101	80 - 120	10.18	0.978	20	

The following samples were analyzed in this batch: HS19060672-01

ALS Houston, US Date: 03-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples
WorkOrder: **HS19060672**

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
Kansas	E-10352 2018-2019	31-Jul-2019
Kentucky	123043, 2019-2020	30-Apr-2020
Louisiana	03087, 2019-2020	30-Jun-2020
Maryland	343, 2019-2020	30-Jun-2020
North Carolina	624-2019	31-Dec-2019
Oklahoma	2018-156	31-Aug-2019
Texas	TX104704231-19-23	30-Apr-2020

ALS Houston, US Date: 03-jul-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples
Work Order: HS19060672

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19060672-01	LH18/24-SP650_061219	Login	13/06/2019 16:48:39	JRM	WET286
HS19060672-01	LH18/24-SP650_061219	Login	13/06/2019 16:48:39	JRM	WET286
HS19060672-01	LH18/24-SP650_061219	Login	13/06/2019 16:48:39	JRM	Sub
HS19060672-02	LH18/24-SP650_061219_BIX	Login	13/06/2019 16:48:39	JRM	Sub

ALS Houston, US Date: 03-Jul-19

Sample Receipt Checklist

Client Name: Bhate Environmental
Work Order: HS19060672
Date/Time Received: **13-Jun-2019 08:45**
Received by: **NDD**

Checklist completed by: *Jared R. Makan* eSignature 14-Jun-2019 Date
Reviewed by: *Corey Grandits* eSignature 14-Jun-2019 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:N/A
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	1.8c/1.8c UC/C	IR25	
Cooler(s)/Kit(s):	25344		
Date/Time sample(s) sent to storage:	06/13/2019 17:00		
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 Modshia

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	Analyses: AMMONIA-N	TOTAL ORGANIC CARBON	ORTHO-PHOSPHATE	PERCHLORATE	Remarks (Preservatives, etc.)	Lab I.D.#
LH18/24-SP650_061219	Water	06/12/19 / 14:00		2	X	X			H2SO4	
LH18/24-SP650_061219	Water	06/12/19 / 14:00		1			X		NONE	
LH18/24-SP650_061219_BIX	Water	06/12/19 / 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	06/12/19	14:30	ND	6/13/19	08:45						

For Lab Use Only

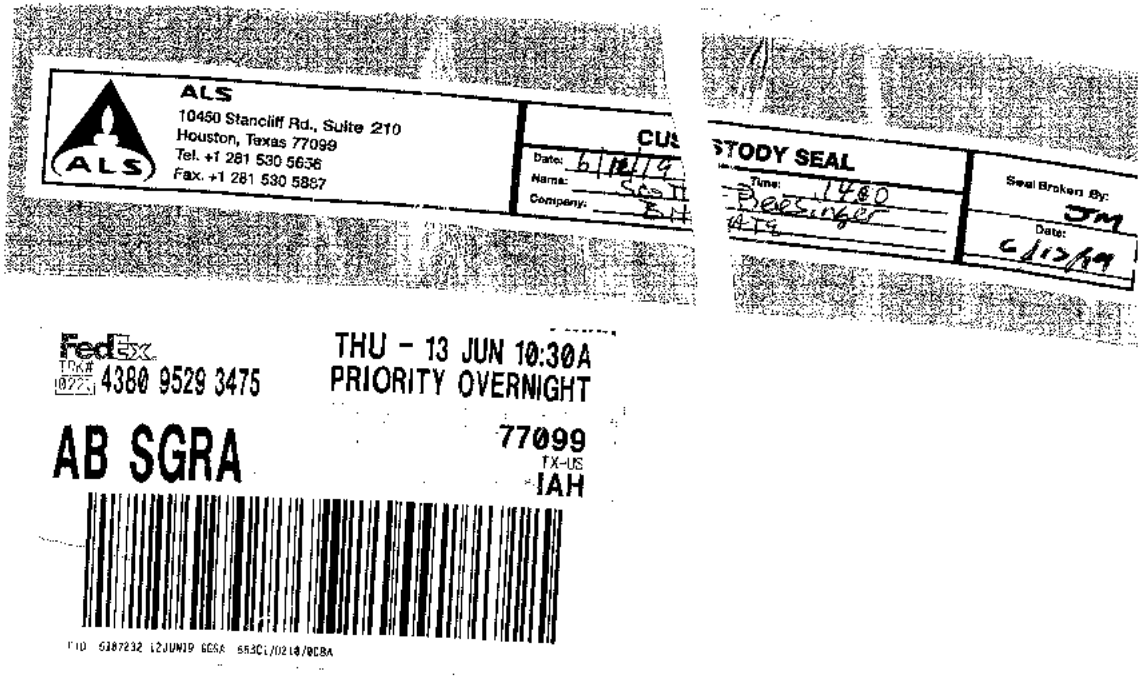
Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition

Remarks: Cooler - 25344 1125
Temp 1.8 0500

HS19060672

Bhate Environmental Associates, Inc.
I18/24 Longhorn GW Treatment Plant Weekly Sampl

(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: 6/12/19
Name: Scott
Company: BH

STODY SEAL
Time: 1430
Bessinger
ALS

Seal Broken By:
JM
Date:
6/13/19

FedEx
TRK# 4380 9529 3475
0225

THU - 13 JUN 10:30A
PRIORITY OVERNIGHT

AB SGRA

77099
TX-US
IAH

FID 5187232 12JUN19 6GSA 563C1/0218/0CBA

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June 27, 2019

Analytical Report for Service Request No: K1905676

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

RE: HS19060672

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory June 18, 2019
For your reference, these analyses have been assigned our service request number **K1905676.**

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: HS19060672
Sample Matrix: Water

Service Request: K1905676
Date Received: 06/18/2019

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples for the Tier level IV requested by the client.

Sample Receipt:

One water sample was received for analysis at ALS Environmental on 06/18/2019. 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 06/27/2019

Chain of Custody

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11905676

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID:** **11589**

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:	HS19060672
TSR:	Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS19060672-01**	**LH18/24-SP650_061219**	**Water**	**12 Jun 2019 14:00**
	TOC Analysis for DOD Level IV			21 Jun 2019

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

QC Level: DOD IV (DoD Data Package)

Relinquished By: _____ Date/Time: 6/17/19 1800

Received By: Fran Flaris ALS Date/Time: 6/18/19 0915

Cooler ID(s): _____ Temperature(s): _____

00939941

PC Kelly

Cooler Receipt and Preservation Form

Client AIS Houston Service Request *K19* 05676

Received: 6·18·19 Opened: 6·18·19 By: AP Unloaded: 6·18·19 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? 2 Front
   If present, were custody seals intact? (Y) N If present, were they signed and dated? (Y) N

Raw Cooler Temp	Corrected Cooler Temp	Raw Temp Blank	Corrected Temp Blank	Corr. Factor	Thermometer ID	Cooler/COC ID NA	Tracking Number NA	Filed
-0.7	-0.6	0.5	0.6	0.1	360	11589	4809 7835 0562	

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

Sample ID on Bottle	Sample ID on COC	Identified by:

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

Notes, Discrepancies, & Resolutions: _____

General Chemistry

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
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www.alsglobal.com

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	K1905676
Project:	HS19060672	**Date Collected:**	06/12/19
Sample Matrix:	Water	**Date Received:**	06/18/19
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_061219	K1905676-001	**2.04**	0.50	0.20	0.07	1	06/20/19 05:08	
Method Blank	K1905676-MB	ND U	0.50	0.20	0.07	1	06/19/19 17:34	

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K1905676
Project	HS19060672	**Date Collected:**	06/12/19
Sample Matrix:	Water	**Date Received:**	06/18/19
		Date Analyzed:	06/20/19

Replicate Sample Summary
General Chemistry Parameters

Sample Name:	LH18/24-SP650_061219	**Units:**	mg/L
Lab Code:	K1905676-001	**Basis:**	NA

Analyte Name	Analysis Method	LOQ	LOD	MDL	Sample Result	Duplicate Sample K1905676-001DUP Result	Average	RPD	RPD Limit
Carbon, Total Organic	SM 5310 C	0.50	0.20	0.07	2.04	1.97	2.01	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:**	K1905676
Project:	HS19060672	**Date Analyzed:**	06/19/19
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:	640162

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K1905676-LCS	24.0	25.0	96	83-117

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US **Service Request:** K1905676
Project: HS19060672

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	640162	KQ1908617-20	06/19/19 17:05	25.0	23.7	95	90-110
CCV2	640162	KQ1908617-21	06/19/19 21:36	25.0	24.2	97	90-110
CCV3	640162	KQ1908617-22	06/20/19 02:18	25.0	24.2	97	90-110
CCV4	640162	KQ1908617-23	06/20/19 07:57	25.0	24.2	97	90-110

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US **Service Request:**K1905676
Project: HS19060672

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	640162	KQ1908617-24	06/19/19 17:19	0.50	0.20	0.07	ND	U
CCB2	640162	KQ1908617-25	06/19/19 21:50	0.50	0.20	0.07	ND	U
CCB3	640162	KQ1908617-26	06/20/19 02:33	0.50	0.20	0.07	ND	U
CCB4	640162	KQ1908617-27	06/20/19 08:11	0.50	0.20	0.07	ND	U

Raw Data

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General Chemistry

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Work Request # (Original) K1905420, 562, 5649, 5652, 5665, 5676, 5696, 5595, 5633, 5675, 5679, 5436

Tier: II II II I II IV II I III II II IV

Date Analyzed: 6/19/19 / 6/20/19

Analyst: HLM / BCP

Run # TOC: 640162, 640173, DOC: 640170

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: K1905612-2/2d, 5679-1/1d, 5436-1/1d report a high %RSD. However, these samples are less than 5x the MRL.
K1905696-2/3 sent for RA due to being higher than calibration.

Final Approved by: [signature] Date: 06/26/19

DQREPORT

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 640162 **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
K1905420-001	Carbon, Total Organic	N/A		Water	3.19 mg/L	10 mL	64 mg/L	20	2	10			6/19/19 20:11:00	N	II
K1905612-001	Carbon, Total Organic	N/A		Water	15.16 mg/L	10 mL	15.2 mg/L	1	0.07	0.50			6/20/19 00:25:00	N	II
K1905612-002	Carbon, Total Organic	N/A		Water	0.67 mg/L	10 mL	0.67 mg/L	1	0.07	0.50			6/20/19 00:53:00	N	II
K1905649-001	Carbon, Total Organic	N/A		Water	5.94 mg/L	10 mL	594 mg/L	100	7	50			6/20/19 01:50:00	N	II
K1905649-002	Carbon, Total Organic	N/A		Water	6.70 mg/L	10 mL	670 mg/L	100	7	50			6/20/19 04:39:00	N	II
K1905652-001	Carbon, Total Organic	N/A		Drinking Water	0.56 mg/L	10 mL	0.56 mg/L	1	0.07	0.50			6/19/19 20:39:00	N	I
K1905666-001	Carbon, Total Organic	N/A		Ground Water	1.82 mg/L	10 mL	1.82 mg/L	1	0.07	0.50			6/19/19 21:07:00	N	II
K1905666-002	Carbon, Total Organic	N/A		Ground Water	0.99 mg/L	10 mL	0.99 mg/L	1	0.07	0.50			6/19/19 22:05:00	N	II
K1905666-003	Carbon, Total Organic	N/A		Ground Water	2.18 mg/L	10 mL	10.9 mg/L	5	0.4	2.5			6/19/19 22:33:00	N	II
K1905666-004	Carbon, Total Organic	N/A		Ground Water	0.39 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/19/19 23:01:00	N	II
K1905666-005	Carbon, Total Organic	N/A		Ground Water	1.90 mg/L	10 mL	1.90 mg/L	1	0.07	0.50			6/19/19 23:29:00	N	II
K1905666-006	Carbon, Total Organic	N/A		Surface Water	11.07 mg/L	10 mL	11.1 mg/L	1	0.07	0.50			6/19/19 23:57:00	N	II
K1905676-001	Carbon, Total Organic	N/A		Water	2.04 mg/L	10 mL	2.04 mg/L	1	0.07	0.50			6/20/19 05:08:00	N	IV
K1905696-001	Carbon, Total Organic	N/A		Water	2.85 mg/L	10 mL	143 mg/L	50	4	25			6/19/19 18:18:00	N	II
K1905696-002	Carbon, Total Organic	N/A		Water	60.28 mg/L	10 mL	121 mg/L	2	0.2	1.0			6/19/19 18:47:00	N	II
K1905696-003	Carbon, Total Organic	N/A		Water	50.96 mg/L	10 mL	102 mg/L	2	0.2	1.0			6/19/19 19:15:00	N	II
KQ1908617-01	Carbon, Total Organic	DUP	K1905612-002	Water	0.52 mg/L	10 mL	0.52 mg/L	1	0.07	0.50		26*	6/20/19 00:53:00	N	II
KQ1908617-02	Carbon, Total Organic	MS	K1905612-002	Water	25.64 mg/L	10 mL	25.6 mg/L	1	0.07	0.50	100		6/20/19 01:21:00	N	II
KQ1908617-03	Carbon, Total Organic	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/19/19 17:34:00	N	II
KQ1908617-04	Carbon, Total Organic	LCS		Water	24.04 mg/L	10 mL	24.0 mg/L	1	0.07	0.50	96		6/19/19 17:49:00	N	II
KQ1908617-05	Carbon, Total Organic	DUP	K1905696-001	Water	2.89 mg/L	10 mL	144 mg/L	50	4	25		1	6/19/19 18:18:00	N	II
KQ1908617-06	Carbon, Total Organic	DUP	K1905696-002	Water	63.21 mg/L	10 mL	126 mg/L	2	0.2	1.0		5	6/19/19 18:47:00	N	II
KQ1908617-07	Carbon, Total Organic	DUP	K1905696-003	Water	50.76 mg/L	10 mL	102 mg/L	2	0.2	1.0		<1	6/19/19 19:15:00	N	II
KQ1908617-08	Carbon, Total Organic	DUP	K1905420-001	Water	3.19 mg/L	10 mL	64 mg/L	20	2	10		NC	6/19/19 20:11:00	N	II
KQ1908617-09	Carbon, Total Organic	DUP	K1905652-001	Drinking Water	0.56 mg/L	10 mL	0.56 mg/L	1	0.07	0.50		<1	6/19/19 20:39:00	N	I
KQ1908617-10	Carbon, Total Organic	DUP	K1905666-001	Ground Water	1.79 mg/L	10 mL	1.79 mg/L	1	0.07	0.50		2	6/19/19 21:07:00	N	II
KQ1908617-11	Carbon, Total Organic	DUP	K1905666-002	Ground Water	0.97 mg/L	10 mL	0.97 mg/L	1	0.07	0.50		1	6/19/19 22:05:00	N	II
KQ1908617-12	Carbon, Total Organic	DUP	K1905666-003	Ground Water	2.09 mg/L	10 mL	10.5 mg/L	5	0.4	2.5		4	6/19/19 22:33:00	N	II
KQ1908617-13	Carbon, Total Organic	DUP	K1905666-004	Ground Water	0.37 mg/L	10 mL	0.37 mg/L J	1	0.07	0.50		NC	6/19/19 23:01:00	N	II
KQ1908617-14	Carbon, Total Organic	DUP	K1905666-005	Ground Water	1.90 mg/L	10 mL	1.90 mg/L	1	0.07	0.50		<1	6/19/19 23:29:00	N	II

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

Printed 6/25/19 17:02

Results Summary

06/26/19

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 640162 **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
KQ1908617-15	Carbon, Total Organic	DUP	K1905666-006	Surface Water	11.15 mg/L	10 mL	11.2 mg/L	1	0.07	0.50		<1	6/19/19 23:57:00	N	II
KQ1908617-16	Carbon, Total Organic	DUP	K1905612-001	Water	15.06 mg/L	10 mL	15.1 mg/L	1	0.07	0.50		<1	6/20/19 00:25:00	N	II
KQ1908617-17	Carbon, Total Organic	DUP	K1905649-001	Water	6.11 mg/L	10 mL	611 mg/L	100	7	50		3	6/20/19 01:50:00	N	II
KQ1908617-18	Carbon, Total Organic	DUP	K1905649-002	Water	6.74 mg/L	10 mL	674 mg/L	100	7	50		<1	6/20/19 04:39:00	N	II
KQ1908617-19	Carbon, Total Organic	DUP	K1905676-001	Water	1.97 mg/L	10 mL	1.97 mg/L	1	0.07	0.50		3	6/20/19 05:08:00	N	IV
KQ1908617-20	Carbon, Total Organic	CCV		Water	23.70 mg/L	10 mL	23.7 mg/L	1					6/19/19 17:05:00	N	II
KQ1908617-21	Carbon, Total Organic	CCV		Water	24.21 mg/L	10 mL	24.2 mg/L	1					6/19/19 21:36:00	N	II
KQ1908617-22	Carbon, Total Organic	CCV		Water	24.22 mg/L	10 mL	24.2 mg/L	1					6/20/19 02:18:00	N	II
KQ1908617-23	Carbon, Total Organic	CCV		Water	24.15 mg/L	10 mL	24.2 mg/L	1					6/20/19 07:57:00	N	II
KQ1908617-24	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/19/19 17:19:00	N	II
KQ1908617-25	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/19/19 21:50:00	N	II
KQ1908617-26	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/20/19 02:33:00	N	II
KQ1908617-27	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/20/19 08:11:00	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:** 640170 **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
K1905595-002	Carbon, Dissolved Organic (DOC)	N/A		Water	33.33 mg/L	10 mL	33.3 mg/L	1	0.07	0.50			6/20/19 06:18:00	N	I
K1905633-001	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	8.82 mg/L	10 mL	8.82 mg/L	1	0.07	0.50			6/20/19 07:01:00	N	III
K1905675-001	Carbon, Dissolved Organic (DOC)	N/A		Water	5.20 mg/L	10 mL	5.20 mg/L	1	0.07	0.50			6/20/19 08:26:00	N	II
K1905679-001	Carbon, Dissolved Organic (DOC)	N/A		Water	1.85 mg/L	10 mL	1.85 mg/L	1	0.07	0.50			6/20/19 05:50:00	N	II
KQ1908621-01	Carbon, Dissolved Organic (DOC)	CCV		Water	24.22 mg/L	10 mL	24.2 mg/L	1					6/20/19 02:18:00	N	II
KQ1908621-02	Carbon, Dissolved Organic (DOC)	CCV		Water	24.15 mg/L	10 mL	24.2 mg/L	1					6/20/19 07:57:00	N	II
KQ1908621-03	Carbon, Dissolved Organic (DOC)	CCV		Water	24.53 mg/L	10 mL	24.5 mg/L	1					6/20/19 13:07:00	N	II
KQ1908621-04	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/20/19 02:33:00	N	II
KQ1908621-05	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/20/19 08:11:00	N	II
KQ1908621-06	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/20/19 13:21:00	N	II
KQ1908621-07	Carbon, Dissolved Organic (DOC)	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/20/19 17:34:00	N	II
KQ1908621-08	Carbon, Dissolved Organic (DOC)	LCS		Water	24.04 mg/L	10 mL	24.0 mg/L	1	0.07	0.50	96		6/20/19 17:49:00	N	II
KQ1908621-09	Carbon, Dissolved Organic (DOC)	DUP	K1905679-001	Water	2.13 mg/L	10 mL	2.13 mg/L	1	0.07	0.50		14*	6/20/19 05:50:00	N	II
KQ1908621-10	Carbon, Dissolved Organic (DOC)	DUP	K1905595-002	Water	32.64 mg/L	10 mL	32.6 mg/L	1	0.07	0.50		2	6/20/19 06:18:00	N	I
KQ1908621-11	Carbon, Dissolved Organic (DOC)	MS	K1905633-001	Surface Water	32.78 mg/L	10 mL	32.8 mg/L	1	0.07	0.50	96		6/20/19 07:29:00	N	III
KQ1908621-12	Carbon, Dissolved Organic (DOC)	DUP	K1905633-001	Surface Water	8.51 mg/L	10 mL	8.51 mg/L	1	0.07	0.50		4	6/20/19 07:01:00	N	III
KQ1908621-13	Carbon, Dissolved Organic (DOC)	DUP	K1905675-001	Water	5.29 mg/L	10 mL	5.29 mg/L	1	0.07	0.50		2	6/20/19 08:26:00	N	II

06/26/19

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Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 640173 **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
K1905436-001	Carbon, Total Organic (TOC)	N/A		Water	0.76 mg/L	10 mL	0.76 mg/L	1		0.50			6/20/19 09:09:00	N	IV
K1905436-002	Carbon, Total Organic (TOC)	N/A		Water	15.16 mg/L	10 mL	15.2 mg/L	1		0.50			6/20/19 10:04:00	N	IV
K1905436-003	Carbon, Total Organic (TOC)	N/A		Water	15.52 mg/L	10 mL	15.5 mg/L	1		0.50			6/20/19 11:01:00	N	IV
KQ1908622-01	Carbon, Total Organic (TOC)	CCV		Water	24.15 mg/L	10 mL	24.2 mg/L	1					6/20/19 07:57:00	N	IV
KQ1908622-02	Carbon, Total Organic (TOC)	CCV		Water	24.53 mg/L	10 mL	24.5 mg/L	1					6/20/19 13:07:00	N	IV
KQ1908622-03	Carbon, Total Organic (TOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50			6/20/19 08:11:00	N	IV
KQ1908622-04	Carbon, Total Organic (TOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50			6/20/19 13:21:00	N	IV
KQ1908622-05	Carbon, Total Organic (TOC)	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50			6/20/19 02:48:00	N	IV
KQ1908622-07	Carbon, Total Organic (TOC)	DUP	K1905436-001	Water	0.58 mg/L	10 mL	0.58 mg/L	1		0.50		26*	6/20/19 09:09:00	N	IV
KQ1908622-08	Carbon, Total Organic (TOC)	TRP	K1905436-001	Water	0.63 mg/L	10 mL	0.63 mg/L	1		0.50		14	6/20/19 09:09:00	N	IV
KQ1908622-09	Carbon, Total Organic (TOC)	QUAD	K1905436-001	Water	0.57 mg/L	10 mL	0.57 mg/L	1		0.50		13	6/20/19 09:09:00	N	IV
KQ1908622-10	Carbon, Total Organic (TOC)	DUP	K1905436-002	Water	15.32 mg/L	10 mL	15.3 mg/L	1		0.50		1	6/20/19 10:04:00	N	IV
KQ1908622-11	Carbon, Total Organic (TOC)	TRP	K1905436-002	Water	15.11 mg/L	10 mL	15.1 mg/L	1		0.50		<1	6/20/19 10:04:00	N	IV
KQ1908622-12	Carbon, Total Organic (TOC)	QUAD	K1905436-002	Water	15.28 mg/L	10 mL	15.3 mg/L	1		0.50		<1	6/20/19 10:04:00	N	IV
KQ1908622-13	Carbon, Total Organic (TOC)	MS	K1905436-003	Water	37.62 mg/L	10 mL	37.6 mg/L	1		0.50	88		6/20/19 11:56:00	N	IV
KQ1908622-14	Carbon, Total Organic (TOC)	MS	K1905436-003	Water	37.65 mg/L	10 mL	37.6 mg/L	1		0.50	89		6/20/19 11:56:00	N	IV
KQ1908622-15	Carbon, Total Organic (TOC)	MS	K1905436-003	Water	38.79 mg/L	10 mL	38.8 mg/L	1		0.50	93		6/20/19 11:56:00	N	IV
KQ1908622-16	Carbon, Total Organic (TOC)	MS	K1905436-003	Water	38.06 mg/L	10 mL	38.1 mg/L	1		0.50	90		6/20/19 11:56:00	N	IV
KQ1908622-17	Carbon, Total Organic (TOC)	DUP	K1905436-003	Water	15.38 mg/L	10 mL	15.4 mg/L	1		0.50		<1	6/20/19 11:01:00	N	IV
KQ1908622-18	Carbon, Total Organic (TOC)	TRP	K1905436-003	Water	15.59 mg/L	10 mL	15.6 mg/L	1		0.50		<1	6/20/19 11:01:00	N	IV
KQ1908622-19	Carbon, Total Organic (TOC)	QUAD	K1905436-003	Water	14.97 mg/L	10 mL	15.0 mg/L	1		0.50		2	6/20/19 11:01:00	N	IV
KQ1908622-20	Carbon, Total Organic (TOC)	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50			6/20/19 02:48:00	N	IV
KQ1908622-21	Carbon, Total Organic (TOC)	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50			6/20/19 02:48:00	N	IV

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

06/26/19

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 640173 **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
KQ1908622-22	Carbon, Total Organic (TOC)	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50			6/20/19 02:48:00	N	IV
KQ1908622-23	Carbon, Total Organic (TOC)	LCS		Water	24.40 mg/L	10 mL	24.4 mg/L	1		0.50	98		6/20/19 03:44:00	N	IV
KQ1908622-24	Carbon, Total Organic (TOC)	LCS		Water	24.37 mg/L	10 mL	24.4 mg/L	1		0.50	97		6/20/19 03:44:00	N	IV
KQ1908622-25	Carbon, Total Organic (TOC)	LCS		Water	24.58 mg/L	10 mL	24.6 mg/L	1		0.50	98		6/20/19 03:44:00	N	IV
KQ1908622-26	Carbon, Total Organic (TOC)	LCS		Water	25.13 mg/L	10 mL	25.1 mg/L	1		0.50	101		6/20/19 03:44:00	N	IV

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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	
CBA	RB	1			0.0000	0	<0.5	
2	C] CCV 25 ppm [25 p	1	23.703	0.0000	23.7028	23.7028	23.7	6/19/2019
3	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	6/19/2019
4	MB1	1	0.000	0.0000	0.0000	0	<0.5	6/19/2019
5	[TOC] LCS [24ppm]	1	24.040	0.0000	24.0395	24.0395	24.0	6/19/2019
6	K1905696-001	50	2.851	0.0000	2.8507	142.535	142.54	6/19/2019
7	K1905696-001d	50	2.889	0.0000	2.8893	144.465	144.5	6/19/2019
8	K1905696-002	2	60.276	0.0000	60.2758	120.5516	121	6/19/2019
9	K1905696-002d	2	63.213	0.0000	63.2132	126.4264	126.43	6/19/2019
10	K1905696-003	2	50.960	0.0000	50.9603	101.9206	101.92	6/19/2019
11	K1905696-003d	2	50.762	0.0000	50.7621	101.5242	101.5	6/19/2019
12	K1905420-001	20	3.186	0.0000	3.1857	63.714	63.71	6/19/2019
13	K1905420-001d	20	3.188	0.0000	3.1876	63.752	63.75	6/19/2019
14	K1905652-001	1	0.559	0.0000	0.5588	0.5588	0.56	6/19/2019
15	K1905652-001d	1	0.555	0.0000	0.5553	0.5553	0.6	6/19/2019
16	K1905666-001	1	1.825	0.0000	1.8248	1.8248	1.8	6/19/2019
17	K1905666-001d	1	1.786	0.0000	1.7856	1.7856	1.79	6/19/2019
18	C] CCV 25 ppm [25 p	1	24.206	0.0000	24.2059	24.2059	24.2	6/19/2019
19	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	6/19/2019
20	K1905666-002	1	0.987	0.0000	0.9868	0.9868	0.99	6/19/2019
21	K1905666-002d	1	0.972	0.0000	0.9722	0.9722	0.97	6/19/2019
22	K1905666-003	5	2.182	0.0000	2.1820	10.91	10.9	6/19/2019
23	K1905666-003d	5	2.095	0.0000	2.0945	10.4725	10.5	6/19/2019
24	K1905666-004	1	0.386	0.0000	0.3856	0.3856	<0.5	6/19/2019
25	K1905666-004d	1	0.373	0.0000	0.3734	0.3734	<0.5	6/19/2019

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: RD	Date Analyzed 6/20/19	
Reviewed By: [signature]	Date Reviewed 06/26/19	

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	K1905666-005	1	1.899	0.0000	1.8986	1.8986	1.90	6/19/2019
27	K1905666-005d	1	1.903	0.0000	1.9028	1.9028	1.90	6/19/2019
28	K1905666-006	1	11.070	0.0000	11.0697	11.0697	11.1	6/19/2019
29	K1905666-006d	1	11.154	0.0000	11.1544	11.1544	11.2	6/19/2019
30	K1905612-001	1	15.159	0.0000	15.1586	15.1586	15.2	6/20/2019
31	K1905612-001d	1	15.061	0.0000	15.0612	15.0612	15.1	6/20/2019
32	K1905612-002	1	0.670	0.0000	0.6698	0.6698	0.7	6/20/2019
33	K1905612-002d	1	0.518	0.0000	0.5177	0.5177	0.5	6/20/2019
34	K1905612-002ms	1	25.640	0.0000	25.6395	25.6395	25.6	6/20/2019
35	K1905649-001	100	5.941	0.0000	5.9406	594.06	594.1	6/20/2019
36	K1905649-001d	100	6.113	0.0000	6.1125	611.25	611.3	6/20/2019
37	C] CCV 25 ppm [25 p	1	24.215	0.0000	24.2154	24.2154	24.2	6/20/2019
38	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	6/20/2019
39	K1905649-002	100	6.702	0.0000	6.7019	670.19	670.2	6/20/2019
40	K1905649-002d	100	6.736	0.0000	6.7361	673.61	673.6	6/20/2019
41	K1905676-001	1	2.039	0.0000	2.0387	2.0387	2.0	6/20/2019
42	K1905676-001d	1	1.973	0.0000	1.9730	1.973	2.0	6/20/2019
43	C] CCV 25 ppm [25 p	1	24.152	0.0000	24.1517	24.1517	24.2	6/20/2019
44	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	6/20/2019
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: [illegible]	Date Analyzed 6/20/19
Reviewed By: [illegible]	Date Reviewed 06/26/19

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	MB1	1	0.000	0.0000	0.0000	0	<0.5	6/19/2019
3	[TOC] LCS [24ppm]	1	24.040	0.0000	24.0395	24.0395	24.0	6/19/2019
4	C] CCV 25 ppm [25 p	1	24.215	0.0000	24.2154	24.2154	24.2	6/20/2019
5	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	6/20/2019
6	K1905679-001	1	1.847	0.0000	1.8474	1.8474	1.85	6/20/2019
7	K1905679-001d	1	2.126	0.0000	2.1259	2.1259	2.1	6/20/2019
8	K1905595-002	1	33.327	0.0000	33.3272	33.3272	33	6/20/2019
9	K1905595-002d	1	32.641	0.0000	32.6406	32.6406	32.64	6/20/2019
10	K1905633-001	1	8.820	0.0000	8.8200	8.82	8.82	6/20/2019
11	K1905633-001d	1	8.512	0.0000	8.5115	8.5115	8.5	6/20/2019
12	K1905633-001ms	1	32.783	0.0000	32.7829	32.7829	32.78	6/20/2019
13	C] CCV 25 ppm [25 p	1	24.152	0.0000	24.1517	24.1517	24.15	6/20/2019
14	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	6/20/2019
15	K1905675-001	1	5.197	0.0000	5.1974	5.1974	5.2	6/20/2019
16	K1905675-001d	1	5.289	0.0000	5.2894	5.2894	5.3	6/20/2019
17	C] CCV 25 ppm [25 p	1	24.534	0.0000	24.5337	24.5337	24.53	6/20/2019
18	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	6/20/2019
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:	BP	Date Analyzed	6/20/19	
Reviewed By:	[signature]	Date Reviewed	06/26/19	

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	MB2	1	0.000	0.0000	0.0000	0	<0.5	6/20/2019
3	MB2d	1	0.000	0.0000	0.0000	0	<0.5	6/20/2019
4	MB2t	1	0.000	0.0000	0.0000	0	<0.5	6/20/2019
5	MB2q	1	0.000	0.0000	0.0000	0	<0.5	6/20/2019
6	[TOC] LCS [24ppm]	1	24.396	0.0000	24.3955	24.3955	24.40	6/20/2019
7	[TOC] LCS [24ppm]d	1	24.371	0.0000	24.3706	24.3706	24.4	6/20/2019
8	[TOC] LCS [24ppm]t	1	24.577	0.0000	24.5773	24.5773	25	6/20/2019
9	[TOC] LCS [24ppm]q	1	25.130	0.0000	25.1299	25.1299	25.13	6/20/2019
10	C] CCV 25 ppm [25 p	1	24.152	0.0000	24.1517	24.1517	24.15	6/20/2019
11	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	6/20/2019
12	K1905436-001	1	0.756	0.0000	0.7564	0.7564	0.76	6/20/2019
13	K1905436-001d	1	0.584	0.0000	0.5842	0.5842	0.58	6/20/2019
14	K1905436-001t	1	0.632	0.0000	0.6315	0.6315	0.63	6/20/2019
15	K1905436-001q	1	0.572	0.0000	0.5717	0.5717	0.6	6/20/2019
16	K1905436-002	1	15.158	0.0000	15.1581	15.1581	15.2	6/20/2019
17	K1905436-002d	1	15.322	0.0000	15.3222	15.3222	15.32	6/20/2019
18	K1905436-002t	1	15.114	0.0000	15.1136	15.1136	15.1	6/20/2019
19	K1905436-002q	1	15.284	0.0000	15.2844	15.2844	15.3	6/20/2019
20	K1905436-003	1	15.516	0.0000	15.5164	15.5164	15.52	6/20/2019
21	K1905436-003d	1	15.378	0.0000	15.3778	15.3778	15.38	6/20/2019
22	K1905436-003t	1	15.587	0.0000	15.5870	15.587	15.6	6/20/2019
23	K1905436-003q	1	14.969	0.0000	14.9685	14.9685	15.0	6/20/2019
24	K1905436-003ms	1	38.057	0.0000	38.0574	38.0574	38.06	6/20/2019
25	K1905436-003msd	1	38.794	0.0000	38.7936	38.7936	38.79	6/20/2019

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: RD	Date Analyzed 6/20/19	
Reviewed By: [signature]	Date Reviewed 06/20/19	

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	K1905436-003	1	37.649	0.0000	37.6492	37.6492	37.65	6/20/2019
27	K1905436-003	1	37.625	0.0000	37.6247	37.6247	37.62	6/20/2019
28	C] CCV 25 ppm [25 p	1	24.534	0.0000	24.5337	24.5337	24.5	6/20/2019
29	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	6/20/2019
30		1		0.0000	0.0000	0	<0.5	
31		1		0.0000	0.0000	0	<0.5	
32		1		0.0000	0.0000	0	<0.5	
33		1		0.0000	0.0000	0	<0.5	
34		1		0.0000	0.0000	0	<0.5	
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:	Bel	Date Analyzed	6/20/19
Reviewed By:		Date Reviewed	06/20/19

TOC: 640162, 640173
DOC: 640170

Schedule: 06192019

Version: 2
Instrument: Fusion1
Last Saved by: Fusion1 (Fusion1)
Last Saved on: 2019/06/19 15:32 - 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	K1905696-001.08 50x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
4	Sample	K1905696-002.08 2x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
5	Sample	K1905696-003.08 2x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
6	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
7	Sample	K1905420-001.02 20x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
8	Sample	K1905652-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
9	Sample	K1905666-001.01	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
10	Sample	K1905666-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
11	Sample	K1905666-003.01 5x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
12	Sample	K1905666-004.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
13	Sample	K1905666-005.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
14	Sample	K1905666-006.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
15	Sample	K1905612-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
16	Sample	K1905612-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
17	Sample	K1905612-002.01 ms	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
18	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
19	Sample	K1905649-001.01 100x	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)	4	True	Ready
C	Check Standard	[TOC] LCS [24.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
21	Sample	K1905649-002.01 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
22	Sample	K1905676-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
23	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
24	Sample	K1905679-001.05 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
25	Sample	K1905595-002 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
26	Sample	FB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
27	Sample	K1905633-001.15 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
28	Sample	K1905633-001.15 ms 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
29	Sample	K1905675-001.02 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
30	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
31	Sample	K1905436-001.01	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
32	Sample	K1905436-002.01	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
33	Sample	K1905436-003.01	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
34	Sample	K1905436-003.01 ms	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
35	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 - 06192019
Wednesday, June 19, 2019 02:52 PM

(View - Reps, Unused Reps, Meta-Data, Signature, History)
Printed on 2019/06/24 14:49 - Monday

Report Summary Information

Company Location:	Gen Chem Lab		
Schedule Name:	06192019	Engine Version:	1.1.5.1
Instrument Name:	Fusion1	Firmware Version:	1.2.0696
Report Version:	1 of 1	Connection:	RS232 COM1
Report Creation by Operators (schedule version):	Fusion1 (Fusion1) (v1) Fusion1 (Fusion1) (v2)		
Comment:			

Report Results

06/20/19

Sample Type: Clean — From Schedule Version 1

	Pos	Analysis Type	Sample ID	Start Time
◈	(clean)		Clean	2019/06/19 14:52

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	8.76	19.59	10.83	49.44	05:22
2	TC Clean	10.59	14.04	3.45	50.49	04:02
3	TC Clean	2.18	5.58	3.40	50.33	03:44
4	TC Clean	1.63	4.83	3.20	50.68	03:45

Sample Type: Clean — From Schedule Version 2

	Pos	Analysis Type	Sample ID	Start Time
◈	(clean)		Clean	2019/06/19 15:32

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	11.74	14.96	3.22	49.78	05:23
2	TC Clean	4.41	7.63	3.22	50.65	04:03
3	TC Clean	1.69	4.97	3.28	50.82	03:47
4	TC Clean	1.18	4.56	3.38	50.79	03:49

Sample Type: Clean — From Schedule Version 2

	Pos	Analysis Type	Sample ID	Start Time
*	(clean)		Clean	2019/06/19 15:54

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	0.83	4.15	3.32	49.83	05:23
2	TC Clean	3.04	6.29	3.25	50.23	04:05
3	TC Clean	1.33	4.50	3.18	50.38	03:48
4	TC Clean	1.16	4.35	3.19	50.64	03:51

Sample Type: Blank (Creating v1267) — From Schedule Version 2

	Pos	Analysis Type	Sample ID	Start Time
*	(blank)		Reagent/Acid Blank	2019/06/19 16:16

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	0.73	3.88	3.14	49.26	05:14
2	TC Clean	2.78	6.04	3.27	50.81	04:04
3	TC Clean	1.31	4.64	3.33	50.62	03:48
4	TC Clean	1.38	4.45	3.07	50.57	03:57
5	Reagent Blank	3.58	6.84	3.26	50.32	05:09
6	Acid Blank	0.94	4.17	3.23	49.42	05:28

Sample Type: Sample — From Schedule Version 2

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	D	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/19 16:50

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.62	11.97	3.35	51.11	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7546 (IC) (v1267)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

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)	23.7028 ppm (PASS)	0.0000 ppm	0%	2019/06/19 17:05

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.7028	237.0285	170.36	173.70	3.34	51.18	10:29

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

Sample Type: Check Standard --> CCB — From Schedule Version 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%	2019/06/19 17:19

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	6.01	9.33	3.32	51.16	10:33

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

Sample Type: Sample — From Schedule Version 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%	2019/06/19 17:34

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.78	8.93	3.15	51.16	10:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7546 (IC) (v1267)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

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)	24.0395 ppm (PASS)	0.0000 ppm	0%	2019/06/19 17:49

Pos	Base Analysis	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time

	Type									
C	TOC	25.0 ppm	1	24.0395	240.3947	172.64	175.86	3.21	51.19	10:29

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

Sample Type: Sample — From Schedule Version 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%	2019/06/19 18:04

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.90	11.08	3.18	51.07	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7546 (IC) (v1267)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	3	TOC	K1905696-001.08 50x	2.8700 ppm	0.0273 ppm	0.9500%	2019/06/19 18:18

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.8507	28.5070	28.10	31.40	3.29	50.97	10:32
2	TOC	2.8893	28.8929	28.37	31.46	3.10	50.92	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7546 (IC) (v1267)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	4	TOC	K1905696-002.08 2x	61.7445 ppm	2.0771 ppm	3.3600%	2019/06/19 18:47

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	60.2758	602.7577	417.90	421.01	3.11	50.80	10:27
2	TOC	63.2132	632.1319	437.84	441.24	3.40	50.71	10:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7546 (IC) (v1267)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	5	TOC	K1905696-003.08 2x	50.8612 ppm	0.1401 ppm	0.2800%	2019/06/19 19:15

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	50.9603	509.6028	354.67	358.07	3.40	50.63	10:31
2	TOC	50.7621	507.6213	353.32	356.69	3.36	50.55	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7546 (IC)	CAS_salt_010711	CAS_salt_010711

(v1267) (v4) (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	6	TOC	RB	0.0769 ppm	0.1087 ppm	141.4200%	2019/06/19 19:43

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.1537	1.5371	9.80	12.92	3.12	50.47	10:29
2	TOC	0.0000	0.0000	7.54	10.77	3.23	50.40	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7546 (IC) (v1267)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	7	TOC	K1905420-001.02 20x	3.1867 ppm	0.0014 ppm	0.0400%	2019/06/19 20:11

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.1857	31.8570	30.38	33.55	3.17	50.36	10:30
2	TOC	3.1876	31.8762	30.39	33.32	2.93	50.32	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7546 (IC) (v1267)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	8	TOC	K1905652-001.01	0.5571 ppm	0.0025 ppm	0.4500%	2019/06/19 20:39

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5588	5.5884	12.55	15.66	3.11	50.28	10:30
2	TOC	0.5553	5.5530	12.52	15.58	3.06	50.25	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7546 (IC) (v1267)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	9	TOC	K1905666-001.01	1.8052 ppm	0.0277 ppm	1.5400%	2019/06/19 21:07

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.8248	18.2476	21.14	24.37	3.23	50.25	10:29
2	TOC	1.7856	17.8557	20.88	24.05	3.18	50.23	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7546 (IC) (v1267)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

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)	24.2059 ppm (PASS)	0.0000 ppm	0%	2019/06/19 21:36

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.2059	242.0594	173.77	176.94	3.17	50.25	10:33

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

Sample Type: Check Standard --> CCB

From Schedule Version 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%	2019/06/19 21:50

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	6.15	9.44	3.29	50.25	10:27

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

Sample Type: Sample

From Schedule Version 2

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	10	TOC	K1905666-002.01	0.9795 ppm	0.0103 ppm	1.0500%	2019/06/19 22:05

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.9868	9.8680	15.45	18.61	3.16	50.25	10:27
2	TOC	0.9722	9.7222	15.35	18.56	3.20	50.24	10:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7546 (IC) (v1267)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	11	TOC	K1905666-003.01 5x	2.1383 ppm	0.0619 ppm	2.8900%	2019/06/19 22:33

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.1820	21.8201	23.57	26.76	3.19	50.27	10:25
2	TOC	2.0945	20.9450	22.97	26.09	3.11	50.26	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7546 (IC) (v1267)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	12	TOC	K1905666-004.01	0.3795 ppm	0.0086 ppm	2.2800%	2019/06/19 23:01

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.3856	3.8559	11.37	14.58	3.20	50.27	10:28
2	TOC	0.3734	3.7336	11.29	14.44	3.16	50.26	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7546 (IC) (v1267)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	13	TOC	K1905666-005.01	1.9007 ppm	0.0030 ppm	0.1600%	2019/06/19 23:29

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.8986	18.9857	21.64	24.80	3.16	50.26	10:29
2	TOC	1.9028	19.0284	21.67	24.86	3.19	50.27	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7546 (IC) (v1267)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	14	TOC	K1905666-006.01	11.1120 ppm	0.0599 ppm	0.5400%	2019/06/19 23:57

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	11.0697	110.6968	83.90	87.12	3.22	50.29	10:28
2	TOC	11.1544	111.5439	84.47	87.68	3.21	50.27	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7546 (IC) (v1267)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	15	TOC	K1905612-001.01	15.1099 ppm	0.0689 ppm	0.4600%	2019/06/20 00:25

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	15.1586	151.5855	111.65	114.59	2.94	50.27	10:30
2	TOC	15.0612	150.6117	110.99	113.91	2.92	50.26	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7546 (IC) (v1267)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	16	TOC	K1905612-002.01	0.5938 ppm	0.1075 ppm	18.1100%	2019/06/20 00:53

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.6698	6.6977	13.30	16.42	3.12	50.27	10:27

2	TOC	0.5177	5.1774	12.27	15.48	3.22	50.21	10:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7546 (IC) (v1267)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
17	TOC	K1905612-002.01 ms	25.6395 ppm	0.0000 ppm	0.0000%	2019/06/20 01:21

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	25.6395	256.3949	182.79	185.79	3.00	50.23	10:33

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7546 (IC) (v1267)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
18	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/20 01:36

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.50	9.51	3.00	50.26	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7546 (IC) (v1267)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
19	TOC	K1905649-001.01 100x	6.0265 ppm	0.1216 ppm	2.0200%	2019/06/20 01:50

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	5.9406	59.4059	49.08	52.23	3.15	50.28	10:26
2	TOC	6.1125	61.1251	50.25	53.41	3.17	50.28	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7546 (IC) (v1267)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

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)	24.2154 ppm (PASS)	0.0000 ppm	0%	2019/06/20 02:18

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.2154	242.1537	173.84	176.87	3.04	50.29	10:28

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

Sample Type: Check Standard --> CCB

From Schedule Version 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%	2019/06/20 02:33

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.85	9.22	3.37	50.32	10:34

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

Sample Type: Sample

From Schedule Version 2

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	20	TOC	MB2	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/20 02:48

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.16	8.40	3.24	50.32	10:29
2	TOC	0.0000	0.0000	5.09	8.28	3.19	50.31	10:28
3	TOC	0.0000	0.0000	4.93	8.25	3.32	50.31	10:23
4	TOC	0.0000	0.0000	5.00	8.18	3.18	50.34	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7546 (IC) (v1267)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

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)	24.6184 ppm (PASS)	0.3533 ppm	1.43%	2019/06/20 03:44

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	24.3955	243.9554	175.06	178.27	3.21	50.33	10:30
C	TOC	25.0 ppm	2	24.3706	243.7065	174.89	178.24	3.35	50.33	10:27
C	TOC	25.0 ppm	3	24.5773	245.7734	176.29	179.65	3.36	50.34	10:26
C	TOC	25.0 ppm	4	25.1299	251.2994	180.04	183.46	3.42	50.42	10:28

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

Sample Type: Sample

From Schedule Version 2

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	21	TOC	K1905649-002.01 100x	6.7190 ppm	0.0242 ppm	0.3600%	2019/06/20 04:39

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	6.7019	67.0194	54.25	57.45	3.21	50.35	10:29
2	TOC	6.7361	67.3612	54.48	57.65	3.17	50.34	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7546 (IC) (v1267)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	22	TOC	K1905676-001.01	2.0058 ppm	0.0465 ppm	2.3200%	2019/06/20 05:08

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.0387	20.3867	22.59	25.87	3.28	50.40	10:25
2	TOC	1.9730	19.7296	22.15	25.40	3.25	50.37	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7546 (IC) (v1267)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	23	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/20 05:36

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.38	9.66	3.28	50.37	10:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7546 (IC) (v1267)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	24	TOC	K1905679-001.05 doc	1.9867 ppm	0.1969 ppm	9.9100%	2019/06/20 05:50

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.8474	18.4745	21.30	24.55	3.26	50.44	10:29
2	TOC	2.1259	21.2588	23.18	26.53	3.34	50.37	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7546 (IC) (v1267)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	25	TOC	K1905595-002 doc	32.9839 ppm	0.4855 ppm	1.4700%	2019/06/20 06:18

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	33.3272	333.2724	234.98	238.25	3.27	50.38	10:27

2	TOC	32.6406	326.4059	230.32	233.48	3.17	50.36	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7546 (IC) (v1267)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	26	TOC	FB	2.0731 ppm	0.0000 ppm	0.0000%	2019/06/20 06:46

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.0731	20.7314	22.83	26.20	3.38	50.37	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7546 (IC) (v1267)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	27	TOC	K1905633-001.15 doc	8.6657 ppm	0.2181 ppm	2.5200%	2019/06/20 07:01

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	8.8200	88.1996	68.62	71.92	3.29	50.38	10:27
2	TOC	8.5115	85.1147	66.53	69.73	3.20	50.35	10:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7546 (IC) (v1267)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	28	TOC	K1905633-001.15 ms doc	28.8315 ppm	5.5882 ppm	19.3800%	2019/06/20 07:29

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	32.7829	327.8290	231.28	234.56	3.28	50.35	10:26
2	TOC	24.8801	248.8006	177.64	181.15	3.51	50.33	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7546 (IC) (v1267)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

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)	24.1517 ppm (PASS)	0.0000 ppm	0%	2019/06/20 07:57

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.1517	241.5173	173.40	176.64	3.24	50.33	10:35

Completion State	Success Action	Method	Calibration	STD Conc - Pos B

Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	50 ppmC

Sample Type: Check Standard --> CCB — From Schedule Version 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%	2019/06/20 08:11

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	7.36	10.52	3.15	50.33	10:31

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

Sample Type: Sample — From Schedule Version 2

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	29	TOC	K1905675-001.02	5.2434 ppm	0.0651 ppm	1.2400%	2019/06/20 08:26

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	5.1974	51.9736	44.03	47.27	3.24	50.30	10:31
2	TOC	5.2894	52.8943	44.66	47.83	3.17	50.30	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7546 (IC) (v1267)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	30	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/20 08:54

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.04	10.17	3.12	50.29	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7546 (IC) (v1267)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	31	TOC	K1905436-001.01	0.6359 ppm	0.0843 ppm	13.2600%	2019/06/20 09:09

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.7564	7.5639	13.89	16.99	3.10	50.25	10:25
2	TOC	0.5842	5.8418	12.72	15.96	3.24	50.24	10:30
3	TOC	0.6315	6.3147	13.04	16.19	3.15	50.21	10:29

4	TOC	0.5717	5.7165	12.64	15.78	3.14	50.23	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7546 (IC) (v1267)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	32	TOC	K1905436-002.01	15.2196 ppm	0.0996 ppm	0.6500%	2019/06/20 10:04

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	15.1581	151.5811	111.65	114.73	3.08	50.19	10:29
2	TOC	15.3222	153.2223	112.76	116.06	3.30	50.18	10:25
3	TOC	15.1136	151.1362	111.34	114.71	3.36	50.14	10:29
4	TOC	15.2844	152.8436	112.50	115.59	3.09	50.11	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7546 (IC) (v1267)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	33	TOC	K1905436-003.01	15.3624 ppm	0.2766 ppm	1.8000%	2019/06/20 11:01

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	15.5164	155.1639	114.08	117.10	3.02	50.06	10:29
2	TOC	15.3778	153.7777	113.14	116.13	2.99	50.04	10:25
3	TOC	15.5870	155.8696	114.56	117.59	3.03	50.07	10:29
4	TOC	14.9685	149.6851	110.36	113.47	3.11	50.04	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7546 (IC) (v1267)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	34	TOC	K1905436-003.01 ms	38.0312 ppm	0.5456 ppm	1.4300%	2019/06/20 11:56

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	38.0574	380.5740	267.09	270.20	3.11	49.97	10:26
2	TOC	38.7936	387.9356	272.08	275.30	3.21	49.98	10:26
3	TOC	37.6492	376.4917	264.32	267.59	3.27	49.97	10:31
4	TOC	37.6247	376.2472	264.15	267.34	3.19	49.99	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7546 (IC) (v1267)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	35	TOC	RB	0.5487 ppm	0.0000 ppm	0.0000%	2019/06/20 12:52

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5487	5.4867	12.48	15.66	3.18	49.97	10:33

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7546 (IC) (v1267)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

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)	24.5337 ppm (PASS)	0.0000 ppm	0%	2019/06/20 13:07

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.5337	245.3373	176.00	178.99	2.99	49.93	10:29

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

Sample Type: Check Standard --> CCB — From Schedule Version 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%	2019/06/20 13:21

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	8.01	11.36	3.35	49.91	10:33

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

Meta Data Used in this Report

Blanks

Version	Reagent (Abs)	Acid (Abs)	DI IC (Abs)	DI TC (Abs)	DI TOC (Abs)	Save Time	Operator
v1266	2.2187	1.4940	0.0000	0.0000	0.0000	2019/06/14 17:57	Fusion1 (Fusion1)
v1267	1.1920	0.9390	0.0000	0.0000	0.0000	2019/06/19 16:50	Fusion1 (Fusion1)

Calibrations

Name: CAS_salt_010711 (TOC)

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

Basic Analysis Type: TOC

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

Methods

Name: CAS_salt_010711 (TOC)

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

Parameter	Value
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	2019/06/20 13:37

ALS Environmental

StarLIMS Run: 640162, 640173, 640170

Analysis: TOC/DOC

Method: 415.1, SM 5310 C, 9060, 9060A

CCV: 11-GEN-05-77K 50 ppm LCS: 11-GEN-05-77D 25.0 ppm

ICAL Date: 3/6/19

ICAL ID: 11-GEN-05-76H

ICS ID: 11-GEN-05-74A

ICS TV: 25.0 ppm ICS % R = 2

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

Sodium Persulfate: 11-GEN-05-78I

21 % H3PO4: 11-GEN-05-78H

Equipment ID: K-TOC-03

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

FILTER ID: FE1165 6/15/19

Analyzed By:	BCD / HLM	Date Analyzed:	6/19/19
Reviewed By:	[signature]	Date Reviewed:	06/20/19

Case Narrative

Method: 6850
Analysis: Perchlorate
Analysis SOP: LC-MS-CLO4
ALS WO ID(s): 1917488, 1917489, 1917672

Client: ALS Laboratories (Houston, TX)
Matrix: Water
ELMS Batch (HBN): 2264 (242398)

General Set Information: There were thirteen 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 samples 1917489001 and 1917672006 were analyzed and reported from 1:100 dilutions. Field sample 1917672001 was analyzed and reported from a 1:1,000 dilution. The reporting limits have been adjusted accordingly.

Method QC data: The method blank (LMB 660892) was less than 1/2 the CRDL. The recovery for the LCS (660893) was within acceptable parameters.

MS/MSD Analysis: MS/MSD was performed on sample 1917488001 (Client ID: LH18/24-SP650_061219_BIX). 5.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. The spike target was 5.µg/L. The MS/MSD percent recoveries were within the performance limits. The MS/MSD failed QC acceptance criteria for relative percent difference. The Matrix Spike and Matrix Spike duplicate is reported for the clients' information only. The sample matrix may be inappropriate for the method selected.

Instrument QC: Instrument initial and continuing calibrations were performed in accordance with published procedures.

NC/CAR(s): NA

Sample Calculation: Samples were reported in 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 – 660890) is reported from the analysis of the Laboratory Control Sample (LCS – 660893) at a level of 4.0µg/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: 19MARI03) along with datafiles 27JUND03/12/20.

Thomas Bosch July 1, 2019
Analyst Date

ANALYTICAL REPORT

Report Date: July 01, 2019

RJ Modashia
ALS Environmental (Houston)
10450 Stancliff Road
Suite 210
Houston, TX 77099

Phone: 281 530-5656

E-mail: RJ.Modashia@ALSGlobal.com

Workorder: **34-1917488**
Project ID: HS19060672
Purchase Order: HS19060672
Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
LH18/24-SP650_061219_BIX	1917488001	06/12/19	06/18/19	

ANALYTICAL REPORT

Workorder: 34-1917488
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **LH18/24-SP650_061219_BIX** | Sampling Site: NA | Collected: 06/12/2019
Lab ID: 1917488001 | Media: 125 mL Nalgene | Received: 06/18/2019
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/2264 (HBN: 242398) | **Percent Solid:** NA
Analyzed: 06/27/2019 09:42 | **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

Comments

Quality Control: EPA 6850, DoD QSM - (HBN: 242398)

Field samples 1917489001 and 1917672006 were analyzed and reported from 1:100 dilutions. Field sample 1917672001 was analyzed and reported from a 1:1,000 dilution. The reporting limits have been adjusted accordingly.

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

Method	Analyst	Peer Review
EPA 6850, DoD QSM	/S/ Thomas Bosch 07/01/2019 10:47	/S/ Stephen Brose 07/01/2019 13:43

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: 34-1917488
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
	Nevada (TNI)	UT00953201-1	https://ndep.nv.gov/water/lab-certification
	Iowa (TNI)	IA# 376	http://www.shl.uiowa.edu/labcert/idnr/
	Kansas	E-10416	http://www.kdheks.gov/envlab/disclaimer.html
	Oklahoma (TNI)	IJ# 9980	http://www.deq.state.ok.us/CSDnew/labcert.htm
	Texas (TNI)	T104704456-18-9	https://www.tceq.texas.gov/assets/public/compliance/compliance_support/qa/txnelap_lab_list.pdf
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: 1917488

Limits:	Client SOW/Contract Specified	**Preparation:**	NA
Basis:	DoD QSM	**Batch:**	NA
		Prepared By:	NA
Analysis:	EPA 6850, DoD QSM		
Batch:	ELMS/2264 (HBN: 242398)		
Analyzed By:	Thomas Bosch		

Blank

LMB: 660892
Analyzed: 06/27/2019 09:28
Units: ug/L

Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 660893
Analyzed: 06/27/2019 09:00
Dilution: 1
Units: ug/L

Analyte	Result	Target	% Rec	QC Limits	
Perchlorate	4.27	4.00	107	78.8	123.8

Matrix Spike - Matrix Spike Duplicate

	Sample	MS	MSD
	1917488001	660894	660895
Analyzed:	06/27/2019 09:42	06/27/2019 09:56	06/27/2019 10:10
Dilution:	1	1	1
Units:	ug/L	ug/L	ug/L

Analyte	Result	Result	Target	% Rec	QC Limits		Result	% Rec		RPD	QC Limits	
Perchlorate	ND	5.13	5	103	78.8	123.8	4.06	81.2	#	23.3	0.0	20.0

Comments

Field samples 1917489001 and 1917672006 were analyzed and reported from 1:100 dilutions. Field sample 1917672001 was analyzed and reported from a 1:1,000 dilution. The reporting limits have been adjusted accordingly.

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

Analyst	Peer Review
/S/ Thomas Bosch	/S/ Stephen Brose
07/01/2019 10:55	07/01/2019 13:43

Symbols and Definitions

- * - Analyte above reporting limit or outside of control limits
- ▲ - Sample result is greater than 4 times the spike added
- ◆ - Sample and Matrix Duplicate less than 5 times the reporting limit
- ● - Result is above the calibration range
- # - The Matrix Spike, Matrix Spike duplicate or Matrix Duplicate is reported for your information only. The sample matrix may be inappropriate for the method selected.

RPD - Relative % Difference (Spike / Spike Duplicate)
ND - Not Detected (U - Qualifier also flags analyte as not detected)
NA - Not Applicable
QC results are not adjusted for moisture correction, where applicable

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

18698/2

W 1917488

# of Custody

SAMPLING STATE: **Dept of Defense** **COC ID:** **11595**

1917488

SUBCONTRACT TO:

ALS Laboratory Group
960 LeVoy Dr
Salt Lake City, UT 84123 **Phone:** +1 801 266 7700

CUSTOMER INFORMATION:		**INVOICE INFORMATION:**	
Company:	ALS Houston	**Company:**	ALS Houston
Contact:	RJ Modashia	**Contact:**	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210	**Address:**	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656	**Phone:**	+1 281 530 5656
Email:	RJ.Modashia@alsglobal.com	**Reference:**	HS19060672
Alternate Contact:		**TSR:**	Danielle Winnings
Email:			

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS19060672-02**	**LH18/24-SP650_061219_BIX**	**Water**	**12 Jun 2019 14:00**
	SUB_Perch-6850			21 Jun 2019

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

QC Level: DOD IV (DoD Data Package)

Relinquished By: _____ Date/Time: 6/17/19 1800.

Received By: Jennifer Jassel Date/Time: 06-18-19 9:58

Cooler ID(s): _____ Temperature(s): _____

RIGHT OF MODIFICATIONS RESERVED

ALS Environmental

CHAIN-OF-CUSTODY

Project / Job / Task: HS19060672	*Split:*	**Workorder ID:** 1917488	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	06/12/2019 14:00	LH18/24-SP650_061219_BIX	1917488001		Water	A	1	A
2								
3								
4								
5								
6								
7								
8								
9								
10								

89 of 100

ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location
Walath, Julie	06/18/2019 09:58	ALS Sample Receiving	Sample Login
[signature]	6/18/19 1435	HC	Storage
R-33.1	6/26/19/08:22	T Brooks	6850

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

00939986

ALS-Salt Lake City-Related Information Report (CRIR)

Cooler or Container Information Checklist (Fill In or Circle)

Client Name: ALS Houston — Project/Task/Site: 191488

Date/Time of Receipt: 06-18-19 9:58 — 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	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.
1	C19 9706	1 °C	4	C19	°C	7	C19	°C
2	C19	°C	5	C19	°C	8	C19	°C
3	C19	°C	6	C19	°C	9	C19	°C

Taken By: Tanner Tassell (Signature) — T. Tanner Tassell (Printed Name) — 06-18-19 (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: _____

Must Deliver Next Business Day
Time and Tempature Sensitive!

ALS

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

SHIP DATE: 17JUN19
ACTWGT: 11.25 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: HS19060672/835 - RJ

FedEx Express

TUE - 18 JUN 3:00P
STANDARD OVERNIGHT

TRK# 0201 4809 7835 0551

AX BTFA

84123
UT-US SLC

Batch Worklist

Batch: ELMS/ 2264 **Created:** 6/27/2019 07:47 **Instrument:** **HBN:** 242398
Rule: EPA 6850, DoD QSM Water **Analyst:** T. Bosch **Status:** WP

Workorder: 1917488 [ENV_LVL4]
Workorder: 1917489 [ENV_LVL4]
Workorder: 1917672 [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	660889	CCV for HBN 242398 [ELMS/2264]				CCV	3		E685041C3Q	5311		7/1/2019	
2	660890	RLVS for HBN 242398 [ELMS/2264				RLVS	3		E685041C3Q	5311		7/1/2019	
3	660891	ICS for HBN 242398 [ELMS/2264]				ICS	3		E6850..D3Q	5311		7/1/2019	
4	660892	LMB for HBN 242398 [ELMS/2264]				LMB	3		E6850Q413Q	5311		7/1/2019	
5	660893	LCS for HBN 242398 [ELMS/2264]				LCS	3		E6850Q413Q	5311		7/1/2019	
6	1917488001	LH18/24-SP650_061219_BIX				SAMPLE	3	1917488001-A	E6850Q41.3	5480	7/10/2019	7/1/2019	
7	660894	LH18/24-SP650...(1917488001MS)				MS	3		E6850Q413Q	5311		7/1/2019	
8	660895	LH18/24-SP65...(1917488001MSD)				MSD	3		E6850Q413Q	5311		7/1/2019	
9	1917489001	18CPTMW22SW_061319				SAMPLE	3	1917489001-A	E6850Q41.3	5480	7/11/2019	7/1/2019	
10	1917489002	18CPTMW22DW_061319				SAMPLE	3	1917489002-A	E6850Q41.3	5480	7/11/2019	7/1/2019	
11	1917489003	18CPTMW22R_061319				SAMPLE	3	1917489003-A	E6850Q41.3	5480	7/11/2019	7/1/2019	
12	1917489004	MW20_061319				SAMPLE	3	1917489004-A	E6850Q41.3	5480	7/11/2019	7/1/2019	
13	1917489005	18CPTMW26SW_061319				SAMPLE	3	1917489005-A	E6850Q41.3	5480	7/11/2019	7/1/2019	
14	1917672001	MW7_061719				SAMPLE	3	1917672001-A	E6850Q41.3	5480	7/15/2019	7/3/2019	
15	1917672002	18CPTMW12DW_061719				SAMPLE	3	1917672002-A	E6850Q41.3	5480	7/15/2019	7/3/2019	
16	660896	CCV for HBN 242398 [ELMS/2264]				CCV	3		E685041C3Q	5311		7/1/2019	
17	1917672003	18CPTMW12SW_061719				SAMPLE	3	1917672003-A	E6850Q41.3	5480	7/15/2019	7/2/2019	
18	1917672004	18CPTMW12SW_061719_a				SAMPLE	3	1917672004-A	E6850Q41.3	5480	7/15/2019	7/2/2019	
19	1917672005	18CPTMW23SW_061719				SAMPLE	3	1917672005-A	E6850Q41.3	5480	7/15/2019	7/2/2019	
20	1917672006	18CPTMW23_061719				SAMPLE	3	1917672006-A	E6850Q41.3	5480	7/15/2019	7/2/2019	
21	1917672007	18W14_061719W_061719				SAMPLE	3	1917672007-A	E6850Q41.3	5480	7/15/2019	7/2/2019	
22	660897	CCV for HBN 242398 [ELMS/2264]				CCV	3		E685041C3Q	5311		7/1/2019	

00939989



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

ALS Work Order #'s & Sample #( )'s: 1917488 (001), 1917489 (001-05), 1917672 (001-07)
ELMS Batch/HBN ID: 2264 (242398)
Prep Date: 06/26/2019 Analysis Date: 06/27/2019 Analyst: T. Bosch
Analyte: **Perchlorate** Matrix: **Water** Method: **6850**
Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2019\JUN\27JUN19D.s
Reported DL: **1.0µg/L** Reported LOD: **2.0µg/L** Reported LOQ: **4.0µg/L**

SAMPLE PREPARATION/ANALYSIS:

Water: Samples were prepared by Thomas 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 AH015-4)/0.1% glacial acetic acid (JT-Baker Lot 04802).
Eluent B1: 95% ACN (B&J Lot AH015-4)/ 5% ASTM Type II water (ALS)/0.1% glacial acetic acid (JT-Baker Lot 04802).

STANDARDS: Internal Standard Spiking Solution Horizon# 43730. Dilutions of Working Standard Solution ID 43702 used for CCV's, LODV's, RLVS and IPC.

CALIBRATION CURVE: Used curve from 03/19/2019, sequence 19MAR19D.s Offline Quantitation Method: CLO4-DP2.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: 7 Injection Volume: 35µL
Column: KP-RPPX C8 separator, 250mm Mobile Phase: 70% Eluent A1; 30% Eluent B1

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: 4.0µL of QC Solution Horizon ID 47516 was used for LCS 660893; Target = 4.0µg/L. ASTM type II water was used for LMB 660892.

MS/MSD: The Matrix Spike and duplicate (MS/MSD) were performed on sample 1917488001 (Client ID: LH18/24-SP650_061219_BIX). 5.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. Spike target = 5.0µg/L.

COMMENTS:

1) Results reported in µg/L. Field samples 1917489001 and 1917672006 were analyzed and reported from 1:100 dilutions. Field sample 1917672001 was analyzed and reported from a 1:1,000 dilution. The reporting limits have been adjusted accordingly.
2) All QC, Blank, CCV, and MS/MSD results were within method parameters, except for the following. The MS/MSD – 660894/95 failed QC acceptance criteria for relative percent difference. The Matrix Spike and Matrix Spike duplicate is reported for the clients' information only. The sample matrix may be inappropriate for the method selected.
3) Sample data can be viewed at two directories within the ALS system: \\ALSLTWS013\LCMS\LCMS04\2019\JUN\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
4) Notebook: \\alsltws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2019\242398-DoD-ALS-Hstn LCMS4 or through \\ALSLTWS013\DATAREVIEW\HBN#
5) The Reporting Limit Verification Standard (RLVS – 660890) is reported from the analysis of the Laboratory Control Sample (LCS – 660893) at a level of 4.0µg/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: 19MARI03) along with datafiles 27JUND03/12/20.

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: 2264 HBN: 242398 Sample Set IDs if Applicable: 1917488/1917489/1917672	Analyst Initials	Reviewer Initials
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
Method Blanks 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 flags applied on QC reports; LCSs analyzed and meet acceptance criteria when performed	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 checked	TB	SB
Preparation and analysis calculations checked	TB	SB
NCRs are completed as necessary NC/CAR# _____	—	—
Report forms are complete and accurate	TB	SB
Manual integrations checked	TB	SB

STANDARD REPORT

Working Standard - CLO4 WRK

CLO4 WRK		Description - 6850 WKG Std 100.ug/L
Standard: 43702	**Created By:** Thomas Bosch	**Amount:** 10 mL
MFG: ALS/SLC	**Create Date:** 09/18/2018 02:09PM	**Expires:** 09/18/2019
MFG Lot: TNB: 09/18/2018		**Usable:** Yes
Pipette ID: Not Provided		**Lab Lot:** CLO4 WRK

Pos.	Analyte	Name	Concentration
			0.1 ug/mL
1	14797-73-0	Perchlorate	

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
43701	CLO4 INT	6850 Intermdt AccStd 10.ug/mL	CLO4 INT	0.1 mL	09/18/2019

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: No
Part ID: IC-PER-10X-1		Lab Lot: CLO4 STOCK

Pos.	Analyte	Name	Concentration 1000 ug/mL
1	14797-73-0	Perchlorate	

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: 43701
MFG: ALS/SLC
MFG Lot: TNB: 09/18/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/18/2018 02:09PM

Amount: 10 mL
Expires: 09/18/2019
Usable: Yes
Lab Lot: CLO4 INT

Pos.	Analyte	Name	Concentration
			10 ug/mL
1	14797-73-0	Perchlorate	

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
MFG: Ultra Scientific
MFG Lot: CP-0860
Part ID: ICC-013

Created By: Thomas Bosch
Create Date: 05/11/2017 01:05PM

Amount: 100 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL

STANDARD REPORT

Constituent

Working Standard - CLO4 QC INT

CLO4 QC INT — **Description - 6850 QC Intrmdt Std-QC 10ug/mL**

Standard: 47515
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

STANDARD REPORT

Working Standard - CLO4ISTDWRK

CLO4ISTDWRK — Description - Perchlorate ISTD Wrk 1,000ug/L

Standard: 43730	**Created By:** Thomas Bosch	**Amount:** 25 mL
MFG: ALS/SLC	**Create Date:** 09/20/2018 09:09AM	**Expires:** 09/20/2019
MFG Lot: TNB: 05/09/2018	**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
43729	CLO4ISTDSTK	Perchlorate ISTD Stock	CLO4ISTDSTK	0.25 mL	04/28/2026

STANDARD REPORT

Constituent

Stock Standard - CLO4ISTDSTK

CLO4ISTDSTK	Description - Perchlorate ISTD Stock

Standard: 43729	Created By: Thomas Bosch	Amount: 1 mL
MFG: Cambridge Isotope	Create Date: 09/20/2018 09:09AM	Expires: 04/28/2026
MFG Lot: SDFF-012A	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

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

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.

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

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*

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

GHS

Signal Word: None

Component		SRM #	Prepared Concentration (µg/mL)
ClO_4	Perchlorate	Ind. Std.	1000

The gravimetric uncertainty for this product is ±0.24%.
The final solution was checked against an independent standard to verify its concentration.
We use the highest purity raw materials available to minimize impurity levels in the final solution. Typically 99.999%+ pure starting materials are used as well as ASTM Type I 18 megohm deionized water.
All solutions are filtered through a 0.2 µm filter prior to being bottled.
All glassware used in preparation is Class A and calibrated regularly.
All weights are traceable through NIST, Test No. 822-275872-11
All bottles are triple rinsed with deionized water prior to use.
Shake bottle prior to use and do not pipette directly out of the bottle. Use only cleaned Class A volumetric glassware.
We certify the accuracy of this standard to be ±0.5% of the stated value until its expiration date provided it is kept tightly capped and stored under the conditions stated above.

Certified By: Meigan O'Leary
Meigan O'Leary, Inorganic QC Manager

For use in routine laboratory analysis.

AccuStandard

Cambridge Isotope Laboratories, Inc.

Certificate of Analysis

Quality Standards:
ISO Guide 34 • ISO/IEC 17025 • ISO 13485 • cGMP

23118

Product Name: (Isotopic Label & Enrichment Specification)	PERCHLORIC ACID, SODIUM SALT (18O4, 90%+) 100 UG/ML IN WATER
Lot Number:	SDDG-013
Catalog Number:	OLM-7310-S

Product Information

Chemical Purity Specification:	≥98%
Labeled CAS Number:	NA
Unlabeled CAS Number:	7601-89-0
MW*:	130.4
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.

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.

* *For isotopically labeled compounds, MW listed is for the fully enriched product.*

Approved by: T. J. Eckersley

Timothy J. Eckersley, Ph.D., Quality Assurance

Quality Control Tests and Results

QC Release Date	2/27/2014
Expiration Date	2/27/2024
Concentration Based on Gravimetry	102 µg/mL
Chemical Purity of Neat Material(s)	98%
LC/MS for Concentration	109.4 ± 2.8 µg/mL (k=2)

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Batch Report: C:\HPCHEM\1\DATA\27JUN19D\27JUN19S.B

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP2.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
*	660889 CCV@25	Vial 71	1	Control	1	1.82515e6	8.439	25.67350
*	660893 QC@4.0	Vial 72	1	Control	2	3.38083e5	8.214	4.26890
*	660891 ICS@4.0	Vial 73	1	Control	3	2.57330e5	7.965	3.92512
*	660892 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	1917488001	Vial 75	1	Sample	5	0.00000	0.000	0.00000
*	660894 174881S	Vial 76	1	Sample	6	2.62640e5	7.903	5.12768
*	660895 174881D	Vial 77	1	Sample	7	2.64844e5	7.941	4.05844
*	1917489001 100	Vial 78	1	Sample	8	4.17326e5	8.686	591.94538
*	1917489002	Vial 79	1	Sample	9	0.00000	0.000	0.00000
*	1917489003	Vial 80	1	Sample	10	0.00000	0.000	0.00000
*	1917489004	Vial 81	1	Sample	11	0.00000	0.000	0.00000
*	1917489005	Vial 82	1	Sample	12	0.00000	0.000	0.00000
*	1917672001 1K	Vial 83	1	Sample	13	1.57532e6	8.712	2.61220e4
*	1917672002	Vial 84	1	Sample	14	6.54028e4	7.973	1.24787
*	660896 CCV@25	Vial 71	1	Control	15	1.48921e6	8.624	25.51318
*	1917672003	Vial 85	1	Sample	16	0.00000	0.000	0.00000
*	1917672004	Vial 86	1	Sample	17	0.00000	0.000	0.00000
*	1917672005	Vial 87	1	Sample	18	0.00000	0.000	0.00000
*	1917672006 100	Vial 88	1	Sample	19	1.71986e6	8.736	2534.96449
*	1917672007	Vial 89	1	Sample	20	0.00000	0.000	0.00000
*	660897 CCV@25	Vial 71	1	Control	21	1.42516e6	8.651	24.42440

#*	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
*	660889 CCV@25	Vial 71	1	Control	1	5.48361e5	8.454	25.97496
*	660893 QC@4.0	Vial 72	1	Control	2	1.12796e5	8.202	4.63897
*	660891 ICS@4.0	Vial 73	1	Control	3	8.93833e4	7.980	4.42426
*	660892 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	1917488001	Vial 75	1	Sample	5	0.00000	0.000	0.00000
*	660894 174881S	Vial 76	1	Sample	6	8.68330e4	7.935	5.55768
*	660895 174881D	Vial 77	1	Sample	7	8.75585e4	7.960	4.36181
*	1917489001 100	Vial 78	1	Sample	8	1.40501e5	8.696	655.91363
*	1917489002	Vial 79	1	Sample	9	0.00000	0.000	0.00000
*	1917489003	Vial 80	1	Sample	10	0.00000	0.000	0.00000
*	1917489004	Vial 81	1	Sample	11	0.00000	0.000	0.00000
*	1917489005	Vial 82	1	Sample	12	0.00000	0.000	0.00000
*	1917672001 1K	Vial 83	1	Sample	13	4.80693e5	8.744	2.68224e4
*	1917672002	Vial 84	1	Sample	14	2.29889e4	7.974	1.29323
*	660896 CCV@25	Vial 71	1	Control	15	4.52707e5	8.622	26.10046
*	1917672003	Vial 85	1	Sample	16	0.00000	0.000	0.00000
*	1917672004	Vial 86	1	Sample	17	0.00000	0.000	0.00000
*	1917672005	Vial 87	1	Sample	18	0.00000	0.000	0.00000
*	1917672006 100	Vial 88	1	Sample	19	5.21595e5	8.762	2587.43586
*	1917672007	Vial 89	1	Sample	20	0.00000	0.000	0.00000
*	660897 CCV@25	Vial 71	1	Control	21	4.30118e5	8.688	24.80913

#*	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
*	660889 CCV@25	Vial 71	1	Control	1	2.15939e5	8.466	5.00000
*	660893 QC@4.0	Vial 72	1	Control	2	2.60134e5	8.243	5.00000
*	660891 ICS@4.0	Vial 73	1	Control	3	2.16232e5	7.969	5.00000
*	660892 LMB	Vial 74	1	Control	4	2.72547e5	8.630	5.00000
*	1917488001	Vial 75	1	Sample	5	2.27402e5	7.920	5.00000
*	660894 174881S	Vial 76	1	Sample	6	1.66848e5	7.932	5.00000
*	660895 174881D	Vial 77	1	Sample	7	2.14876e5	7.954	5.00000
*	1917489001 100	Vial 78	1	Sample	8	2.28283e5	8.729	500.00000
*	1917489002	Vial 79	1	Sample	9	2.07849e5	7.985	5.00000
*	1917489003	Vial 80	1	Sample	10	2.26487e5	8.403	5.00000

00940009

#	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
*	1917489004	Vial 81	1	Sample	11	1.93008e5	7.993	5.00000
*	1917489005	Vial 82	1	Sample	12	1.81500e5	7.840	5.00000
*	1917672001 1K	Vial 83	1	Sample	13	1.82987e5	8.737	5000.00000
*	1917672002	Vial 84	1	Sample	14	1.91018e5	8.001	5.00000
*	660896 CCV@25	Vial 71	1	Control	15	1.77368e5	8.624	5.00000
*	1917672003	Vial 85	1	Sample	16	1.65261e5	7.950	5.00000
*	1917672004	Vial 86	1	Sample	17	1.47928e5	7.939	5.00000
*	1917672005	Vial 87	1	Sample	18	1.93450e5	8.278	5.00000
*	1917672006 100	Vial 88	1	Sample	19	2.06241e5	8.740	500.00000
*	1917672007	Vial 89	1	Sample	20	1.87344e5	7.970	5.00000
*	660897 CCV@25	Vial 71	1	Control	21	1.77769e5	8.693	5.00000

*** End of Report ***

Sequence Table:

Method and Injection Info Part:

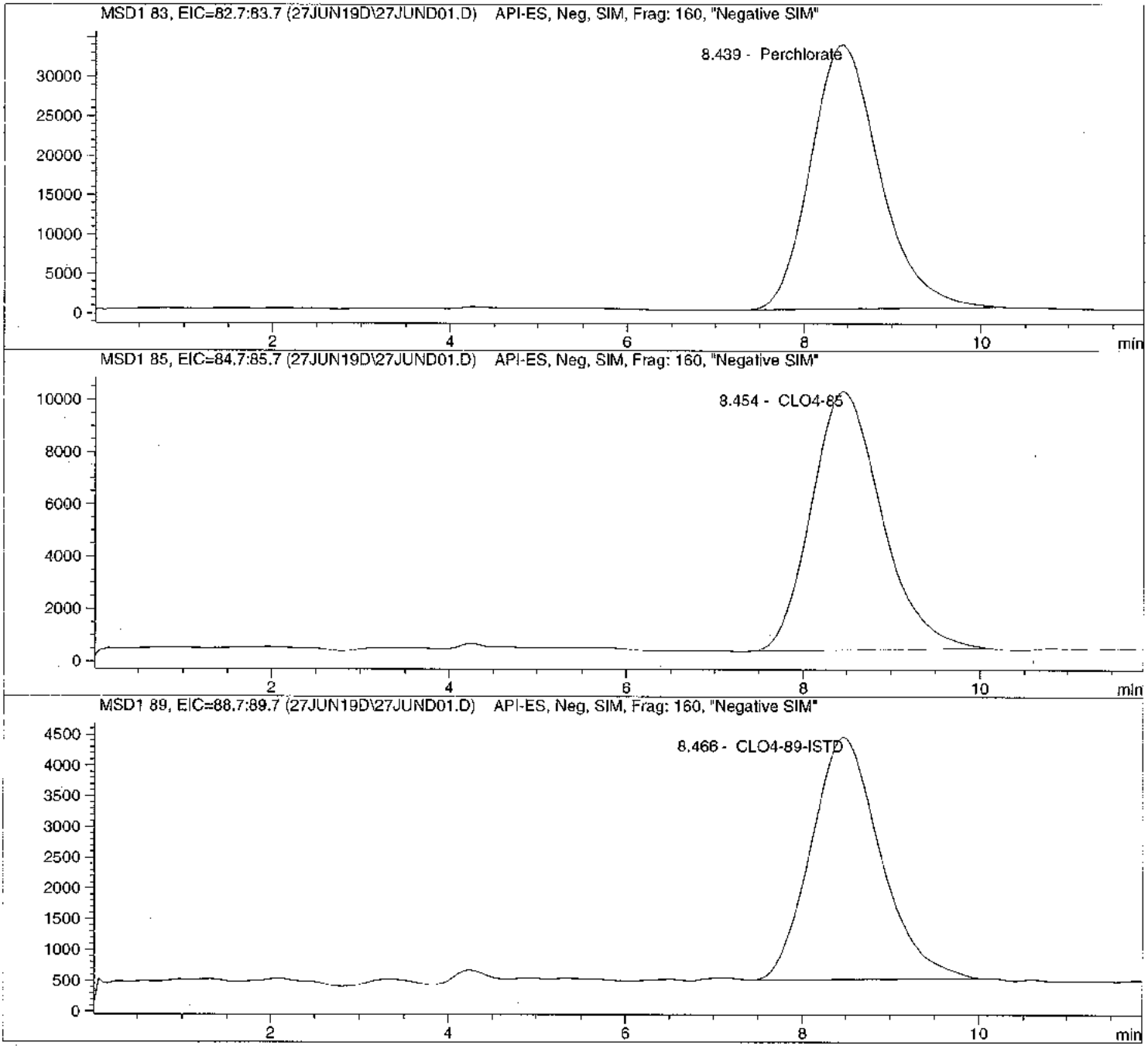
Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	660889 CCV@25	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	660893 QC@4.0	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	660891 ICS@4.0	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	660892 LMB	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	1917488001	CLO4-AQN	1	Sample		
6	Vial 76	660894 174881S	CLO4-AQN	1	Sample		
7	Vial 77	660895 174881D	CLO4-AQN	1	Sample		
8	Vial 78	1917489001 100	CLO4-AQN	1	Sample		
9	Vial 79	1917489002	CLO4-AQN	1	Sample		
10	Vial 80	1917489003	CLO4-AQN	1	Sample		
11	Vial 81	1917489004	CLO4-AQN	1	Sample		
12	Vial 82	1917489005	CLO4-AQN	1	Sample		
13	Vial 83	1917672001 1K	CLO4-AQN	1	Sample		
14	Vial 84	1917672002	CLO4-AQN	1	Sample		
15	Vial 71	660896 CCV@25	CLO4-AQN	1	Ctrl Samp		
16	Vial 85	1917672003	CLO4-AQN	1	Sample		
17	Vial 86	1917672004	CLO4-AQN	1	Sample		
18	Vial 87	1917672005	CLO4-AQN	1	Sample		
19	Vial 88	1917672006 100	CLO4-AQN	1	Sample		
20	Vial 89	1917672007	CLO4-AQN	1	Sample		
21	Vial 71	660897 CCV@25	CLO4-AQN	1	Ctrl Samp		

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND01.D Sample Name: 660889 CCV@25

Injection Date:	6/27/2019 08:45:38	Seq Line:	1
Sample Name:	660889 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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND01.D Sample Name: 660889 CCV@25

Injection Date:	6/27/2019 08:45:38	Seq Line:	1
Sample Name:	660889 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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.439	PBA	1825148.0	25.6735	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.454	PBA	548361.0	25.9750	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.466	PBA	215939.1	5.0000	CLO4-89-ISTD

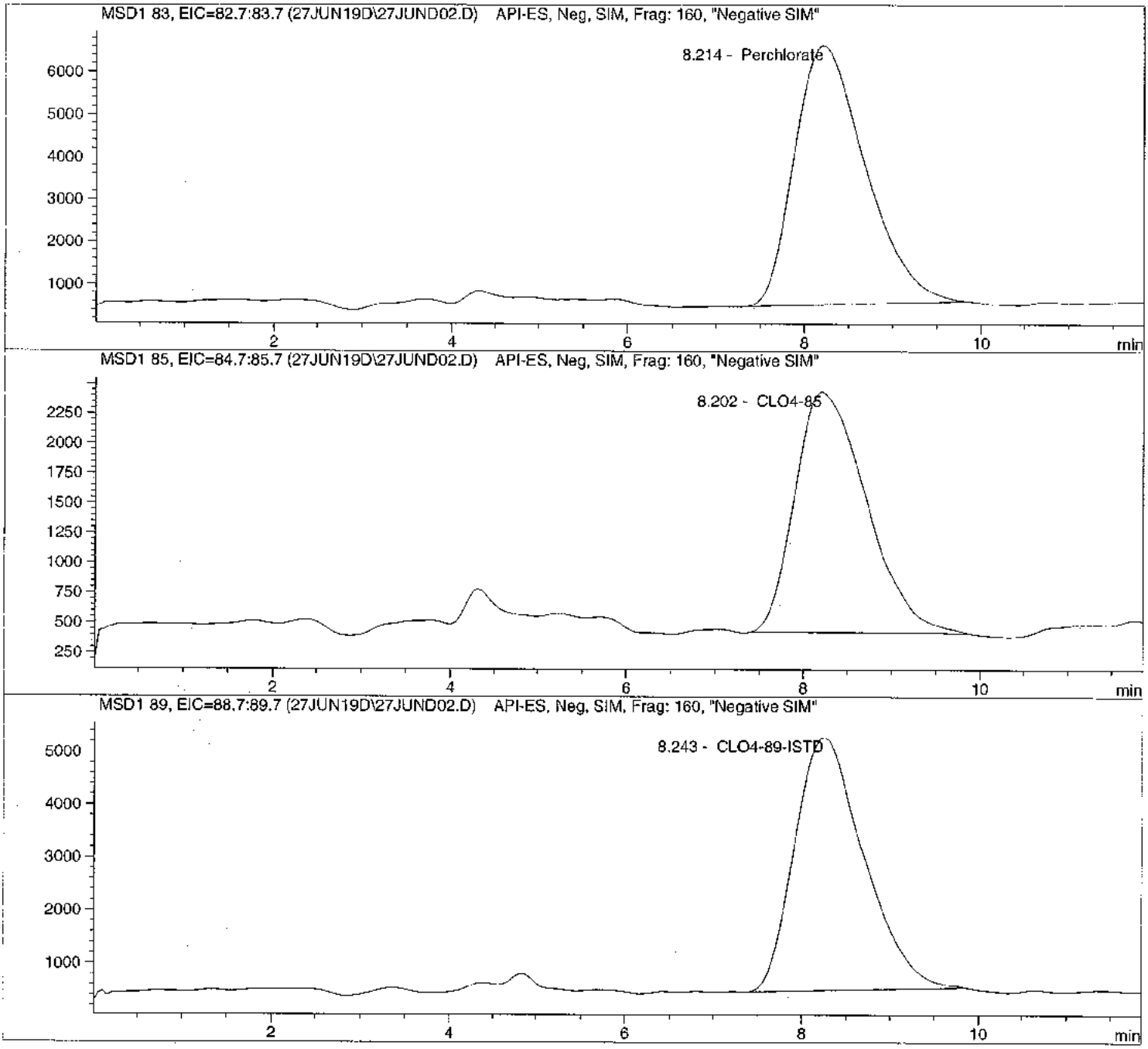
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND02.D Sample Name: 660893 QC@4.0

Injection Date:	6/27/2019 09:00:21	Seq Line:	2
Sample Name:	660893 QC@4.0	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND02.D Sample Name: 660893 QC@4.0

Injection Date:	6/27/2019 09:00:21	Seq Line:	2
Sample Name:	660893 QC@4.0	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.214	PBA	338083.1	4.2689	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.202	PBA	112796.3	4.6390	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.243	PBA	260134.2	5.0000	CLO4-89-ISTD

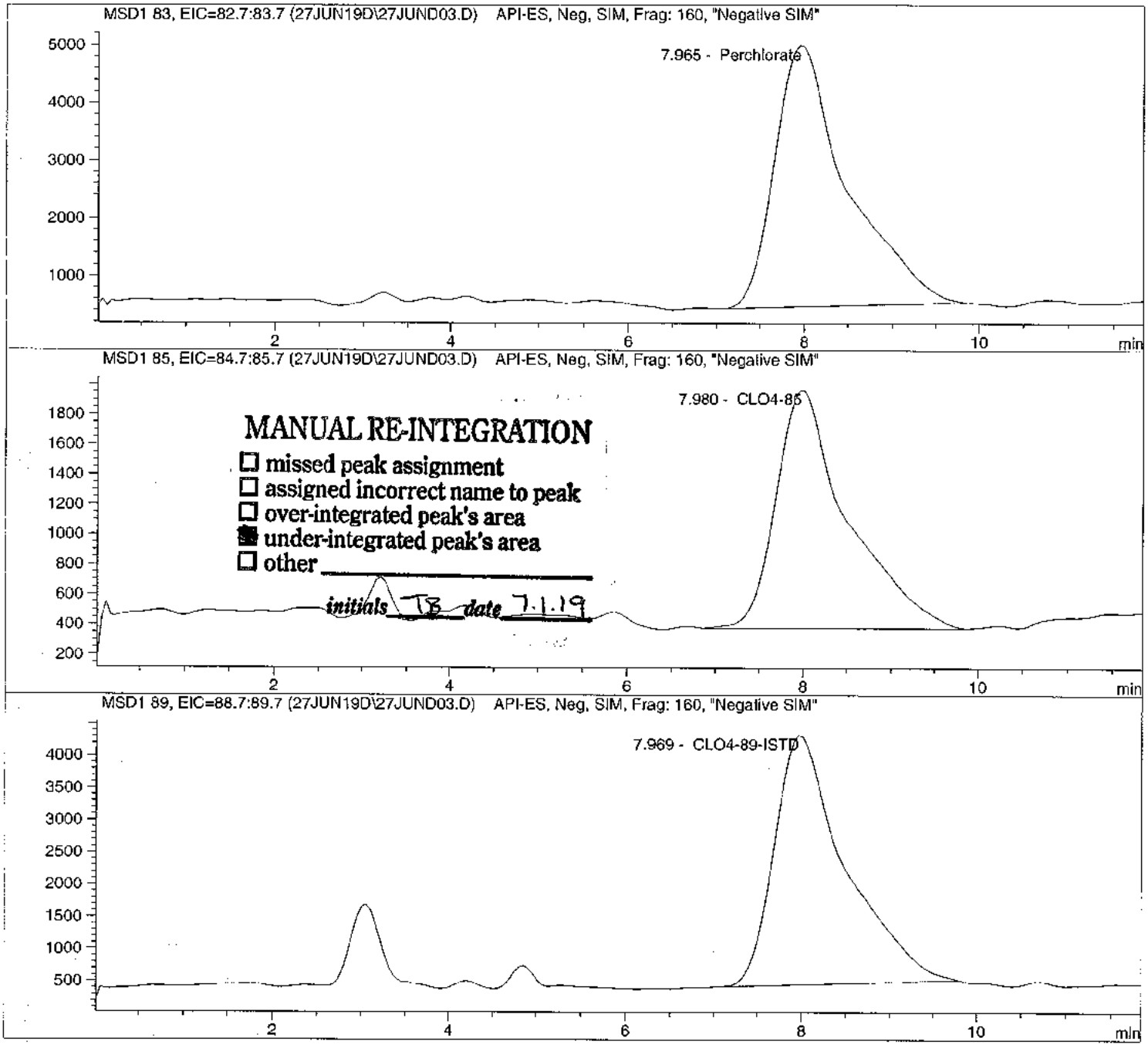
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND03.D Sample Name: 660891 ICS@4.0

Injection Date:	6/27/2019 09:14:16	Seq Line:	3
Sample Name:	660891 ICS@4.0	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Injection Date:	6/27/2019 09:14:16	Seq Line:	3
Sample Name:	660891 ICS@4.0	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.965	PBA	257330.2	3.9251	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.980	MM	89383.3	4.4243	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.969	BBA	216232.2	5.0000	CLO4-89-ISTD

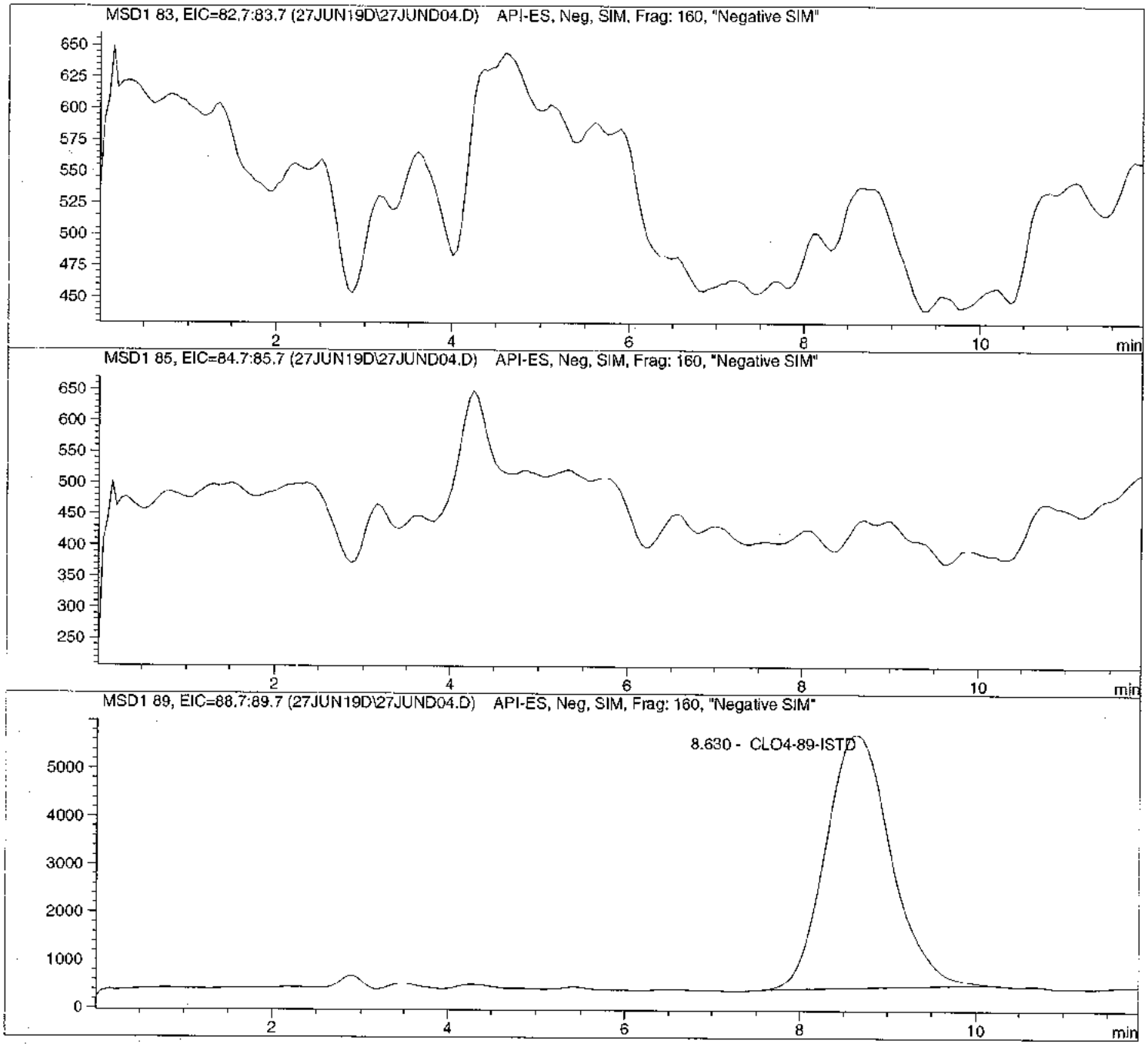
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND04.D Sample Name: 660892 LMB

Injection Date:	6/27/2019 09:28:13	Seq Line:	4
Sample Name:	660892 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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND04.D Sample Name: 660892 LMB

Injection Date:	6/27/2019 09:28:13	Seq Line:	4
Sample Name:	660892 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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.630	PBA	272546.7	5.0000	CLO4-89-ISTD

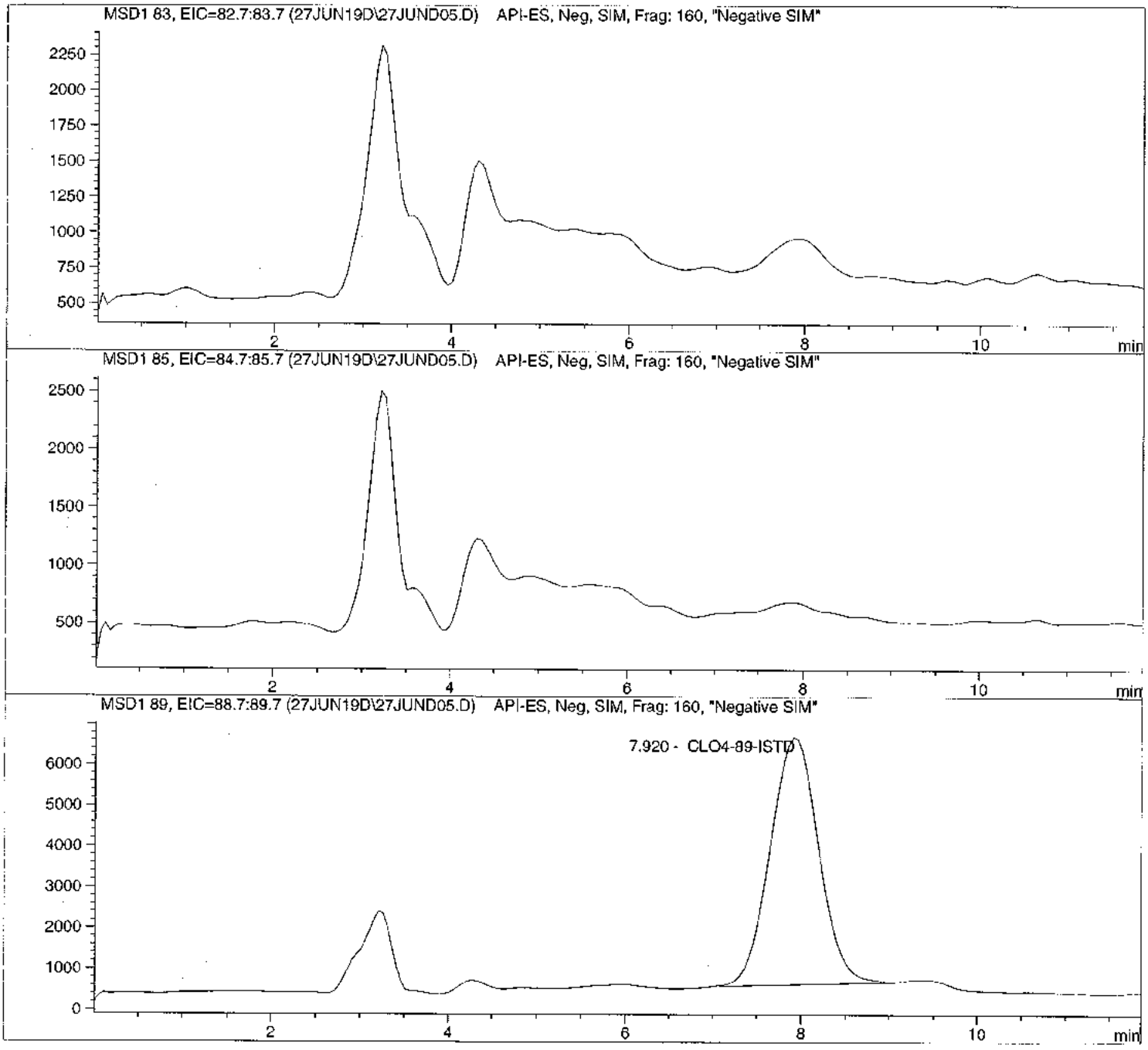
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND05.D Sample Name: 1917488001

Injection Date:	6/27/2019 09:42:40	Seq Line:	5
Sample Name:	1917488001	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND05.D Sample Name: 1917488001

Injection Date:	6/27/2019 09:42:40	Seq Line:	5
Sample Name:	1917488001	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
7.920	PBA	227402.2	5.0000	CLO4-89-ISTD

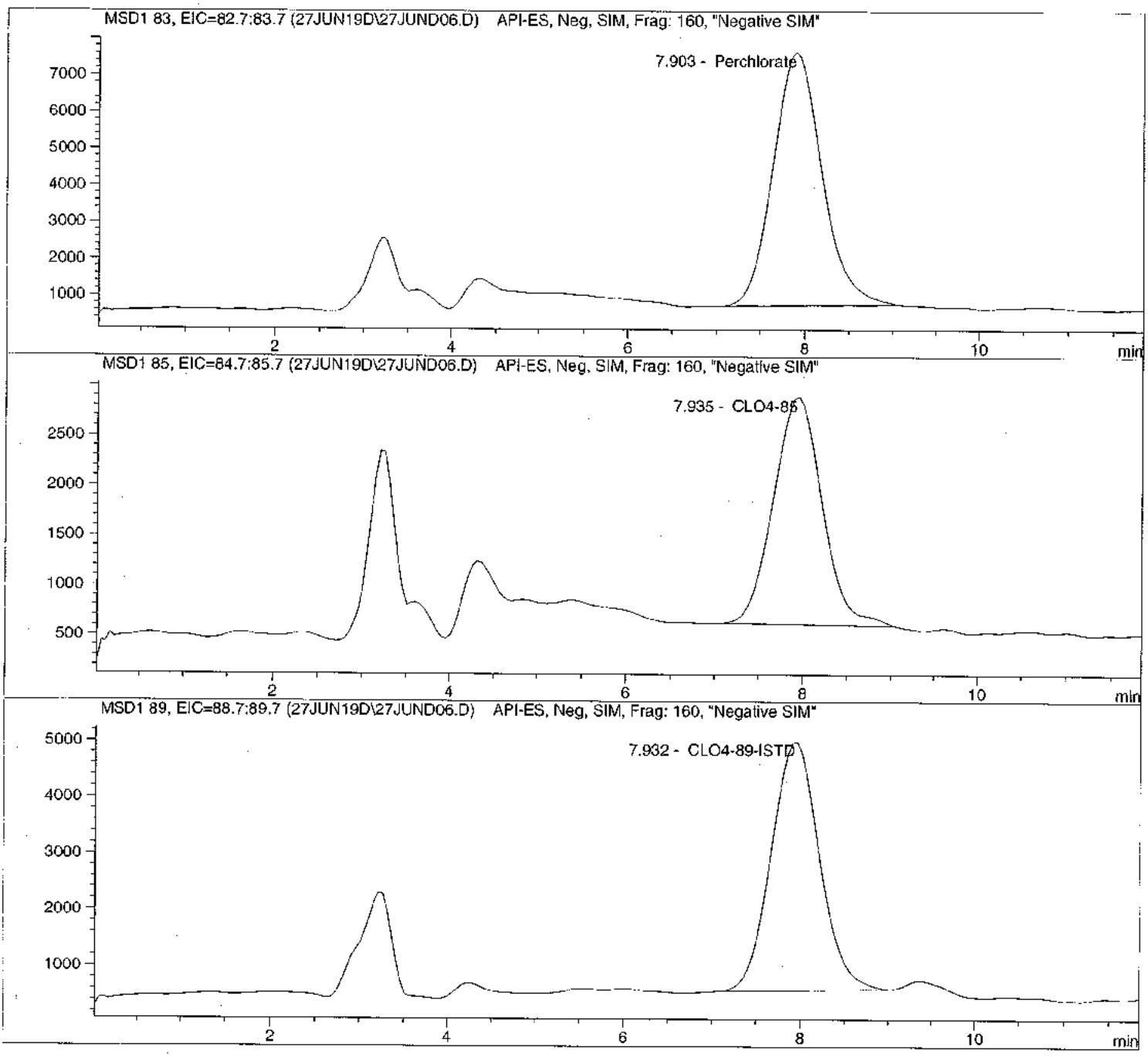
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND06.D Sample Name: 660894 174881S

Injection Date:	6/27/2019 09:56:36	Seq Line:	6
Sample Name:	660894 174881S	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND06.D Sample Name: 660894 174881S

Injection Date:	6/27/2019 09:56:36	Seq Line:	6
Sample Name:	660894 174881S	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
7.903	PBA	262639.7	5.1277	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.935	BBA	86833.0	5.5577	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.932	PBA	166848.2	5.0000	CLO4-89-ISTD

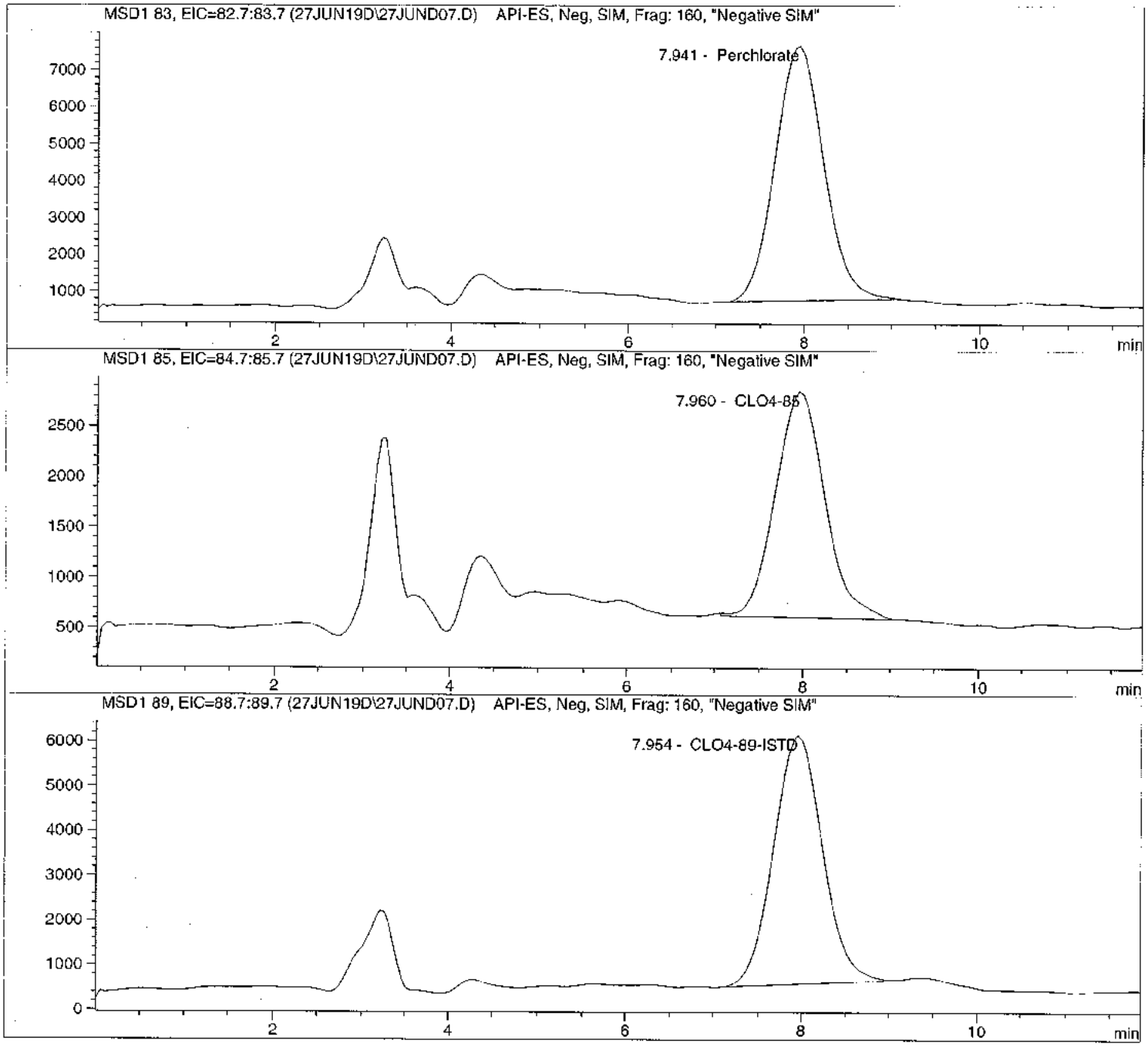
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND07.D Sample Name: 660895 174881D

Injection Date:	6/27/2019 10:10:32	Seq Line:	7
Sample Name:	660895 174881D	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND07.D Sample Name: 660895 174881D

Injection Date:	6/27/2019 10:10:32	Seq Line:	7
Sample Name:	660895 174881D	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
7.941	PBA	264844.2	4.0584	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.960	BBA	87558.5	4.3618	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.954	PBA	214876.4	5.0000	CLO4-89-ISTD

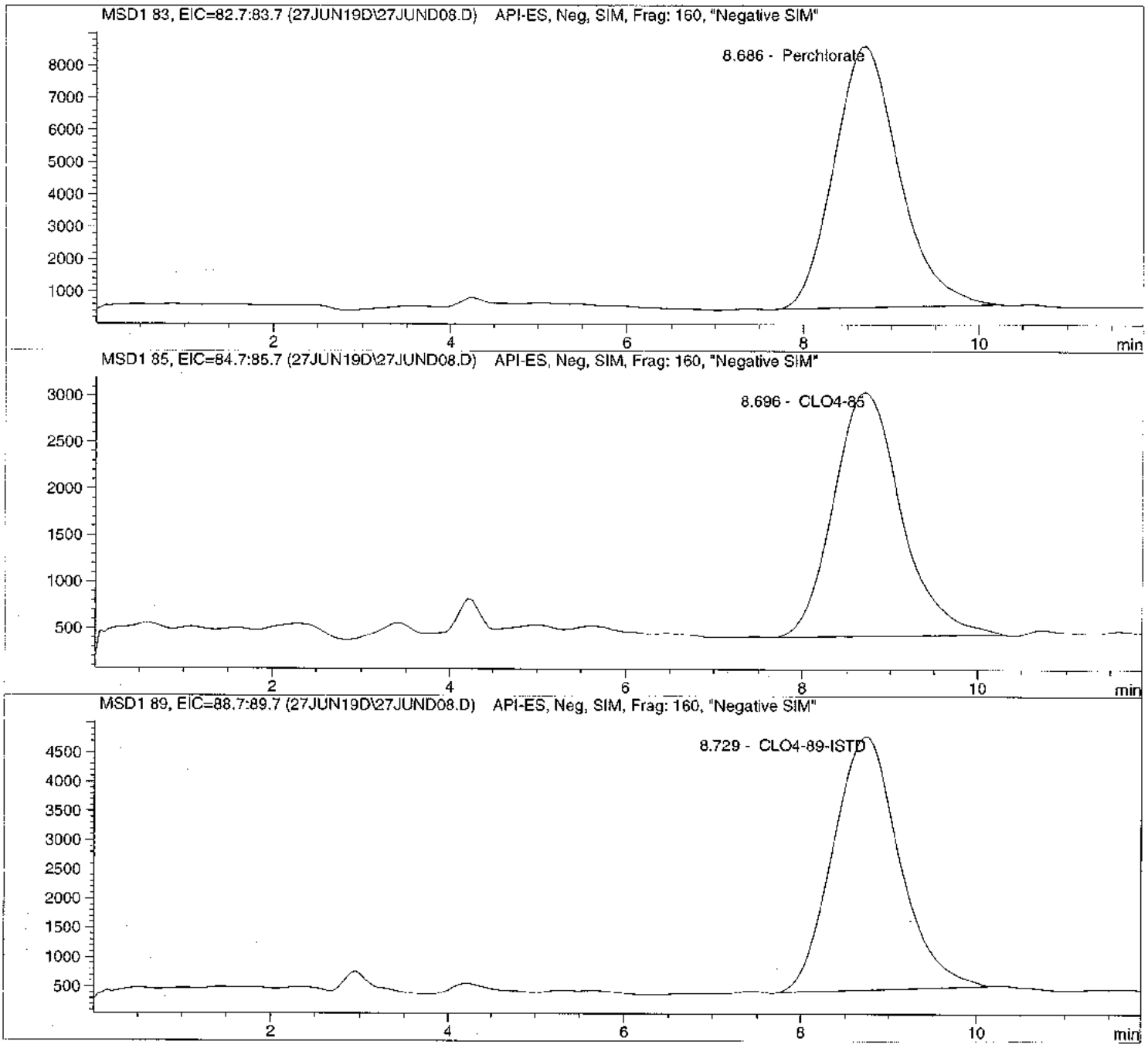
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND08.D Sample Name: 1917489001 100

Injection Date:	6/27/2019 10:24:27	Seq Line:	8
Sample Name:	1917489001 100	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Injection Date:	6/27/2019 10:24:27	Seq Line:	8
Sample Name:	1917489001 100	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.686	PBA	417326.3	591.9454	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.696	PBA	140501.0	655.9136	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.729	PBA	228282.9	500.0000	CLO4-89-ISTD

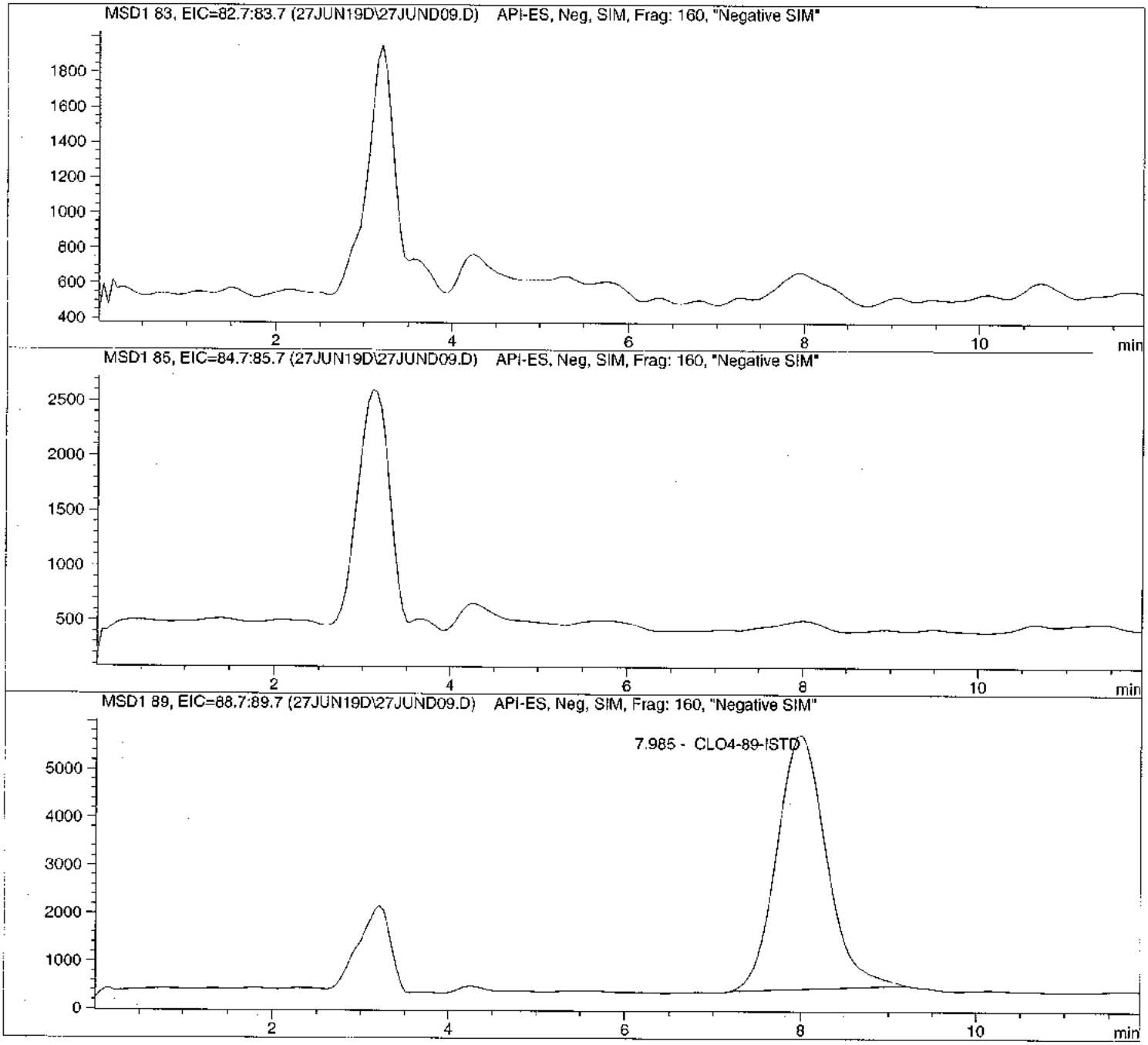
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND09.D Sample Name: 1917489002

Injection Date:	6/27/2019 10:38:23	Seq Line:	9
Sample Name:	1917489002	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND09.D Sample Name: 1917489002

Injection Date:	6/27/2019 10:38:23	Seq Line:	9
Sample Name:	1917489002	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
7.985	BBA	207849.5	5.0000	CLO4-89-ISTD

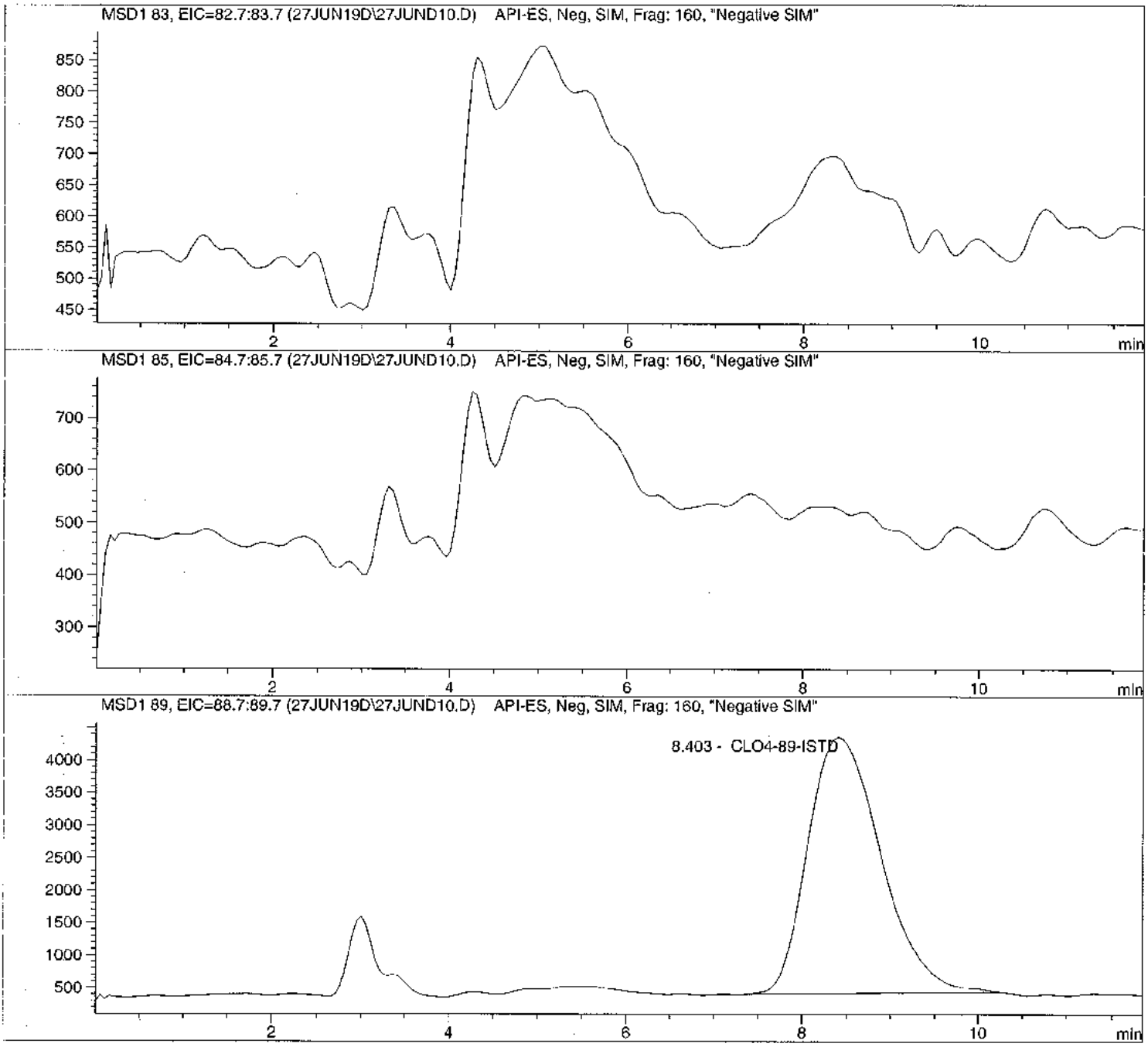
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND10.D Sample Name: 1917489003

Injection Date:	6/27/2019 10:52:17	Seq Line:	10
Sample Name:	1917489003	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND10.D Sample Name: 1917489003

Injection Date:	6/27/2019 10:52:17	Seq Line:	10
Sample Name:	1917489003	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.403	PBA	226487.0	5.0000	CLO4-89-ISTD

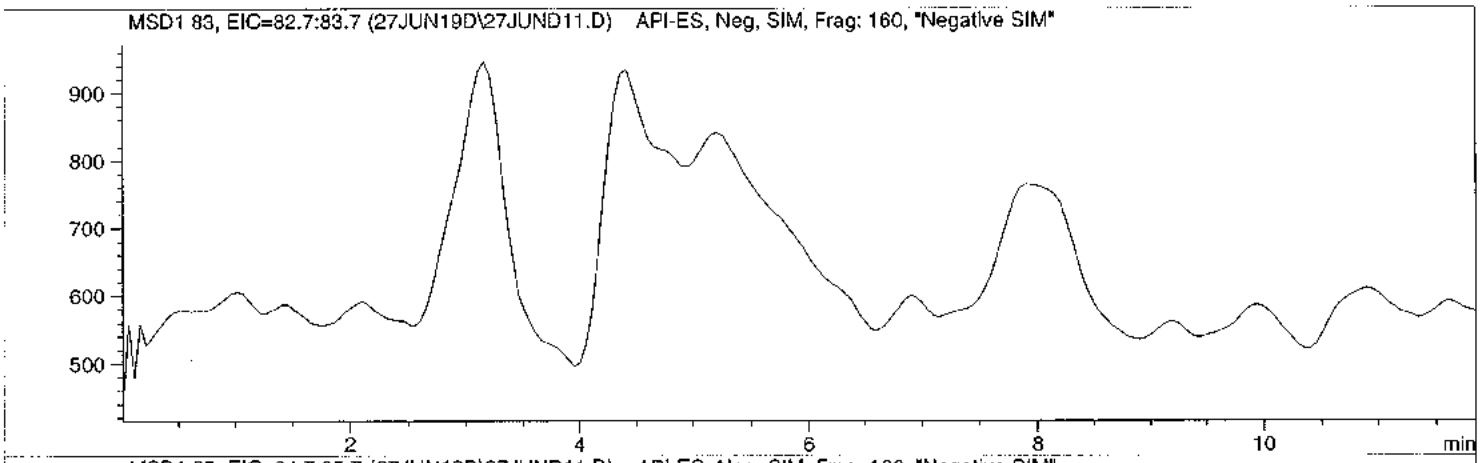
*** End of Report ***

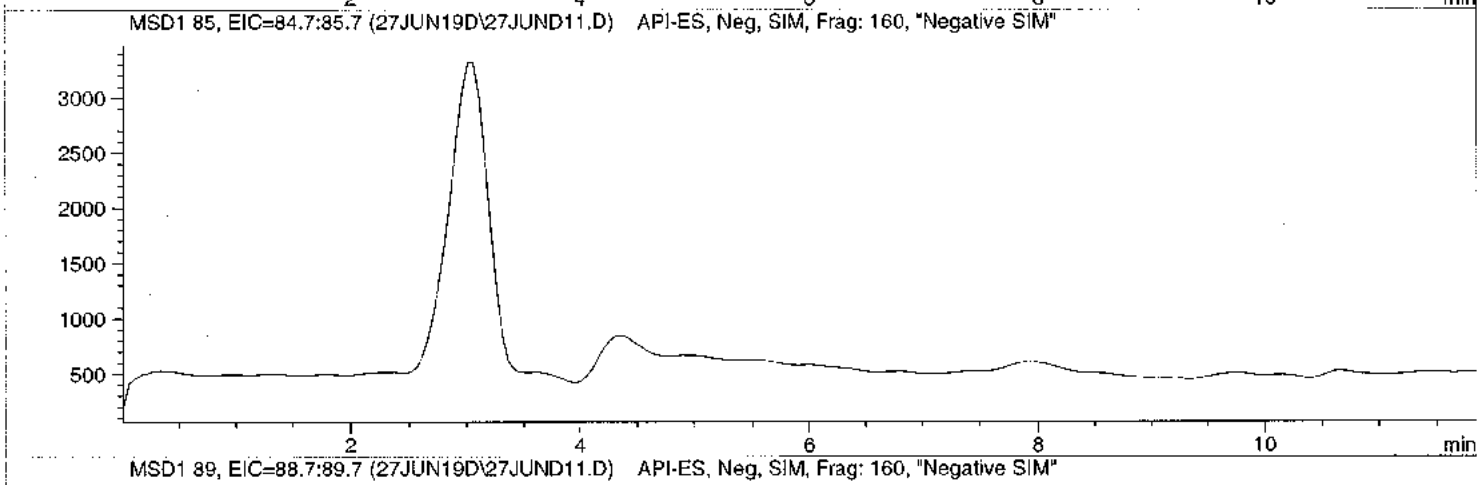
Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND11.D Sample Name: 1917489004

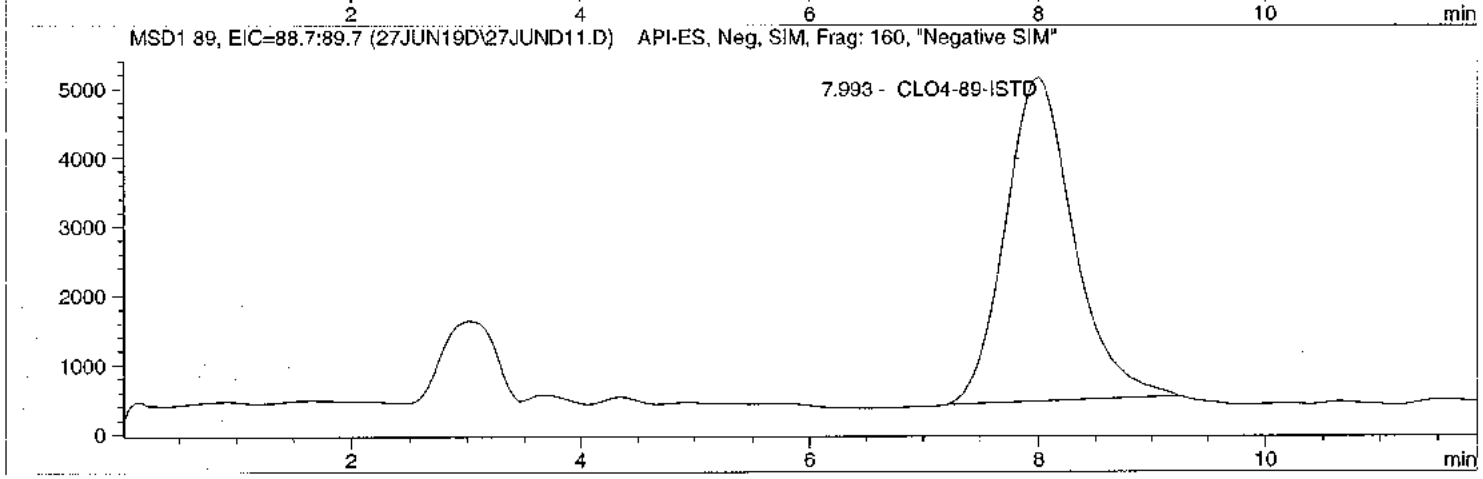
Injection Date:	6/27/2019 11:06:11	Seq Line:	11
Sample Name:	1917489004	Location:	Vial 81
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND11.D Sample Name: 1917489004

Injection Date:	6/27/2019 11:06:11	Seq Line:	11
Sample Name:	1917489004	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Fri, 12. Apr. 2019,07:52:58 am
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
7.993	BBA	193007.7	5.0000	CLO4-89-ISTD

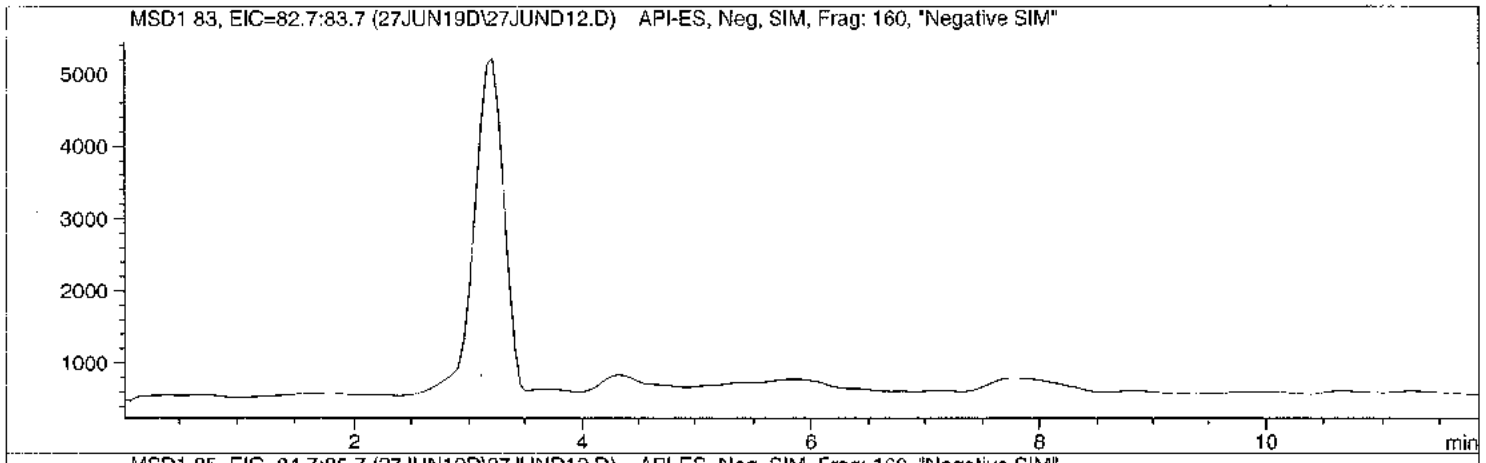
*** End of Report ***

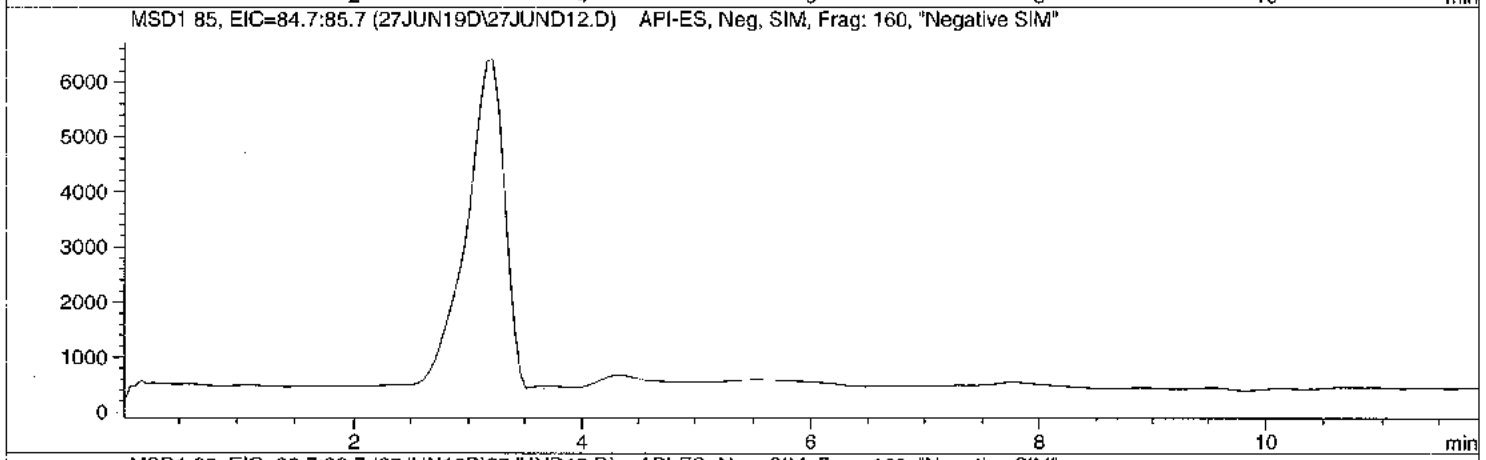
Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND12.D Sample Name: 1917489005

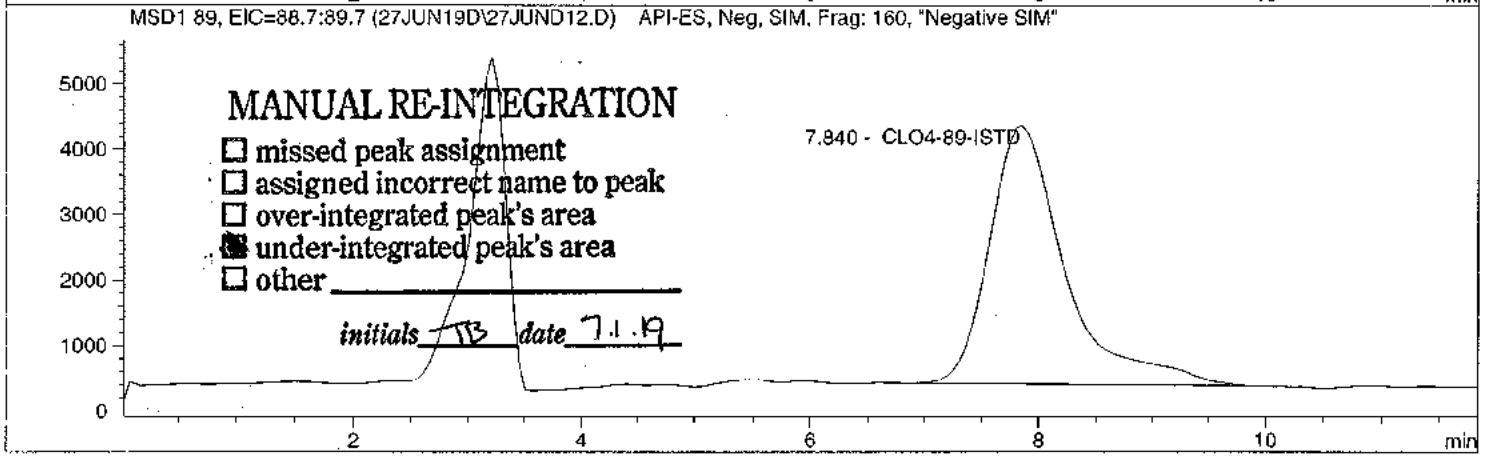
Injection Date:	6/27/2019 11:20:03	Seq Line:	12
Sample Name:	1917489005	Location:	Vial 82
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND12.D Sample Name: 1917489005

Injection Date:	6/27/2019 11:20:03	Seq Line:	12
Sample Name:	1917489005	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-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
7.840	MM	181499.8	5.0000	CLO4-89-ISTD

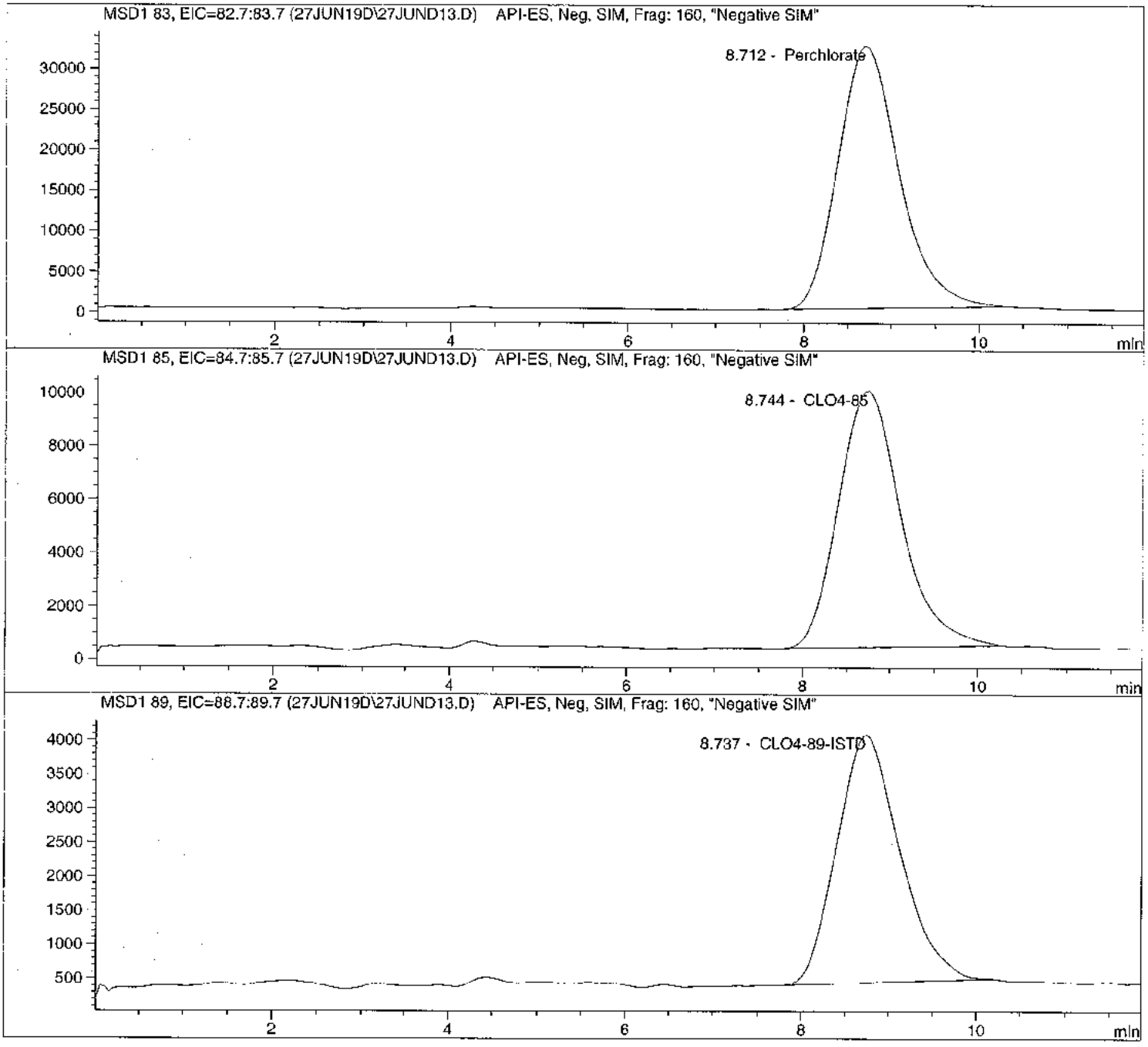
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND13.D Sample Name: 1917672001 1K

Injection Date:	6/27/2019 11:33:53	Seq Line:	13
Sample Name:	1917672001 1K	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND13.D Sample Name: 1917672001 1K

Injection Date:	6/27/2019 11:33:53	Seq Line:	13
Sample Name:	1917672001 1K	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.712	PBA	1575319.3	26121.9614	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.744	PBA	480692.7	26822.4361	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.737	PBA	182986.5	5000.0000	CLO4-89-ISTD

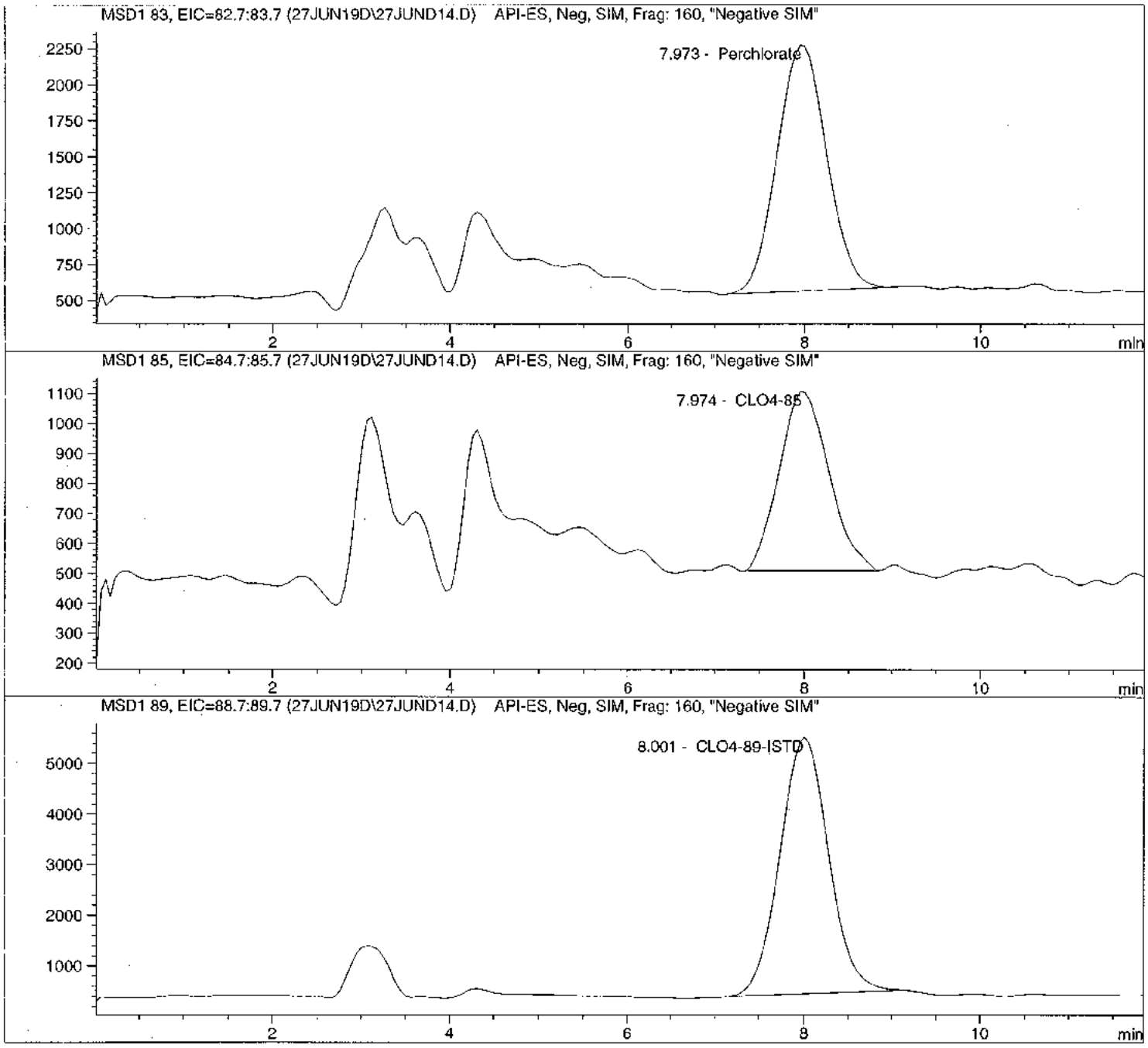
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND14.D Sample Name: 1917672002

Injection Date:	6/27/2019 11:47:53	Seq Line:	14
Sample Name:	1917672002	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND14.D Sample Name: 1917672002

Injection Date:	6/27/2019 11:47:53	Seq Line:	14
Sample Name:	1917672002	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-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
7.973	PBA	65402.8	1.2479	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.974	PBA	22988.9	1.2932	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.001	PBA	191017.5	5.0000	CLO4-89-ISTD

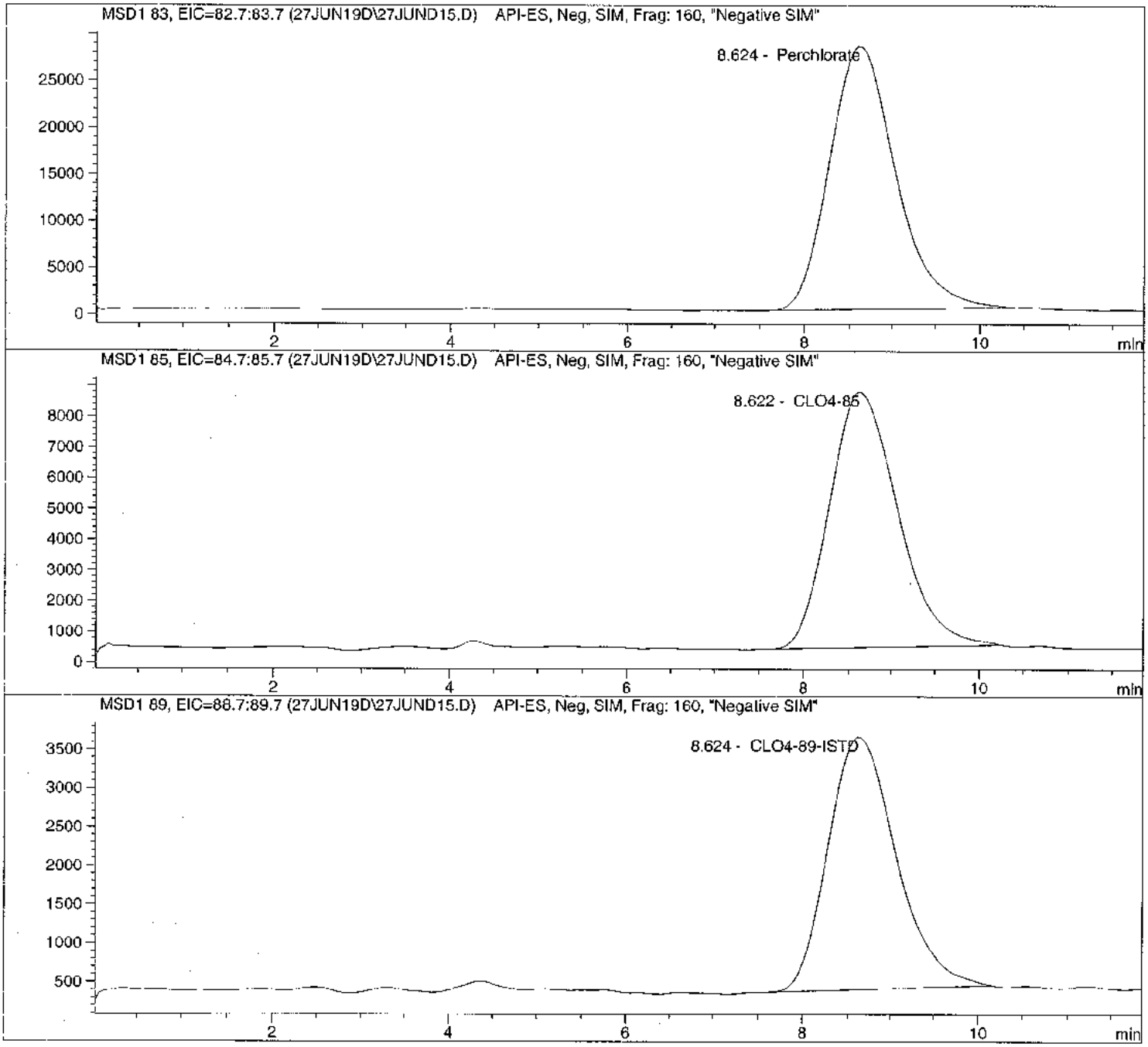
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND15.D Sample Name: 660896 CCV@25

Injection Date:	6/27/2019 12:01:48	Seq Line:	15
Sample Name:	660896 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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND15.D Sample Name: 660896 CCV@25

Injection Date:	6/27/2019 12:01:48	Seq Line:	15
Sample Name:	660896 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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Fri, 12. Apr. 2019,07:52:58 am
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
8.624	PBA	1489207.3	25.5132	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.622	PBA	452707.0	26.1005	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.624	PBA	177367.7	5.0000	CLO4-89-ISTD

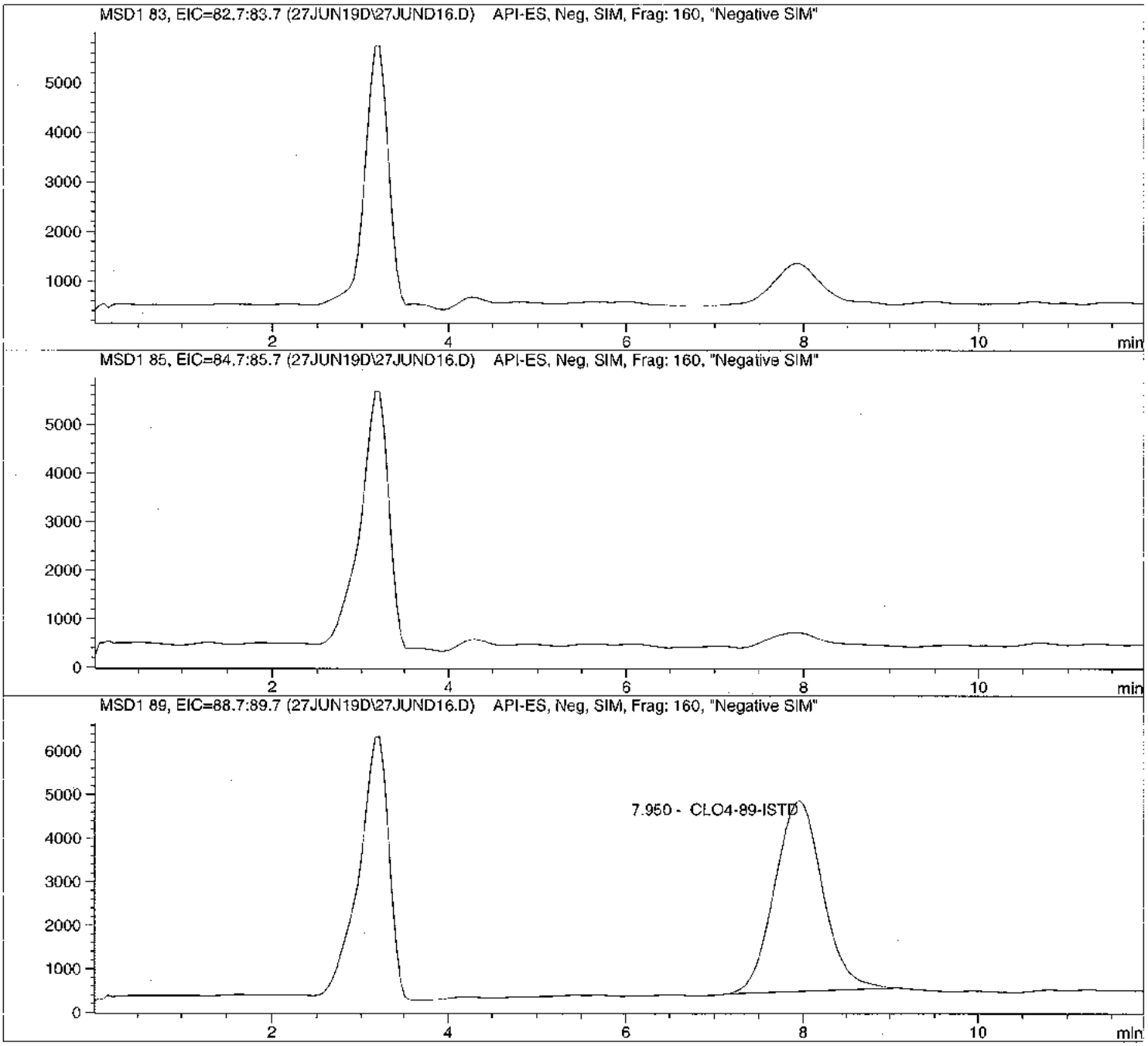
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND16.D Sample Name: 1917672003

Injection Date:	6/27/2019 12:15:39	Seq Line:	16
Sample Name:	1917672003	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND16.D Sample Name: 1917672003

Injection Date:	6/27/2019 12:15:39	Seq Line:	16
Sample Name:	1917672003	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
7.950	PBA	165260.9	5.0000	CLO4-89-ISTD

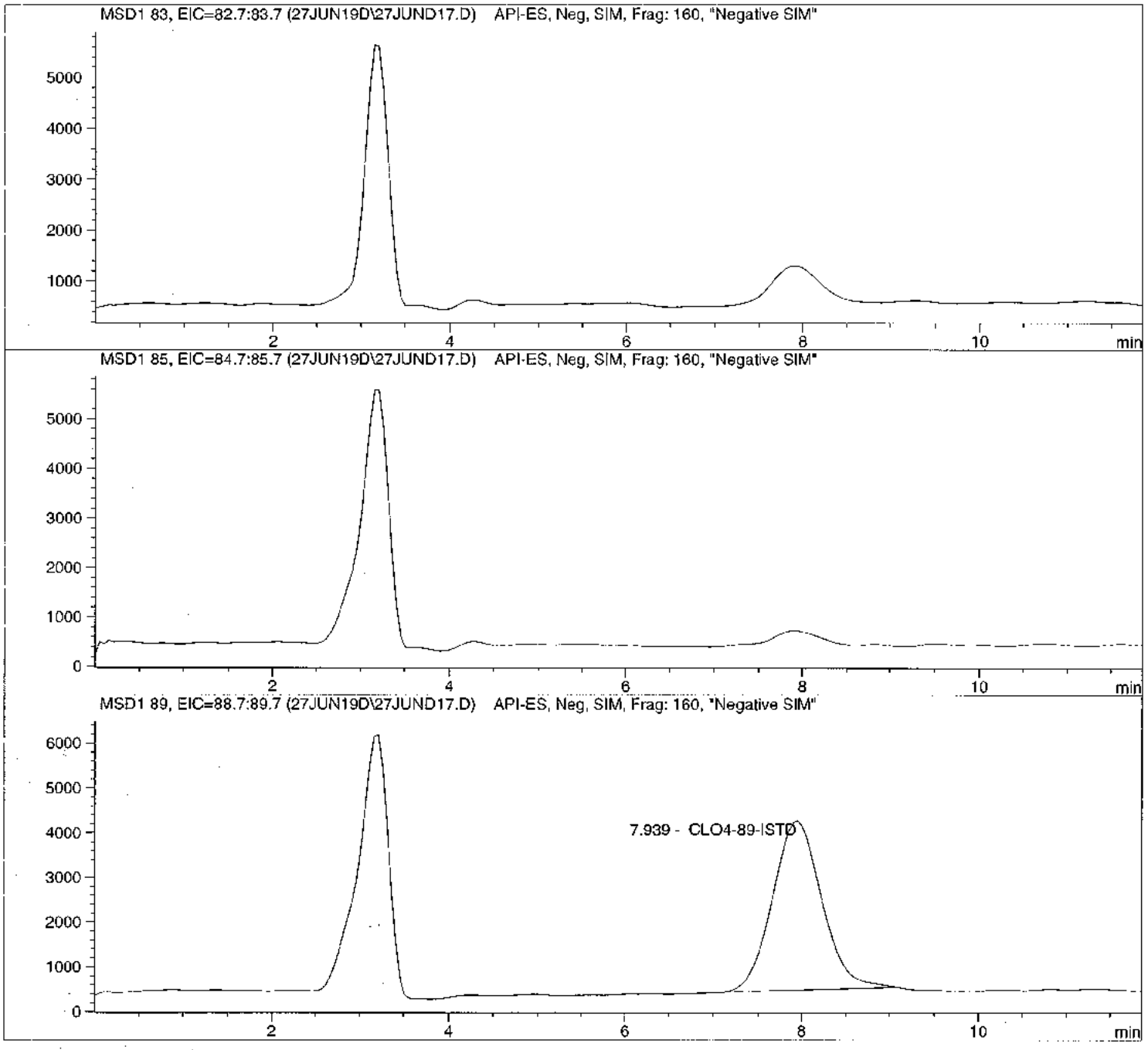
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND17.D Sample Name: 1917672004

Injection Date:	6/27/2019 12:29:33	Seq Line:	17
Sample Name:	1917672004	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND17.D Sample Name: 1917672004

Injection Date:	6/27/2019 12:29:33	Seq Line:	17
Sample Name:	1917672004	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
7.939	BBA	147927.7	5.0000	CLO4-89-ISTD

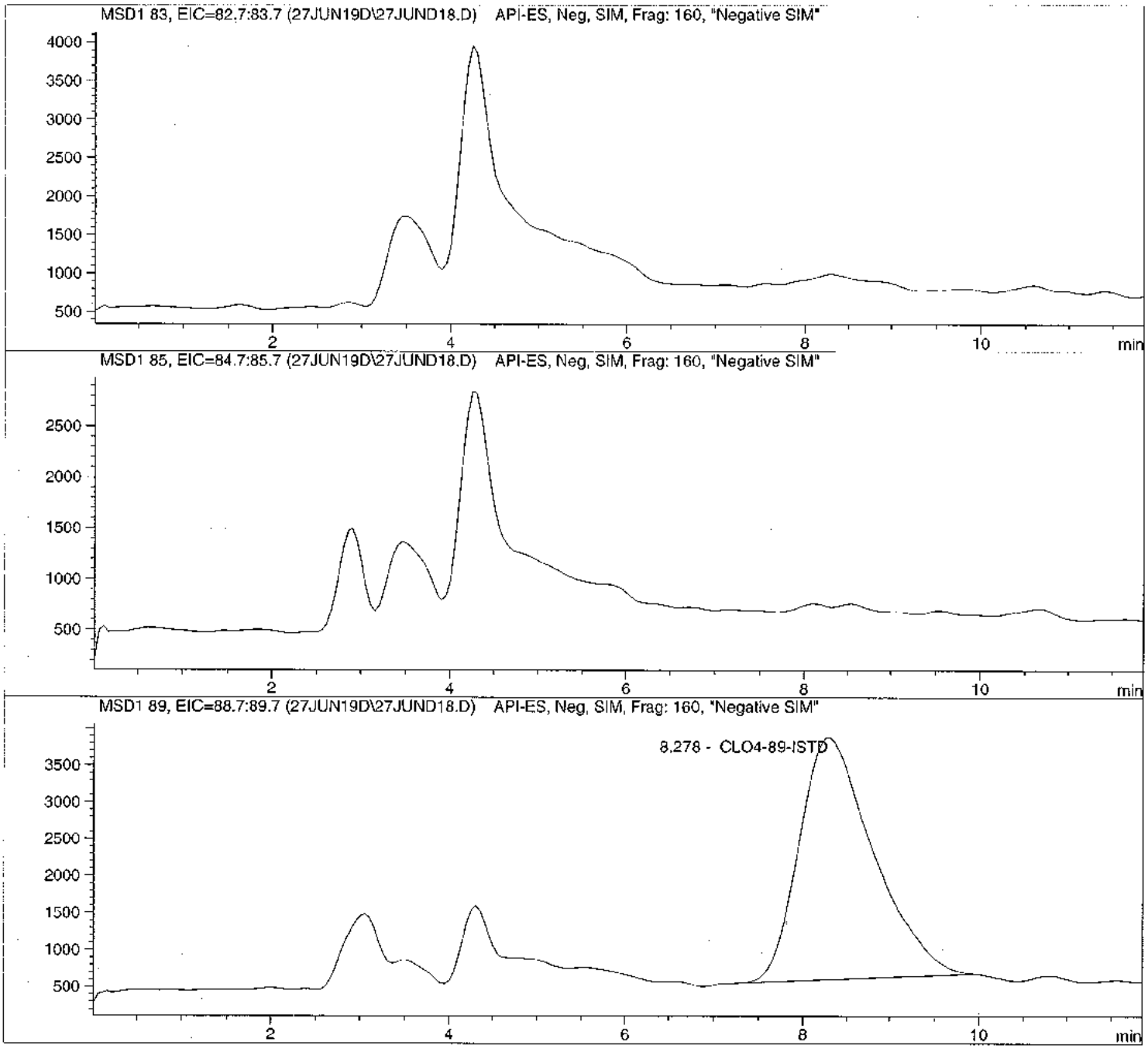
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND18.D Sample Name: 1917672005

Injection Date:	6/27/2019 12:43:25	Seq Line:	18
Sample Name:	1917672005	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND18.D Sample Name: 1917672005

Injection Date:	6/27/2019 12:43:25	Seq Line:	18
Sample Name:	1917672005	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.278	PBA	193450.5	5.0000	CLO4-89-ISTD

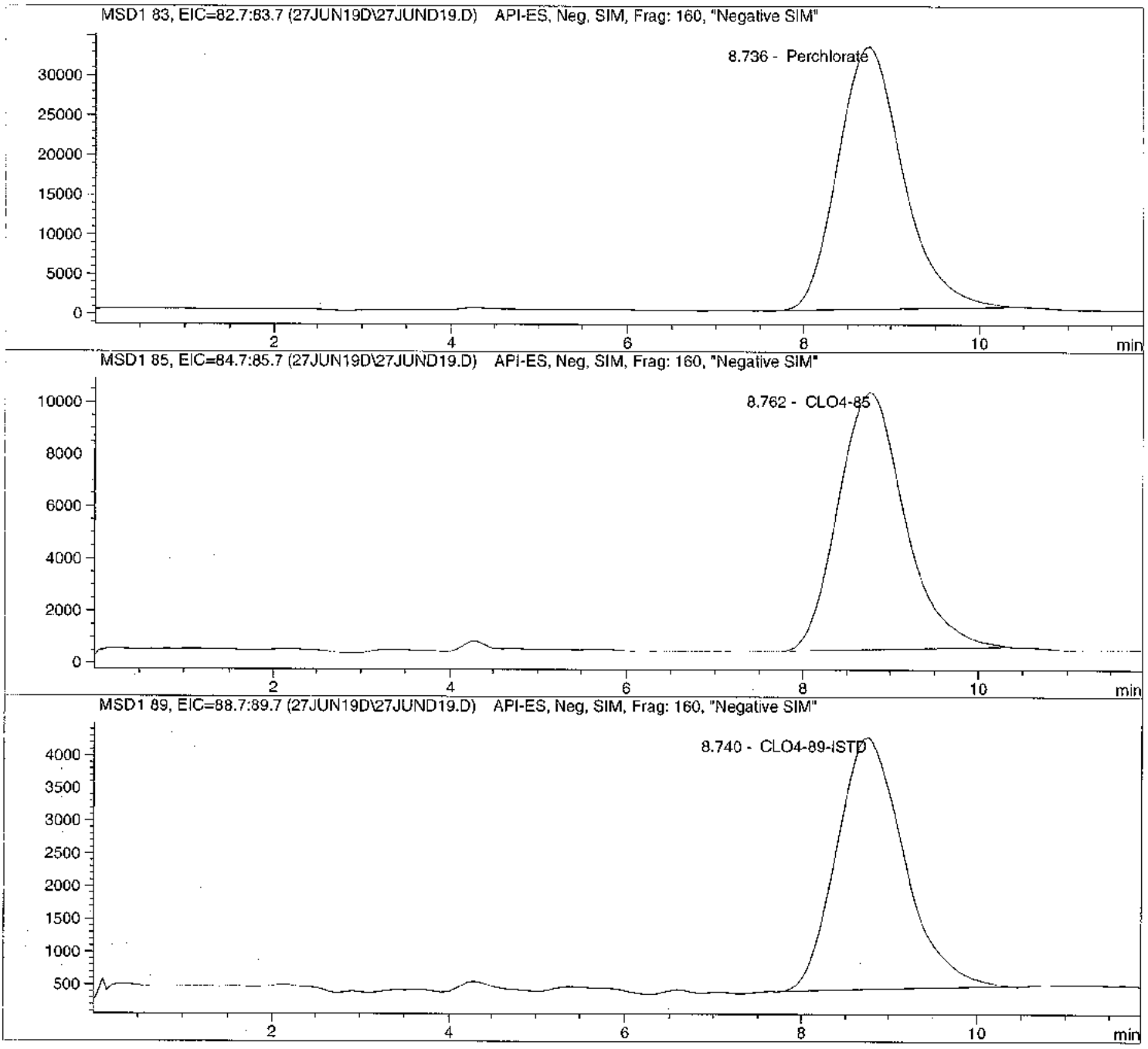
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND19.D Sample Name: 1917672006 100

Injection Date:	6/27/2019 12:57:19	Seq Line:	19
Sample Name:	1917672006 100	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND19.D Sample Name: 1917672006 100

Injection Date:	6/27/2019 12:57:19	Seq Line:	19
Sample Name:	1917672006 100	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.736	PBA	1719861.8	2534.9645	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.762	PBA	521595.0	2587.4359	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.740	BBA	206241.0	500.0000	CLO4-89-ISTD

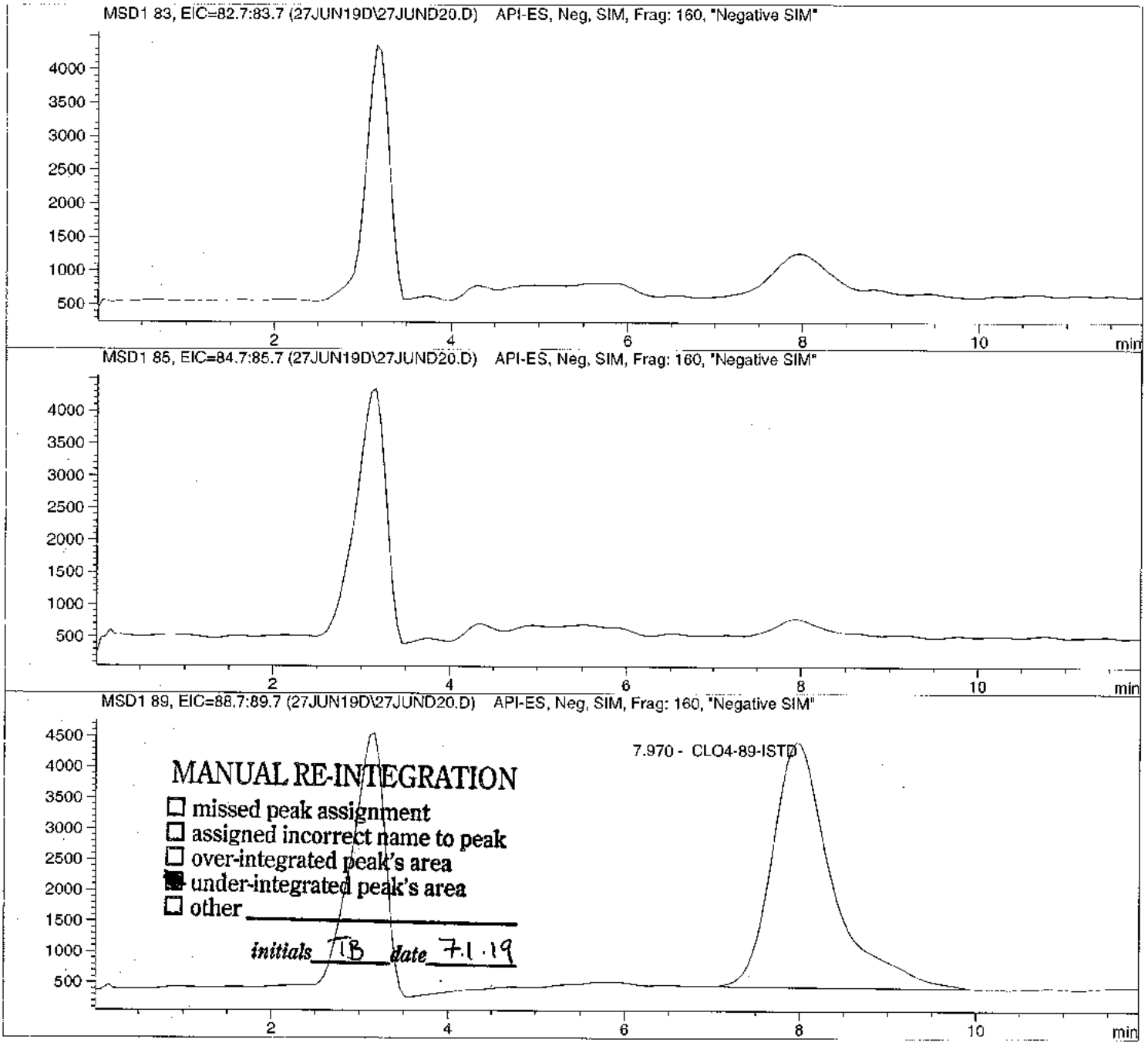
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND20.D Sample Name: 1917672007

Injection Date:	6/27/2019 13:11:15	Seq Line:	20
Sample Name:	1917672007	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-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND20.D Sample Name: 1917672007

Injection Date:	6/27/2019 13:11:15	Seq Line:	20
Sample Name:	1917672007	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
7.970	MM	187343.8	5.0000	CLO4-89-ISTD

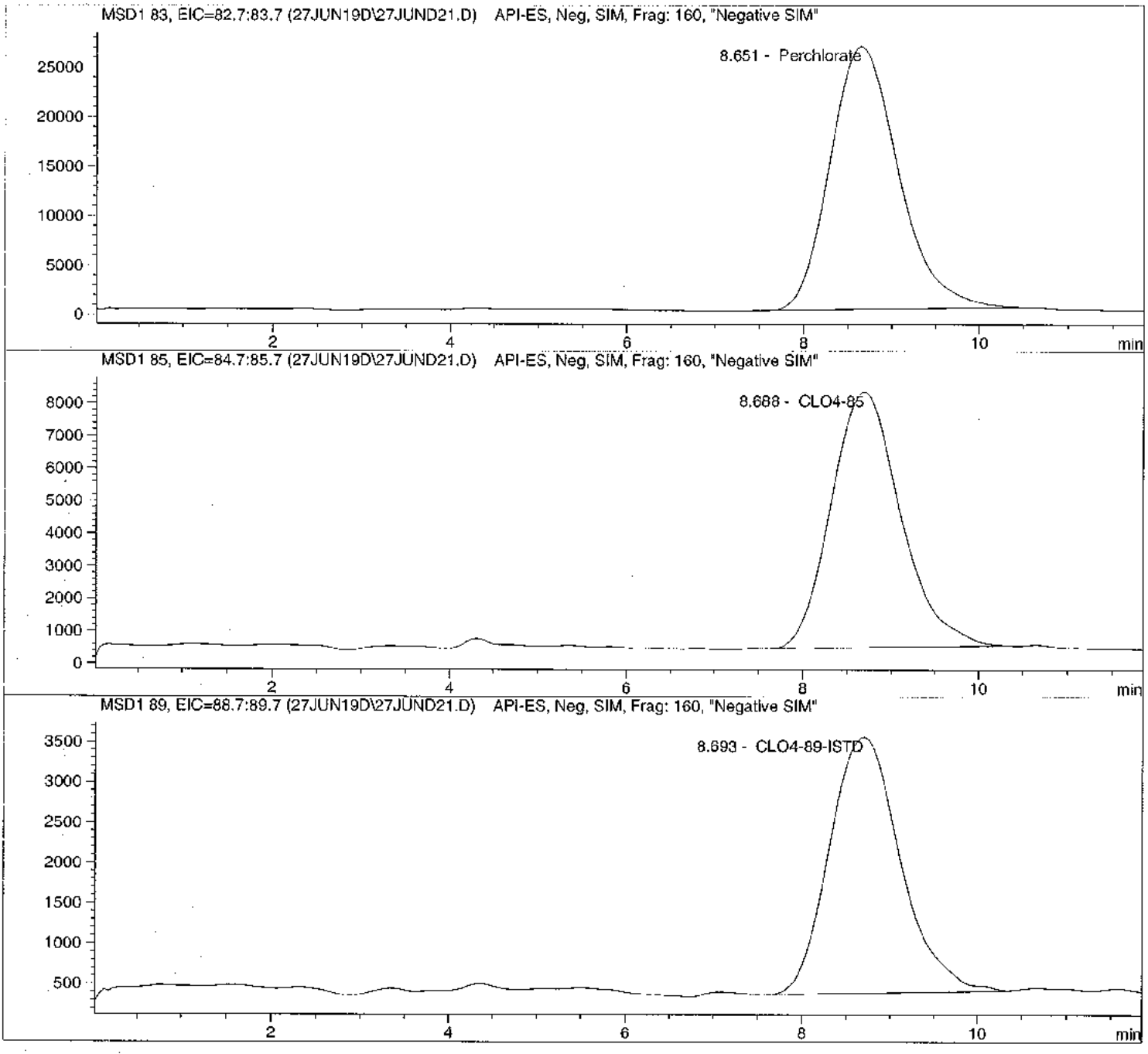
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND21.D Sample Name: 660897 CCV@25

Injection Date:	6/27/2019 13:28:58	Seq Line:	21
Sample Name:	660897 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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND21.D Sample Name: 660897 CCV@25

Injection Date:	6/27/2019 13:28:58	Seq Line:	21
Sample Name:	660897 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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.651	PBA	1425160.6	24.4244	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.688	PBA	430117.7	24.8091	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.693	PBA	177769.0	5.0000	CLO4-89-ISTD

*** End of Report ***

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Initial Calibration

Calibration Table

Perchlorate

Calib. Data Modified : 3/19/2019 2:35:19 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
8.744	1	1	1.00000	7.76074e4	1.28854e-5		1	Perchlorate
		2	2.00000	1.35273e5	1.47849e-5			
		3	5.00000	3.37764e5	1.48033e-5			
		4	10.00000	6.83454e5	1.46316e-5			
		5	25.00000	2.08433e6	1.19943e-5			
		6	50.00000	4.13334e6	1.20968e-5			
		7	75.00000	5.99313e6	1.25143e-5			
8.755	2	1	1.00000	2.36780e4	4.22333e-5		1	CLO4-85
		2	2.00000	4.69486e4	4.25998e-5			
		3	5.00000	1.06124e5	4.71147e-5			
		4	10.00000	2.13523e5	4.68335e-5			
		5	25.00000	6.14295e5	4.06971e-5			
		6	50.00000	1.19814e6	4.17315e-5			
		7	75.00000	1.78355e6	4.20509e-5			
8.766	3	1	5.00000	2.73208e5	1.83011e-5	+I1		CLO4-89-ISTD
		2	5.00000	2.24886e5	2.22335e-5			
		3	5.00000	2.33196e5	2.14412e-5			
		4	5.00000	2.34454e5	2.13262e-5			
		5	5.00000	2.50568e5	1.99547e-5			
		6	5.00000	2.30977e5	2.16472e-5			

RetTime [min]	Sig	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
		7	5.00000	2.21504e5	2.25729e-5			

More compound-specific settings:

Compound: Perchlorate
- Time Window : From 6.654 min To 12.544 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 0.5
  - Level 3 : 0.2
  - Level 4 : 0.1
  - Level 5 : 0.04
  - Level 6 : 0.02
  - Level 7 : 0.013333

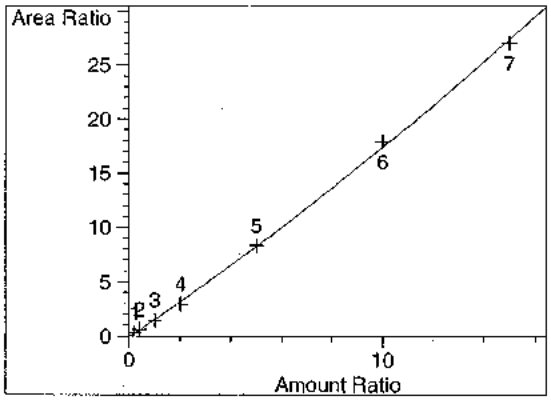
Compound: CLO4-85
- Time Window : From 6.650 min To 12.505 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 0.5
  - Level 3 : 0.2
  - Level 4 : 0.1
  - Level 5 : 0.04
  - Level 6 : 0.02
  - Level 7 : 0.013333

Compound: CLO4-89-ISTD
- Time Window : From 6.659 min To 12.466 min
- Curve Type : Linear
- Origin : Included
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 1
  - Level 3 : 1
  - Level 4 : 1
  - Level 5 : 1
  - Level 6 : 1
  - Level 7 : 1

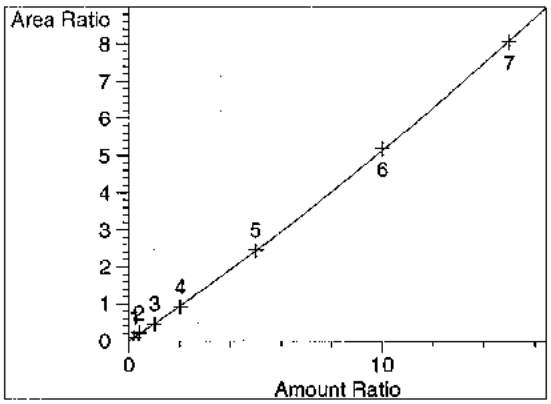
Peak Sum Table

No Entries in table

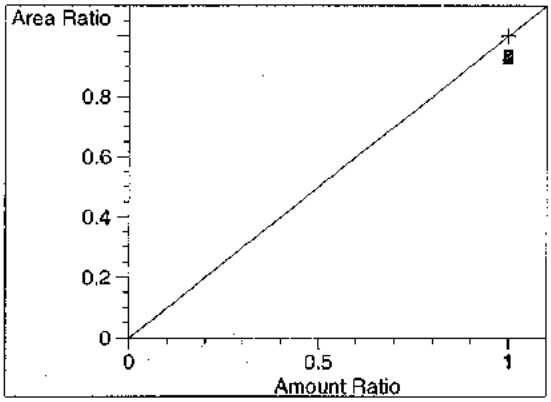
Calibration Curves



Perchlorate at exp. RT: 8.744
MSD1 83, EIC=82.7:83.7
Correlation: 0.99957
Residual Std. Dev.: 0.30744
Formula: $y = ax^2 + bx + c$
a: 1.76988e-2
b: 1.56480
c: -4.92430e-2
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.5
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.013333



CLO4-85 at exp. RT: 8.755
MSD1 85, EIC=84.7:85.7
Correlation: 0.99983
Residual Std. Dev.: 0.03473
Formula: $y = ax^2 + bx + c$
a: 5.13396e-3
b: 4.62055e-1
c: 4.97209e-4
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.5
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.013333



CLO4-89-ISTD at exp. RT: 8.766
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 1 : 1
Level 2 : 1
Level 3 : 1
Level 4 : 1
Level 5 : 1
Level 6 : 1
Level 7 : 1

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP2.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	7.76074e4	8.744	1.06245
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	1.35273e5	8.992	2.06969
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	3.37764e5	8.586	4.73474
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	6.83454e5	8.698	9.27727
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.08433e6	8.451	25.29036
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	4.13334e6	8.810	51.36844
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	5.99313e6	8.586	74.16754
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	7.34719e5	8.702	9.25940

#	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.36780e4	8.755	9.30535e-1
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	4.69486e4	9.012	2.24255
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	1.06124e5	8.602	4.86656
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.13523e5	8.713	9.64312
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	6.14295e5	8.468	25.12159
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	1.19814e6	8.825	50.46721
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	1.78355e6	8.603	74.72019
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.27495e5	8.721	9.54024

#	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	2.73208e5	8.766	5.00000
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	2.24886e5	9.012	5.00000
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	2.33196e5	8.609	5.00000
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.34454e5	8.716	5.00000
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.50568e5	8.472	5.00000
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	2.30977e5	8.825	5.00000
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	2.21504e5	8.610	5.00000
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.52544e5	8.725	5.00000

*** End of Report ***

Sequence Table:

Method and Injection Info Part:

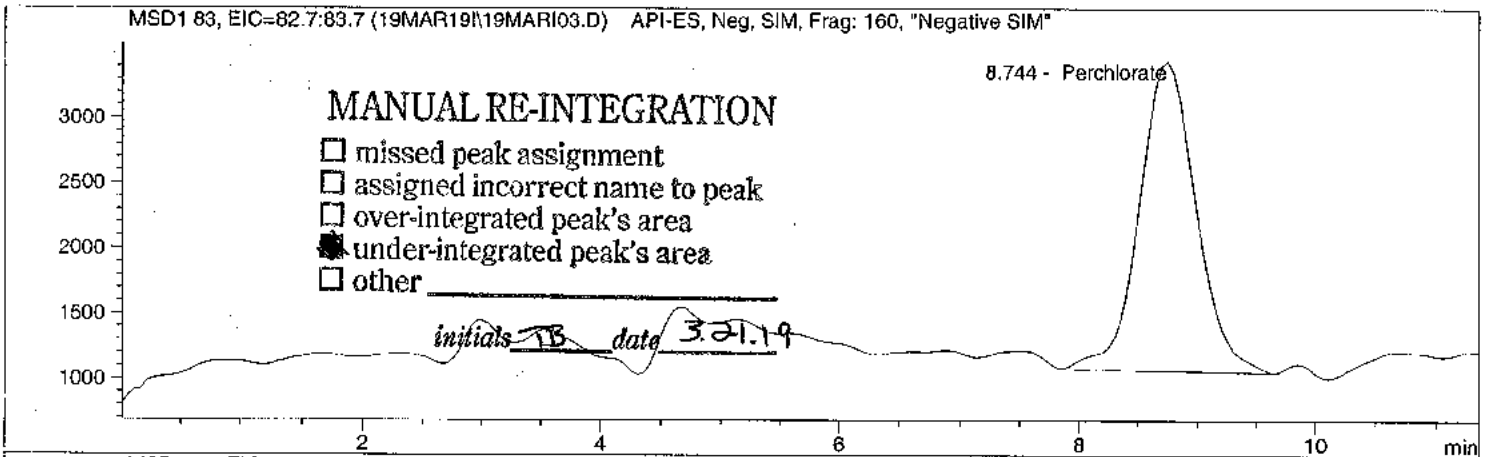
Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	CLO4@ 0.2ug/L	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	CLO4@ 0.5ug/L	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	CLO4@ 1.0ug/L	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	CLO4@ 2.0ug/L	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	CLO4@ 5.0ug/L	CLO4-AQN	1	Ctrl Samp		
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 80	ICAL Verf@10ug/L	CLO4-AQN	1	Ctrl Samp		

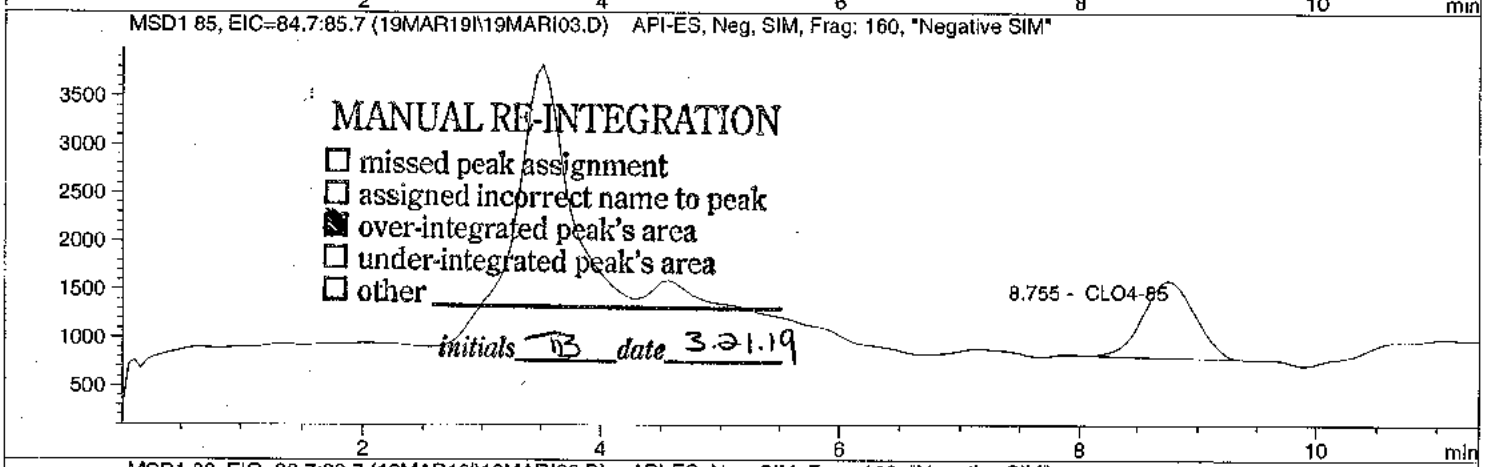
Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

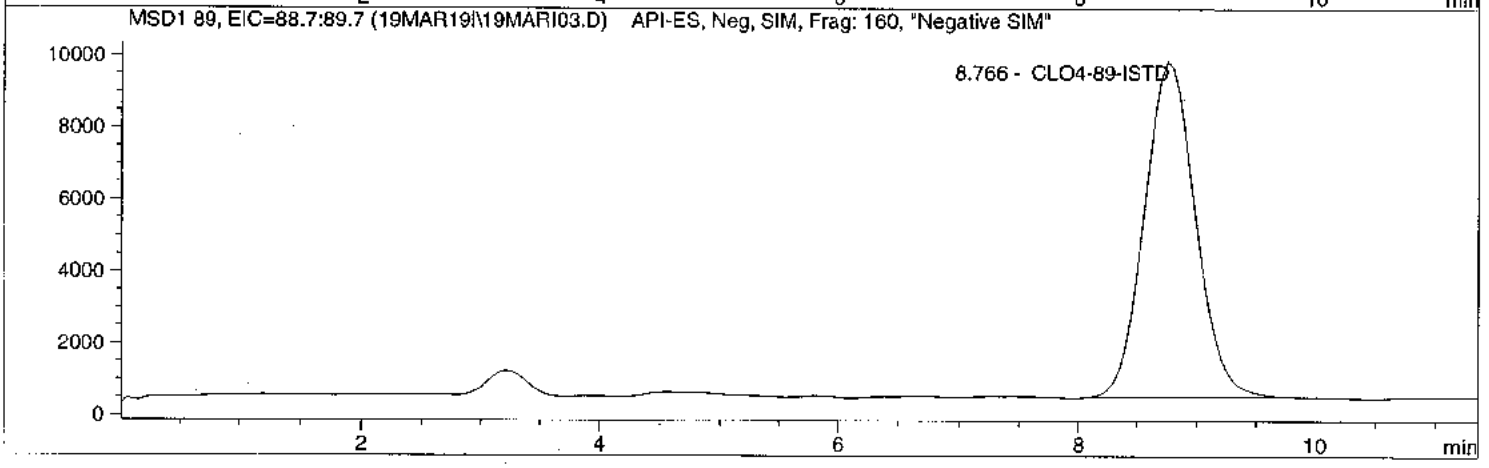
Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 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
8.744	MM	77607.4	1.0625	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	MM	23678.0	0.9305	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

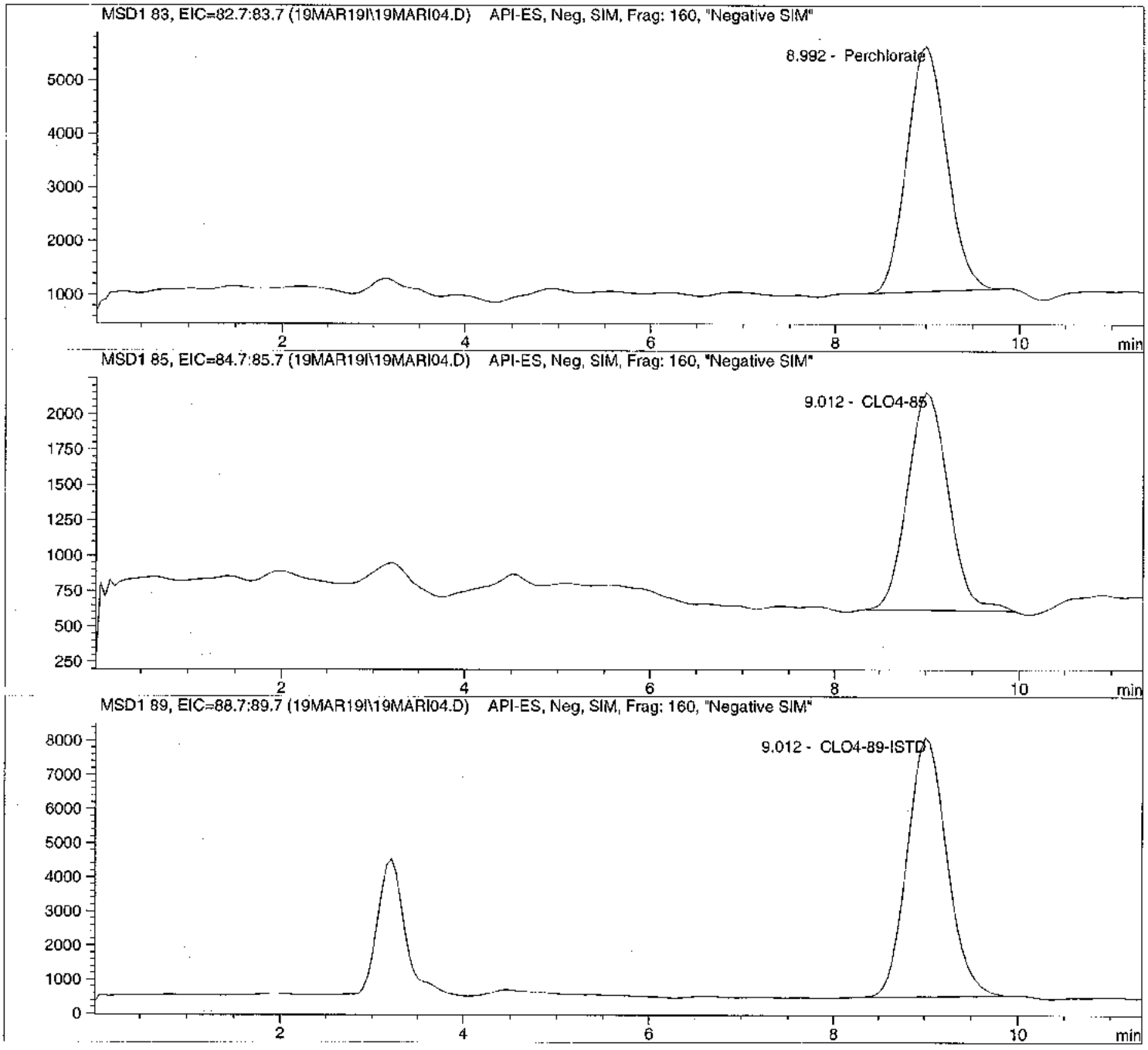
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	3/19/2019 09:53:00	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	3/19/2019 09:53:00	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 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
8.992	BBA	135272.8	2.0697	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	46948.6	2.2425	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	224885.9	5.0000	CLO4-89-ISTD

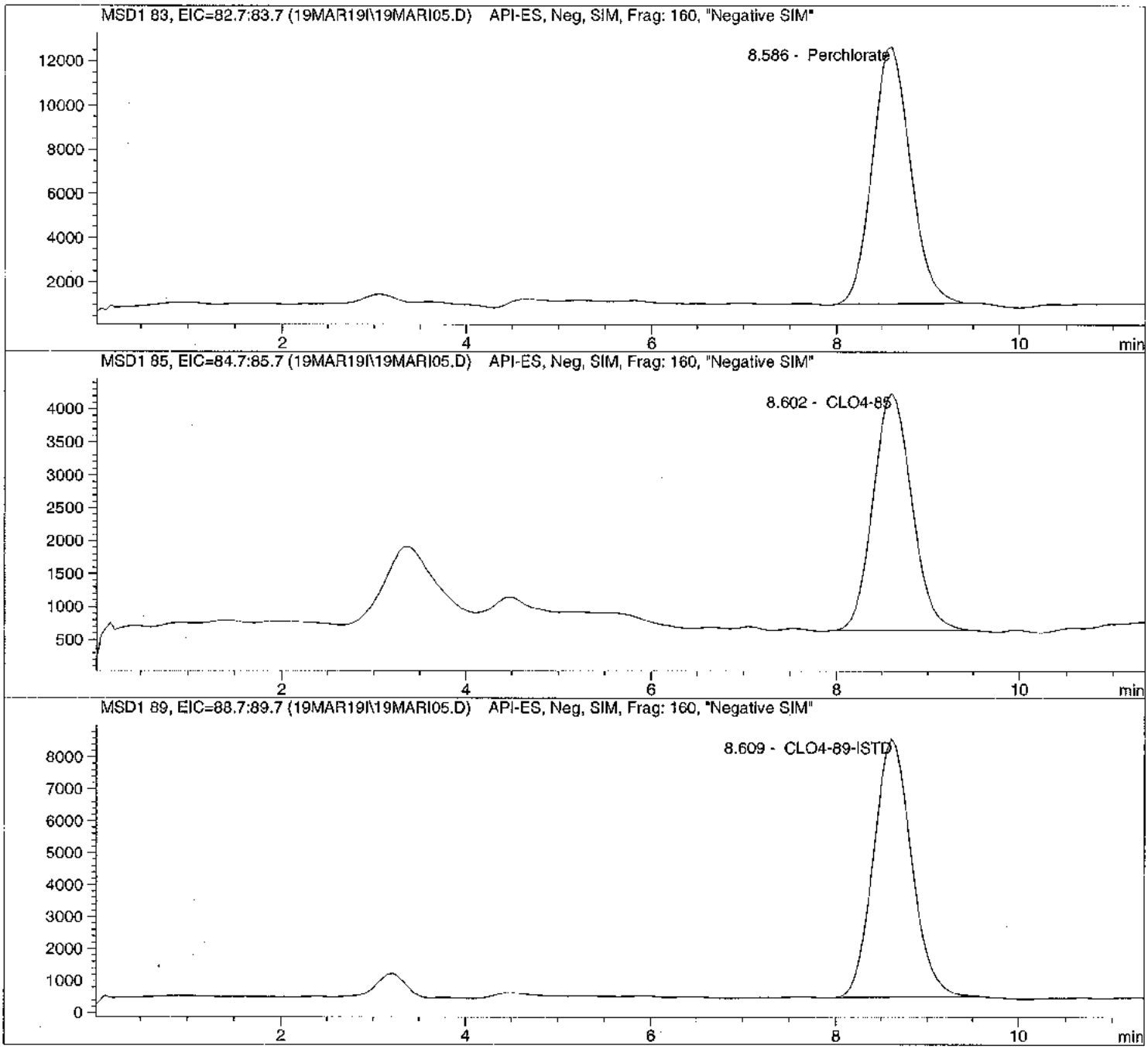
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	3/19/2019 10:06:16	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	3/19/2019 10:06:16	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 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
8.586	PBA	337763.6	4.7347	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.602	PBA	106124.0	4.8666	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.609	PBA	233196.3	5.0000	CLO4-89-ISTD

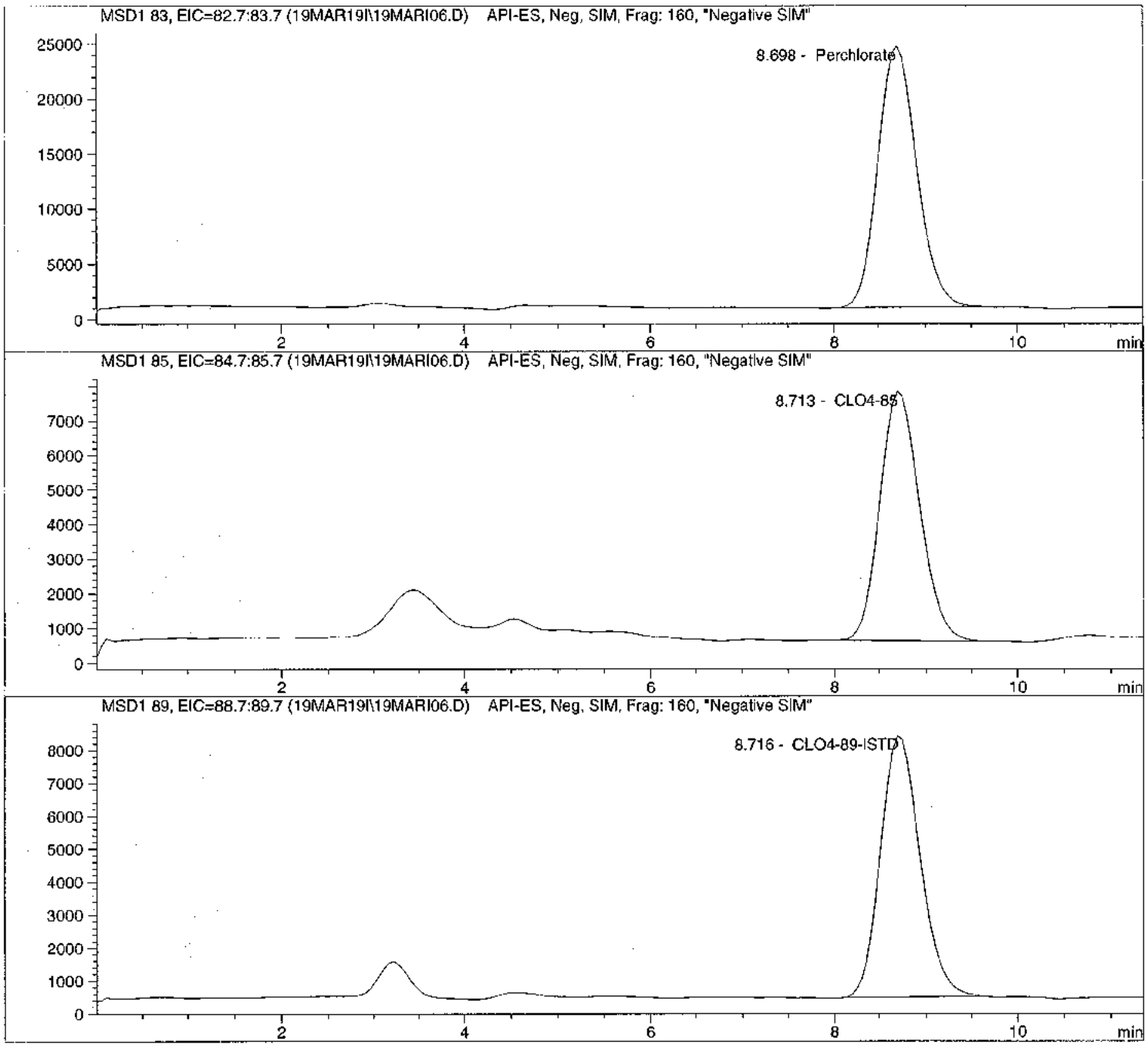
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	3/19/2019 10:19:32	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	3/19/2019 10:19:32	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 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
8.698	PBA	683454.4	9.2773	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.713	BBA	213522.6	9.6431	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.716	PBA	234453.6	5.0000	CLO4-89-ISTD

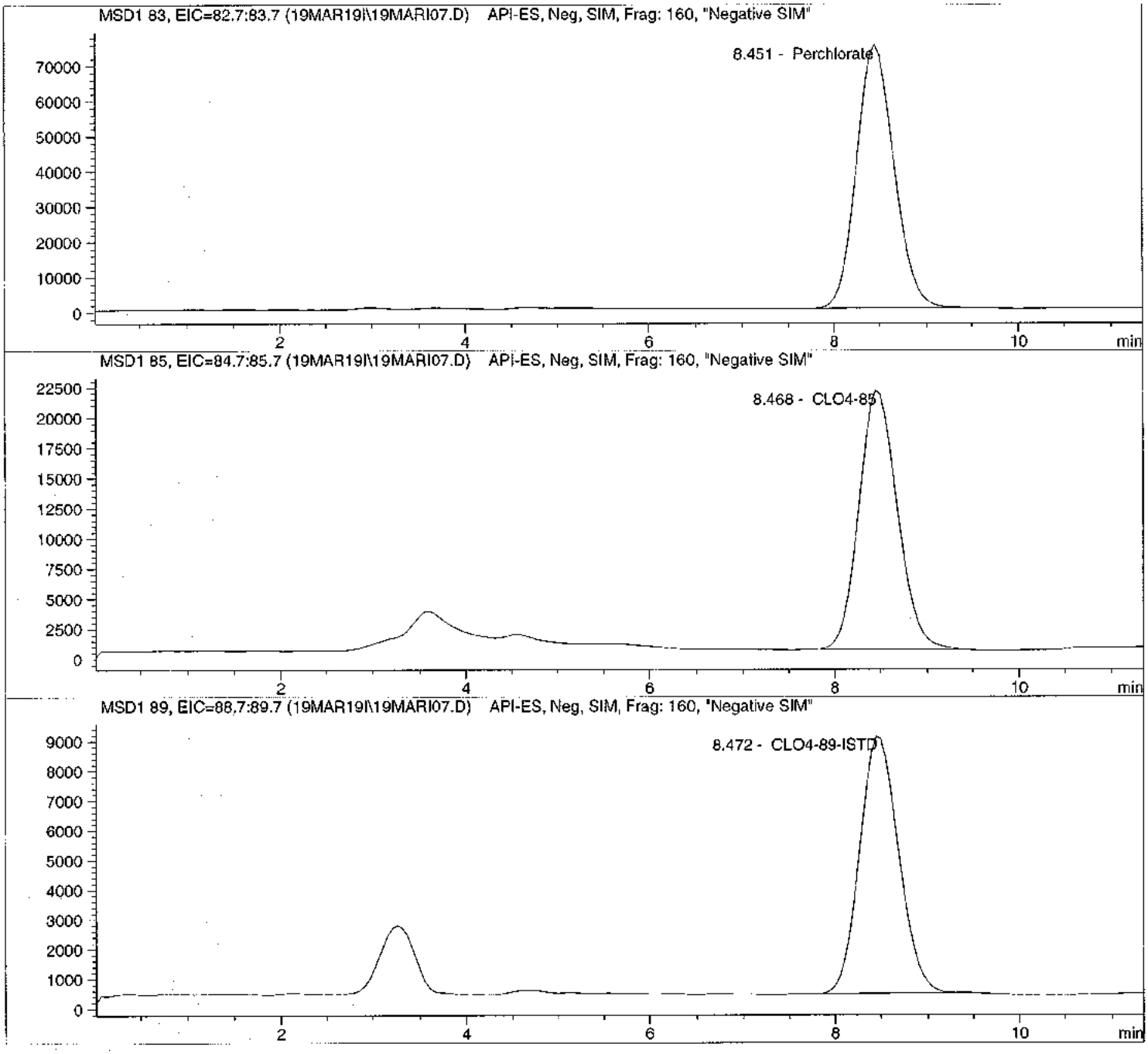
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	3/19/2019 10:32:49	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	3/19/2019 10:32:49	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 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
8.451	PBA	2084327.4	25.2904	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.468	BBA	614294.8	25.1216	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.472	BBA	250568.0	5.0000	CLO4-89-ISTD

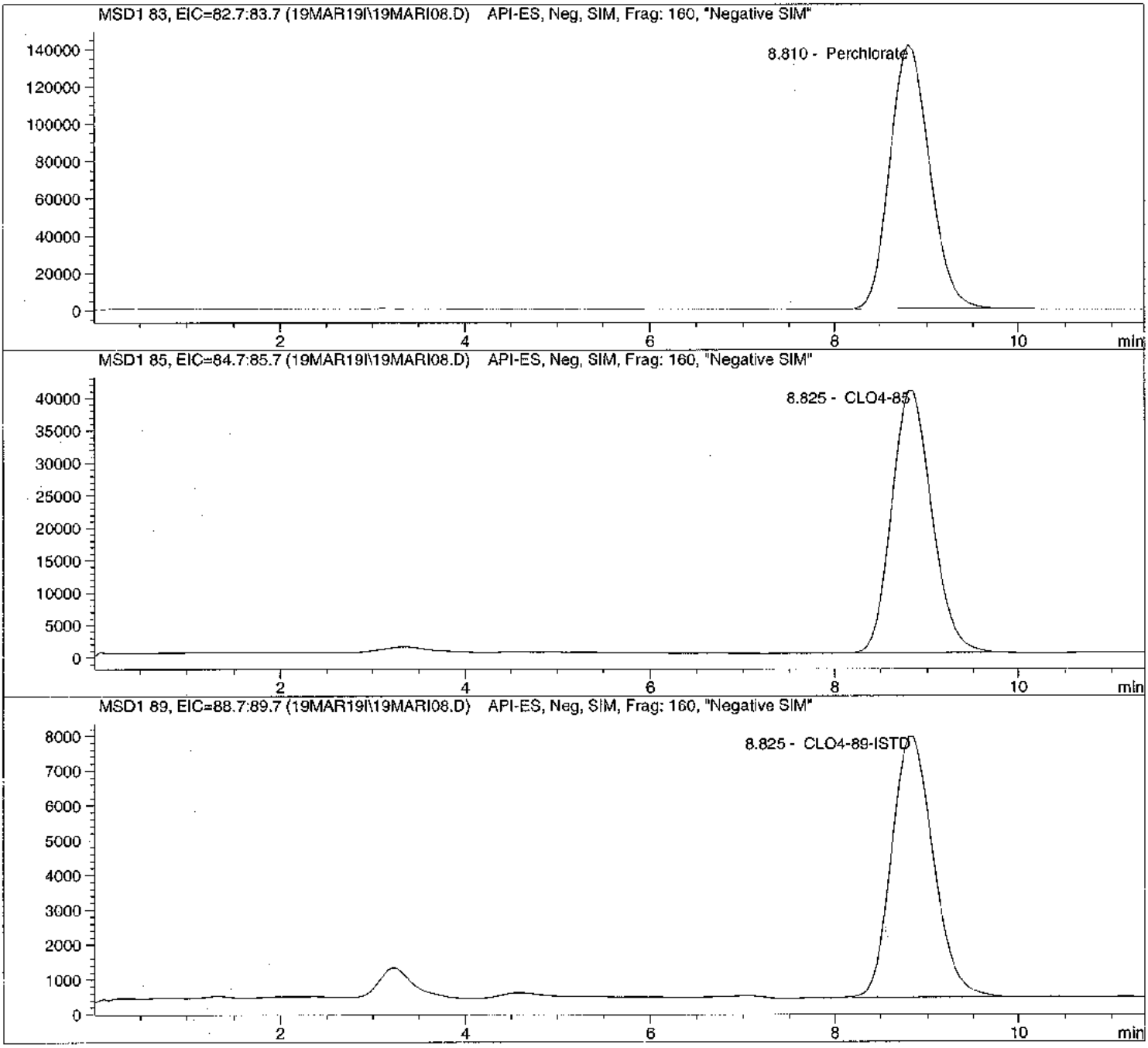
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	3/19/2019 10:46:05	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	3/19/2019 10:46:05	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 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
8.810	PBA	4133340.5	51.3684	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	1198135.6	50.4672	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	230976.7	5.0000	CLO4-89-ISTD

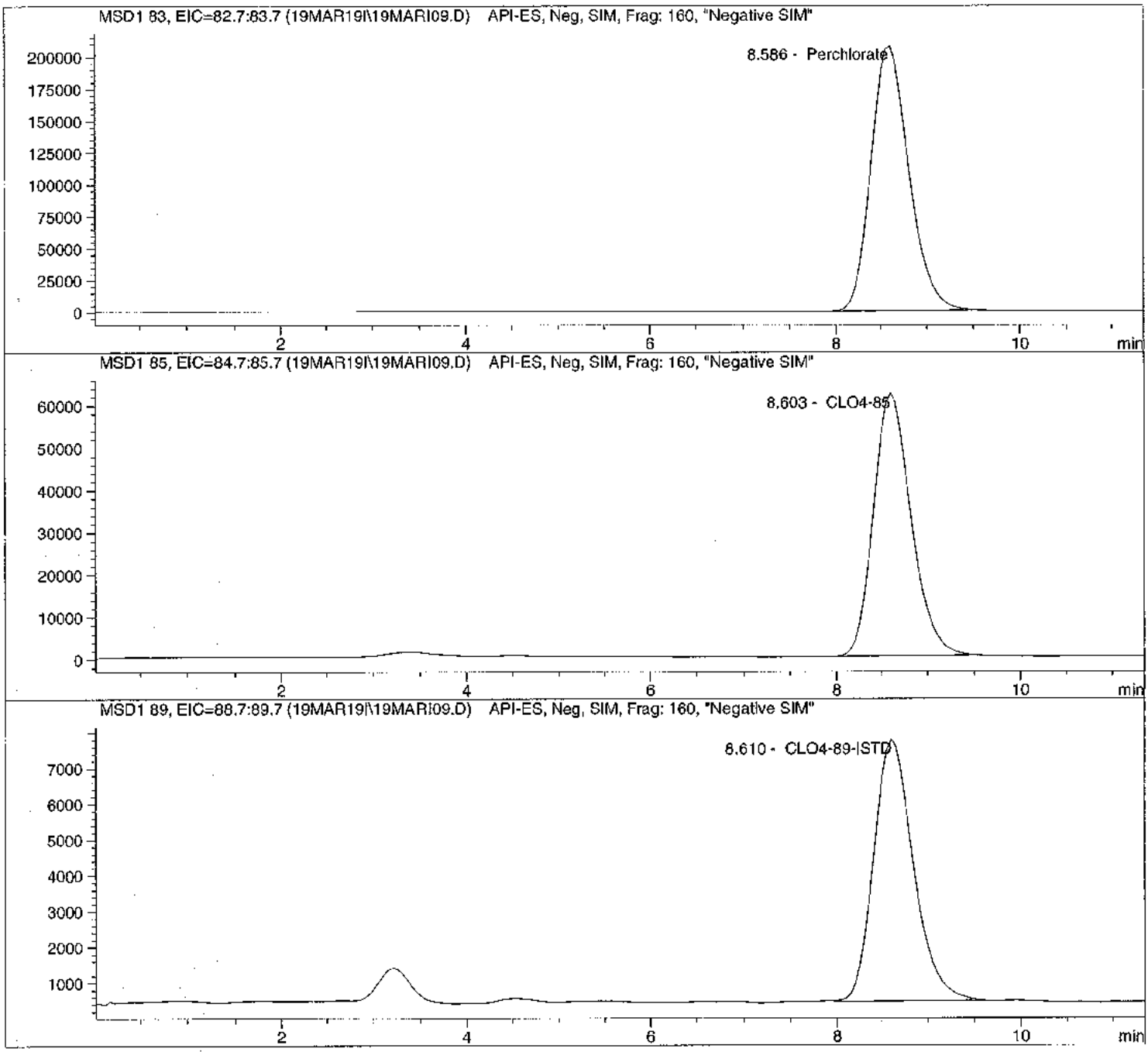
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	3/19/2019 10:59:22	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	3/19/2019 10:59:22	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 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
8.586	PBA	5993128.0	74.1675	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.603	PBA	1783554.4	74.7202	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.610	BBA	221504.5	5.0000	CLO4-89-ISTD

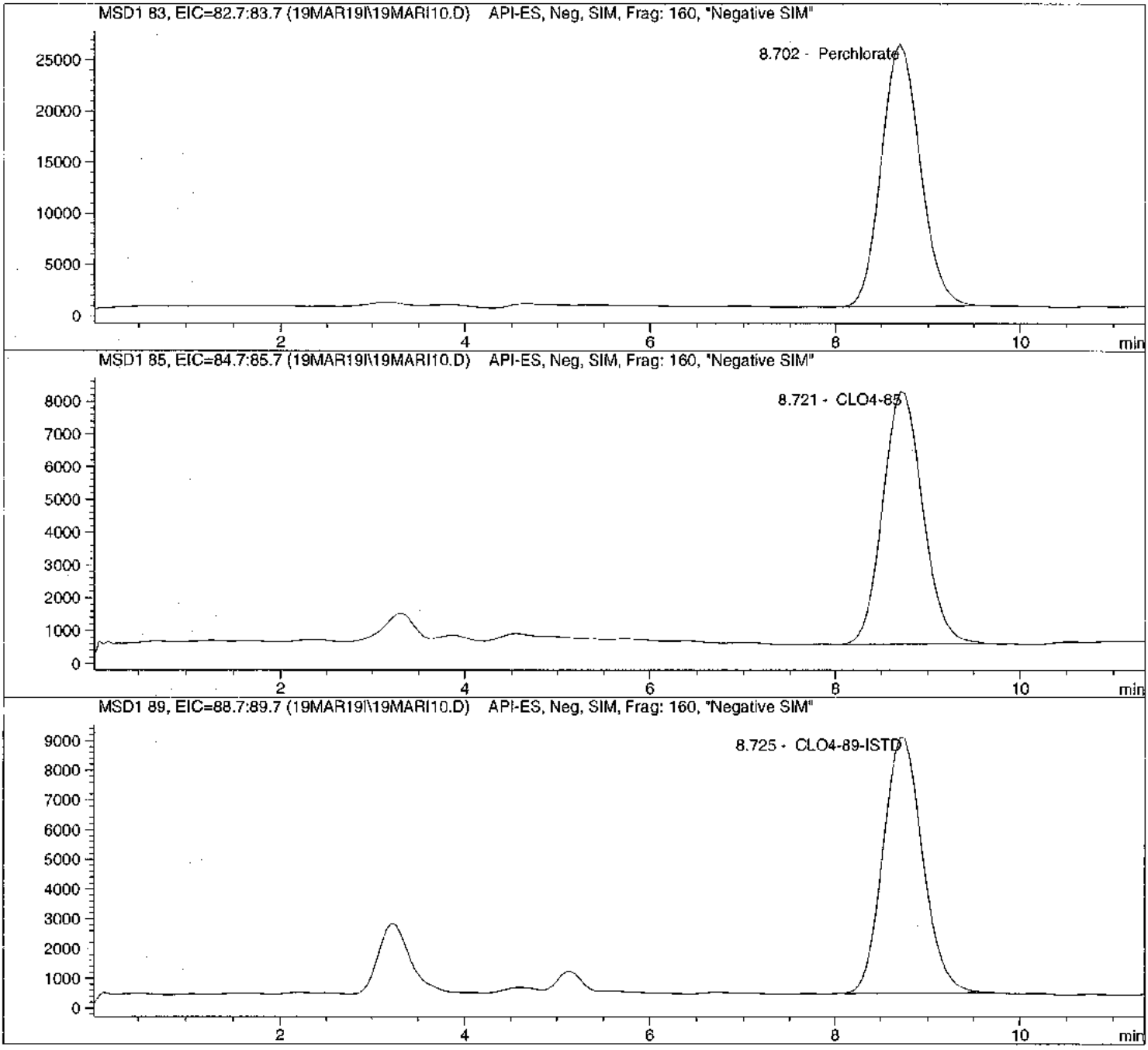
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L

Injection Date:	3/19/2019 11:12:42	Seq Line:	10
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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L

Injection Date:	3/19/2019 11:12:42	Seq Line:	10
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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 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
8.702	PBA	734718.7	9.2594	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.721	PBA	227494.7	9.5402	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.725	BBA	252544.4	5.0000	CLO4-89-ISTD

*** End of Report ***



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

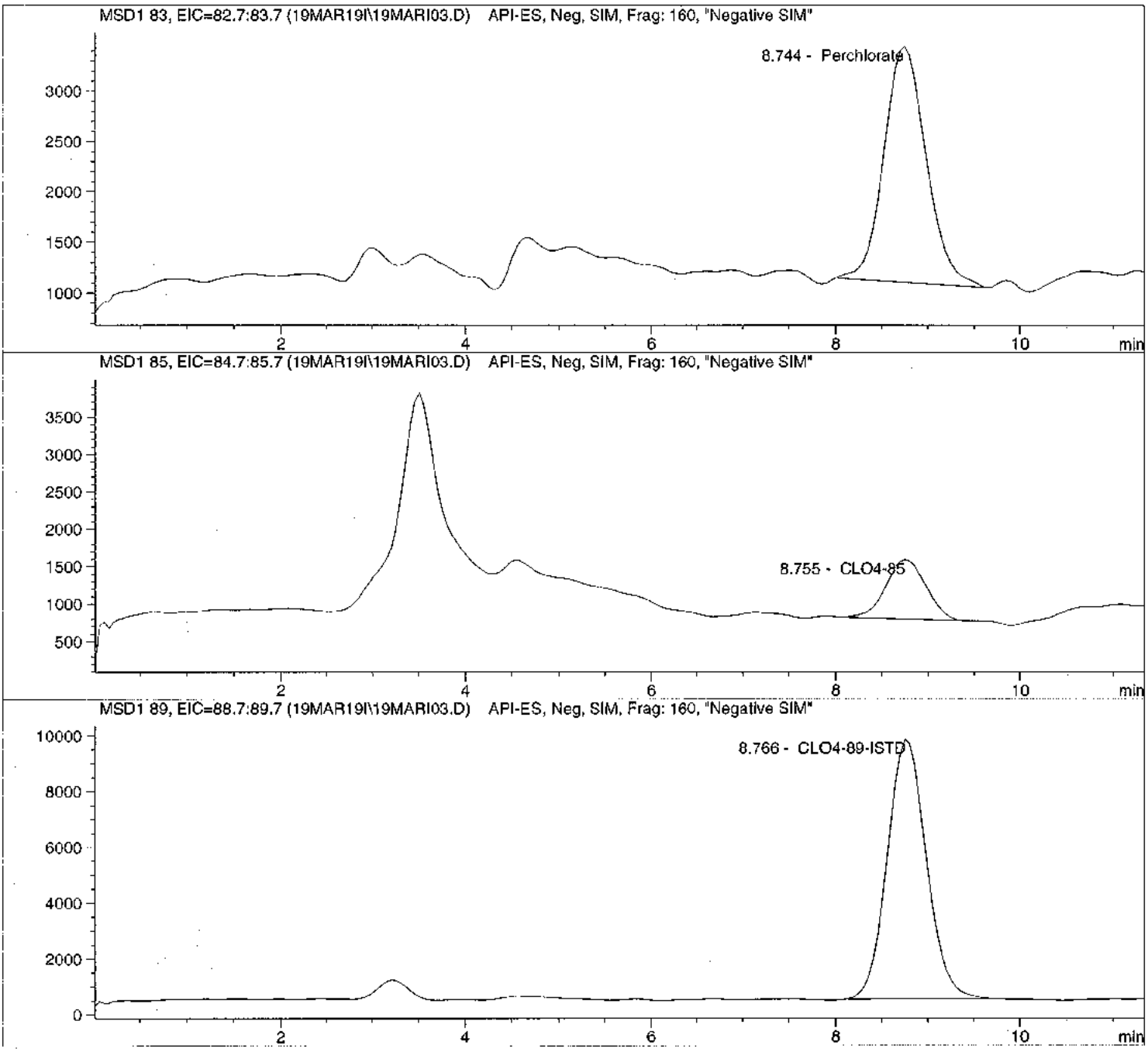
Unmodified

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	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-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	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-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 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
8.744	BBA	74166.3	1.0224	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	BBA	24138.1	0.9487	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

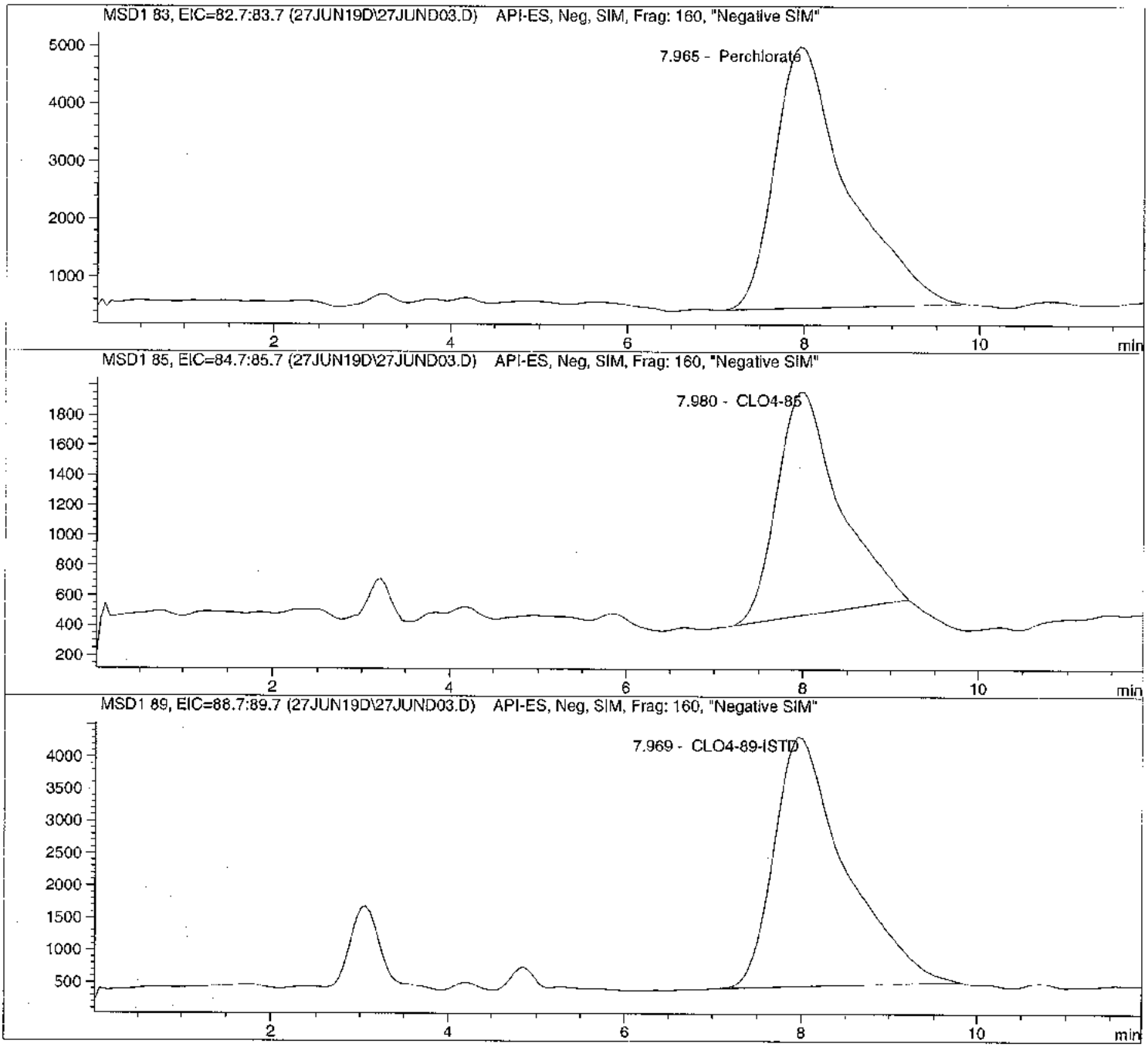
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND03.D Sample Name: 660891 ICS@4.0

Injection Date:	6/27/2019 09:14:16	Seq Line:	3
Sample Name:	660891 ICS@4.0	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND03.D Sample Name: 660891 ICS@4.0

Injection Date:	6/27/2019 09:14:16	Seq Line:	3
Sample Name:	660891 ICS@4.0	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.965	PBA	257330.2	3.9251	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.980	PBA	71973.3	3.5682	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.969	BBA	216232.2	5.0000	CLO4-89-ISTD

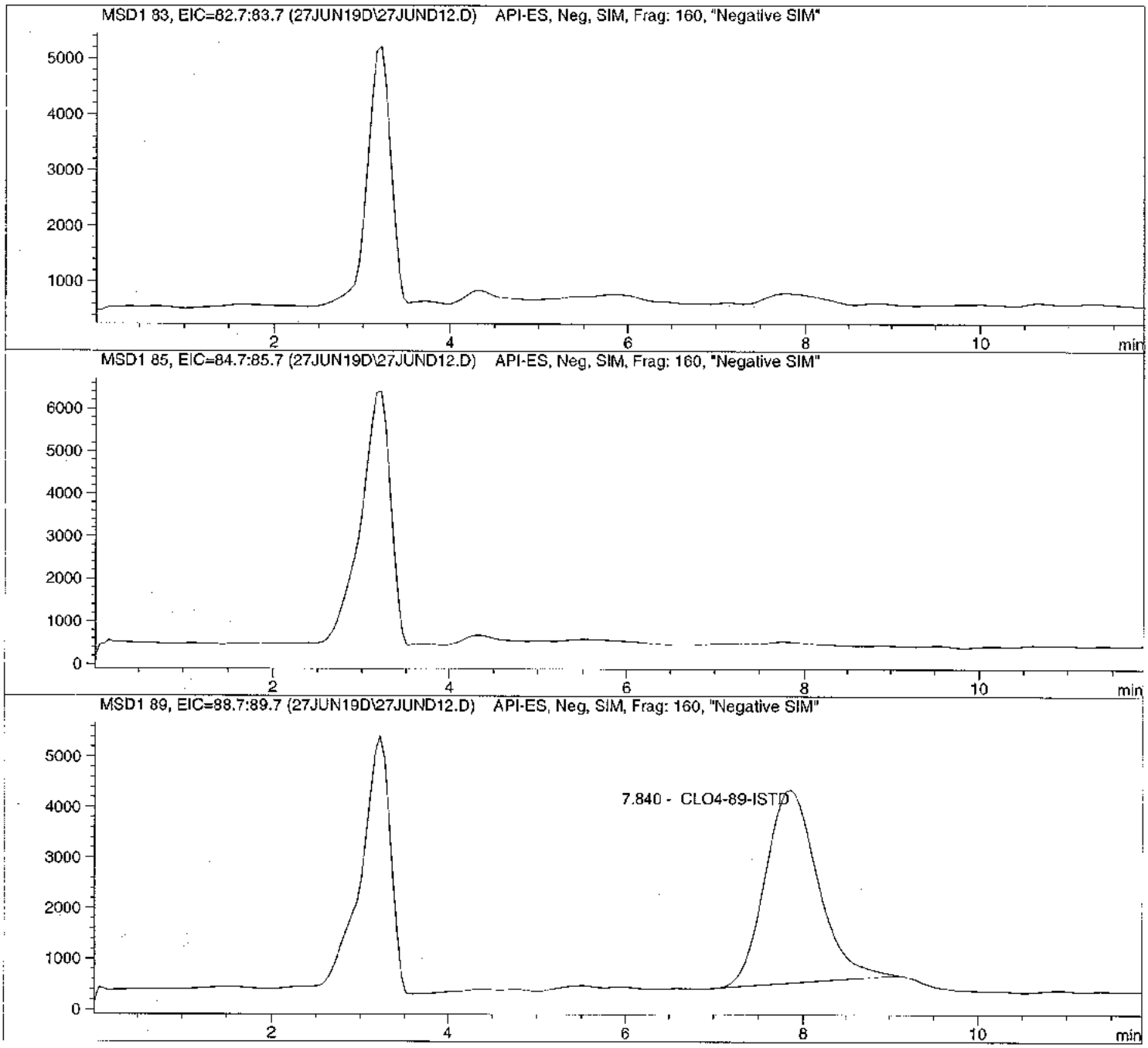
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND12.D Sample Name: 1917489005

Injection Date:	6/27/2019 11:20:03	Seq Line:	12
Sample Name:	1917489005	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND12.D Sample Name: 1917489005

Injection Date:	6/27/2019 11:20:03	Seq Line:	12
Sample Name:	1917489005	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
7.840	PBA	156379.6	5.0000	CLO4-89-ISTD

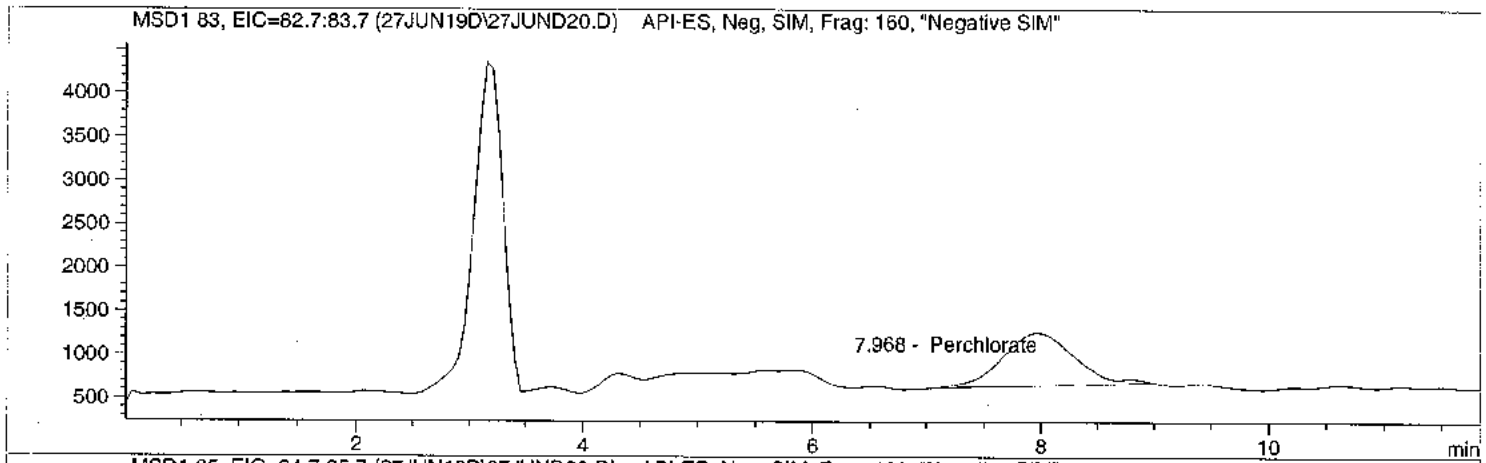
*** End of Report ***

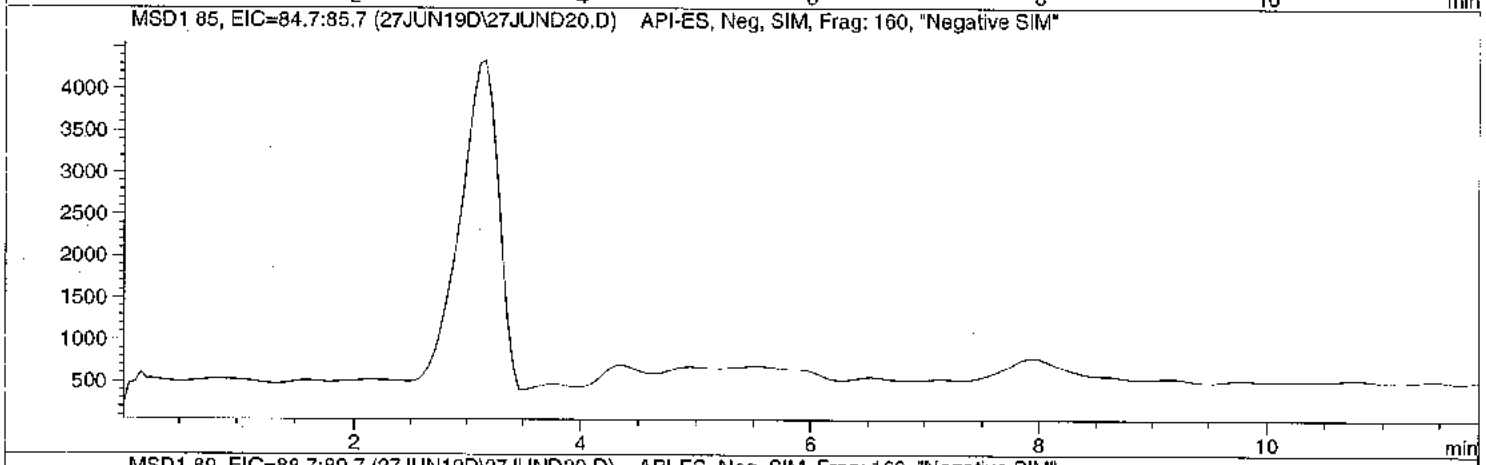
Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND20.D Sample Name: 1917672007

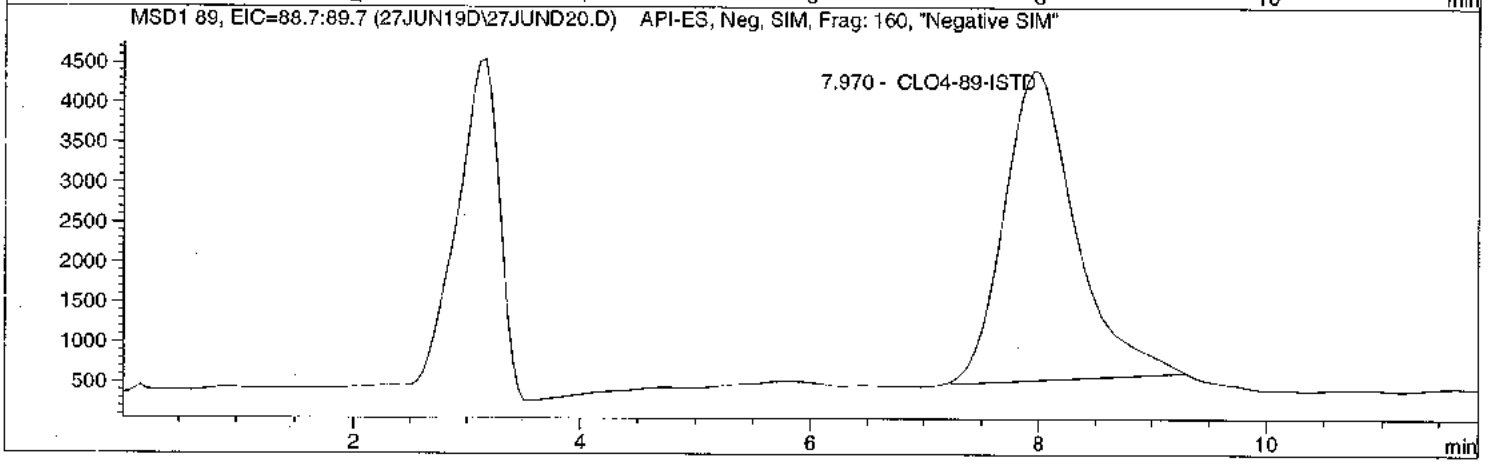
Injection Date:	6/27/2019 13:11:15	Seq Line:	20
Sample Name:	1917672007	Location:	Vial 89
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND20.D Sample Name: 1917672007

Injection Date:	6/27/2019 13:11:15	Seq Line:	20
Sample Name:	1917672007	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
7.968	PBA	26504.7	0.6583	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
7.970	PBA	168729.9	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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June 27, 2019

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

Work Order: **HS19060699**

Laboratory Results for: **Longhorn GW Treatment Plant Bi-Weekly Samples**

Dear Marcia,

ALS Environmental received 2 sample(s) on Jun 13, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: DAYNA.FISHER
RJ Modashia
Project Manager

ALS Houston, US Date: 27-jun-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
Work Order: HS19060699

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19060699-01	LH18/24-SP650_061219	Water		12-Jun-2019 14:00	13-Jun-2019 08:45	☐
HS19060699-02	Trip Blank	Water	CG 052219 -10	12-Jun-2019 14:00	13-Jun-2019 08:45	☐

ALS Houston, US Date: 27-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
Work Order: HS19060699

CASE NARRATIVE

GCMS Volatiles by Method SW8260

Batch ID: R341360

Sample ID: CCV

- Acetone exceeded %D limits for CCV. Samples are ND for this compound.

Sample ID: HS19060820-02MS

- MS and MSD are for an unrelated sample

Sample ID: VLCSW-190626

- 1,2,3_Trichlorobenzene exceeded QC limits for LCS. CCV is OK.

WetChemistry by Method SW9056

Batch ID: R340983

Sample ID: HS19060404-07MS

- MS and MSD are for an unrelated sample (Chloride,Sulfate)

ALS Houston, US Date: 27-Jun-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: Longhorn GW Treatment Plant Bi-Weekly Samples WorkOrder:HS19060699
Sample ID: LH18/24-SP650_061219 Lab ID:HS19060699-01
Collection Date: 12-Jun-2019 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-Jun-2019 15:19
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	26-Jun-2019 15:19
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	26-Jun-2019 15:19
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	26-Jun-2019 15:19
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	26-Jun-2019 15:19
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	26-Jun-2019 15:19
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Jun-2019 15:19
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	26-Jun-2019 15:19
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	26-Jun-2019 15:19
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	26-Jun-2019 15:19
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Jun-2019 15:19
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	26-Jun-2019 15:19
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	26-Jun-2019 15:19
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	26-Jun-2019 15:19
1,2-Dichloroethane	**0.46**	J	**0.20**	**0.50**	**1.0**	**UG/L**	1	26-Jun-2019 15:19
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	26-Jun-2019 15:19
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Jun-2019 15:19
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	26-Jun-2019 15:19
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	26-Jun-2019 15:19
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	26-Jun-2019 15:19
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	26-Jun-2019 15:19
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	26-Jun-2019 15:19
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Jun-2019 15:19
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	26-Jun-2019 15:19
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	26-Jun-2019 15:19
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Jun-2019 15:19
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	26-Jun-2019 15:19
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	26-Jun-2019 15:19
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	26-Jun-2019 15:19
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	26-Jun-2019 15:19
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	26-Jun-2019 15:19
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	26-Jun-2019 15:19
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	26-Jun-2019 15:19
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	26-Jun-2019 15:19
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	26-Jun-2019 15:19
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	26-Jun-2019 15:19
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Jun-2019 15:19
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	26-Jun-2019 15:19
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	26-Jun-2019 15:19

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

ALS Houston, US Date: 27-Jun-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: Longhorn GW Treatment Plant Bi-Weekly Samples WorkOrder:HS19060699
Sample ID: LH18/24-SP650_061219 Lab ID:HS19060699-01
Collection Date: 12-Jun-2019 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-Jun-2019 15:19
cis-1,2-Dichloroethene	**0.49**	J	**0.20**	**0.50**	**1.0**	**UG/L**	1	26-Jun-2019 15:19
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	26-Jun-2019 15:19
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	26-Jun-2019 15:19
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	26-Jun-2019 15:19
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	26-Jun-2019 15:19
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Jun-2019 15:19
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	26-Jun-2019 15:19
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Jun-2019 15:19
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	26-Jun-2019 15:19
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	26-Jun-2019 15:19
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	26-Jun-2019 15:19
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Jun-2019 15:19
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Jun-2019 15:19
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Jun-2019 15:19
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Jun-2019 15:19
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Jun-2019 15:19
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Jun-2019 15:19
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Jun-2019 15:19
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	26-Jun-2019 15:19
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	26-Jun-2019 15:19
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	26-Jun-2019 15:19
Trichloroethene	**0.64**	J	**0.20**	**0.50**	**1.0**	**UG/L**	1	26-Jun-2019 15:19
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	26-Jun-2019 15:19
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	26-Jun-2019 15:19
Surr: 1,2-Dichloroethane-d4	*101*			**0**	*81-118*	*%REC*	*1*	*26-Jun-2019 15:19*
Surr: 4-Bromofluorobenzene	*94.8*			**0**	*85-114*	*%REC*	*1*	*26-Jun-2019 15:19*
Surr: Dibromofluoromethane	*94.0*			**0**	*80-119*	*%REC*	*1*	*26-Jun-2019 15:19*
Surr: Toluene-d8	*99.0*			**0**	*89-112*	*%REC*	*1*	*26-Jun-2019 15:19*
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Chloride	**362**		**2.00**	**5.00**	**5.00**	**mg/L**	10	20-Jun-2019 23:13
Sulfate	**33.4**		**2.00**	**5.00**	**5.00**	**mg/L**	10	20-Jun-2019 23:13

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

ALS Houston, US Date: 27-Jun-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: Longhorn GW Treatment Plant Bi-Weekly Samples WorkOrder:HS19060699
Sample ID: Trip Blank Lab ID:HS19060699-02
Collection Date: 12-Jun-2019 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-Jun-2019 14:55
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	26-Jun-2019 14:55
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	26-Jun-2019 14:55
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	26-Jun-2019 14:55
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	26-Jun-2019 14:55
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	26-Jun-2019 14:55
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Jun-2019 14:55
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	26-Jun-2019 14:55
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	26-Jun-2019 14:55
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	26-Jun-2019 14:55
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Jun-2019 14:55
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	26-Jun-2019 14:55
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	26-Jun-2019 14:55
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	26-Jun-2019 14:55
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	26-Jun-2019 14:55
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	26-Jun-2019 14:55
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Jun-2019 14:55
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	26-Jun-2019 14:55
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	26-Jun-2019 14:55
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	26-Jun-2019 14:55
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	26-Jun-2019 14:55
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	26-Jun-2019 14:55
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Jun-2019 14:55
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	26-Jun-2019 14:55
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	26-Jun-2019 14:55
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Jun-2019 14:55
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	26-Jun-2019 14:55
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	26-Jun-2019 14:55
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	26-Jun-2019 14:55
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	26-Jun-2019 14:55
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	26-Jun-2019 14:55
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	26-Jun-2019 14:55
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	26-Jun-2019 14:55
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	26-Jun-2019 14:55
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	26-Jun-2019 14:55
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	26-Jun-2019 14:55
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Jun-2019 14:55
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	26-Jun-2019 14:55
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	26-Jun-2019 14:55

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

ALS Houston, US Date: 27-Jun-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: Longhorn GW Treatment Plant Bi-Weekly Samples WorkOrder:HS19060699
Sample ID: Trip Blank Lab ID:HS19060699-02
Collection Date: 12-Jun-2019 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-Jun-2019 14:55
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	26-Jun-2019 14:55
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	26-Jun-2019 14:55
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	26-Jun-2019 14:55
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	26-Jun-2019 14:55
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	26-Jun-2019 14:55
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Jun-2019 14:55
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	26-Jun-2019 14:55
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Jun-2019 14:55
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	26-Jun-2019 14:55
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	26-Jun-2019 14:55
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	26-Jun-2019 14:55
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Jun-2019 14:55
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Jun-2019 14:55
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Jun-2019 14:55
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Jun-2019 14:55
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Jun-2019 14:55
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Jun-2019 14:55
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Jun-2019 14:55
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	26-Jun-2019 14:55
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	26-Jun-2019 14:55
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	26-Jun-2019 14:55
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	26-Jun-2019 14:55
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	26-Jun-2019 14:55
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	26-Jun-2019 14:55
Surr: 1,2-Dichloroethane-d4	*102*			**0**	*81-118*	*%REC*	*1*	*26-Jun-2019 14:55*
Surr: 4-Bromofluorobenzene	*95.1*			**0**	*85-114*	*%REC*	*1*	*26-Jun-2019 14:55*
Surr: Dibromofluoromethane	*93.4*			**0**	*80-119*	*%REC*	*1*	*26-Jun-2019 14:55*
Surr: Toluene-d8	*100*			**0**	*89-112*	*%REC*	*1*	*26-Jun-2019 14:55*

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

ALS Houston, US Date: 27-jun-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: HS19060699

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID R340983	**Test Name :** ANIONS BY SW9056A			**Matrix:** Water		
HS19060699-01	LH18/24-SP650_061219	12 Jun 2019 14:00			20 Jun 2019 23:13	10
Batch ID R341360	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C			**Matrix:** Water		
HS19060699-01	LH18/24-SP650_061219	12 Jun 2019 14:00			26 Jun 2019 15:19	1
HS19060699-02	Trip Blank	12 Jun 2019 14:00			26 Jun 2019 14:55	1

ALS Houston, US Date: 27-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: HS19060699

QC BATCH REPORT

Batch ID: R341360 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-190626** Units: **UG/L** Analysis Date: **26-Jun-2019 14:07**
Client ID: Run ID: **VOA6_341360** SeqNo: **5142418** 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-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: HS19060699

QC BATCH REPORT

Batch ID: R341360 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-190626** Units: **UG/L** Analysis Date: **26-Jun-2019 14:07**
Client ID: Run ID: **VOA6_341360** SeqNo: **5142418** 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	*52.89*	*1.0*	*50*	*0*	*106*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*48.84*	*1.0*	*50*	*0*	*97.7*	*85 - 114*				
Surr: Dibromofluoromethane	*48.56*	*1.0*	*50*	*0*	*97.1*	*80 - 119*				
Surr: Toluene-d8	*51.5*	*1.0*	*50*	*0*	*103*	*89 - 112*				

ALS Houston, US Date: 27-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: HS19060699

QC BATCH REPORT

Batch ID: R341360 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

LCS Sample ID: **VLCSW-190626** Units: **UG/L** Analysis Date: **26-Jun-2019 10:46**
Client ID: Run ID: **VOA6_341360** SeqNo: **5142459** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	18.84	1.0	20	0	94.2	78 - 124				
1,1,1-Trichloroethane	19.78	1.0	20	0	98.9	74 - 131				
1,1,2,2-Tetrachloroethane	22.25	1.0	20	0	111	71 - 121				
1,1,2-Trichloroethane	20.42	1.0	20	0	102	80 - 119				
1,1-Dichloroethane	19.97	1.0	20	0	99.8	77 - 125				
1,1-Dichloroethene	20.91	1.0	20	0	105	71 - 131				
1,1-Dichloropropene	20.26	1.0	20	0	101	78 - 125				
1,2,3-Trichlorobenzene	26.83	1.0	20	0	134	69 - 129				S
1,2,3-Trichloropropane	22.17	1.0	20	0	111	73 - 122				
1,2,4-Trichlorobenzene	23.48	1.0	20	0	117	69 - 130				
1,2,4-Trimethylbenzene	19.07	1.0	20	0	95.4	76 - 124				
1,2-Dibromo-3-chloropropane	23.99	1.0	20	0	120	62 - 128				
1,2-Dibromoethane	20.16	1.0	20	0	101	77 - 121				
1,2-Dichlorobenzene	19.03	1.0	20	0	95.1	80 - 119				
1,2-Dichloroethane	19.06	1.0	20	0	95.3	73 - 128				
1,2-Dichloropropane	19.61	1.0	20	0	98.1	78 - 122				
1,3,5-Trimethylbenzene	18.48	1.0	20	0	92.4	75 - 124				
1,3-Dichlorobenzene	18.67	1.0	20	0	93.4	80 - 119				
1,3-Dichloropropane	20.69	1.0	20	0	103	80 - 119				
1,4-Dichlorobenzene	20.22	1.0	20	0	101	79 - 118				
2,2-Dichloropropane	20.47	1.0	20	0	102	60 - 139				
2-Butanone	48.73	2.0	40	0	122	56 - 143				
2-Chlorotoluene	19.97	1.0	20	0	99.9	79 - 122				
2-Hexanone	43.71	2.0	40	0	109	57 - 139				
4-Chlorotoluene	20.01	1.0	20	0	100	78 - 122				
4-Isopropyltoluene	19.25	1.0	20	0	96.2	77 - 127				
4-Methyl-2-pentanone	42.69	2.0	40	0	107	67 - 130				
Acetone	60.02	2.0	40	0	150	39 - 160				
Benzene	19.84	1.0	20	0	99.2	79 - 120				
Bromobenzene	18.23	1.0	20	0	91.2	80 - 120				
Bromochloromethane	18.66	1.0	20	0	93.3	78 - 123				
Bromodichloromethane	20.01	1.0	20	0	100	79 - 125				
Bromoform	20.17	1.0	20	0	101	66 - 130				
Bromomethane	23.22	1.0	20	0	116	53 - 141				

ALS Houston, US Date: 27-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: HS19060699

QC BATCH REPORT

Batch ID: R341360 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

LCS Sample ID: **VLCSW-190626** Units: **UG/L** Analysis Date: **26-Jun-2019 10:46**
Client ID: Run ID: **VOA6_341360** SeqNo: **5142459** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	37.14	2.0	40	0	92.9	64 - 133				
Carbon tetrachloride	19.18	1.0	20	0	95.9	72 - 136				
Chlorobenzene	18.99	1.0	20	0	95.0	82 - 118				
Chloroethane	20.85	1.0	20	0	104	60 - 138				
Chloroform	20.12	1.0	20	0	101	79 - 124				
Chloromethane	19.19	1.0	20	0	95.9	50 - 139				
cis-1,2-Dichloroethene	20.09	1.0	20	0	100	78 - 123				
cis-1,3-Dichloropropene	19.73	1.0	20	0	98.7	75 - 124				
Dibromochloromethane	19.32	1.0	20	0	96.6	74 - 126				
Dibromomethane	19.89	1.0	20	0	99.4	79 - 123				
Dichlorodifluoromethane	21.08	1.0	20	0	105	32 - 152				
Ethylbenzene	19.09	1.0	20	0	95.4	79 - 121				
Hexachlorobutadiene	25.13	1.0	20	0	126	66 - 134				
Isopropylbenzene	18.93	1.0	20	0	94.7	72 - 131				
m,p-Xylene	37.87	2.0	40	0	94.7	80 - 121				
Methylene chloride	19.61	2.0	20	0	98.1	74 - 124				
Naphthalene	25.38	1.0	20	0	127	61 - 128				
n-Butylbenzene	19.73	1.0	20	0	98.7	75 - 128				
n-Propylbenzene	20.02	1.0	20	0	100	76 - 126				
o-Xylene	18.63	1.0	20	0	93.2	78 - 122				
sec-Butylbenzene	20.39	1.0	20	0	102	77 - 126				
Styrene	19.72	1.0	20	0	98.6	78 - 123				
tert-Butylbenzene	19.99	1.0	20	0	99.9	78 - 124				
Tetrachloroethene	18.27	1.0	20	0	91.3	74 - 129				
Toluene	18.59	1.0	20	0	93.0	80 - 121				
trans-1,2-Dichloroethene	19.79	1.0	20	0	99.0	75 - 124				
trans-1,3-Dichloropropene	20.03	1.0	20	0	100	73 - 127				
Trichloroethene	18.47	1.0	20	0	92.3	79 - 123				
Trichlorofluoromethane	21.23	1.0	20	0	106	65 - 141				
Vinyl chloride	21.22	1.0	20	0	106	58 - 137				
Surr: 1,2-Dichloroethane-d4	*55.24*	*1.0*	*50*	*0*	*110*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*51.28*	*1.0*	*50*	*0*	*103*	*85 - 114*				
Surr: Dibromofluoromethane	*51.71*	*1.0*	*50*	*0*	*103*	*80 - 119*				
Surr: Toluene-d8	*48.04*	*1.0*	*50*	*0*	*96.1*	*89 - 112*				

ALS Houston, US Date: 27-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: HS19060699

QC BATCH REPORT

Batch ID: R341360 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS19060820-02MS** Units: **UG/L** Analysis Date: **26-Jun-2019 16:09**
Client ID: Run ID: **VOA6_341360** SeqNo: **5142423** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	17.67	1.0	20	0	88.3	78 - 124				
1,1,1-Trichloroethane	18.91	1.0	20	0	94.5	74 - 131				
1,1,2,2-Tetrachloroethane	19.66	1.0	20	0	98.3	71 - 121				
1,1,2-Trichloroethane	18.63	1.0	20	0	93.2	80 - 119				
1,1-Dichloroethane	17.86	1.0	20	0	89.3	77 - 125				
1,1-Dichloroethene	19.89	1.0	20	0	99.5	71 - 131				
1,1-Dichloropropene	19.78	1.0	20	0	98.9	78 - 125				
1,2,3-Trichlorobenzene	20.97	1.0	20	0	105	69 - 129				
1,2,3-Trichloropropane	19.77	1.0	20	0	98.9	73 - 122				
1,2,4-Trichlorobenzene	20.11	1.0	20	0	101	69 - 130				
1,2,4-Trimethylbenzene	18.69	1.0	20	0	93.5	76 - 124				
1,2-Dibromo-3-chloropropane	20.24	1.0	20	0	101	62 - 128				
1,2-Dibromoethane	18.03	1.0	20	0	90.1	77 - 121				
1,2-Dichlorobenzene	18.15	1.0	20	1.556	83.0	80 - 119				
1,2-Dichloroethane	17.35	1.0	20	0	86.7	73 - 128				
1,2-Dichloropropane	17.99	1.0	20	0	90.0	78 - 122				
1,3,5-Trimethylbenzene	18.65	1.0	20	0	93.3	75 - 124				
1,3-Dichlorobenzene	17.91	1.0	20	0	89.5	80 - 119				
1,3-Dichloropropane	18.53	1.0	20	0	92.7	80 - 119				
1,4-Dichlorobenzene	19.27	1.0	20	0	96.3	79 - 118				
2,2-Dichloropropane	17.96	1.0	20	0	89.8	60 - 139				
2-Butanone	37.47	2.0	40	0	93.7	56 - 143				
2-Chlorotoluene	19.71	1.0	20	0	98.6	79 - 122				
2-Hexanone	35.3	2.0	40	0	88.3	57 - 139				
4-Chlorotoluene	19.56	1.0	20	0	97.8	78 - 122				
4-Isopropyltoluene	19.52	1.0	20	0	97.6	77 - 127				
4-Methyl-2-pentanone	35.89	2.0	40	0	89.7	67 - 130				
Acetone	39.11	2.0	40	0	97.8	39 - 160				
Benzene	18.78	1.0	20	0.9822	89.0	79 - 120				
Bromobenzene	17.32	1.0	20	0	86.6	80 - 120				
Bromochloromethane	16.53	1.0	20	0	82.6	78 - 123				
Bromodichloromethane	18.02	1.0	20	0	90.1	79 - 125				
Bromoform	17.93	1.0	20	0	89.6	66 - 130				
Bromomethane	19.78	1.0	20	0	98.9	53 - 141				

ALS Houston, US Date: 27-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: HS19060699

QC BATCH REPORT

Batch ID: R341360 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS19060820-02MS** Units: **UG/L** Analysis Date: **26-Jun-2019 16:09**
Client ID: Run ID: **VOA6_341360** SeqNo: **5142423** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	34.97	2.0	40	0	87.4	64 - 133				
Carbon tetrachloride	19.18	1.0	20	0	95.9	72 - 136				
Chlorobenzene	17.82	1.0	20	0	89.1	82 - 118				
Chloroethane	19.6	1.0	20	0	98.0	60 - 138				
Chloroform	17.92	1.0	20	0	89.6	79 - 124				
Chloromethane	19.69	1.0	20	0	98.4	50 - 139				
cis-1,2-Dichloroethene	17.5	1.0	20	0	87.5	78 - 123				
cis-1,3-Dichloropropene	17.36	1.0	20	0	86.8	75 - 124				
Dibromochloromethane	17.47	1.0	20	0	87.4	74 - 126				
Dibromomethane	17.67	1.0	20	0	88.3	79 - 123				
Dichlorodifluoromethane	18.66	1.0	20	0	93.3	32 - 152				
Ethylbenzene	18.77	1.0	20	2.723	80.2	79 - 121				
Hexachlorobutadiene	23.24	1.0	20	0	116	66 - 134				
Isopropylbenzene	75.9	1.0	20	607.3	-2660	72 - 131				SO
m,p-Xylene	37.56	2.0	40	3.202	85.9	80 - 121				
Methylene chloride	17.2	2.0	20	0	86.0	74 - 124				
Naphthalene	20.29	1.0	20	0	101	61 - 128				
n-Butylbenzene	20	1.0	20	0	100	75 - 128				
n-Propylbenzene	21.79	1.0	20	13.14	43.3	76 - 126				S
o-Xylene	18.03	1.0	20	0	90.2	78 - 122				
sec-Butylbenzene	21.32	1.0	20	5.569	78.7	77 - 126				
Styrene	18.46	1.0	20	0	92.3	78 - 123				
tert-Butylbenzene	20.97	1.0	20	6.016	74.8	78 - 124				S
Tetrachloroethene	18.14	1.0	20	0	90.7	74 - 129				
Toluene	18.17	1.0	20	0	90.8	80 - 121				
trans-1,2-Dichloroethene	18.53	1.0	20	0	92.7	75 - 124				
trans-1,3-Dichloropropene	17.51	1.0	20	0	87.5	73 - 127				
Trichloroethene	17.6	1.0	20	0	88.0	79 - 123				
Trichlorofluoromethane	20.23	1.0	20	0	101	65 - 141				
Vinyl chloride	19.48	1.0	20	0	97.4	58 - 137				
Surr: 1,2-Dichloroethane-d4	*50.6*	*1.0*	*50*	*0*	*101*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*51.21*	*1.0*	*50*	*0*	*102*	*85 - 114*				
Surr: Dibromofluoromethane	*49.32*	*1.0*	*50*	*0*	*98.6*	*80 - 119*				
Surr: Toluene-d8	*50.02*	*1.0*	*50*	*0*	*100*	*89 - 112*				

ALS Houston, US Date: 27-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: HS19060699

QC BATCH REPORT

Batch ID: R341360 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS19060820-02MSD** Units: **UG/L** Analysis Date: **26-Jun-2019 16:33**
Client ID: Run ID: **VOA6_341360** SeqNo: **5142424** 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	17.82	1.0	20	0	89.1	78 - 124	17.67	0.896	20	
1,1,1-Trichloroethane	18.71	1.0	20	0	93.5	74 - 131	18.91	1.08	20	
1,1,2,2-Tetrachloroethane	20.11	1.0	20	0	101	71 - 121	19.66	2.24	20	
1,1,2-Trichloroethane	19.08	1.0	20	0	95.4	80 - 119	18.63	2.41	20	
1,1-Dichloroethane	18.09	1.0	20	0	90.5	77 - 125	17.86	1.32	20	
1,1-Dichloroethene	19.82	1.0	20	0	99.1	71 - 131	19.89	0.373	20	
1,1-Dichloropropene	19.39	1.0	20	0	97.0	78 - 125	19.78	1.99	20	
1,2,3-Trichlorobenzene	20.85	1.0	20	0	104	69 - 129	20.97	0.551	20	
1,2,3-Trichloropropane	19.96	1.0	20	0	99.8	73 - 122	19.77	0.961	20	
1,2,4-Trichlorobenzene	19.85	1.0	20	0	99.3	69 - 130	20.11	1.28	20	
1,2,4-Trimethylbenzene	18.49	1.0	20	0	92.5	76 - 124	18.69	1.07	20	
1,2-Dibromo-3-chloropropane	20.53	1.0	20	0	103	62 - 128	20.24	1.44	20	
1,2-Dibromoethane	18.12	1.0	20	0	90.6	77 - 121	18.03	0.542	20	
1,2-Dichlorobenzene	18.44	1.0	20	1.556	84.4	80 - 119	18.15	1.55	20	
1,2-Dichloroethane	17.83	1.0	20	0	89.1	73 - 128	17.35	2.74	20	
1,2-Dichloropropane	18.34	1.0	20	0	91.7	78 - 122	17.99	1.89	20	
1,3,5-Trimethylbenzene	18.48	1.0	20	0	92.4	75 - 124	18.65	0.915	20	
1,3-Dichlorobenzene	17.77	1.0	20	0	88.8	80 - 119	17.91	0.763	20	
1,3-Dichloropropane	18.87	1.0	20	0	94.3	80 - 119	18.53	1.79	20	
1,4-Dichlorobenzene	18.93	1.0	20	0	94.6	79 - 118	19.27	1.78	20	
2,2-Dichloropropane	17.64	1.0	20	0	88.2	60 - 139	17.96	1.81	20	
2-Butanone	37.37	2.0	40	0	93.4	56 - 143	37.47	0.283	20	
2-Chlorotoluene	19.58	1.0	20	0	97.9	79 - 122	19.71	0.649	20	
2-Hexanone	36.91	2.0	40	0	92.3	57 - 139	35.3	4.45	20	
4-Chlorotoluene	19.6	1.0	20	0	98.0	78 - 122	19.56	0.209	20	
4-Isopropyltoluene	19.29	1.0	20	0	96.4	77 - 127	19.52	1.21	20	
4-Methyl-2-pentanone	36.02	2.0	40	0	90.0	67 - 130	35.89	0.353	20	
Acetone	40.74	2.0	40	0	102	39 - 160	39.11	4.09	20	
Benzene	18.92	1.0	20	0.9822	89.7	79 - 120	18.78	0.724	20	
Bromobenzene	17.44	1.0	20	0	87.2	80 - 120	17.32	0.709	20	
Bromochloromethane	16.95	1.0	20	0	84.7	78 - 123	16.53	2.49	20	
Bromodichloromethane	18.31	1.0	20	0	91.5	79 - 125	18.02	1.56	20	
Bromoform	18.34	1.0	20	0	91.7	66 - 130	17.93	2.26	20	
Bromomethane	19.43	1.0	20	0	97.2	53 - 141	19.78	1.78	20	

ALS Houston, US Date: 27-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: HS19060699

QC BATCH REPORT

Batch ID: R341360 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MSD Sample ID: **HS19060820-02MSD** Units: **UG/L** Analysis Date: **26-Jun-2019 16:33**
Client ID: Run ID: **VOA6_341360** SeqNo: **5142424** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Carbon disulfide	34.58	2.0	40	0	86.5	64 - 133	34.97	1.13	20	
Carbon tetrachloride	19.01	1.0	20	0	95.1	72 - 136	19.18	0.87	20	
Chlorobenzene	17.91	1.0	20	0	89.6	82 - 118	17.82	0.509	20	
Chloroethane	19.45	1.0	20	0	97.2	60 - 138	19.6	0.771	20	
Chloroform	18.29	1.0	20	0	91.5	79 - 124	17.92	2.07	20	
Chloromethane	19.17	1.0	20	0	95.8	50 - 139	19.69	2.69	20	
cis-1,2-Dichloroethene	18	1.0	20	0	90.0	78 - 123	17.5	2.77	20	
cis-1,3-Dichloropropene	17.2	1.0	20	0	86.0	75 - 124	17.36	0.955	20	
Dibromochloromethane	17.57	1.0	20	0	87.8	74 - 126	17.47	0.546	20	
Dibromomethane	17.8	1.0	20	0	89.0	79 - 123	17.67	0.745	20	
Dichlorodifluoromethane	18.21	1.0	20	0	91.0	32 - 152	18.66	2.44	20	
Ethylbenzene	18.53	1.0	20	2.723	79.0	79 - 121	18.77	1.3	20	
Hexachlorobutadiene	22.04	1.0	20	0	110	66 - 134	23.24	5.31	20	
Isopropylbenzene	73.92	1.0	20	607.3	-2670	72 - 131	75.9	2.65	20	SO
m,p-Xylene	37.14	2.0	40	3.202	84.8	80 - 121	37.56	1.12	20	
Methylene chloride	17.84	2.0	20	0	89.2	74 - 124	17.2	3.66	20	
Naphthalene	19.75	1.0	20	0	98.8	61 - 128	20.29	2.7	20	
n-Butylbenzene	19.51	1.0	20	0	97.5	75 - 128	20	2.51	20	
n-Propylbenzene	21.32	1.0	20	13.14	40.9	76 - 126	21.79	2.22	20	S
o-Xylene	18.11	1.0	20	0	90.5	78 - 122	18.03	0.412	20	
sec-Butylbenzene	20.96	1.0	20	5.569	76.9	77 - 126	21.32	1.71	20	S
Styrene	18.47	1.0	20	0	92.3	78 - 123	18.46	0.0121	20	
tert-Butylbenzene	20.83	1.0	20	6.016	74.0	78 - 124	20.97	0.695	20	S
Tetrachloroethene	17.85	1.0	20	0	89.3	74 - 129	18.14	1.58	20	
Toluene	18.02	1.0	20	0	90.1	80 - 121	18.17	0.831	20	
trans-1,2-Dichloroethene	18.4	1.0	20	0	92.0	75 - 124	18.53	0.701	20	
trans-1,3-Dichloropropene	17.73	1.0	20	0	88.7	73 - 127	17.51	1.29	20	
Trichloroethene	17.64	1.0	20	0	88.2	79 - 123	17.6	0.211	20	
Trichlorofluoromethane	19.91	1.0	20	0	99.5	65 - 141	20.23	1.61	20	
Vinyl chloride	19.04	1.0	20	0	95.2	58 - 137	19.48	2.32	20	
Surr: 1,2-Dichloroethane-d4	*52.28*	*1.0*	*50*	*0*	*105*	*81 - 118*	*50.6*	*3.26*	*20*	
Surr: 4-Bromofluorobenzene	*51.11*	*1.0*	*50*	*0*	*102*	*85 - 114*	*51.21*	*0.196*	*20*	
Surr: Dibromofluoromethane	*49.75*	*1.0*	*50*	*0*	*99.5*	*80 - 119*	*49.32*	*0.875*	*20*	
Surr: Toluene-d8	*49.96*	*1.0*	*50*	*0*	*99.9*	*89 - 112*	*50.02*	*0.111*	*20*	

ALS Houston, US Date: 27-Jun-19

Client:	Bhate Environmental Associates, Inc.
Project:	Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder:	HS19060699

QC BATCH REPORT

Batch ID:	**R341360 (0)**	**Instrument:**	**VOA6**	**Method:**	**VOLATILES ORGANICS BY METHOD 8260C**

The following samples were analyzed in this batch:	HS19060699-01	HS19060699-02

ALS Houston, US Date: 27-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: HS19060699

QC BATCH REPORT

Batch ID: R340983 (0) **Instrument: ICS2100** **Method: ANIONS BY SW9056A**

MBLK Sample ID: **WBLKW1-062019** Units: **mg/L** Analysis Date: **20-Jun-2019 19:04**
Client ID: Run ID: **ICS2100_340983** SeqNo: **5133579** 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: **WLCSW1-062019** Units: **mg/L** Analysis Date: **20-Jun-2019 19:19**
Client ID: Run ID: **ICS2100_340983** SeqNo: **5133580** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	20.61	0.500	20	0	103	80 - 120				
Sulfate	20.53	0.500	20	0	103	80 - 120				

LCSD Sample ID: **WLCSDW1-062019** Units: **mg/L** Analysis Date: **20-Jun-2019 19:34**
Client ID: Run ID: **ICS2100_340983** SeqNo: **5133581** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	21.75	0.500	20	0	109	80 - 120	20.61	5.39	20	
Sulfate	21.78	0.500	20	0	109	80 - 120	20.53	5.94	20	

MS Sample ID: **HS19060732-03MS** Units: **mg/L** Analysis Date: **21-Jun-2019 02:38**
Client ID: Run ID: **ICS2100_340983** SeqNo: **5133601** PrepDate: DF: **20**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	1231	10.0	200	1061	84.9	80 - 120				O
Sulfate	199.9	10.0	200	7.734	96.1	80 - 120				

MS Sample ID: **HS19060404-07MS** Units: **mg/L** Analysis Date: **20-Jun-2019 22:15**
Client ID: Run ID: **ICS2100_340983** SeqNo: **5133585** PrepDate: DF: **20**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	711.7	10.0	200	447.1	132	80 - 120				S
Sulfate	476.2	10.0	200	226.8	125	80 - 120				S

ALS Houston, US Date: 27-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: HS19060699

QC BATCH REPORT

Batch ID: R340983 (0) **Instrument: ICS2100** **Method: ANIONS BY SW9056A**

MSD Sample ID: **HS19060732-03MSD** Units: **mg/L** Analysis Date: **21-Jun-2019 02:53**
Client ID: Run ID: **ICS2100_340983** SeqNo: **5133602** PrepDate: DF: **20**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	1297	10.0	200	1061	118	80 - 120	1231	5.21	20	O
Sulfate	213.2	10.0	200	7.734	103	80 - 120	199.9	6.44	20	

MSD Sample ID: **HS19060404-07MSD** Units: **mg/L** Analysis Date: **20-Jun-2019 22:29**
Client ID: Run ID: **ICS2100_340983** SeqNo: **5133586** PrepDate: DF: **20**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	688.6	10.0	200	447.1	121	80 - 120	711.7	3.3	20	S
Sulfate	459.9	10.0	200	226.8	117	80 - 120	476.2	3.47	20	

The following samples were analyzed in this batch: HS19060699-01

ALS Houston, US Date: 27-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: **HS19060699**

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: 27-Jun-19

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	19-028-0	27-Mar-2020
Dept of Defense	ANAB L2231	20-Dec-2021
Illinois	004438	29-Jun-2019
Kansas	E-10352 2018-2019	31-Jul-2019
Louisiana	03087	30-Jun-2019
Maryland	343, 2018-2019	30-Jun-2019
North Carolina	624-2019	31-Dec-2019
Oklahoma	2018-156	31-Aug-2019
Texas	TX104704231-19-23	30-Apr-2020

ALS Houston, US Date: 27-jun-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
Work Order: HS19060699

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19060699-01	LH18/24-SP650_061219	Login	14/06/2019 7:04:46	JRM	WET224
HS19060699-01	LH18/24-SP650_061219	Login	14/06/2019 7:04:46	JRM	VOA151
HS19060699-02	Trip Blank	Login	14/06/2019 7:04:46	JRM	VOA151

00940106

ALS Houston, US Date: 27-Jun-19

Sample Receipt Checklist

Client Name: Bhate Environmental
Work Order: HS19060699
Date/Time Received: **13-Jun-2019 08:45**
Received by: **JRM**

Checklist completed by: *Jared R. Makan* eSignature 14-Jun-2019 Date
Reviewed by: *Corey Grandits* eSignature 14-Jun-2019 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:N/A
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	1.8c/1.8c UC/C	IR25	
Cooler(s)/Kit(s):	25344		
Date/Time sample(s) sent to storage:	06/14/2019 19:10		
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:

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

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_061219	Water	06/12/19 / 14:00		3	3		HCL	
LH18/24-SP650_061219	Water	06/12/19 / 14:00		1		1	NONE	
Trip Blank	Water	06/12/19		2	2		HCL	

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	06/12/19	14:30									

For Lab Use Only

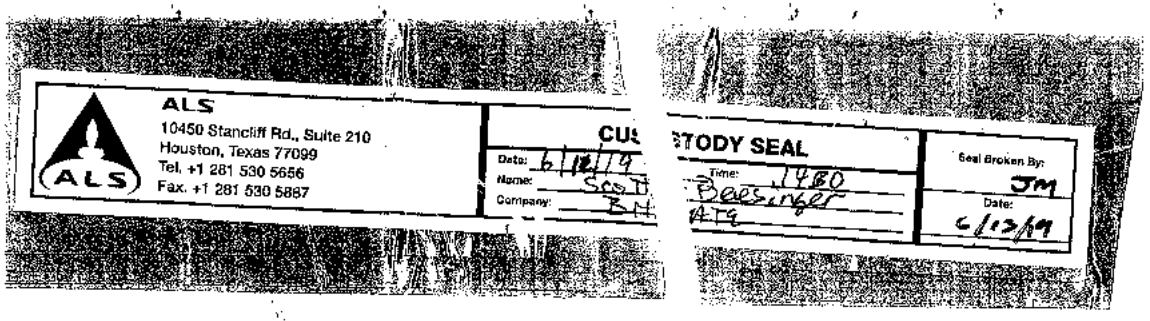
Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition
ND	6/13/19	08:45							

Remarks
Cooler 25344 1225
Temp 1.8 CF0.0

HS19060699

Bhate Environmental Associates, Inc.
Longhorn GW Treatment Plant Bi-Weekly Samples

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



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

CU
Date: 6/12/19
Name: Scott
Company: BH

STODY SEAL
Time: 1460
Beesinger
ATG

Seal Broken By:
JM
Date:
6/13/19

FedEx.
TRK# 4380 9529 3475
0221

THU - 13 JUN 10:30A
PRIORITY OVERNIGHT

77099
TX-US
IAH

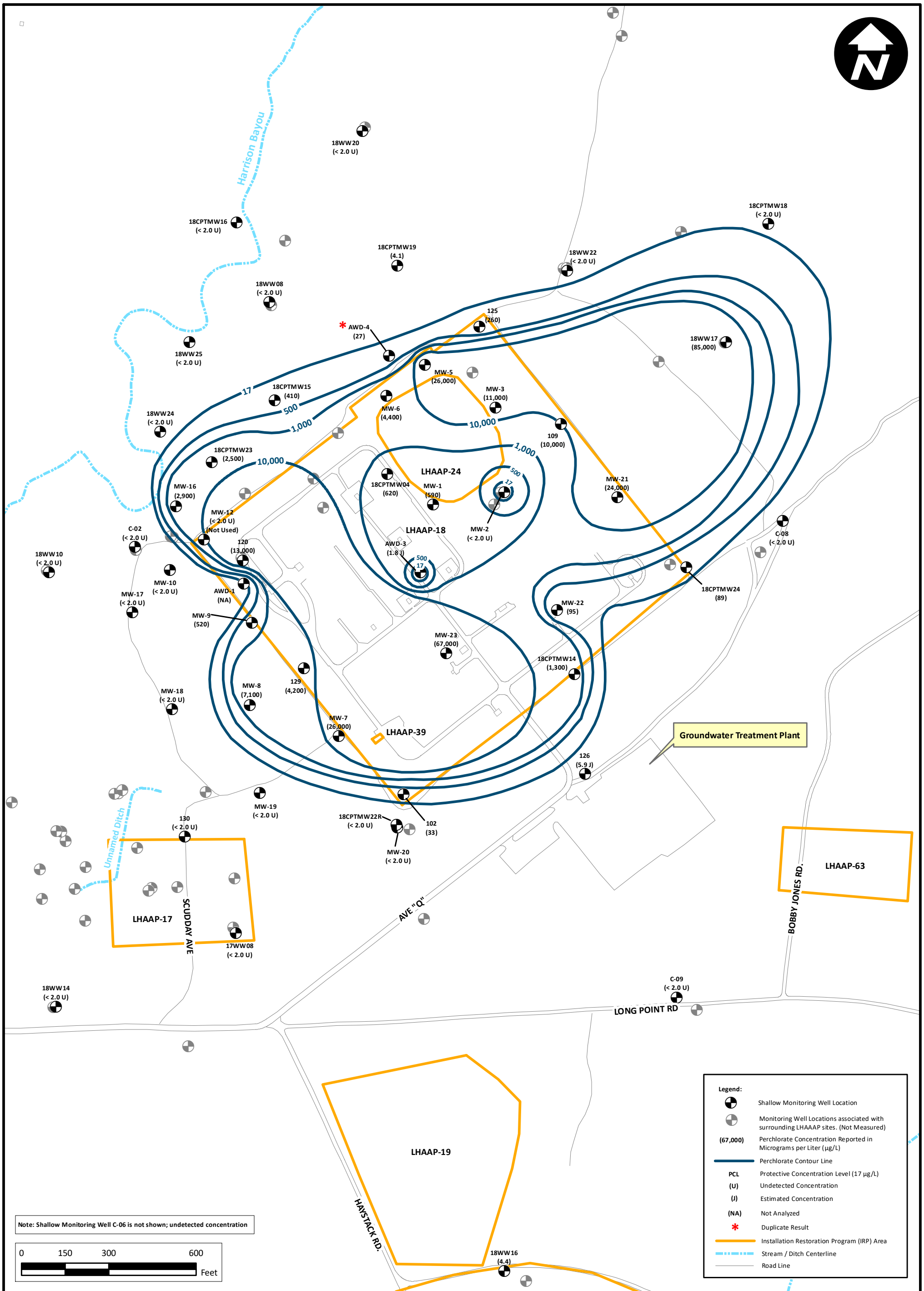
AB SGRA



PID 5107292 12JUN19 0606 9530/0218/9C8A

APPENDIX D
ISOPLETH CONTOUR MAPS

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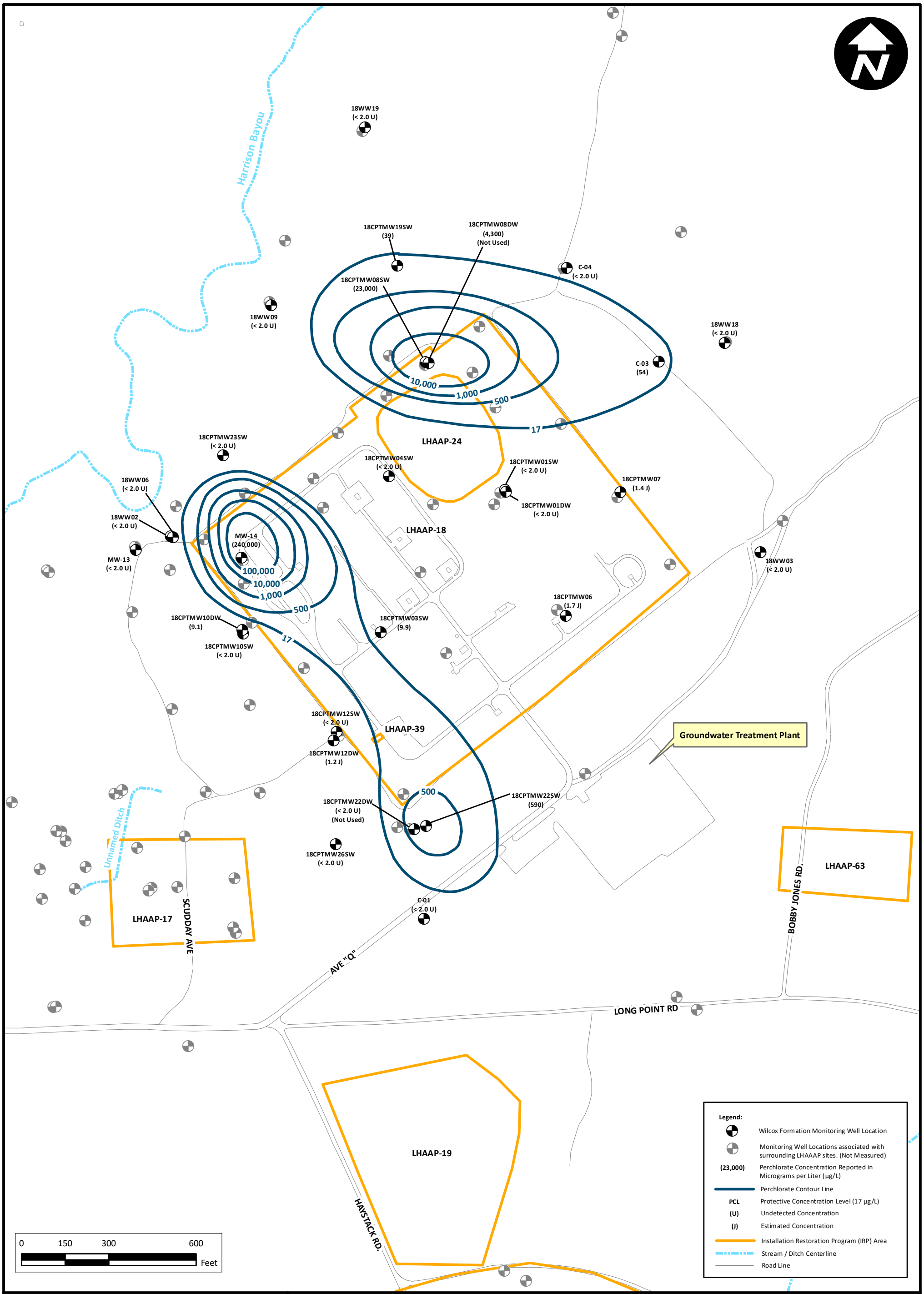
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Quarterly Evaluation Report 2nd Quarter (April – June) 2019
Groundwater Treatment Plant
Longhorn Army Ammunition Plant, Karnack, Texas

PROJECT NO:	SCALE:	DATE:	DRAWN BY:
NWO1312.0150	As Shown	10/7/2019	MRM

Perchlorate Isopleth Contours in Shallow Zone (June 2019)

Figure D-1



bhate

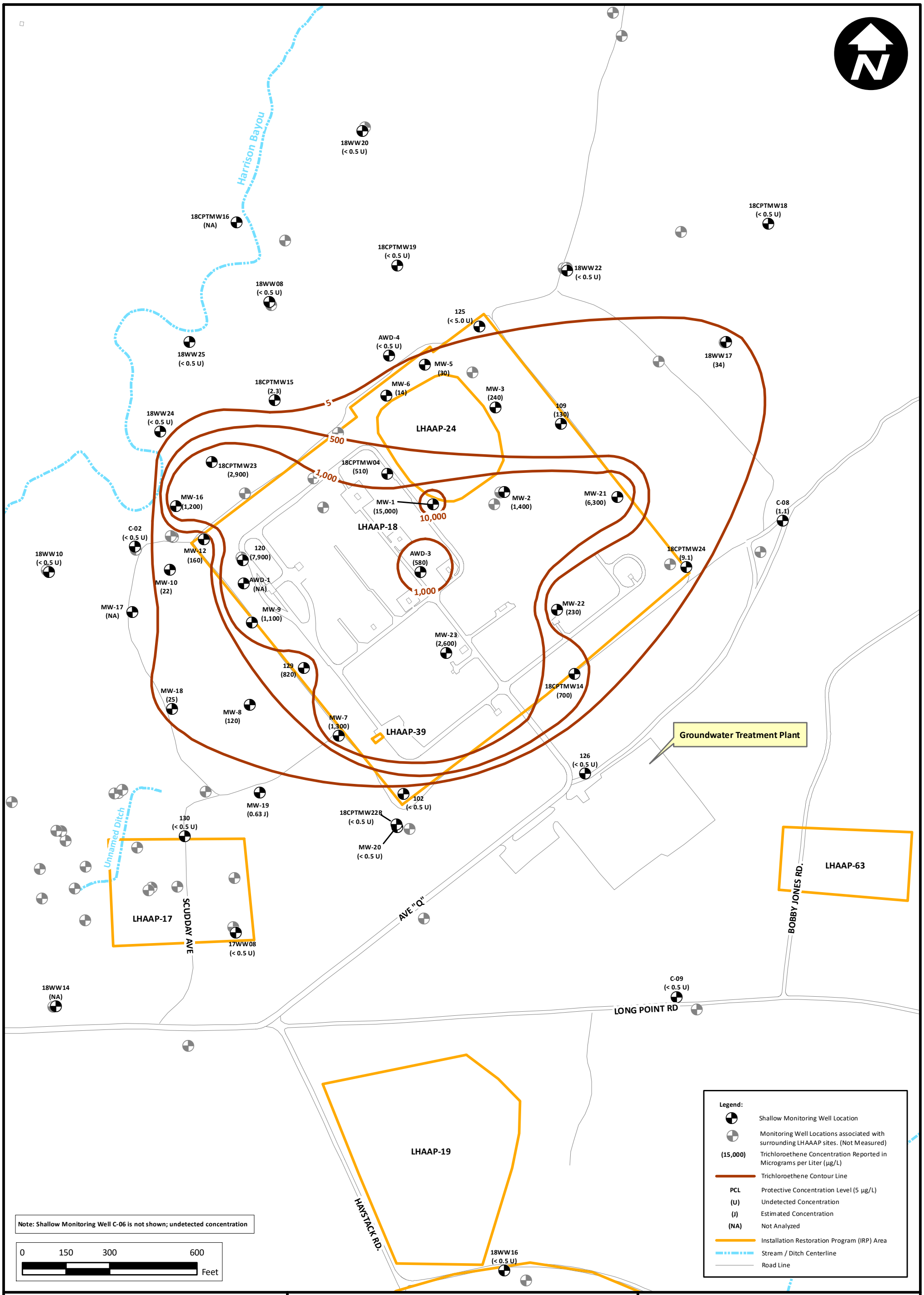
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Quarterly Evaluation Report 2nd Quarter (April – June) 2019
Groundwater Treatment Plant
Longhorn Army Ammunition Plant, Karnack, Texas

PROJECT NO:	SCALE:	DATE:	DRAWN BY:
NWO1312.0150	As Shown	10/7/2019	MRM

Perchlorate Isopleth Contours in Wilcox Formation (June 2019)

Figure D-2



bhate

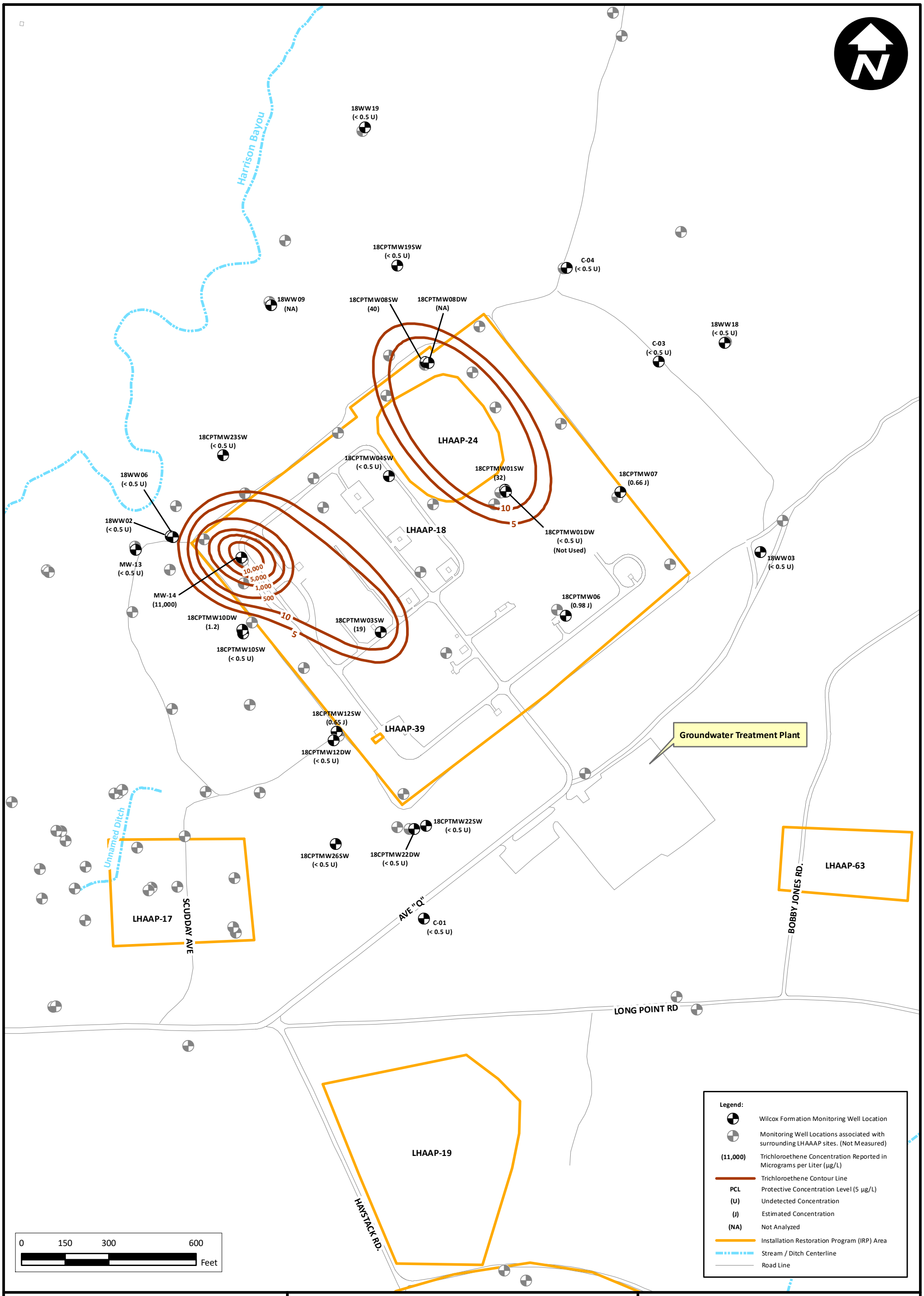
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Quarterly Evaluation Report 2nd Quarter (April – June) 2019
Groundwater Treatment Plant
Longhorn Army Ammunition Plant, Karnack, Texas

PROJECT NO:	SCALE:	DATE:	DRAWN BY:
NWO1312.0150	As Shown	10/7/2019	MRM

Trichloroethene Isopleth Contours in Shallow Zone (June 2019)

Figure D-3



bhate

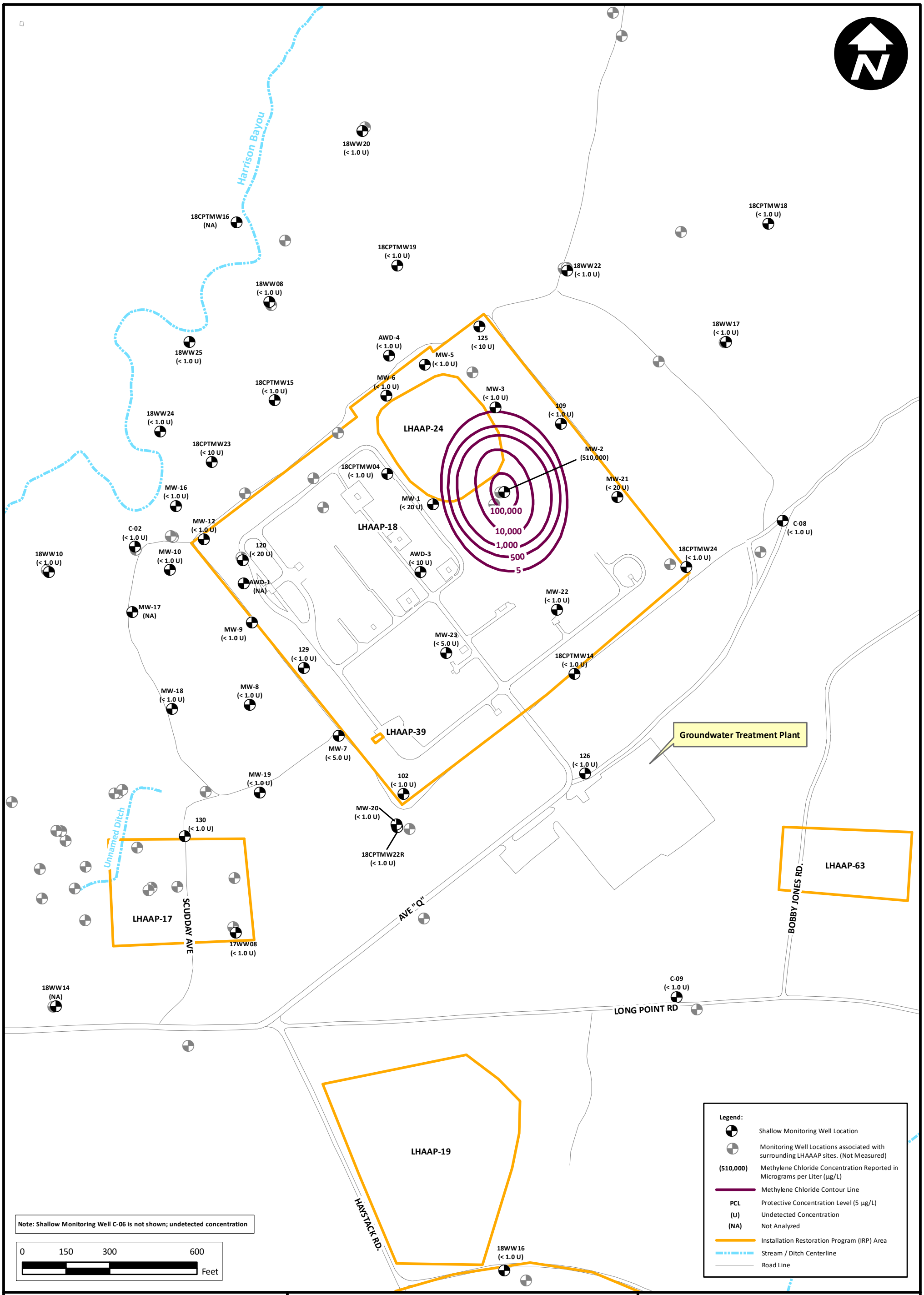
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Quarterly Evaluation Report 2nd Quarter (April – June) 2019
Groundwater Treatment Plant
Longhorn Army Ammunition Plant, Karnack, Texas

PROJECT NO:	SCALE:	DATE:	DRAWN BY:
NWO1312.0150	As Shown	10/7/2019	MRM

Trichloroethene Isopleth Contours in Wilcox Formation (June 2019)

Figure D-4



bhate

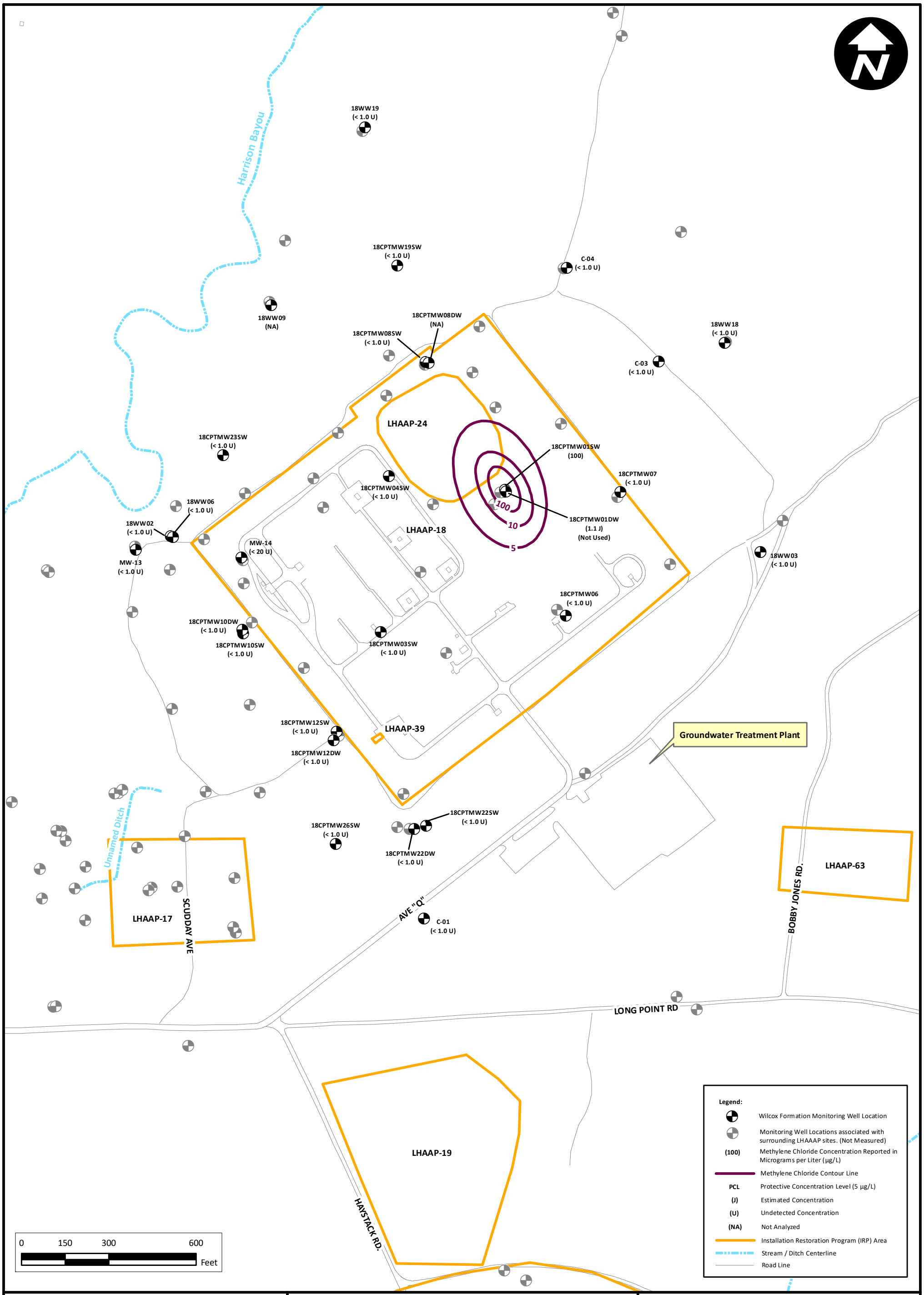
www.bhate.com

Quarterly Evaluation Report 2nd Quarter (April – June) 2019
Groundwater Treatment Plant
Longhorn Army Ammunition Plant, Karnack, Texas

PROJECT NO:	SCALE:	DATE:	DRAWN BY:
NWO1312.0150	As Shown	10/7/2019	MRM

Methylene Chloride Isopleth Contours in Shallow Zone (June 2019)

Figure D-5



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Quarterly Evaluation Report 2nd Quarter (April – June) 2019
Groundwater Treatment Plant
Longhorn Army Ammunition Plant, Karnack, Texas

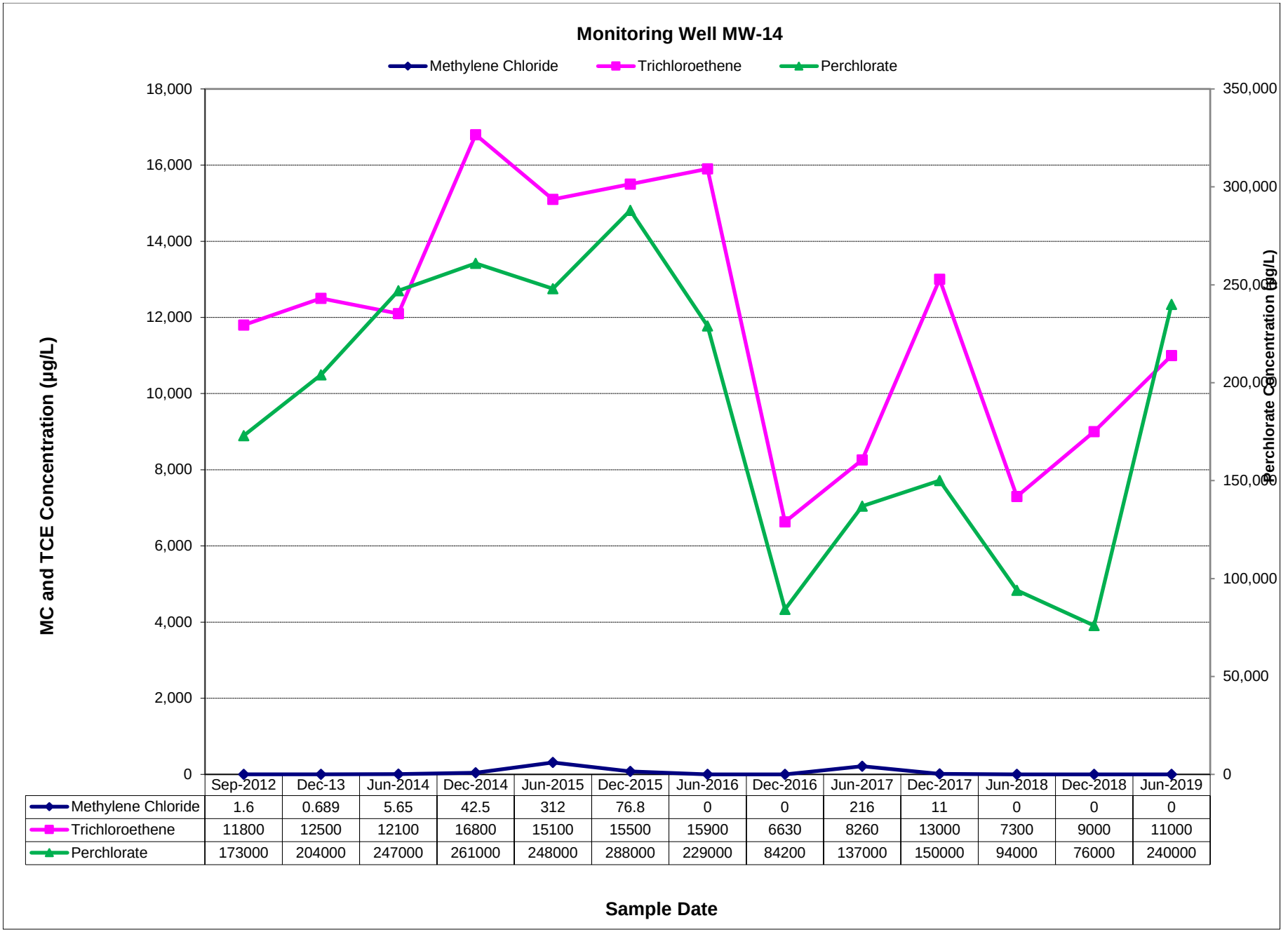
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NWO1312.0150	As Shown	10/7/2019	MRM

Methylene Chloride Isopleth Contours in Wilcox Formation (June 2019)

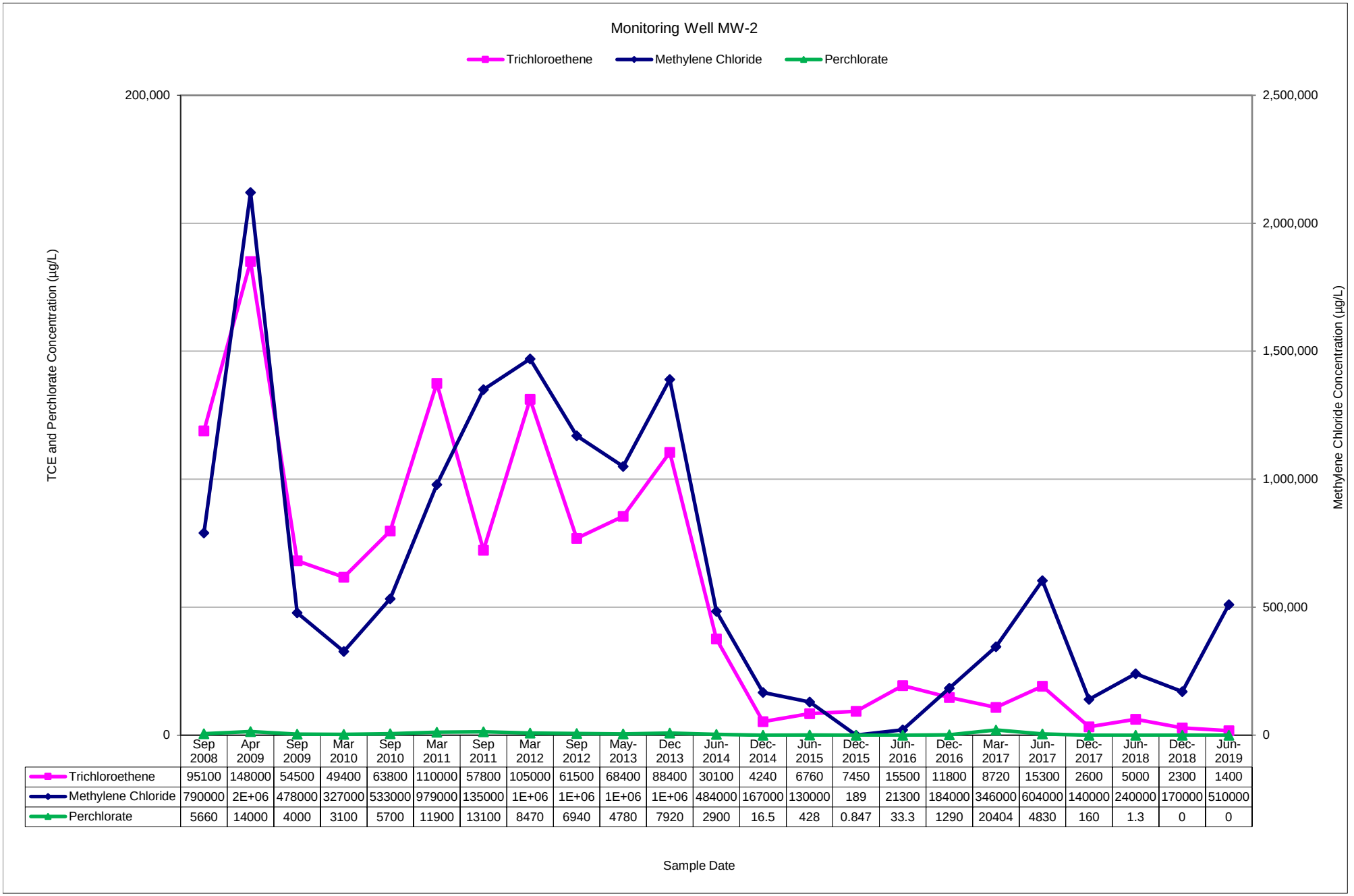
Figure D-6

APPENDIX E
MONITORING WELL TREND CHARTS

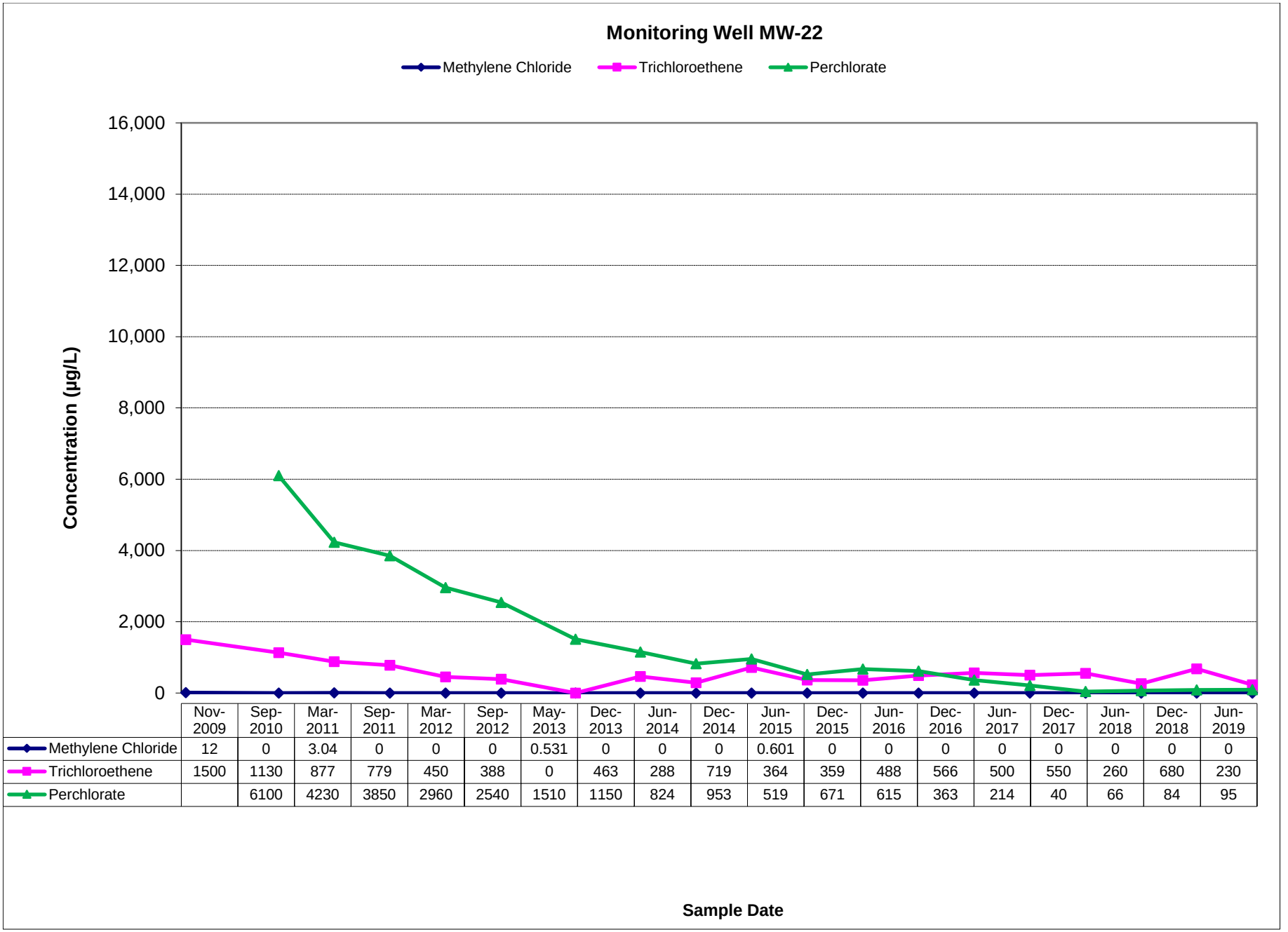
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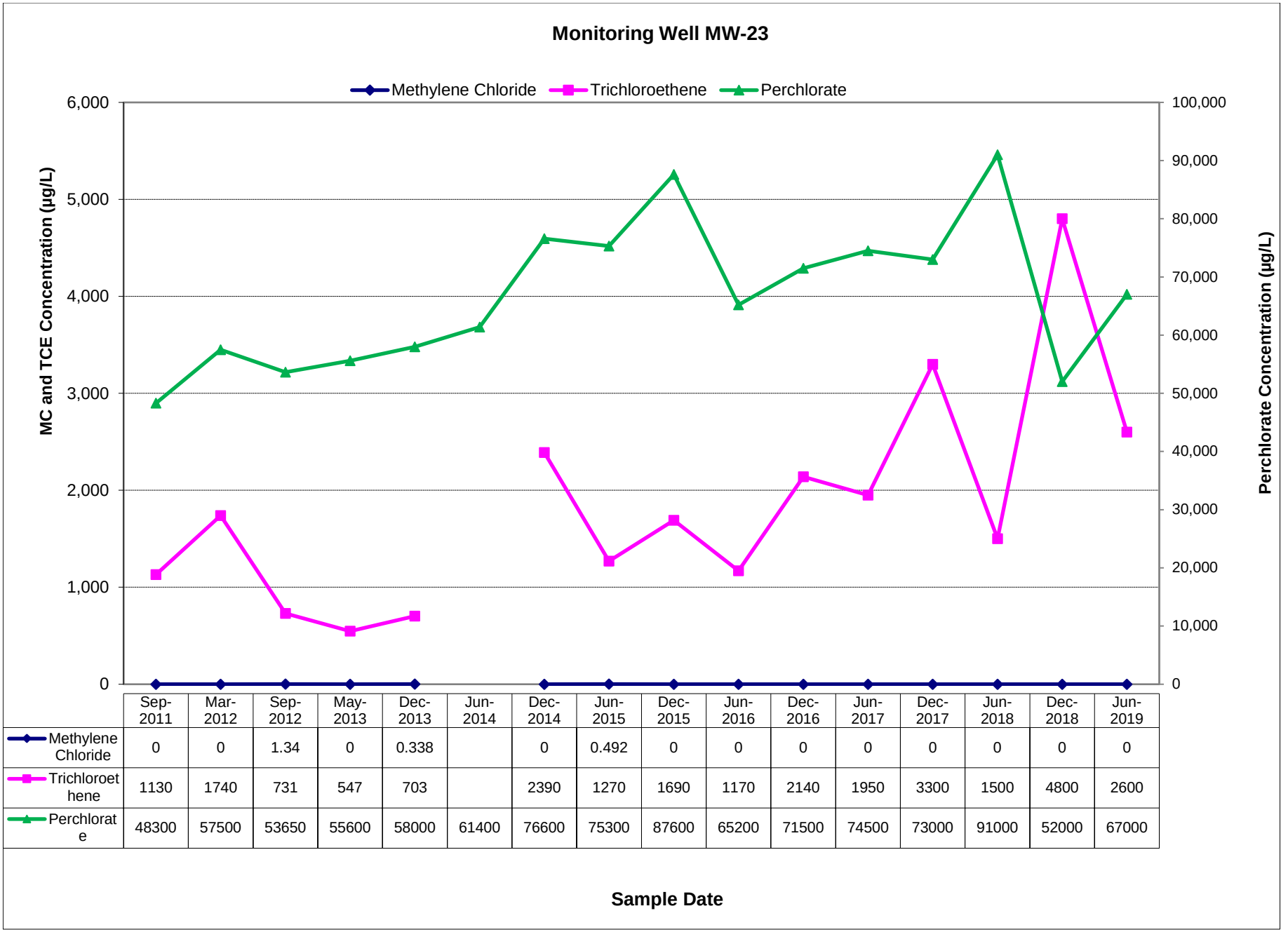
	Sep-2012	Dec-13	Jun-2014	Dec-2014	Jun-2015	Dec-2015	Jun-2016	Dec-2016	Jun-2017	Dec-2017	Jun-2018	Dec-2018	Jun-2019
Methylene Chloride	1.6	0.689	5.65	42.5	312	76.8	0	0	216	11	0	0	0
Trichloroethene	11800	12500	12100	16800	15100	15500	15900	6630	8260	13000	7300	9000	11000
Perchlorate	173000	204000	247000	261000	248000	288000	229000	84200	137000	150000	94000	76000	240000



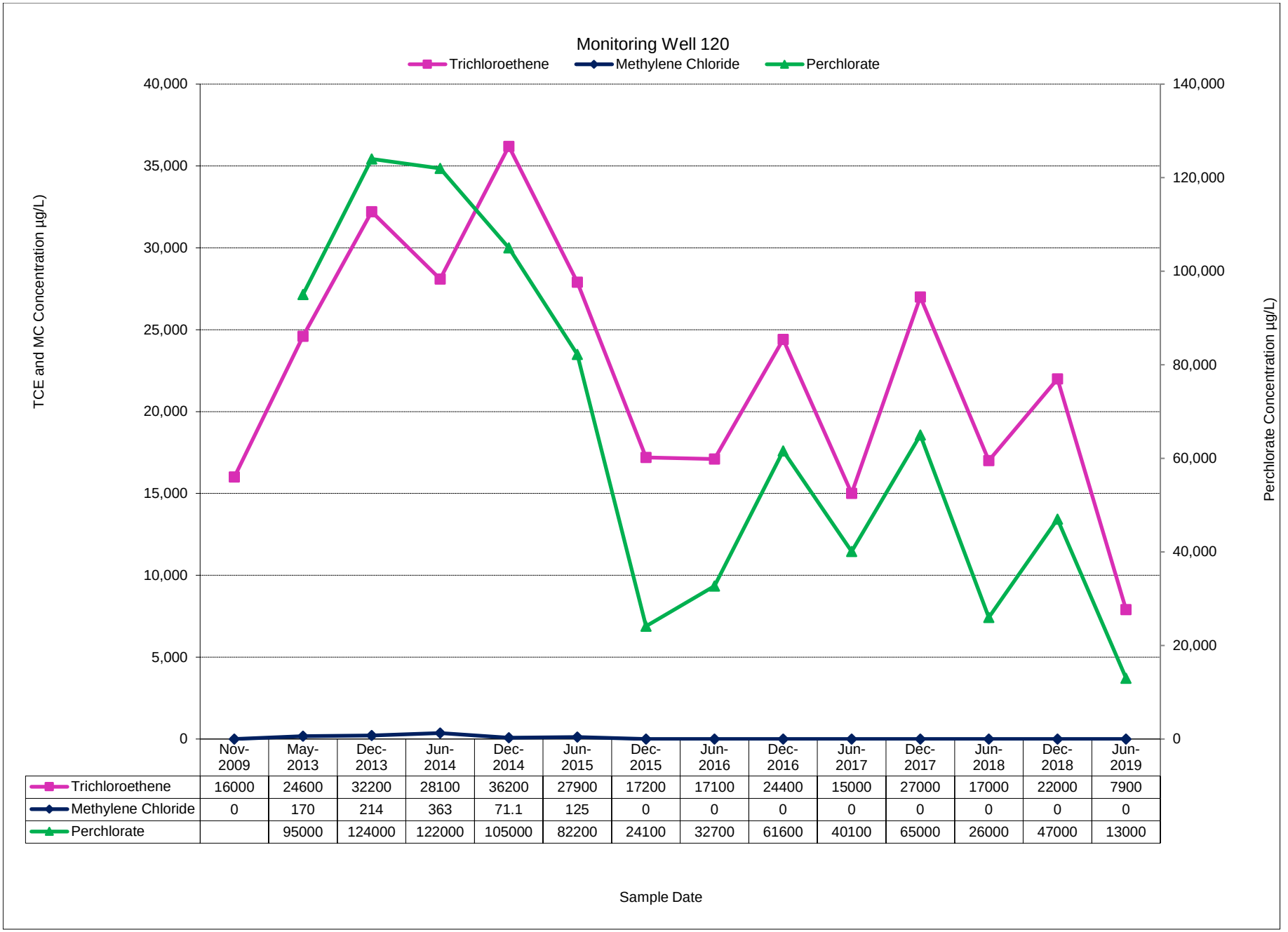
	Sep 2008	Apr 2009	Sep 2009	Mar 2010	Sep 2010	Mar 2011	Sep 2011	Mar 2012	Sep 2012	May-2013	Dec 2013	Jun-2014	Dec-2014	Jun-2015	Dec-2015	Jun-2016	Dec-2016	Mar-2017	Jun-2017	Dec-2017	Jun-2018	Dec-2018	Jun-2019
Trichloroethene	95100	148000	54500	49400	63800	110000	57800	105000	61500	68400	88400	30100	4240	6760	7450	15500	11800	8720	15300	2600	5000	2300	1400
Methylene Chloride	790000	2E+06	478000	327000	533000	979000	135000	1E+06	1E+06	1E+06	1E+06	484000	167000	130000	189	21300	184000	346000	604000	140000	240000	170000	510000
Perchlorate	5660	14000	4000	3100	5700	11900	13100	8470	6940	4780	7920	2900	16.5	428	0.847	33.3	1290	20404	4830	160	1.3	0	0



	Nov-2009	Sep-2010	Mar-2011	Sep-2011	Mar-2012	Sep-2012	May-2013	Dec-2013	Jun-2014	Dec-2014	Jun-2015	Dec-2015	Jun-2016	Dec-2016	Jun-2017	Dec-2017	Jun-2018	Dec-2018	Jun-2019
Methylene Chloride	12	0	3.04	0	0	0	0.531	0	0	0	0.601	0	0	0	0	0	0	0	0
Trichloroethene	1500	1130	877	779	450	388	0	463	288	719	364	359	488	566	500	550	260	680	230
Perchlorate		6100	4230	3850	2960	2540	1510	1150	824	953	519	671	615	363	214	40	66	84	95

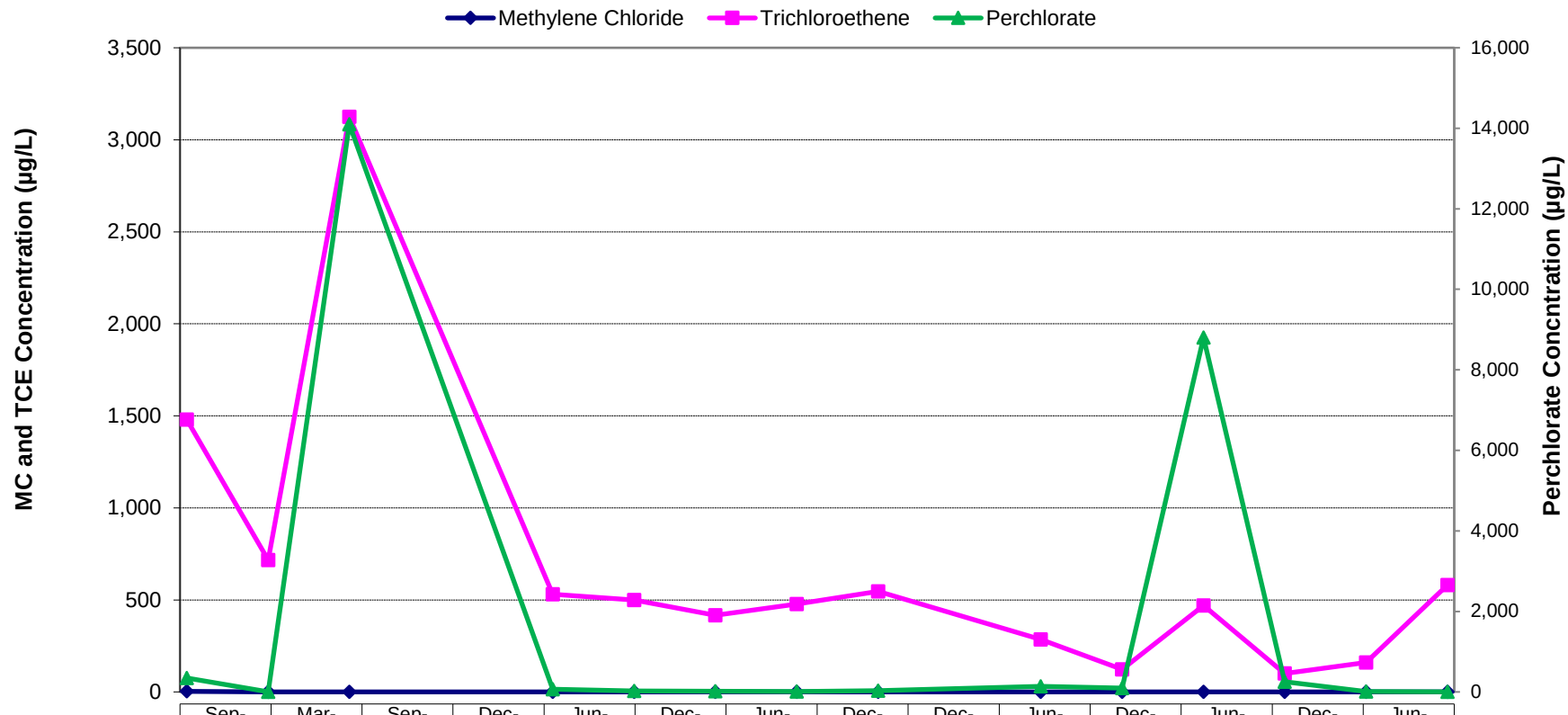


	Sep-2011	Mar-2012	Sep-2012	May-2013	Dec-2013	Jun-2014	Dec-2014	Jun-2015	Dec-2015	Jun-2016	Dec-2016	Jun-2017	Dec-2017	Jun-2018	Dec-2018	Jun-2019
Methylene Chloride	0	0	1.34	0	0.338		0	0.492	0	0	0	0	0	0	0	0
Trichloroethene	1130	1740	731	547	703		2390	1270	1690	1170	2140	1950	3300	1500	4800	2600
Perchlorate	48300	57500	53650	55600	58000	61400	76600	75300	87600	65200	71500	74500	73000	91000	52000	67000



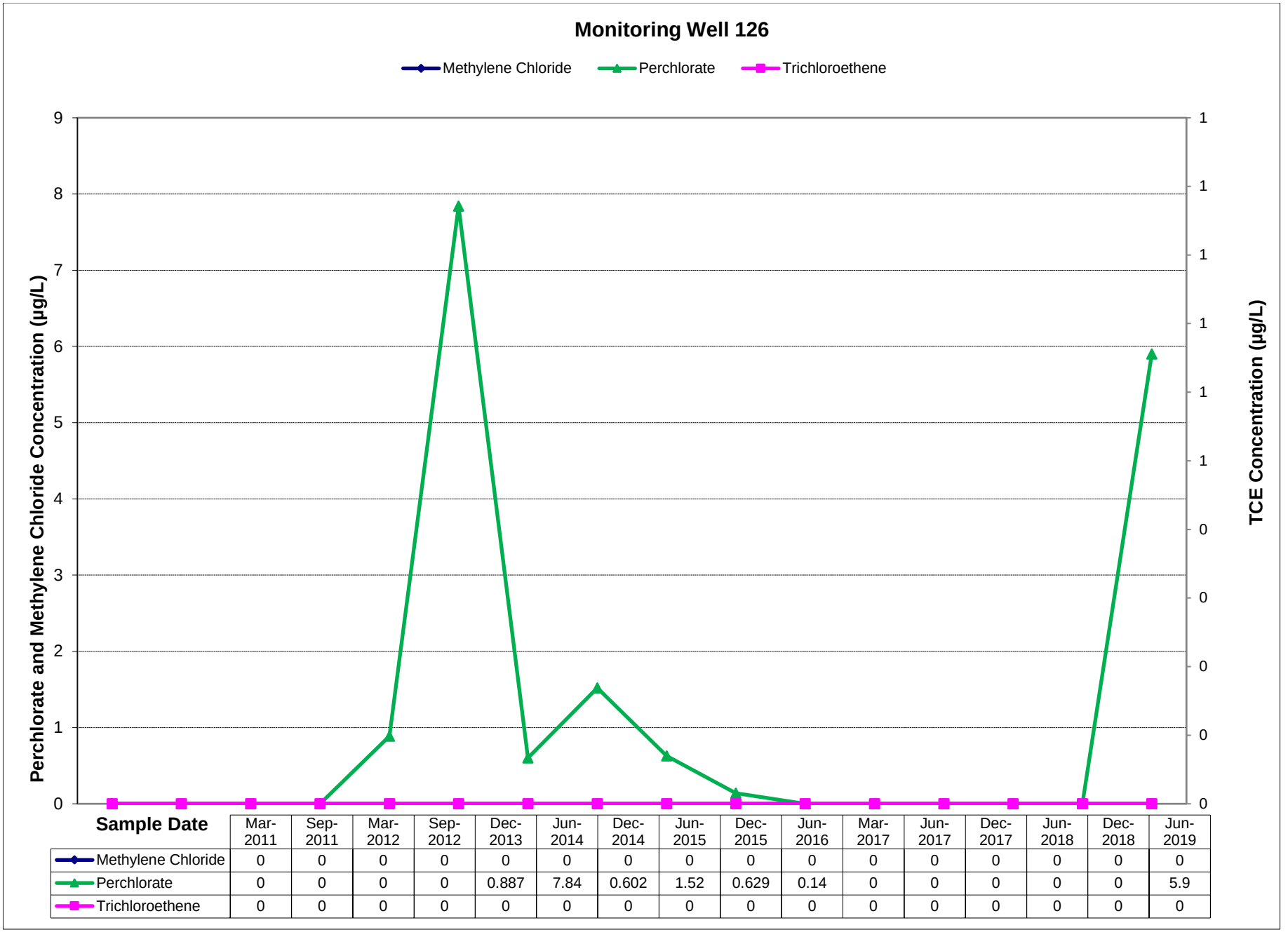
	Nov-2009	May-2013	Dec-2013	Jun-2014	Dec-2014	Jun-2015	Dec-2015	Jun-2016	Dec-2016	Jun-2017	Dec-2017	Jun-2018	Dec-2018	Jun-2019
Trichloroethene	16000	24600	32200	28100	36200	27900	17200	17100	24400	15000	27000	17000	22000	7900
Methylene Chloride	0	170	214	363	71.1	125	0	0	0	0	0	0	0	0
Perchlorate		95000	124000	122000	105000	82200	24100	32700	61600	40100	65000	26000	47000	13000

Monitoring Well AWD-3

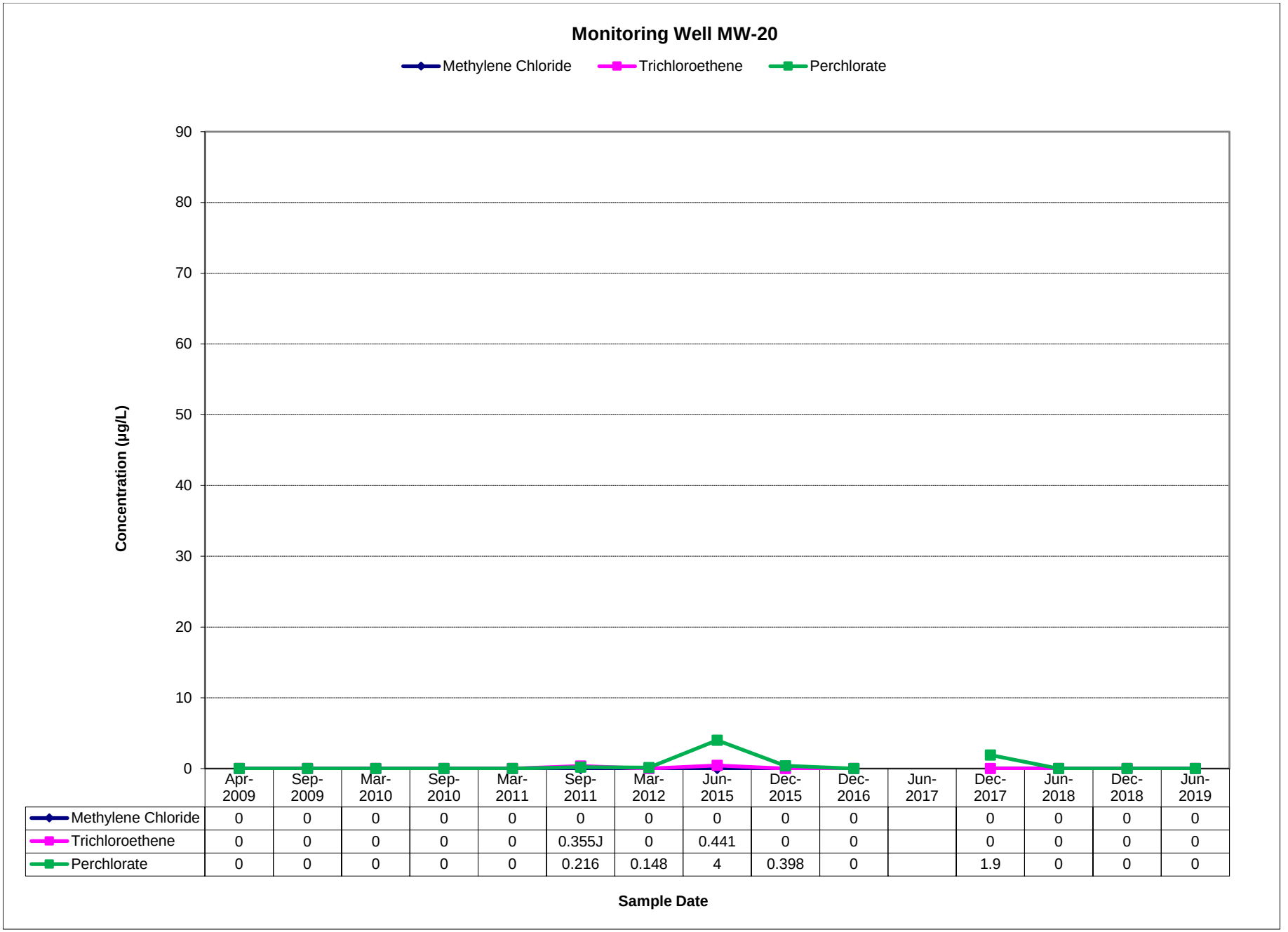


	Sep-2011	Mar-2012	Sep-2012	Dec-2013	Jun-2014	Dec-2014	Jun-2015	Dec-2015	Dec-2016	Jun-2017	Dec-2017	Jun-2018	Dec-2018	Jun-2019
Methylene Chloride	2.92J	0	0	0	0	0	0	0	0	0	0	0	0	0
Trichloroethene	1480	716	3125	530	499	417	477	547	285	122	470	100	160	580
Perchlorate	342	3.88	14100	67.2	25	13.6	8.33	33.8	140	95.4	8800	250	6.9	1.8

Sample Date

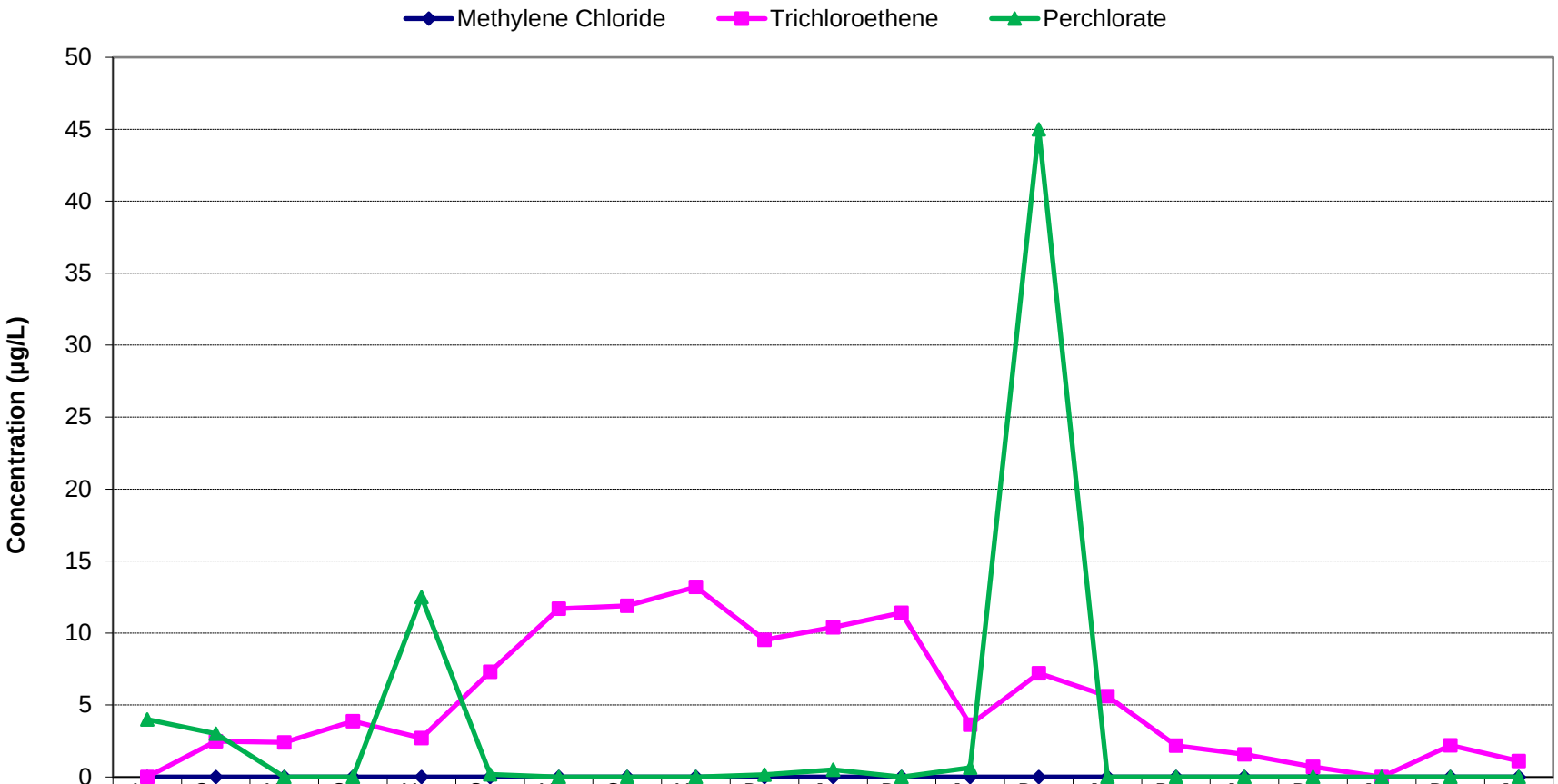


Sample Date	Mar-2011	Sep-2011	Mar-2012	Sep-2012	Dec-2013	Jun-2014	Dec-2014	Jun-2015	Dec-2015	Jun-2016	Mar-2017	Jun-2017	Dec-2017	Jun-2018	Dec-2018	Jun-2019
Methylene Chloride	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Perchlorate	0	0	0	0	0.887	7.84	0.602	1.52	0.629	0.14	0	0	0	0	0	5.9
Trichloroethene	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



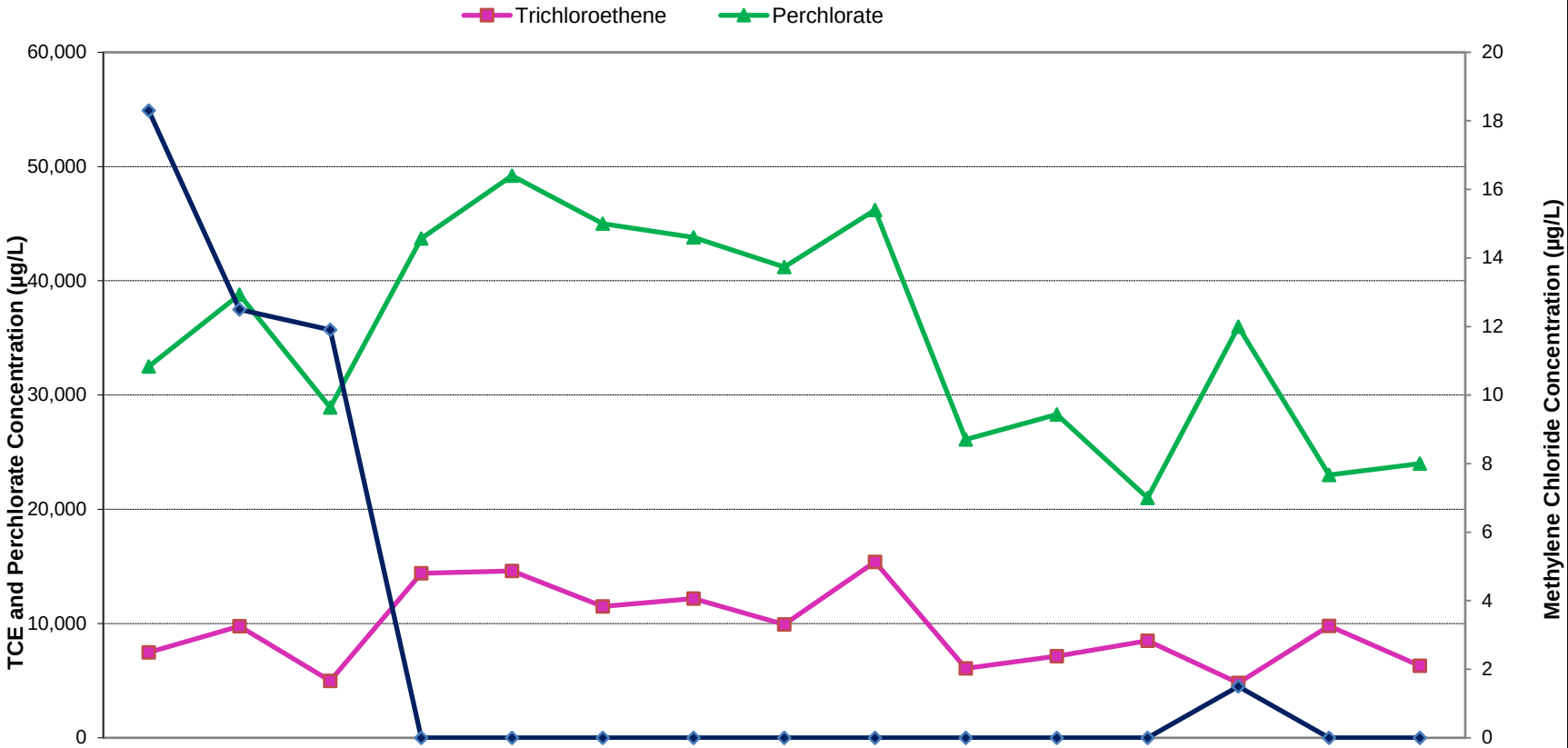
	Apr-2009	Sep-2009	Mar-2010	Sep-2010	Mar-2011	Sep-2011	Mar-2012	Jun-2015	Dec-2015	Dec-2016	Jun-2017	Dec-2017	Jun-2018	Dec-2018	Jun-2019
Methylene Chloride	0	0	0	0	0	0	0	0	0	0		0	0	0	0
Trichloroethene	0	0	0	0	0	0.355J	0	0.441	0	0		0	0	0	0
Perchlorate	0	0	0	0	0	0.216	0.148	4	0.398	0		1.9	0	0	0

Monitoring Well C-08



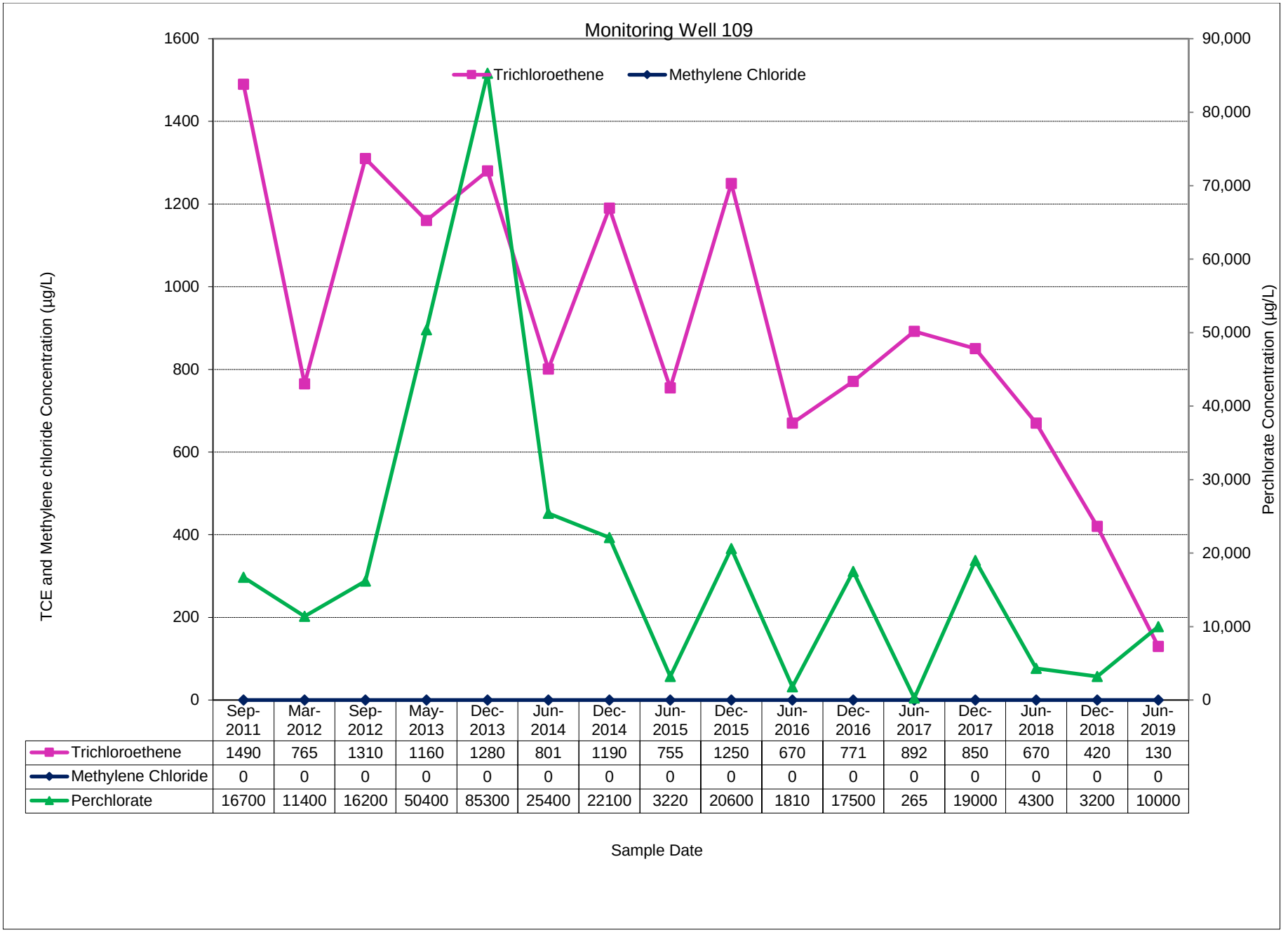
	Apr-2009	Sep-2009	Mar-2010	Sep-2010	Mar-2011	Sep-2011	Mar-2012	Sep-2012	May-2013	Dec-2013	Jun-2014	Dec-2014	Jun-2015	Dec-2015	Jun-2016	Dec-2016	Jun-2017	Dec-2017	Jun-2018	Dec-2018	Jun-2019
Methylene Chloride	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Trichloroethene	0	2.49	2.41	3.87	2.7	7.3	11.7	11.9	13.2	9.54	10.4	11.4	3.64	7.21	5.61	2.18	1.57	0.7	0	2.2	1.1
Perchlorate	4	3	0	0	12.5	0.179J	0	0	0	0.17	0.501	0	0.648	45	0	0	0	0	0	0	0

Monitoring Well MW-21



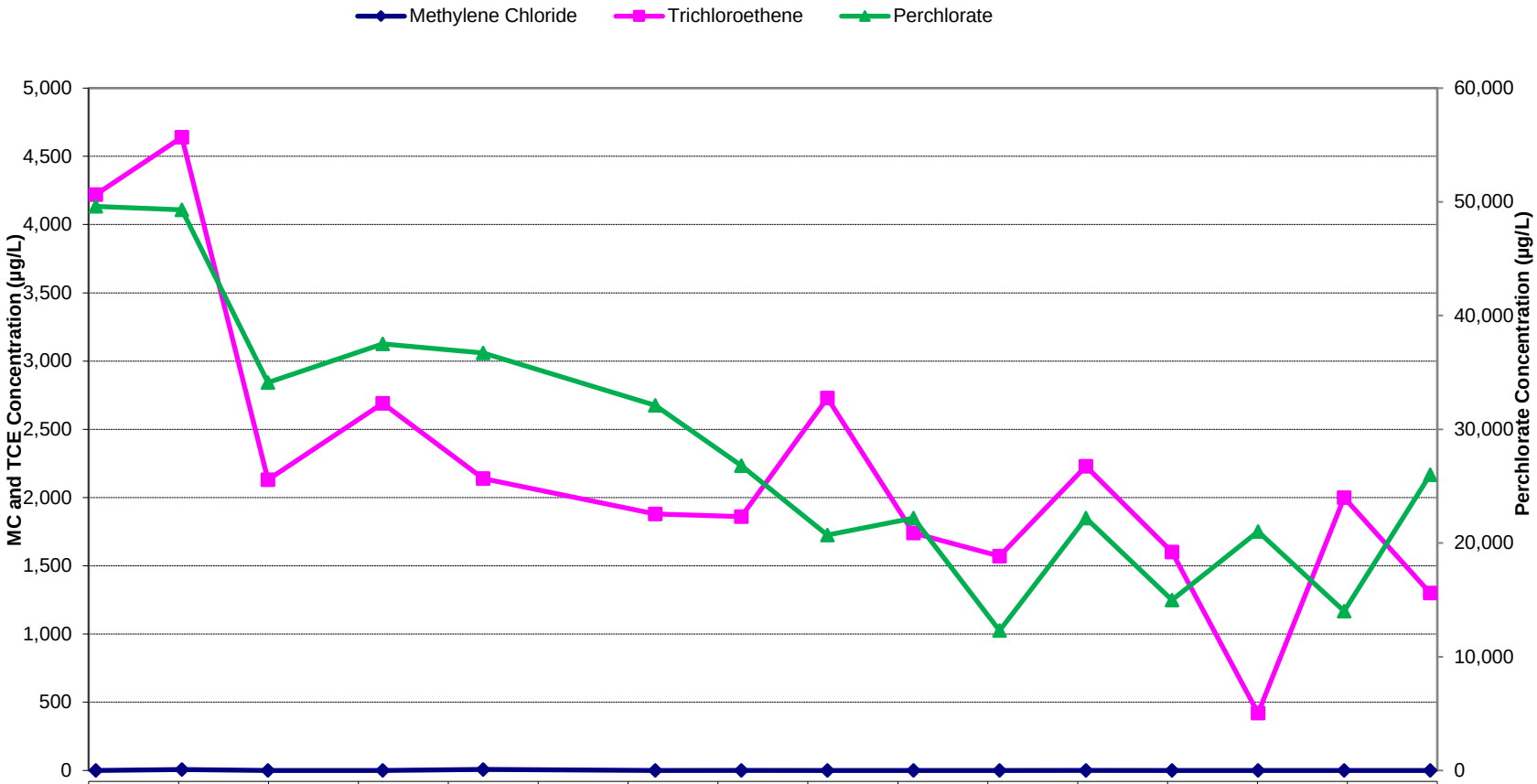
	Sep-2011	Mar-2012	Sep-2012	May-2013	Dec-2013	Jun-2014	Dec-2014	Jun-2015	Dec-2015	Jun-2016	Jun-2017	Dec-2017	Jun-2018	Dec-2018	Jun-2019
Trichloroethene	7470	9760	4980	14400	14600	11500	12200	9910	15400	6080	7140	8500	4800	9800	6300
Perchlorate	32500	38800	28900	43700	49200	45000	43800	41200	46200	26100	28300	21000	36000	23000	24000
Methylene Chloride	18.3J	12.5	11.9	0	0	0	0	0	0	0	0	0	1.5	0	0

Sample Date



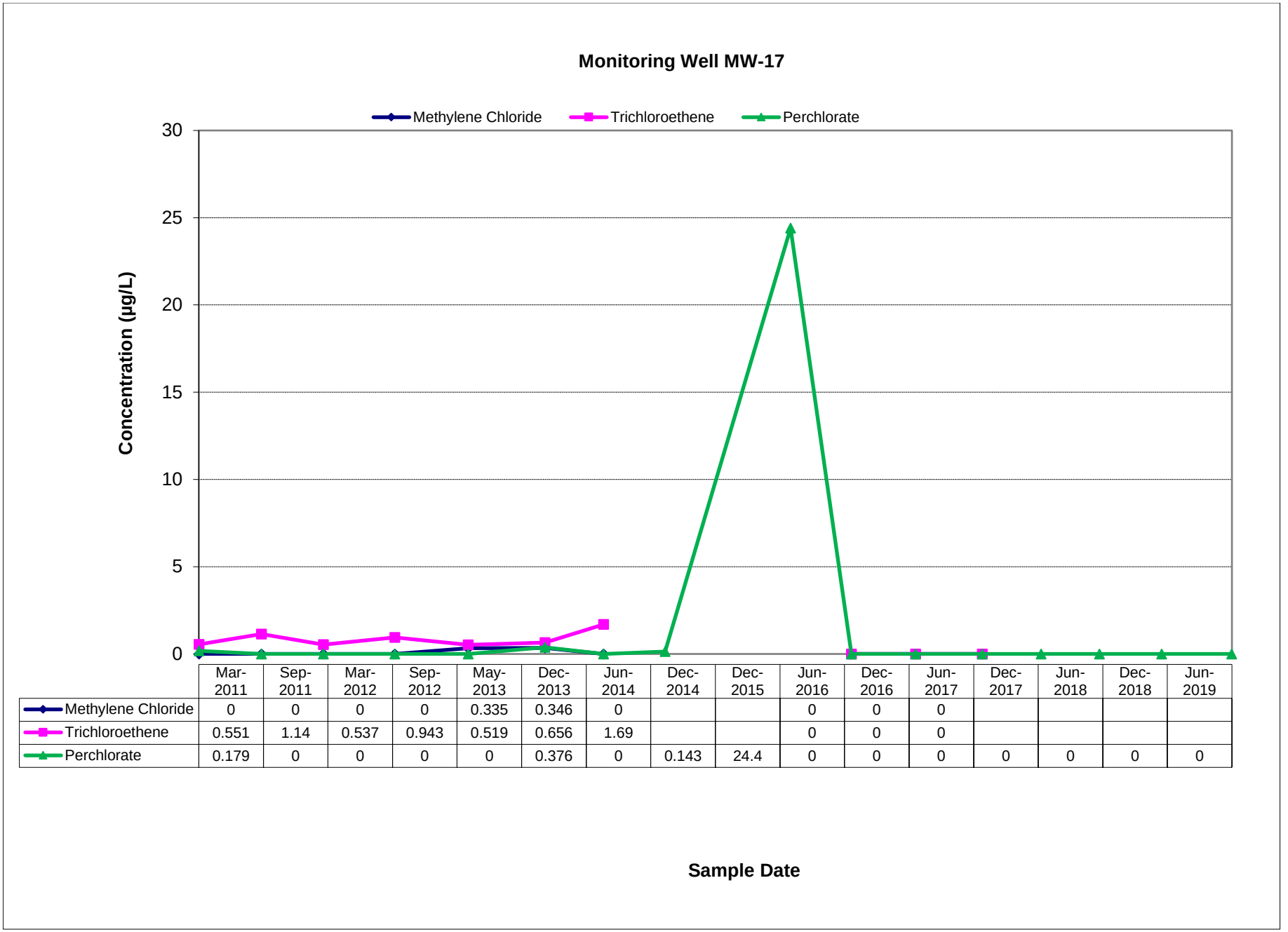
	Sep-2011	Mar-2012	Sep-2012	May-2013	Dec-2013	Jun-2014	Dec-2014	Jun-2015	Dec-2015	Jun-2016	Dec-2016	Jun-2017	Dec-2017	Jun-2018	Dec-2018	Jun-2019
Trichloroethene	1490	765	1310	1160	1280	801	1190	755	1250	670	771	892	850	670	420	130
Methylene Chloride	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Perchlorate	16700	11400	16200	50400	85300	25400	22100	3220	20600	1810	17500	265	19000	4300	3200	10000

Monitoring Well MW-7

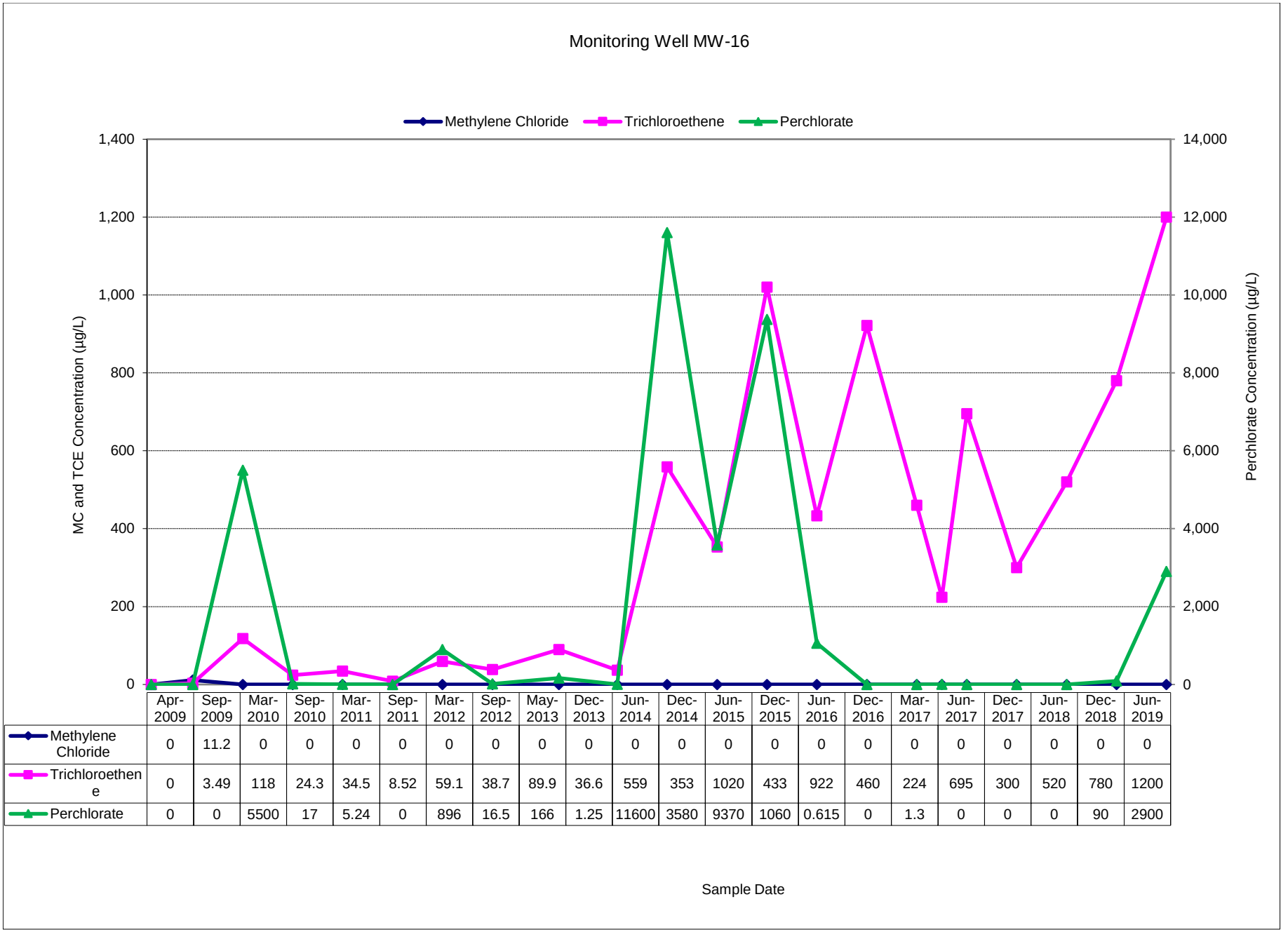


	Sep-2011	Mar-2012	Sep-2012	May-2013	Dec-2013	Dec-2014	Jun-2015	Dec-2015	Jun-2016	Dec-2016	Jun-2017	Dec-2017	Jun-2018	Dec-2018	Jun-2019
Methylene Chloride	0	7.75	0	0	7.81	0	0.352	0	0	0	0.314	0	0	0	0
Trichloroethene	4220	4640	2130	2690	2140	1880	1860	2730	1740	1570	2230	1600	420	2000	1300
Perchlorate	49600	49300	34100	37500	36700	32100	26800	20700	22200	12300	22200	15000	21000	14000	26000

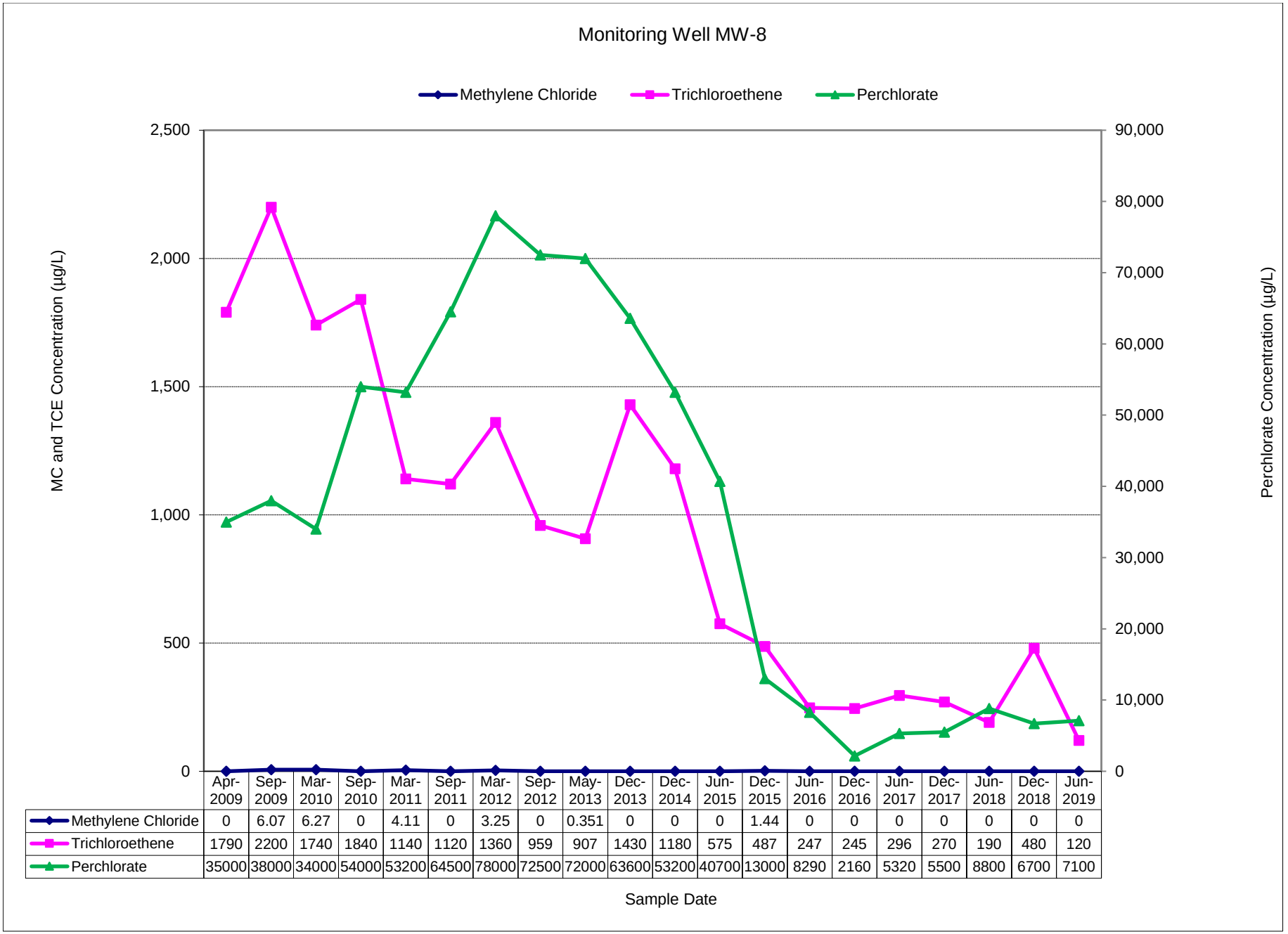
Sample Date



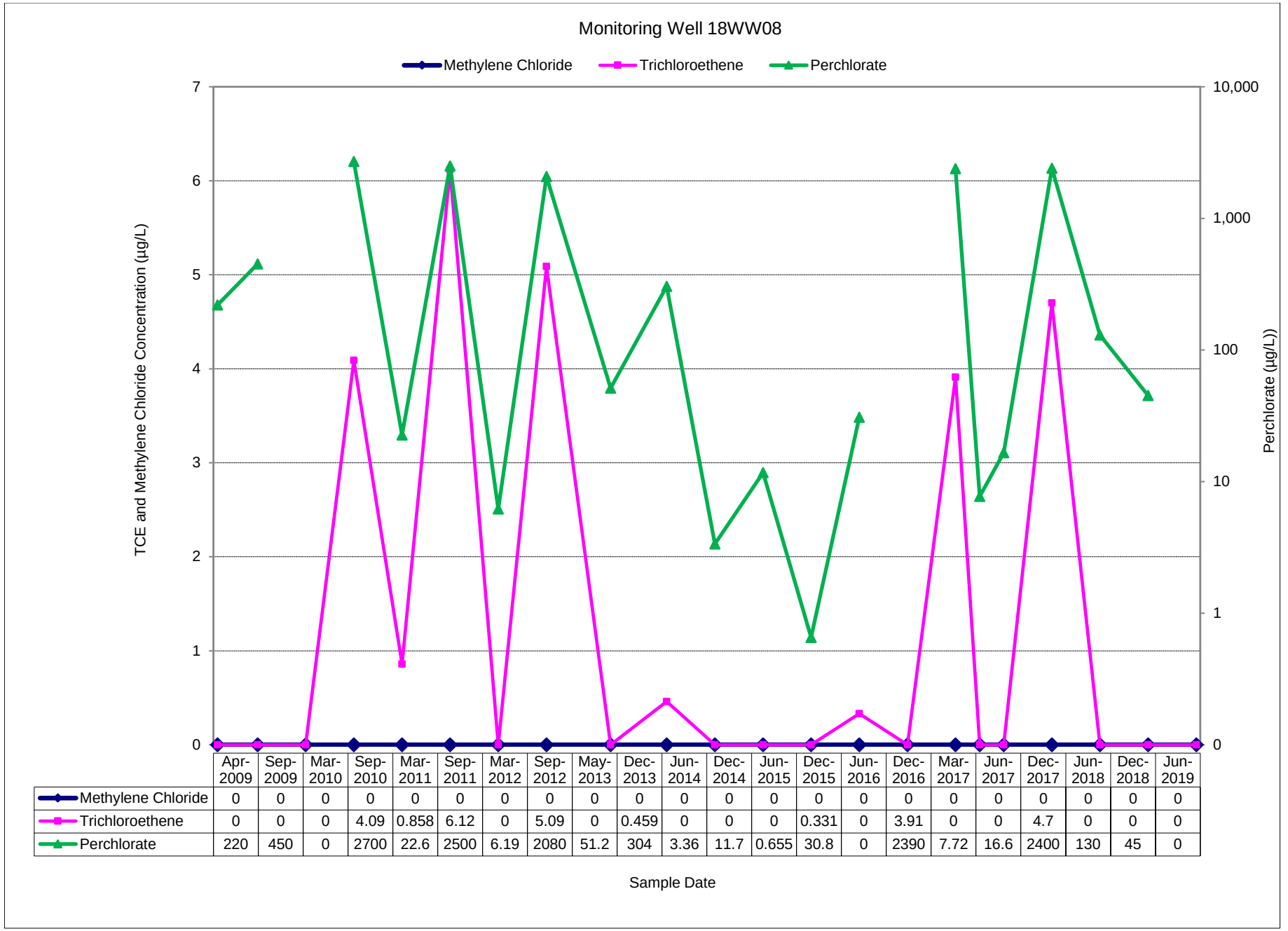
	Mar-2011	Sep-2011	Mar-2012	Sep-2012	May-2013	Dec-2013	Jun-2014	Dec-2014	Dec-2015	Jun-2016	Dec-2016	Jun-2017	Dec-2017	Jun-2018	Dec-2018	Jun-2019
Methylene Chloride	0	0	0	0	0.335	0.346	0			0	0	0				
Trichloroethene	0.551	1.14	0.537	0.943	0.519	0.656	1.69			0	0	0				
Perchlorate	0.179	0	0	0	0	0.376	0	0.143	24.4	0	0	0	0	0	0	0



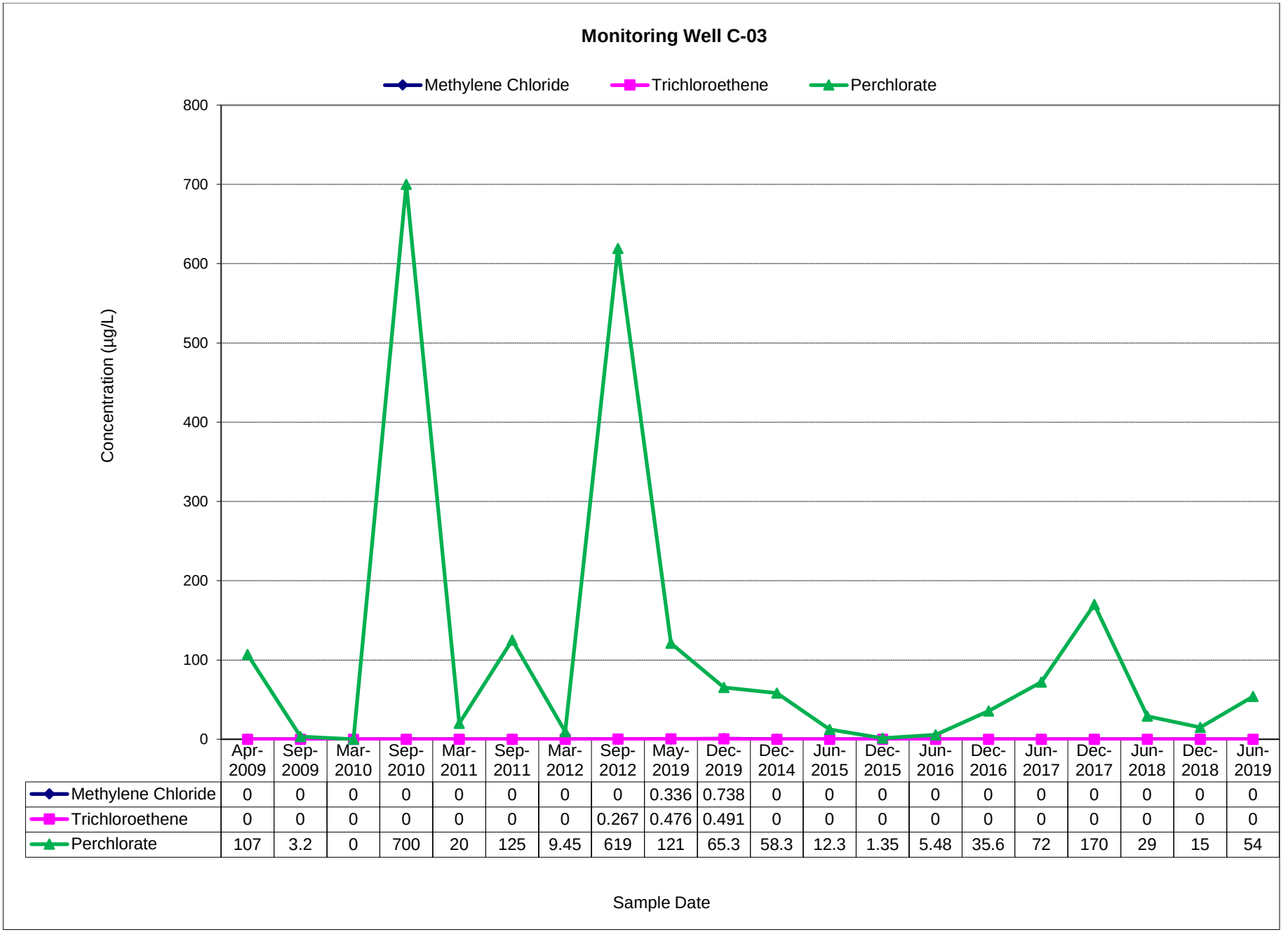
	Apr-2009	Sep-2009	Mar-2010	Sep-2010	Mar-2011	Sep-2011	Mar-2012	Sep-2012	May-2013	Dec-2013	Jun-2014	Dec-2014	Jun-2015	Dec-2015	Jun-2016	Dec-2016	Mar-2017	Jun-2017	Dec-2017	Jun-2018	Dec-2018	Jun-2019
Methylene Chloride	0	11.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Trichloroethene	0	3.49	118	24.3	34.5	8.52	59.1	38.7	89.9	36.6	559	353	1020	433	922	460	224	695	300	520	780	1200
Perchlorate	0	0	5500	17	5.24	0	896	16.5	166	1.25	11600	3580	9370	1060	0.615	0	1.3	0	0	0	90	2900



	Apr-2009	Sep-2009	Mar-2010	Sep-2010	Mar-2011	Sep-2011	Mar-2012	Sep-2012	May-2013	Dec-2013	Dec-2014	Jun-2015	Dec-2015	Jun-2016	Dec-2016	Jun-2017	Dec-2017	Jun-2018	Dec-2018	Jun-2019
Methylene Chloride	0	6.07	6.27	0	4.11	0	3.25	0	0.351	0	0	0	1.44	0	0	0	0	0	0	0
Trichloroethene	1790	2200	1740	1840	1140	1120	1360	959	907	1430	1180	575	487	247	245	296	270	190	480	120
Perchlorate	35000	38000	34000	54000	53200	64500	78000	72500	72000	63600	53200	40700	13000	8290	2160	5320	5500	8800	6700	7100



	Apr-2009	Sep-2009	Mar-2010	Sep-2010	Mar-2011	Sep-2011	Mar-2012	Sep-2012	May-2013	Dec-2013	Jun-2014	Dec-2014	Jun-2015	Dec-2015	Jun-2016	Dec-2016	Mar-2017	Jun-2017	Dec-2017	Jun-2018	Dec-2018	Jun-2019
Methylene Chloride	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Trichloroethene	0	0	0	4.09	0.858	6.12	0	5.09	0	0.459	0	0	0	0.331	0	3.91	0	0	4.7	0	0	0
Perchlorate	220	450	0	2700	22.6	2500	6.19	2080	51.2	304	3.36	11.7	0.655	30.8	0	2390	7.72	16.6	2400	130	45	0



	Apr-2009	Sep-2009	Mar-2010	Sep-2010	Mar-2011	Sep-2011	Mar-2012	Sep-2012	May-2019	Dec-2019	Dec-2014	Jun-2015	Dec-2015	Jun-2016	Dec-2016	Jun-2017	Dec-2017	Jun-2018	Dec-2018	Jun-2019
Methylene Chloride	0	0	0	0	0	0	0	0	0.336	0.738	0	0	0	0	0	0	0	0	0	0
Trichloroethene	0	0	0	0	0	0	0	0.267	0.476	0.491	0	0	0	0	0	0	0	0	0	0
Perchlorate	107	3.2	0	700	20	125	9.45	619	121	65.3	58.3	12.3	1.35	5.48	35.6	72	170	29	15	54

APPENDIX F
GWTP WATER SAMPLING LABORATORY ANALYTICAL RESULTS (PROVIDED ON CD ONLY)

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July 10, 2019

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

Work Order: **HS19060835**

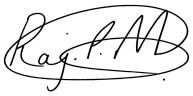
Laboratory Results for: **LHAAP 18 24**

Dear Marcia,

ALS Environmental received 5 sample(s) on Jun 14, 2019 for the analysis presented in the following report.

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

Regards,



Generated By: RJ.MODASHIA
RJ Modashia
Project Manager

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July 10, 2019

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

Work Order: **HS19060929**

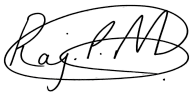
Laboratory Results for: **LHAAP 18 24**

Dear Marcia,

ALS Environmental received 8 sample(s) on Jun 18, 2019 for the analysis presented in the following report.

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

Regards,



Generated By: RJ.MODASHIA
RJ Modashia
Project Manager

ALS Houston, US Date: 10-jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Work Order: HS19060929

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19060929-01	MW7_061719	Groundwater		17-Jun-2019 08:20	18-Jun-2019 08:51	☐
HS19060929-02	18CPTMW12DW_061719	Groundwater		17-Jun-2019 09:15	18-Jun-2019 08:51	☐
HS19060929-03	18CPTMW12SW_061719	Groundwater		17-Jun-2019 10:10	18-Jun-2019 08:51	☐
HS19060929-04	18CPTMW12SW_061719_a	Groundwater		17-Jun-2019 10:10	18-Jun-2019 08:51	☐
HS19060929-05	18CPTMW23SW_061719	Groundwater		17-Jun-2019 11:15	18-Jun-2019 08:51	☐
HS19060929-06	18CPTMW23_061719	Groundwater		17-Jun-2019 12:05	18-Jun-2019 08:51	☐
HS19060929-07	18WW14_061719	Groundwater		17-Jun-2019 13:05	18-Jun-2019 08:51	☐
HS19060929-08	Trip Blank	Water		17-Jun-2019 00:00	18-Jun-2019 08:51	☐

Revision:1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc. **CASE NARRATIVE**
Project: LHAAP 18 24
Work Order: HS19060929

Work Order Comments

• Revised to correct the reporting limit for Mercury

Work Order Comments

• The analyses for Perchlorate was subcontracted to ALS Environmental in Salt Lake City, UT. Final Report attached.

GCMS Semivolatiles by Method SW8270SIM

Batch ID: 142169

Sample ID: MW7_061719 (HS19060929-01)

• The surrogate recoveries could not be determined due to dilution below the calibration range.

Sample ID: 18cptMW23_061719 (HS19060929-06)

• The surrogate recoveries could not be determined due to dilution below the calibration range.

Sample ID: LCSD-142169

• LCS/LCSD RPD recovered above the RPD limit. The individual recoveries met acceptance criteria (Surrogate 4-Terphenyl-d14)

GCMS Volatiles by Method SW8260

Batch ID: R341453

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

Metals by Method SW6020

Batch ID: 142427

Sample ID: HS19060986-04MS

• MS and MSD are for an unrelated sample

Metals by Method SW7470

Batch ID: 142269

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: MW7_061719
Collection Date: 17-Jun-2019 08:20

ANALYTICAL REPORT
WorkOrder:HS19060929
Lab ID:HS19060929-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	2.5	U	1.5	2.5	5.0	UG/L	5	27-Jun-2019 13:59
1,1,1-Trichloroethane	2.5	U	1.0	2.5	5.0	UG/L	5	27-Jun-2019 13:59
1,1,2,2-Tetrachloroethane	2.5	U	2.5	2.5	5.0	UG/L	5	27-Jun-2019 13:59
1,1,2-Trichloroethane	2.5	U	1.5	2.5	5.0	UG/L	5	27-Jun-2019 13:59
1,1-Dichloroethane	2.5	U	1.0	2.5	5.0	UG/L	5	27-Jun-2019 13:59
1,1-Dichloroethene	2.5	U	1.0	2.5	5.0	UG/L	5	27-Jun-2019 13:59
1,1-Dichloropropene	2.5	U	1.5	2.5	5.0	UG/L	5	27-Jun-2019 13:59
1,2,3-Trichlorobenzene	2.5	U	2.0	2.5	5.0	UG/L	5	27-Jun-2019 13:59
1,2,3-Trichloropropane	2.5	U	2.5	2.5	5.0	UG/L	5	27-Jun-2019 13:59
1,2,4-Trichlorobenzene	2.5	U	2.5	2.5	5.0	UG/L	5	27-Jun-2019 13:59
1,2,4-Trimethylbenzene	2.5	U	1.5	2.5	5.0	UG/L	5	27-Jun-2019 13:59
1,2-Dibromo-3-chloropropane	2.5	U	1.0	2.5	5.0	UG/L	5	27-Jun-2019 13:59
1,2-Dibromoethane	2.5	U	1.0	2.5	5.0	UG/L	5	27-Jun-2019 13:59
1,2-Dichlorobenzene	2.5	U	2.5	2.5	5.0	UG/L	5	27-Jun-2019 13:59
1,2-Dichloroethane	**26**		**1.0**	**2.5**	**5.0**	**UG/L**	5	27-Jun-2019 13:59
1,2-Dichloropropane	2.5	U	2.5	2.5	5.0	UG/L	5	27-Jun-2019 13:59
1,3,5-Trimethylbenzene	2.5	U	1.5	2.5	5.0	UG/L	5	27-Jun-2019 13:59
1,3-Dichlorobenzene	2.5	U	2.0	2.5	5.0	UG/L	5	27-Jun-2019 13:59
1,3-Dichloropropane	2.5	U	1.5	2.5	5.0	UG/L	5	27-Jun-2019 13:59
1,4-Dichlorobenzene	2.5	U	2.0	2.5	5.0	UG/L	5	27-Jun-2019 13:59
2,2-Dichloropropane	2.5	U	1.0	2.5	5.0	UG/L	5	27-Jun-2019 13:59
2-Butanone	5.0	U	2.5	5.0	10	UG/L	5	27-Jun-2019 13:59
2-Chlorotoluene	2.5	U	1.5	2.5	5.0	UG/L	5	27-Jun-2019 13:59
2-Hexanone	5.0	U	5.0	5.0	10	UG/L	5	27-Jun-2019 13:59
4-Chlorotoluene	2.5	U	2.0	2.5	5.0	UG/L	5	27-Jun-2019 13:59
4-Isopropyltoluene	2.5	U	1.5	2.5	5.0	UG/L	5	27-Jun-2019 13:59
4-Methyl-2-pentanone	5.0	U	3.5	5.0	10	UG/L	5	27-Jun-2019 13:59
Acetone	5.0	U	2.0	5.0	10	UG/L	5	27-Jun-2019 13:59
Benzene	2.5	U	1.0	2.5	5.0	UG/L	5	27-Jun-2019 13:59
Bromobenzene	2.5	U	2.0	2.5	5.0	UG/L	5	27-Jun-2019 13:59
Bromochloromethane	2.5	U	1.0	2.5	5.0	UG/L	5	27-Jun-2019 13:59
Bromodichloromethane	2.5	U	1.0	2.5	5.0	UG/L	5	27-Jun-2019 13:59
Bromoform	2.5	U	2.0	2.5	5.0	UG/L	5	27-Jun-2019 13:59
Bromomethane	2.5	U	2.0	2.5	5.0	UG/L	5	27-Jun-2019 13:59
Carbon disulfide	5.0	U	3.0	5.0	10	UG/L	5	27-Jun-2019 13:59
Carbon tetrachloride	2.5	U	2.5	2.5	5.0	UG/L	5	27-Jun-2019 13:59
Chlorobenzene	2.5	U	1.5	2.5	5.0	UG/L	5	27-Jun-2019 13:59
Chloroethane	2.5	U	1.5	2.5	5.0	UG/L	5	27-Jun-2019 13:59
Chloroform	**3.4**	J	**1.0**	**2.5**	**5.0**	**UG/L**	5	27-Jun-2019 13:59

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: MW7_061719
Collection Date: 17-Jun-2019 08:20

ANALYTICAL REPORT
WorkOrder:HS19060929
Lab ID:HS19060929-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	2.5	U	1.0	2.5	5.0	UG/L	5	27-Jun-2019 13:59
cis-1,2-Dichloroethene	**10**		**1.0**	**2.5**	**5.0**	**UG/L**	5	27-Jun-2019 13:59
cis-1,3-Dichloropropene	2.5	U	0.50	2.5	5.0	UG/L	5	27-Jun-2019 13:59
Dibromochloromethane	2.5	U	1.5	2.5	5.0	UG/L	5	27-Jun-2019 13:59
Dibromomethane	2.5	U	1.0	2.5	5.0	UG/L	5	27-Jun-2019 13:59
Dichlorodifluoromethane	2.5	U	1.5	2.5	5.0	UG/L	5	27-Jun-2019 13:59
Ethylbenzene	2.5	U	1.5	2.5	5.0	UG/L	5	27-Jun-2019 13:59
Hexachlorobutadiene	5.0	U	5.0	5.0	5.0	UG/L	5	27-Jun-2019 13:59
Isopropylbenzene	2.5	U	1.5	2.5	5.0	UG/L	5	27-Jun-2019 13:59
m,p-Xylene	5.0	U	2.5	5.0	10	UG/L	5	27-Jun-2019 13:59
Methylene chloride	5.0	U	2.0	5.0	10	UG/L	5	27-Jun-2019 13:59
n-Butylbenzene	2.5	U	2.0	2.5	5.0	UG/L	5	27-Jun-2019 13:59
n-Propylbenzene	2.5	U	1.5	2.5	5.0	UG/L	5	27-Jun-2019 13:59
Naphthalene	2.5	U	1.5	2.5	5.0	UG/L	5	27-Jun-2019 13:59
o-Xylene	2.5	U	1.5	2.5	5.0	UG/L	5	27-Jun-2019 13:59
sec-Butylbenzene	2.5	U	1.5	2.5	5.0	UG/L	5	27-Jun-2019 13:59
Styrene	2.5	U	1.5	2.5	5.0	UG/L	5	27-Jun-2019 13:59
tert-Butylbenzene	2.5	U	1.5	2.5	5.0	UG/L	5	27-Jun-2019 13:59
Tetrachloroethene	2.5	U	1.5	2.5	5.0	UG/L	5	27-Jun-2019 13:59
Toluene	2.5	U	1.0	2.5	5.0	UG/L	5	27-Jun-2019 13:59
trans-1,2-Dichloroethene	2.5	U	1.0	2.5	5.0	UG/L	5	27-Jun-2019 13:59
trans-1,3-Dichloropropene	2.5	U	1.0	2.5	5.0	UG/L	5	27-Jun-2019 13:59
Trichloroethene	**1,300**		**5.0**	**12**	**25**	**UG/L**	25	27-Jun-2019 15:34
Trichlorofluoromethane	2.5	U	1.5	2.5	5.0	UG/L	5	27-Jun-2019 13:59
Vinyl chloride	2.5	U	1.0	2.5	5.0	UG/L	5	27-Jun-2019 13:59
Surr: 1,2-Dichloroethane-d4	*106*			**0**	*81-118*	*%REC*	*25*	*27-Jun-2019 15:34*
Surr: 1,2-Dichloroethane-d4	*107*			**0**	*81-118*	*%REC*	*5*	*27-Jun-2019 13:59*
Surr: 4-Bromofluorobenzene	*99.1*			**0**	*85-114*	*%REC*	*5*	*27-Jun-2019 13:59*
Surr: 4-Bromofluorobenzene	*98.0*			**0**	*85-114*	*%REC*	*25*	*27-Jun-2019 15:34*
Surr: Dibromofluoromethane	*98.8*			**0**	*80-119*	*%REC*	*5*	*27-Jun-2019 13:59*
Surr: Dibromofluoromethane	*99.4*			**0**	*80-119*	*%REC*	*25*	*27-Jun-2019 15:34*
Surr: Toluene-d8	*103*			**0**	*89-112*	*%REC*	*5*	*27-Jun-2019 13:59*
Surr: Toluene-d8	*101*			**0**	*89-112*	*%REC*	*25*	*27-Jun-2019 15:34*
SEMIVOLATILES SIM		**Method:SW8270SIM**				Prep:SW3510 / 19-Jun-2019		Analyst: LG
1,4-Dioxane	**9.7**		**1.0**	**1.0**	**1.0**	**ug/L**	100	27-Jun-2019 18:24
Surr: 2-Fluorobiphenyl	*0*	*S*		0	*40-140*	*%REC*	*100*	*27-Jun-2019 18:24*
Surr: 4-Terphenyl-d14	*0*	*S*		0	*40-140*	*%REC*	*100*	*27-Jun-2019 18:24*
Surr: Nitrobenzene-d5	*0*	*S*		0	*40-140*	*%REC*	*100*	*27-Jun-2019 18:24*

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: MW7_061719
Collection Date: 17-Jun-2019 08:20

ANALYTICAL REPORT
WorkOrder:HS19060929
Lab ID:HS19060929-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	03-Jul-2019 09:32

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW12DW_061719
Collection Date: 17-Jun-2019 09:15

ANALYTICAL REPORT
WorkOrder:HS19060929
Lab ID:HS19060929-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 16:46
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 16:46
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 16:46
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 16:46
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 16:46
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 16:46
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 16:46
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 16:46
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 16:46
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 16:46
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 16:46
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 16:46
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 16:46
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 16:46
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 16:46
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 16:46
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 16:46
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 16:46
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 16:46
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 16:46
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 16:46
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	27-Jun-2019 16:46
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 16:46
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	27-Jun-2019 16:46
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 16:46
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 16:46
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	27-Jun-2019 16:46
Acetone	**3.2**		**0.40**	**1.0**	**2.0**	**UG/L**	1	27-Jun-2019 16:46
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 16:46
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 16:46
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 16:46
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 16:46
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 16:46
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 16:46
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	27-Jun-2019 16:46
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 16:46
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 16:46
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 16:46
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 16:46

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: LHAAP 18 24 WorkOrder:HS19060929
Sample ID: 18CPTMW12DW_061719 Lab ID:HS19060929-02
Collection Date: 17-Jun-2019 09:15 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 16:46
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 16:46
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	27-Jun-2019 16:46
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 16:46
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 16:46
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 16:46
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 16:46
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	27-Jun-2019 16:46
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 16:46
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	27-Jun-2019 16:46
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	27-Jun-2019 16:46
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 16:46
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 16:46
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 16:46
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 16:46
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 16:46
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 16:46
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 16:46
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 16:46
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 16:46
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 16:46
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 16:46
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 16:46
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 16:46
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 16:46
Surr: 1,2-Dichloroethane-d4	*102*			**0**	*81-118*	*%REC*	*1*	*27-Jun-2019 16:46*
Surr: 4-Bromofluorobenzene	*94.5*			**0**	*85-114*	*%REC*	*1*	*27-Jun-2019 16:46*
Surr: Dibromofluoromethane	*94.5*			**0**	*80-119*	*%REC*	*1*	*27-Jun-2019 16:46*
Surr: Toluene-d8	*97.6*			**0**	*89-112*	*%REC*	*1*	*27-Jun-2019 16:46*
SEMIVOLATILES SIM		**Method:SW8270SIM**				Prep:SW3510 / 19-Jun-2019		Analyst: LG
1,4-Dioxane	**0.11**		**0.010**	**0.010**	**0.010**	**ug/L**	1	27-Jun-2019 14:16
Surr: 2-Fluorobiphenyl	*73.4*			**0**	*40-140*	*%REC*	*1*	*27-Jun-2019 14:16*
Surr: 4-Terphenyl-d14	*102*			**0**	*40-140*	*%REC*	*1*	*27-Jun-2019 14:16*
Surr: Nitrobenzene-d5	*117*			**0**	*40-140*	*%REC*	*1*	*27-Jun-2019 14:16*

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW12DW_061719
Collection Date: 17-Jun-2019 09:15

ANALYTICAL REPORT
WorkOrder:HS19060929
Lab ID:HS19060929-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 25-Jun-2019		Analyst: JHD
Aluminum	**0.0201**		**0.00180**	**0.00500**	**0.0100**	**mg/L**	1	27-Jun-2019 17:43
Antimony	**0.000406**	J	**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 17:43
Arsenic	**0.00401**	J	**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 17:43
Barium	**0.133**		**0.00190**	**0.00250**	**0.00500**	**mg/L**	1	27-Jun-2019 17:43
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	28-Jun-2019 15:36
Cadmium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Jun-2019 17:43
Calcium	**9.65**		**0.0340**	**0.0500**	**0.500**	**mg/L**	1	27-Jun-2019 17:43
Chromium	**0.0136**		**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 17:43
Cobalt	**0.000115**	J	**0.000100**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 17:43
Copper	0.00100	U	0.00100	0.00100	0.00500	mg/L	1	27-Jun-2019 17:43
Iron	**1.14**		**0.0120**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 17:43
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	27-Jun-2019 17:43
Magnesium	**4.67**		**0.0100**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 17:43
Manganese	**0.0329**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 17:43
Nickel	**0.000995**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 17:43
Potassium	**108**		**0.0180**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 17:43
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	27-Jun-2019 17:43
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	27-Jun-2019 17:43
Sodium	**184**		**0.0280**	**0.100**	**0.400**	**mg/L**	2	28-Jun-2019 15:38
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Jun-2019 17:43
Vanadium	**0.00169**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 17:43
Zinc	**0.0198**		**0.00200**	**0.00200**	**0.00500**	**mg/L**	1	27-Jun-2019 17:43
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 20-Jun-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	20-Jun-2019 17:17
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	03-Jul-2019 09:32

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW12SW_061719
Collection Date: 17-Jun-2019 10:10

ANALYTICAL REPORT
WorkOrder:HS19060929
Lab ID:HS19060929-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:10
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:10
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 17:10
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:10
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:10
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:10
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:10
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 17:10
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 17:10
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 17:10
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:10
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:10
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:10
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 17:10
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:10
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 17:10
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:10
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 17:10
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:10
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 17:10
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:10
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	27-Jun-2019 17:10
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:10
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	27-Jun-2019 17:10
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 17:10
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:10
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	27-Jun-2019 17:10
Acetone	**2.9**		**0.40**	**1.0**	**2.0**	**UG/L**	1	27-Jun-2019 17:10
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:10
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 17:10
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:10
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:10
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 17:10
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 17:10
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	27-Jun-2019 17:10
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 17:10
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:10
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:10
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:10

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW12SW_061719
Collection Date: 17-Jun-2019 10:10

ANALYTICAL REPORT
WorkOrder:HS19060929
Lab ID:HS19060929-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:10
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:10
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	27-Jun-2019 17:10
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:10
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:10
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:10
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:10
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	27-Jun-2019 17:10
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:10
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	27-Jun-2019 17:10
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	27-Jun-2019 17:10
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 17:10
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:10
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:10
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:10
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:10
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:10
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:10
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:10
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:10
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:10
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:10
Trichloroethene	**0.65**	J	**0.20**	**0.50**	**1.0**	**UG/L**	1	27-Jun-2019 17:10
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:10
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:10
Surr: 1,2-Dichloroethane-d4	*102*			**0**	*81-118*	*%REC*	*1*	*27-Jun-2019 17:10*
Surr: 4-Bromofluorobenzene	*93.5*			**0**	*85-114*	*%REC*	*1*	*27-Jun-2019 17:10*
Surr: Dibromofluoromethane	*95.1*			**0**	*80-119*	*%REC*	*1*	*27-Jun-2019 17:10*
Surr: Toluene-d8	*97.8*			**0**	*89-112*	*%REC*	*1*	*27-Jun-2019 17:10*
SEMIVOLATILES SIM		**Method:SW8270SIM**				Prep:SW3510 / 19-Jun-2019		Analyst: LG
1,4-Dioxane	**0.073**		**0.010**	**0.010**	**0.010**	**ug/L**	1	27-Jun-2019 14:37
Surr: 2-Fluorobiphenyl	*93.3*			**0**	*40-140*	*%REC*	*1*	*27-Jun-2019 14:37*
Surr: 4-Terphenyl-d14	*109*			**0**	*40-140*	*%REC*	*1*	*27-Jun-2019 14:37*
Surr: Nitrobenzene-d5	*106*			**0**	*40-140*	*%REC*	*1*	*27-Jun-2019 14:37*

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW12SW_061719
Collection Date: 17-Jun-2019 10:10

ANALYTICAL REPORT
WorkOrder:HS19060929
Lab ID:HS19060929-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 25-Jun-2019		Analyst: JHD
Aluminum	**0.0204**		**0.00180**	**0.00500**	**0.0100**	**mg/L**	1	27-Jun-2019 17:45
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	27-Jun-2019 17:45
Arsenic	**0.000866**	J	**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 17:45
Barium	**0.803**		**0.00190**	**0.00250**	**0.00500**	**mg/L**	1	27-Jun-2019 17:45
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Jun-2019 17:45
Cadmium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Jun-2019 17:45
Calcium	**58.5**		**0.0340**	**0.0500**	**0.500**	**mg/L**	1	27-Jun-2019 17:45
Chromium	**0.0159**		**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 17:45
Cobalt	**0.00248**	J	**0.000100**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 17:45
Copper	0.00100	U	0.00100	0.00100	0.00500	mg/L	1	27-Jun-2019 17:45
Iron	**0.540**		**0.0120**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 17:45
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	27-Jun-2019 17:45
Magnesium	**38.8**		**0.0100**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 17:45
Manganese	**0.181**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 17:45
Nickel	**0.00382**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 17:45
Potassium	**75.5**		**0.0180**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 17:45
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	27-Jun-2019 17:45
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	27-Jun-2019 17:45
Sodium	**234**		**0.140**	**0.500**	**2.00**	**mg/L**	10	28-Jun-2019 15:40
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Jun-2019 17:45
Vanadium	**0.00102**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 17:45
Zinc	**0.0181**		**0.00200**	**0.00200**	**0.00500**	**mg/L**	1	27-Jun-2019 17:45
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 20-Jun-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	20-Jun-2019 17:23
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	03-Jul-2019 09:32

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW12SW_061719_a
Collection Date: 17-Jun-2019 10:10

ANALYTICAL REPORT
WorkOrder:HS19060929
Lab ID:HS19060929-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:34
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:34
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 17:34
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:34
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:34
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:34
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:34
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 17:34
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 17:34
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 17:34
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:34
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:34
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:34
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 17:34
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:34
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 17:34
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:34
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 17:34
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:34
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 17:34
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:34
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	27-Jun-2019 17:34
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:34
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	27-Jun-2019 17:34
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 17:34
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:34
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	27-Jun-2019 17:34
Acetone	**3.0**		**0.40**	**1.0**	**2.0**	**UG/L**	1	27-Jun-2019 17:34
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:34
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 17:34
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:34
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:34
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 17:34
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 17:34
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	27-Jun-2019 17:34
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 17:34
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:34
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:34
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:34

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW12SW_061719_a
Collection Date: 17-Jun-2019 10:10

ANALYTICAL REPORT
WorkOrder:HS19060929
Lab ID:HS19060929-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:34
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:34
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	27-Jun-2019 17:34
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:34
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:34
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:34
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:34
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	27-Jun-2019 17:34
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:34
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	27-Jun-2019 17:34
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	27-Jun-2019 17:34
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 17:34
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:34
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:34
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:34
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:34
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:34
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:34
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:34
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:34
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:34
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:34
Trichloroethene	**0.60**	J	**0.20**	**0.50**	**1.0**	**UG/L**	1	27-Jun-2019 17:34
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:34
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:34
Surr: 1,2-Dichloroethane-d4	*103*			**0**	*81-118*	*%REC*	*1*	*27-Jun-2019 17:34*
Surr: 4-Bromofluorobenzene	*95.8*			**0**	*85-114*	*%REC*	*1*	*27-Jun-2019 17:34*
Surr: Dibromofluoromethane	*95.5*			**0**	*80-119*	*%REC*	*1*	*27-Jun-2019 17:34*
Surr: Toluene-d8	*99.1*			**0**	*89-112*	*%REC*	*1*	*27-Jun-2019 17:34*
SEMIVOLATILES SIM		**Method:SW8270SIM**				Prep:SW3510 / 19-Jun-2019		Analyst: LG
1,4-Dioxane	**0.18**		**0.010**	**0.010**	**0.010**	**ug/L**	1	27-Jun-2019 14:57
Surr: 2-Fluorobiphenyl	*93.3*			**0**	*40-140*	*%REC*	*1*	*27-Jun-2019 14:57*
Surr: 4-Terphenyl-d14	*106*			**0**	*40-140*	*%REC*	*1*	*27-Jun-2019 14:57*
Surr: Nitrobenzene-d5	*126*			**0**	*40-140*	*%REC*	*1*	*27-Jun-2019 14:57*

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW12SW_061719_a
Collection Date: 17-Jun-2019 10:10

ANALYTICAL REPORT
WorkOrder:HS19060929
Lab ID:HS19060929-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 25-Jun-2019		Analyst: JHD
Aluminum	**0.0248**		**0.00180**	**0.00500**	**0.0100**	**mg/L**	1	27-Jun-2019 17:47
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	27-Jun-2019 17:47
Arsenic	**0.00106**	J	**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 17:47
Barium	**0.825**		**0.00190**	**0.00250**	**0.00500**	**mg/L**	1	27-Jun-2019 17:47
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	28-Jun-2019 15:41
Cadmium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Jun-2019 17:47
Calcium	**58.7**		**0.0340**	**0.0500**	**0.500**	**mg/L**	1	27-Jun-2019 17:47
Chromium	**0.0160**		**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 17:47
Cobalt	**0.00304**	J	**0.000100**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 17:47
Copper	0.00100	U	0.00100	0.00100	0.00500	mg/L	1	27-Jun-2019 17:47
Iron	**0.669**		**0.0120**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 17:47
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	27-Jun-2019 17:47
Magnesium	**39.2**		**0.0100**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 17:47
Manganese	**0.232**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 17:47
Nickel	**0.00361**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 17:47
Potassium	**75.0**		**0.0180**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 17:47
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	27-Jun-2019 17:47
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	27-Jun-2019 17:47
Sodium	**229**		**0.0280**	**0.100**	**0.400**	**mg/L**	2	28-Jun-2019 15:43
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Jun-2019 17:47
Vanadium	**0.00150**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 17:47
Zinc	**0.0159**		**0.00200**	**0.00200**	**0.00500**	**mg/L**	1	27-Jun-2019 17:47
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 20-Jun-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	20-Jun-2019 17:24
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	03-Jul-2019 09:32

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW23SW_061719
Collection Date: 17-Jun-2019 11:15

ANALYTICAL REPORT
WorkOrder:HS19060929
Lab ID:HS19060929-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:58
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:58
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 17:58
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:58
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:58
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:58
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:58
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 17:58
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 17:58
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 17:58
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:58
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:58
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:58
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 17:58
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:58
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 17:58
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:58
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 17:58
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:58
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 17:58
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:58
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	27-Jun-2019 17:58
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:58
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	27-Jun-2019 17:58
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 17:58
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:58
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	27-Jun-2019 17:58
Acetone	**2.7**		**0.40**	**1.0**	**2.0**	**UG/L**	1	27-Jun-2019 17:58
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:58
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 17:58
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:58
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:58
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 17:58
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 17:58
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	27-Jun-2019 17:58
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 17:58
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:58
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:58
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:58

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW23SW_061719
Collection Date: 17-Jun-2019 11:15

ANALYTICAL REPORT
WorkOrder:HS19060929
Lab ID:HS19060929-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:58
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:58
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	27-Jun-2019 17:58
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:58
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:58
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:58
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:58
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	27-Jun-2019 17:58
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:58
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	27-Jun-2019 17:58
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	27-Jun-2019 17:58
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 17:58
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:58
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:58
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:58
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:58
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:58
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:58
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:58
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:58
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:58
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:58
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:58
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:58
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:58
Surr: 1,2-Dichloroethane-d4	*102*			**0**	*81-118*	*%REC*	*1*	*27-Jun-2019 17:58*
Surr: 4-Bromofluorobenzene	*93.8*			**0**	*85-114*	*%REC*	*1*	*27-Jun-2019 17:58*
Surr: Dibromofluoromethane	*94.9*			**0**	*80-119*	*%REC*	*1*	*27-Jun-2019 17:58*
Surr: Toluene-d8	*96.3*			**0**	*89-112*	*%REC*	*1*	*27-Jun-2019 17:58*
SEMIVOLATILES SIM		**Method:SW8270SIM**				Prep:SW3510 / 19-Jun-2019		Analyst: LG
1,4-Dioxane	0.010	U	0.010	0.010	0.010	ug/L	1	27-Jun-2019 15:18
Surr: 2-Fluorobiphenyl	*107*			**0**	*40-140*	*%REC*	*1*	*27-Jun-2019 15:18*
Surr: 4-Terphenyl-d14	*88.9*			**0**	*40-140*	*%REC*	*1*	*27-Jun-2019 15:18*
Surr: Nitrobenzene-d5	*100*			**0**	*40-140*	*%REC*	*1*	*27-Jun-2019 15:18*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	03-Jul-2019 09:32

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: LHAAP 18 24 WorkOrder:HS19060929
Sample ID: 18CPTMW23_061719 Lab ID:HS19060929-06
Collection Date: 17-Jun-2019 12:05 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	5.0	U	3.0	5.0	10	UG/L	10	27-Jun-2019 14:23
1,1,1-Trichloroethane	5.0	U	2.0	5.0	10	UG/L	10	27-Jun-2019 14:23
1,1,2,2-Tetrachloroethane	5.0	U	5.0	5.0	10	UG/L	10	27-Jun-2019 14:23
1,1,2-Trichloroethane	5.0	U	3.0	5.0	10	UG/L	10	27-Jun-2019 14:23
1,1-Dichloroethane	5.0	U	2.0	5.0	10	UG/L	10	27-Jun-2019 14:23
1,1-Dichloroethene	5.0	U	2.0	5.0	10	UG/L	10	27-Jun-2019 14:23
1,1-Dichloropropene	5.0	U	3.0	5.0	10	UG/L	10	27-Jun-2019 14:23
1,2,3-Trichlorobenzene	5.0	U	4.0	5.0	10	UG/L	10	27-Jun-2019 14:23
1,2,3-Trichloropropane	5.0	U	5.0	5.0	10	UG/L	10	27-Jun-2019 14:23
1,2,4-Trichlorobenzene	5.0	U	5.0	5.0	10	UG/L	10	27-Jun-2019 14:23
1,2,4-Trimethylbenzene	5.0	U	3.0	5.0	10	UG/L	10	27-Jun-2019 14:23
1,2-Dibromo-3-chloropropane	5.0	U	2.0	5.0	10	UG/L	10	27-Jun-2019 14:23
1,2-Dibromoethane	5.0	U	2.0	5.0	10	UG/L	10	27-Jun-2019 14:23
1,2-Dichlorobenzene	5.0	U	5.0	5.0	10	UG/L	10	27-Jun-2019 14:23
1,2-Dichloroethane	**150**		**2.0**	**5.0**	**10**	**UG/L**	10	27-Jun-2019 14:23
1,2-Dichloropropane	5.0	U	5.0	5.0	10	UG/L	10	27-Jun-2019 14:23
1,3,5-Trimethylbenzene	5.0	U	3.0	5.0	10	UG/L	10	27-Jun-2019 14:23
1,3-Dichlorobenzene	5.0	U	4.0	5.0	10	UG/L	10	27-Jun-2019 14:23
1,3-Dichloropropane	5.0	U	3.0	5.0	10	UG/L	10	27-Jun-2019 14:23
1,4-Dichlorobenzene	5.0	U	4.0	5.0	10	UG/L	10	27-Jun-2019 14:23
2,2-Dichloropropane	5.0	U	2.0	5.0	10	UG/L	10	27-Jun-2019 14:23
2-Butanone	10	U	5.0	10	20	UG/L	10	27-Jun-2019 14:23
2-Chlorotoluene	5.0	U	3.0	5.0	10	UG/L	10	27-Jun-2019 14:23
2-Hexanone	10	U	10	10	20	UG/L	10	27-Jun-2019 14:23
4-Chlorotoluene	5.0	U	4.0	5.0	10	UG/L	10	27-Jun-2019 14:23
4-Isopropyltoluene	5.0	U	3.0	5.0	10	UG/L	10	27-Jun-2019 14:23
4-Methyl-2-pentanone	10	U	7.0	10	20	UG/L	10	27-Jun-2019 14:23
Acetone	10	U	4.0	10	20	UG/L	10	27-Jun-2019 14:23
Benzene	5.0	U	2.0	5.0	10	UG/L	10	27-Jun-2019 14:23
Bromobenzene	5.0	U	4.0	5.0	10	UG/L	10	27-Jun-2019 14:23
Bromochloromethane	5.0	U	2.0	5.0	10	UG/L	10	27-Jun-2019 14:23
Bromodichloromethane	5.0	U	2.0	5.0	10	UG/L	10	27-Jun-2019 14:23
Bromoform	5.0	U	4.0	5.0	10	UG/L	10	27-Jun-2019 14:23
Bromomethane	5.0	U	4.0	5.0	10	UG/L	10	27-Jun-2019 14:23
Carbon disulfide	10	U	6.0	10	20	UG/L	10	27-Jun-2019 14:23
Carbon tetrachloride	5.0	U	5.0	5.0	10	UG/L	10	27-Jun-2019 14:23
Chlorobenzene	5.0	U	3.0	5.0	10	UG/L	10	27-Jun-2019 14:23
Chloroethane	5.0	U	3.0	5.0	10	UG/L	10	27-Jun-2019 14:23
Chloroform	5.0	U	2.0	5.0	10	UG/L	10	27-Jun-2019 14:23

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW23_061719
Collection Date: 17-Jun-2019 12:05

ANALYTICAL REPORT
WorkOrder:HS19060929
Lab ID:HS19060929-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	5.0	U	2.0	5.0	10	UG/L	10	27-Jun-2019 14:23
cis-1,2-Dichloroethene	**150**		**2.0**	**5.0**	**10**	**UG/L**	10	27-Jun-2019 14:23
cis-1,3-Dichloropropene	5.0	U	1.0	5.0	10	UG/L	10	27-Jun-2019 14:23
Dibromochloromethane	5.0	U	3.0	5.0	10	UG/L	10	27-Jun-2019 14:23
Dibromomethane	5.0	U	2.0	5.0	10	UG/L	10	27-Jun-2019 14:23
Dichlorodifluoromethane	5.0	U	3.0	5.0	10	UG/L	10	27-Jun-2019 14:23
Ethylbenzene	5.0	U	3.0	5.0	10	UG/L	10	27-Jun-2019 14:23
Hexachlorobutadiene	10	U	10	10	10	UG/L	10	27-Jun-2019 14:23
Isopropylbenzene	5.0	U	3.0	5.0	10	UG/L	10	27-Jun-2019 14:23
m,p-Xylene	10	U	5.0	10	20	UG/L	10	27-Jun-2019 14:23
Methylene chloride	10	U	4.0	10	20	UG/L	10	27-Jun-2019 14:23
n-Butylbenzene	5.0	U	4.0	5.0	10	UG/L	10	27-Jun-2019 14:23
n-Propylbenzene	5.0	U	3.0	5.0	10	UG/L	10	27-Jun-2019 14:23
Naphthalene	5.0	U	3.0	5.0	10	UG/L	10	27-Jun-2019 14:23
o-Xylene	5.0	U	3.0	5.0	10	UG/L	10	27-Jun-2019 14:23
sec-Butylbenzene	5.0	U	3.0	5.0	10	UG/L	10	27-Jun-2019 14:23
Styrene	5.0	U	3.0	5.0	10	UG/L	10	27-Jun-2019 14:23
tert-Butylbenzene	5.0	U	3.0	5.0	10	UG/L	10	27-Jun-2019 14:23
Tetrachloroethene	5.0	U	3.0	5.0	10	UG/L	10	27-Jun-2019 14:23
Toluene	5.0	U	2.0	5.0	10	UG/L	10	27-Jun-2019 14:23
trans-1,2-Dichloroethene	5.0	U	2.0	5.0	10	UG/L	10	27-Jun-2019 14:23
trans-1,3-Dichloropropene	5.0	U	2.0	5.0	10	UG/L	10	27-Jun-2019 14:23
Trichloroethene	**2,900**		**20**	**50**	**100**	**UG/L**	100	27-Jun-2019 15:58
Trichlorofluoromethane	5.0	U	3.0	5.0	10	UG/L	10	27-Jun-2019 14:23
Vinyl chloride	5.0	U	2.0	5.0	10	UG/L	10	27-Jun-2019 14:23
Surr: 1,2-Dichloroethane-d4	*102*			**0**	*81-118*	*%REC*	*10*	*27-Jun-2019 14:23*
Surr: 1,2-Dichloroethane-d4	*99.8*			**0**	*81-118*	*%REC*	*100*	*27-Jun-2019 15:58*
Surr: 4-Bromofluorobenzene	*96.9*			**0**	*85-114*	*%REC*	*10*	*27-Jun-2019 14:23*
Surr: 4-Bromofluorobenzene	*94.3*			**0**	*85-114*	*%REC*	*100*	*27-Jun-2019 15:58*
Surr: Dibromofluoromethane	*95.4*			**0**	*80-119*	*%REC*	*10*	*27-Jun-2019 14:23*
Surr: Dibromofluoromethane	*93.2*			**0**	*80-119*	*%REC*	*100*	*27-Jun-2019 15:58*
Surr: Toluene-d8	*99.8*			**0**	*89-112*	*%REC*	*10*	*27-Jun-2019 14:23*
Surr: Toluene-d8	*97.8*			**0**	*89-112*	*%REC*	*100*	*27-Jun-2019 15:58*
SEMIVOLATILES SIM	**Method:SW8270SIM**					Prep:SW3510 / 19-Jun-2019		Analyst: LG
1,4-Dioxane	**8.1**		**0.50**	**0.50**	**0.50**	**ug/L**	50	27-Jun-2019 18:45
Surr: 2-Fluorobiphenyl	*0*	*S*		0	*40-140*	*%REC*	*50*	*27-Jun-2019 18:45*
Surr: 4-Terphenyl-d14	*0*	*S*		0	*40-140*	*%REC*	*50*	*27-Jun-2019 18:45*
Surr: Nitrobenzene-d5	*0*	*S*		0	*40-140*	*%REC*	*50*	*27-Jun-2019 18:45*

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW23_061719
Collection Date: 17-Jun-2019 12:05

ANALYTICAL REPORT
WorkOrder:HS19060929
Lab ID:HS19060929-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	03-Jul-2019 09:32

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18WW14_061719
Collection Date: 17-Jun-2019 13:05

ANALYTICAL REPORT
WorkOrder:HS19060929
Lab ID:HS19060929-07
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 25-Jun-2019		Analyst: JHD
Aluminum	**0.138**		**0.00180**	**0.00500**	**0.0100**	**mg/L**	1	27-Jun-2019 17:50
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	27-Jun-2019 17:50
Arsenic	**0.000663**	J	**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 17:50
Barium	**1.19**		**0.00190**	**0.00250**	**0.00500**	**mg/L**	1	27-Jun-2019 17:50
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Jun-2019 17:50
Cadmium	**0.000783**	J	**0.000200**	**0.000500**	**0.00200**	**mg/L**	1	27-Jun-2019 17:50
Calcium	**50.8**		**0.0340**	**0.0500**	**0.500**	**mg/L**	1	27-Jun-2019 17:50
Chromium	**0.409**		**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 17:50
Cobalt	**0.0132**		**0.000100**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 17:50
Copper	**0.0119**		**0.00100**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 17:50
Iron	**1.90**		**0.0120**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 17:50
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	27-Jun-2019 17:50
Magnesium	**40.4**		**0.0100**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 17:50
Manganese	**0.876**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 17:50
Nickel	**0.306**		**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 17:50
Potassium	**4.38**		**0.0180**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 17:50
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	27-Jun-2019 17:50
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	27-Jun-2019 17:50
Sodium	**137**		**0.0140**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 17:50
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Jun-2019 17:50
Vanadium	**0.00422**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 17:50
Zinc	**0.0390**		**0.00200**	**0.00200**	**0.00500**	**mg/L**	1	27-Jun-2019 17:50
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 20-Jun-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	20-Jun-2019 17:26
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	03-Jul-2019 09:32

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: Trip Blank
Collection Date: 17-Jun-2019 00:00

ANALYTICAL REPORT
WorkOrder:HS19060929
Lab ID:HS19060929-08
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 16:22
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 16:22
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 16:22
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 16:22
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 16:22
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 16:22
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 16:22
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 16:22
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 16:22
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 16:22
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 16:22
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 16:22
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 16:22
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 16:22
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 16:22
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 16:22
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 16:22
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 16:22
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 16:22
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 16:22
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 16:22
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	27-Jun-2019 16:22
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 16:22
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	27-Jun-2019 16:22
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 16:22
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 16:22
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	27-Jun-2019 16:22
Acetone	**17**		**0.40**	**1.0**	**2.0**	**UG/L**	1	27-Jun-2019 16:22
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 16:22
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 16:22
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 16:22
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 16:22
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 16:22
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 16:22
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	27-Jun-2019 16:22
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 16:22
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 16:22
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 16:22
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 16:22

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
ANALYTICAL REPORT
Project: LHAAP 18 24
WorkOrder:HS19060929
Sample ID: Trip Blank
Lab ID:HS19060929-08
Collection Date: 17-Jun-2019 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	27-Jun-2019 16:22
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 16:22
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	27-Jun-2019 16:22
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 16:22
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 16:22
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 16:22
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 16:22
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	27-Jun-2019 16:22
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 16:22
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	27-Jun-2019 16:22
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	27-Jun-2019 16:22
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 16:22
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 16:22
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 16:22
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 16:22
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 16:22
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 16:22
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 16:22
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 16:22
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 16:22
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 16:22
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 16:22
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 16:22
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 16:22
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 16:22
Surr: 1,2-Dichloroethane-d4	*106*			**0**	*81-118*	*%REC*	*1*	*27-Jun-2019 16:22*
Surr: 4-Bromofluorobenzene	*96.1*			**0**	*85-114*	*%REC*	*1*	*27-Jun-2019 16:22*
Surr: Dibromofluoromethane	*98.0*			**0**	*80-119*	*%REC*	*1*	*27-Jun-2019 16:22*
Surr: Toluene-d8	*99.8*			**0**	*89-112*	*%REC*	*1*	*27-Jun-2019 16:22*

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

RIGHT SOLUTIONS | RIGHT PARTNER

WEIGHT LOG

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060929

Batch ID: 142169 **Method:** SEMIVOLATILES SIM **Prep:** 3510_B_SIM

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19060929-01	1	1000	1 (mL)	0.001
HS19060929-02	1	1000	1 (mL)	0.001
HS19060929-03	1	1000	1 (mL)	0.001
HS19060929-04	1	1000	1 (mL)	0.001
HS19060929-05	1	1000	1 (mL)	0.001
HS19060929-06	1	1000	1 (mL)	0.001

Batch ID: 142269 **Method:** MERCURY BY SW7470A **Prep:** HG_WPR

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19060929-02	1	10 (mL)	10 (mL)	1
HS19060929-03	1	10 (mL)	10 (mL)	1
HS19060929-04	1	10 (mL)	10 (mL)	1
HS19060929-07	1	10 (mL)	10 (mL)	1

Batch ID: 142427 **Method:** METALS BY ICPMS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19060929-02	1	10	10 (mL)	1
HS19060929-03	1	10	10 (mL)	1
HS19060929-04	1	10	10 (mL)	1
HS19060929-07	1	10	10 (mL)	1

ALS Houston, US Date: 10-jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060929

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID: 142169 (0)	**Test Name :** SEMIVOLATILES SIM				**Matrix:** Groundwater	
HS19060929-01	MW7_061719	17 Jun 2019 08:20		19 Jun 2019 09:21	27 Jun 2019 18:24	100
HS19060929-02	18CPTMW12DW_061719	17 Jun 2019 09:15		19 Jun 2019 09:21	27 Jun 2019 14:16	1
HS19060929-03	18CPTMW12SW_061719	17 Jun 2019 10:10		19 Jun 2019 09:21	27 Jun 2019 14:37	1
HS19060929-04	18CPTMW12SW_061719_a	17 Jun 2019 10:10		19 Jun 2019 09:21	27 Jun 2019 14:57	1
HS19060929-05	18CPTMW23SW_061719	17 Jun 2019 11:15		19 Jun 2019 09:21	27 Jun 2019 15:18	1
HS19060929-06	18CPTMW23_061719	17 Jun 2019 12:05		19 Jun 2019 09:21	27 Jun 2019 18:45	50
Batch ID: 142269 (0)	**Test Name :** MERCURY BY SW7470A				**Matrix:** Groundwater	
HS19060929-02	18CPTMW12DW_061719	17 Jun 2019 09:15		20 Jun 2019 12:00	20 Jun 2019 17:17	1
HS19060929-03	18CPTMW12SW_061719	17 Jun 2019 10:10		20 Jun 2019 12:00	20 Jun 2019 17:23	1
HS19060929-04	18CPTMW12SW_061719_a	17 Jun 2019 10:10		20 Jun 2019 12:00	20 Jun 2019 17:24	1
HS19060929-07	18WW14_061719	17 Jun 2019 13:05		20 Jun 2019 12:00	20 Jun 2019 17:26	1
Batch ID: 142427 (0)	**Test Name :** METALS BY ICPMS BY SW6020A				**Matrix:** Groundwater	
HS19060929-02	18CPTMW12DW_061719	17 Jun 2019 09:15		25 Jun 2019 11:30	28 Jun 2019 15:38	2
HS19060929-02	18CPTMW12DW_061719	17 Jun 2019 09:15		25 Jun 2019 11:30	28 Jun 2019 15:36	1
HS19060929-02	18CPTMW12DW_061719	17 Jun 2019 09:15		25 Jun 2019 11:30	27 Jun 2019 17:43	1
HS19060929-03	18CPTMW12SW_061719	17 Jun 2019 10:10		25 Jun 2019 11:30	28 Jun 2019 15:40	10
HS19060929-03	18CPTMW12SW_061719	17 Jun 2019 10:10		25 Jun 2019 11:30	27 Jun 2019 17:45	1
HS19060929-04	18CPTMW12SW_061719_a	17 Jun 2019 10:10		25 Jun 2019 11:30	28 Jun 2019 15:43	2
HS19060929-04	18CPTMW12SW_061719_a	17 Jun 2019 10:10		25 Jun 2019 11:30	28 Jun 2019 15:41	1
HS19060929-04	18CPTMW12SW_061719_a	17 Jun 2019 10:10		25 Jun 2019 11:30	27 Jun 2019 17:47	1
HS19060929-07	18WW14_061719	17 Jun 2019 13:05		25 Jun 2019 11:30	27 Jun 2019 17:50	1
Batch ID: R341453 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS19060929-08	Trip Blank	17 Jun 2019 00:00			27 Jun 2019 16:22	1
Batch ID: R341453 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS19060929-01	MW7_061719	17 Jun 2019 08:20			27 Jun 2019 15:34	25
HS19060929-01	MW7_061719	17 Jun 2019 08:20			27 Jun 2019 13:59	5
HS19060929-02	18CPTMW12DW_061719	17 Jun 2019 09:15			27 Jun 2019 16:46	1
HS19060929-03	18CPTMW12SW_061719	17 Jun 2019 10:10			27 Jun 2019 17:10	1
HS19060929-04	18CPTMW12SW_061719_a	17 Jun 2019 10:10			27 Jun 2019 17:34	1
HS19060929-05	18CPTMW23SW_061719	17 Jun 2019 11:15			27 Jun 2019 17:58	1
HS19060929-06	18CPTMW23_061719	17 Jun 2019 12:05			27 Jun 2019 15:58	100
HS19060929-06	18CPTMW23_061719	17 Jun 2019 12:05			27 Jun 2019 14:23	10

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060929

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID: R341759 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** Groundwater	
HS19060929-01	MW7_061719	17 Jun 2019 08:20			03 Jul 2019 09:32	1
HS19060929-02	18CPTMW12DW_061719	17 Jun 2019 09:15			03 Jul 2019 09:32	1
HS19060929-03	18CPTMW12SW_061719	17 Jun 2019 10:10			03 Jul 2019 09:32	1
HS19060929-04	18CPTMW12SW_061719_a	17 Jun 2019 10:10			03 Jul 2019 09:32	1
HS19060929-05	18CPTMW23SW_061719	17 Jun 2019 11:15			03 Jul 2019 09:32	1
HS19060929-06	18CPTMW23_061719	17 Jun 2019 12:05			03 Jul 2019 09:32	1
HS19060929-07	18WW14_061719	17 Jun 2019 13:05			03 Jul 2019 09:32	1

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060929

QC BATCH REPORT

Batch ID: 142269 (0) **Instrument: HG03** **Method: MERCURY BY SW7470A**

MBLK Sample ID: **MBLK-142269** Units: **mg/L** Analysis Date: **20-Jun-2019 17:14**
Client ID: Run ID: **HG03_340940** SeqNo: **5133203** PrepDate: **20-Jun-2019** 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-142269** Units: **mg/L** Analysis Date: **20-Jun-2019 17:16**
Client ID: Run ID: **HG03_340940** SeqNo: **5133204** PrepDate: **20-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00510	0.000200	0.005	0	102	80 - 120				

MS Sample ID: **HS19060929-02MS** Units: **mg/L** Analysis Date: **20-Jun-2019 17:19**
Client ID: **18CPTMW12DW_061719** Run ID: **HG03_340940** SeqNo: **5133206** PrepDate: **20-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00000500	0.000000200	5e-006	0.0000000310	99.4	75 - 125				

MSD Sample ID: **HS19060929-02MSD** Units: **mg/L** Analysis Date: **20-Jun-2019 17:21**
Client ID: **18CPTMW12DW_061719** Run ID: **HG03_340940** SeqNo: **5133207** PrepDate: **20-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00000501	0.000000200	5e-006	0.0000000310	99.6	75 - 125	0.000005000	0.2	20	

The following samples were analyzed in this batch: HS19060929-02 HS19060929-03 HS19060929-04 HS19060929-07

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060929

QC BATCH REPORT

Batch ID: 142427 (0) **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

MBLK Sample ID: **MBLK-142427** Units: **mg/L** Analysis Date: **27-Jun-2019 17:22**
Client ID: Run ID: **ICPMS06_341376** SeqNo: **5145221** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.002457	0.0100								J
Antimony	0.000500	0.00500								U
Arsenic	0.000500	0.00500								U
Barium	0.00250	0.00500								U
Beryllium	0.000500	0.00200								U
Cadmium	0.000500	0.00200								U
Calcium	0.0500	0.500								U
Chromium	0.000500	0.00500								U
Cobalt	0.000500	0.00500								U
Copper	0.001932	0.00500								J
Iron	0.0500	0.200								U
Lead	0.00100	0.00500								U
Magnesium	0.0500	0.200								U
Manganese	0.00100	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	0.02437	0.200								J
Thallium	0.000500	0.00200								U
Vanadium	0.001051	0.00500								J
Zinc	0.00200	0.00500								U

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060929

QC BATCH REPORT

Batch ID: 142427 (0) **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

LCS Sample ID: **LCS-142427** Units: **mg/L** Analysis Date: **27-Jun-2019 16:58**
Client ID: Run ID: **ICPMS06_341376** SeqNo: **5145214** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.1091	0.0100	0.1	0	109	84 - 117				
Antimony	0.0559	0.00500	0.05	0	112	85 - 117				
Arsenic	0.05618	0.00500	0.05	0	112	84 - 116				
Barium	0.05364	0.00500	0.05	0	107	86 - 114				
Beryllium	0.05694	0.00200	0.05	0	114	83 - 121				
Cadmium	0.05632	0.00200	0.05	0	113	87 - 115				
Calcium	5.323	0.500	5	0	106	87 - 118				
Chromium	0.05591	0.00500	0.05	0	112	85 - 116				
Cobalt	0.05561	0.00500	0.05	0	111	86 - 115				
Copper	0.05732	0.00500	0.05	0	115	85 - 118				
Iron	5.504	0.200	5	0	110	87 - 118				
Lead	0.05401	0.00500	0.05	0	108	88 - 115				
Magnesium	5.42	0.200	5	0	108	83 - 118				
Manganese	0.05651	0.00500	0.05	0	113	87 - 115				
Nickel	0.05699	0.00500	0.05	0	114	85 - 117				
Potassium	5.366	0.200	5	0	107	87 - 115				
Selenium	0.05781	0.00500	0.05	0	116	80 - 120				
Silver	0.05393	0.00500	0.05	0	108	85 - 116				
Sodium	5.418	0.200	5	0	108	85 - 117				
Thallium	0.05098	0.00200	0.05	0	102	82 - 116				
Vanadium	0.05441	0.00500	0.05	0	109	86 - 115				
Zinc	0.05821	0.00500	0.05	0	116	83 - 119				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060929

QC BATCH REPORT

Batch ID: 142427 (0) **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

MS Sample ID: **HS19060986-04MS** Units: **mg/L** Analysis Date: **27-Jun-2019 17:03**
Client ID: Run ID: **ICPMS06_341376** SeqNo: **5145217** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.116	0.0100	0.1	0.01515	101	84 - 117				
Antimony	0.05308	0.00500	0.05	0.000258	106	85 - 117				
Arsenic	0.05627	0.00500	0.05	0.002036	108	84 - 116				
Barium	0.8428	0.00500	0.05	0.8565	-27.4	86 - 114				SO
Beryllium	0.05294	0.00200	0.05	0.000048	106	83 - 121				
Cadmium	0.05116	0.00200	0.05	0.000205	102	87 - 115				
Calcium	35.9	0.500	5	33.03	57.3	87 - 118				SO
Chromium	0.3735	0.00500	0.05	0.2809	185	85 - 116				SO
Cobalt	0.0563	0.00500	0.05	0.005607	101	86 - 115				
Copper	0.058	0.00500	0.05	0.005199	106	85 - 118				
Iron	7.669	0.200	5	2.556	102	87 - 118				
Lead	0.05089	0.00500	0.05	0.000094	102	88 - 115				
Magnesium	31.26	0.200	5	27.76	69.9	83 - 118				SO
Manganese	0.2154	0.00500	0.05	0.164	103	87 - 115				
Nickel	0.2401	0.00500	0.05	0.2011	78.0	85 - 117				SO
Potassium	7.654	0.200	5	2.639	100	87 - 115				
Selenium	0.05384	0.00500	0.05	0.000343	107	80 - 120				
Silver	0.04654	0.00500	0.05	0.000013	93.1	85 - 116				
Sodium	233.3	0.200	5	245	-233	85 - 117				SEO
Thallium	0.04975	0.00200	0.05	0.000043	99.4	82 - 116				
Vanadium	0.0572	0.00500	0.05	0.003781	107	86 - 115				
Zinc	0.07874	0.00500	0.05	0.03582	85.8	83 - 119				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060929

QC BATCH REPORT

Batch ID: 142427 (0) **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

MSD Sample ID: **HS19060986-04MSD** Units: **mg/L** Analysis Date: **27-Jun-2019 17:05**
Client ID: Run ID: **ICPMS06_341376** SeqNo: **5145218** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.1062	0.0100	0.1	0.01515	91.1	84 - 117	0.116	8.82	20	
Antimony	0.04965	0.00500	0.05	0.000258	98.8	85 - 117	0.05308	6.66	20	
Arsenic	0.05281	0.00500	0.05	0.002036	102	84 - 116	0.05627	6.34	20	
Barium	0.8139	0.00500	0.05	0.8565	-85.2	86 - 114	0.8428	3.49	20	SO
Beryllium	0.05024	0.00200	0.05	0.000048	100	83 - 121	0.05294	5.24	20	
Cadmium	0.04833	0.00200	0.05	0.000205	96.2	87 - 115	0.05116	5.7	20	
Calcium	33.36	0.500	5	33.03	6.56	87 - 118	35.9	7.33	20	SO
Cobalt	0.0531	0.00500	0.05	0.005607	95.0	86 - 115	0.0563	5.85	20	
Copper	0.05342	0.00500	0.05	0.005199	96.4	85 - 118	0.058	8.23	20	
Iron	7.023	0.200	5	2.556	89.3	87 - 118	7.669	8.8	20	
Lead	0.04808	0.00500	0.05	0.000094	96.0	88 - 115	0.05089	5.67	20	
Magnesium	28.94	0.200	5	27.76	23.5	83 - 118	31.26	7.71	20	SO
Manganese	0.1904	0.00500	0.05	0.164	52.8	87 - 115	0.2154	12.4	20	S
Nickel	0.2255	0.00500	0.05	0.2011	48.7	85 - 117	0.2401	6.29	20	SO
Potassium	7.309	0.200	5	2.639	93.4	87 - 115	7.654	4.62	20	
Selenium	0.05051	0.00500	0.05	0.000343	100	80 - 120	0.05384	6.37	20	
Silver	0.04575	0.00500	0.05	0.000013	91.5	85 - 116	0.04654	1.71	20	
Sodium	224.6	0.200	5	245	-407	85 - 117	233.3	3.8	20	SEO
Thallium	0.04905	0.00200	0.05	0.000043	98.0	82 - 116	0.04975	1.42	20	
Vanadium	0.05284	0.00500	0.05	0.003781	98.1	86 - 115	0.0572	7.93	20	
Zinc	0.08005	0.00500	0.05	0.03582	88.5	83 - 119	0.07874	1.66	20	

MSD Sample ID: **HS19060986-04MSD** Units: **mg/L** Analysis Date: **28-Jun-2019 15:07**
Client ID: Run ID: **ICPMS06_341483** SeqNo: **5145651** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium	0.343	0.00500	0.05	0.2809	124	85 - 116	0.3735	8.51	20	SO

Revision: 1

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ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060929

QC BATCH REPORT

Batch ID: 142427 (0) **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

PDS Sample ID: **HS19060986-04PDS** Units: **mg/L** Analysis Date: **27-Jun-2019 17:07**
Client ID: Run ID: **ICPMS06_341376** SeqNo: **5145219** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.1008	0.0100	0.1	0.01515	85.7	80 - 120				
Antimony	0.08752	0.00500	0.1	0.000258	87.3	80 - 120				
Arsenic	0.09313	0.00500	0.1	0.002036	91.1	80 - 120				
Beryllium	0.09784	0.00200	0.1	0.000048	97.8	80 - 120				
Cadmium	0.09096	0.00200	0.1	0.000205	90.8	80 - 120				
Cobalt	0.09093	0.00500	0.1	0.005607	85.3	80 - 120				
Copper	0.09101	0.00500	0.1	0.005199	85.8	80 - 120				
Iron	10.93	0.200	10	2.556	83.8	80 - 120				
Lead	0.09017	0.00500	0.1	0.000094	90.1	80 - 120				
Potassium	11.36	0.200	10	2.639	87.2	80 - 120				
Selenium	0.09025	0.00500	0.1	0.000343	89.9	80 - 120				
Silver	0.08464	0.00500	0.1	0.000013	84.6	80 - 120				
Thallium	0.08892	0.00200	0.1	0.000043	88.9	80 - 120				
Vanadium	0.09309	0.00500	0.1	0.003781	89.3	80 - 120				
Zinc	0.1183	0.00500	0.1	0.03582	82.5	80 - 120				

PDS Sample ID: **HS19060986-04PDS** Units: **mg/L** Analysis Date: **28-Jun-2019 15:14**
Client ID: Run ID: **ICPMS06_341483** SeqNo: **5145655** PrepDate: **25-Jun-2019** DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Barium	1.703	0.0500	1	0.7	100	80 - 120				
Calcium	129.7	5.00	100	26.89	103	80 - 120				
Chromium	1.283	0.0500	1	0.2283	105	80 - 120				
Iron	107.4	2.00	100	2.151	105	80 - 120				
Magnesium	125.2	2.00	100	22.92	102	80 - 120				
Manganese	1.175	0.0500	1	0.1367	104	80 - 120				
Nickel	1.217	0.0500	1	0.1678	105	80 - 120				
Potassium	106.9	2.00	100	2.16	105	80 - 120				
Sodium	299.8	2.00	100	202.9	96.9	80 - 120				

Revision: 1

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ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060929

QC BATCH REPORT

Batch ID: 142427 (0) **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

SD Sample ID: **HS19060986-04SD** Units: **mg/L** Analysis Date: **27-Jun-2019 17:02**
Client ID: Run ID: **ICPMS06_341376** SeqNo: **5145216** PrepDate: **25-Jun-2019** DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Aluminum	0.01988	0.0500					0.01515	0	10	J
Antimony	0.00250	0.0250					0.000258	0	10	U
Arsenic	0.002183	0.0250					0.002036	0	10	J
Beryllium	0.00250	0.0100					0.000048	0	10	U
Cadmium	0.00250	0.0100					0.000205	0	10	U
Cobalt	0.004619	0.0250					0.005607	0	10	J
Copper	0.00500	0.0250					0.005199	0	10	U
Lead	0.00500	0.0250					0.000094	0	10	U
Selenium	0.0125	0.0250					0.000343	0	10	U
Silver	0.00250	0.0250					0.000013	0	10	U
Thallium	0.00250	0.0100					0.000043	0	10	U
Vanadium	0.01164	0.0250					0.003781	0	10	J
Zinc	0.038	0.0250					0.03582	6.07	10	

SD Sample ID: **HS19060986-04SD** Units: **mg/L** Analysis Date: **28-Jun-2019 15:13**
Client ID: Run ID: **ICPMS06_341483** SeqNo: **5145654** PrepDate: **25-Jun-2019** DF: **50**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Barium	0.6998	0.250					0.7	0.0306	10	
Calcium	27.1	25.0					26.89	0.761	10	
Chromium	0.234	0.250					0.2283	0	10	J
Iron	2.19	10.0					2.151	0	10	J
Magnesium	22.74	10.0					22.92	0.776	10	
Manganese	0.1567	0.250					0.1367	0	10	J
Nickel	0.1736	0.250					0.1678	0	10	J
Potassium	2.068	10.0					2.16	0	10	J
Sodium	207.1	10.0					202.9	2.06	10	

The following samples were analyzed in this batch: HS19060929-02 HS19060929-03 HS19060929-04 HS19060929-07

Revision: 1

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ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060929

QC BATCH REPORT

Batch ID: 142169 (0) **Instrument: SV-5** **Method: SEMIVOLATILES SIM**

MBLK Sample ID: **MBLK-142169** Units: **ug/L** Analysis Date: **27-Jun-2019 11:30**
Client ID: Run ID: **SV-5_341496** SeqNo: **5145167** PrepDate: **19-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.010	0.010								U
Surr: 2-Fluorobiphenyl	*0.07589*	*0*	*0.08*	*0*	*94.9*	*40 - 140*				
Surr: 4-Terphenyl-d14	*0.09153*	*0*	*0.08*	*0*	*114*	*40 - 140*				
Surr: Nitrobenzene-d5	*0.09043*	*0*	*0.08*	*0*	*113*	*40 - 140*				

LCS Sample ID: **LCS-142169** Units: **ug/L** Analysis Date: **27-Jun-2019 11:51**
Client ID: Run ID: **SV-5_341496** SeqNo: **5145168** PrepDate: **19-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.07581	0.010	0.08	0	94.8	40 - 140				
Surr: 2-Fluorobiphenyl	*0.0738*	*0*	*0.08*	*0*	*92.2*	*40 - 140*				
Surr: 4-Terphenyl-d14	*0.07856*	*0*	*0.08*	*0*	*98.2*	*40 - 140*				
Surr: Nitrobenzene-d5	*0.08245*	*0*	*0.08*	*0*	*103*	*40 - 140*				

LCSD Sample ID: **LCSD-142169** Units: **ug/L** Analysis Date: **27-Jun-2019 12:11**
Client ID: Run ID: **SV-5_341496** SeqNo: **5145169** PrepDate: **19-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.07894	0.010	0.08	0	98.7	40 - 140	0.07581	4.05	20	
Surr: 2-Fluorobiphenyl	*0.07855*	*0*	*0.08*	*0*	*98.2*	*40 - 140*	*0.0738*	*6.23*	*20*	
Surr: 4-Terphenyl-d14	*0.1075*	*0*	*0.08*	*0*	*134*	*40 - 140*	*0.07856*	*31.1*	*20*	R
Surr: Nitrobenzene-d5	*0.08954*	*0*	*0.08*	*0*	*112*	*40 - 140*	*0.08245*	*8.25*	*20*	

The following samples were analyzed in this batch: HS19060929-01 HS19060929-02 HS19060929-03 HS19060929-04 HS19060929-05 HS19060929-06

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060929

QC BATCH REPORT

Batch ID: R341453 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-190627** Units: **UG/L** Analysis Date: **27-Jun-2019 11:11**
Client ID: Run ID: **VOA6_341453** SeqNo: **5144199** 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

Revision: 1

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ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060929

QC BATCH REPORT

Batch ID: R341453 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-190627** Units: **UG/L** Analysis Date: **27-Jun-2019 11:11**
Client ID: Run ID: **VOA6_341453** SeqNo: **5144199** 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	*49.36*	*1.0*	*50*	*0*	*98.7*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*47.49*	*1.0*	*50*	*0*	*95.0*	*85 - 114*				
Surr: Dibromofluoromethane	*46.28*	*1.0*	*50*	*0*	*92.6*	*80 - 119*				
Surr: Toluene-d8	*49.04*	*1.0*	*50*	*0*	*98.1*	*89 - 112*				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060929

QC BATCH REPORT

Batch ID: R341453 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

LCS Sample ID: **VLCSW-190627** Units: **UG/L** Analysis Date: **27-Jun-2019 10:23**
Client ID: Run ID: **VOA6_341453** SeqNo: **5144198** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	18.77	1.0	20	0	93.8	78 - 124				
1,1,1-Trichloroethane	19.61	1.0	20	0	98.1	74 - 131				
1,1,2,2-Tetrachloroethane	20.69	1.0	20	0	103	71 - 121				
1,1,2-Trichloroethane	20.36	1.0	20	0	102	80 - 119				
1,1-Dichloroethane	19.43	1.0	20	0	97.1	77 - 125				
1,1-Dichloroethene	19.6	1.0	20	0	98.0	71 - 131				
1,1-Dichloropropene	19.74	1.0	20	0	98.7	78 - 125				
1,2,3-Trichlorobenzene	23.06	1.0	20	0	115	69 - 129				
1,2,3-Trichloropropane	21.25	1.0	20	0	106	73 - 122				
1,2,4-Trichlorobenzene	20.84	1.0	20	0	104	69 - 130				
1,2,4-Trimethylbenzene	18.56	1.0	20	0	92.8	76 - 124				
1,2-Dibromo-3-chloropropane	21.57	1.0	20	0	108	62 - 128				
1,2-Dibromoethane	19.54	1.0	20	0	97.7	77 - 121				
1,2-Dichlorobenzene	18.49	1.0	20	0	92.4	80 - 119				
1,2-Dichloroethane	18.7	1.0	20	0	93.5	73 - 128				
1,2-Dichloropropane	19.06	1.0	20	0	95.3	78 - 122				
1,3,5-Trimethylbenzene	18.18	1.0	20	0	90.9	75 - 124				
1,3-Dichlorobenzene	18.01	1.0	20	0	90.1	80 - 119				
1,3-Dichloropropane	19.83	1.0	20	0	99.1	80 - 119				
1,4-Dichlorobenzene	19.42	1.0	20	0	97.1	79 - 118				
2,2-Dichloropropane	20.55	1.0	20	0	103	60 - 139				
2-Butanone	45.99	2.0	40	0	115	56 - 143				
2-Chlorotoluene	19.68	1.0	20	0	98.4	79 - 122				
2-Hexanone	39.89	2.0	40	0	99.7	57 - 139				
4-Chlorotoluene	19.71	1.0	20	0	98.5	78 - 122				
4-Isopropyltoluene	18.53	1.0	20	0	92.6	77 - 127				
4-Methyl-2-pentanone	39.77	2.0	40	0	99.4	67 - 130				
Acetone	49.5	2.0	40	0	124	39 - 160				
Benzene	19.65	1.0	20	0	98.2	79 - 120				
Bromobenzene	17.92	1.0	20	0	89.6	80 - 120				
Bromochloromethane	18.73	1.0	20	0	93.7	78 - 123				
Bromodichloromethane	19.3	1.0	20	0	96.5	79 - 125				
Bromoform	19.68	1.0	20	0	98.4	66 - 130				
Bromomethane	21.59	1.0	20	0	108	53 - 141				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060929

QC BATCH REPORT

Batch ID: R341453 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-190627** Units: **UG/L** Analysis Date: **27-Jun-2019 10:23**
Client ID: Run ID: **VOA6_341453** SeqNo: **5144198** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	35.73	2.0	40	0	89.3	64 - 133				
Carbon tetrachloride	19.41	1.0	20	0	97.0	72 - 136				
Chlorobenzene	18.46	1.0	20	0	92.3	82 - 118				
Chloroethane	20.98	1.0	20	0	105	60 - 138				
Chloroform	19.78	1.0	20	0	98.9	79 - 124				
Chloromethane	18.51	1.0	20	0	92.5	50 - 139				
cis-1,2-Dichloroethene	19.31	1.0	20	0	96.6	78 - 123				
cis-1,3-Dichloropropene	19.08	1.0	20	0	95.4	75 - 124				
Dibromochloromethane	18.87	1.0	20	0	94.4	74 - 126				
Dibromomethane	19.13	1.0	20	0	95.6	79 - 123				
Dichlorodifluoromethane	19.8	1.0	20	0	99.0	32 - 152				
Ethylbenzene	18.41	1.0	20	0	92.0	79 - 121				
Hexachlorobutadiene	23.02	1.0	20	0	115	66 - 134				
Isopropylbenzene	18.47	1.0	20	0	92.4	72 - 131				
m,p-Xylene	37.16	2.0	40	0	92.9	80 - 121				
Methylene chloride	18.91	2.0	20	0	94.5	74 - 124				
Naphthalene	21.45	1.0	20	0	107	61 - 128				
n-Butylbenzene	18.85	1.0	20	0	94.2	75 - 128				
n-Propylbenzene	19.66	1.0	20	0	98.3	76 - 126				
o-Xylene	18.48	1.0	20	0	92.4	78 - 122				
sec-Butylbenzene	19.8	1.0	20	0	99.0	77 - 126				
Styrene	19.29	1.0	20	0	96.4	78 - 123				
tert-Butylbenzene	19.57	1.0	20	0	97.8	78 - 124				
Tetrachloroethene	18.01	1.0	20	0	90.1	74 - 129				
Toluene	18.39	1.0	20	0	91.9	80 - 121				
trans-1,2-Dichloroethene	19.44	1.0	20	0	97.2	75 - 124				
trans-1,3-Dichloropropene	19.45	1.0	20	0	97.3	73 - 127				
Trichloroethene	18.29	1.0	20	0	91.4	79 - 123				
Trichlorofluoromethane	20.3	1.0	20	0	102	65 - 141				
Vinyl chloride	19.44	1.0	20	0	97.2	58 - 137				
Surr: 1,2-Dichloroethane-d4	*53.25*	*1.0*	*50*	*0*	*106*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*51.3*	*1.0*	*50*	*0*	*103*	*85 - 114*				
Surr: Dibromofluoromethane	*51.63*	*1.0*	*50*	*0*	*103*	*80 - 119*				
Surr: Toluene-d8	*49.81*	*1.0*	*50*	*0*	*99.6*	*89 - 112*				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060929

QC BATCH REPORT

Batch ID: R341453 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MS Sample ID: **HS19060986-04MS** Units: **UG/L** Analysis Date: **27-Jun-2019 14:47**
Client ID: Run ID: **VOA6_341453** SeqNo: **5144208** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	17.6	1.0	20	0	88.0	78 - 124				
1,1,1-Trichloroethane	19.37	1.0	20	0	96.9	74 - 131				
1,1,2,2-Tetrachloroethane	19.88	1.0	20	0	99.4	71 - 121				
1,1,2-Trichloroethane	18.84	1.0	20	0	94.2	80 - 119				
1,1-Dichloroethane	20.52	1.0	20	0	103	77 - 125				
1,1-Dichloroethene	20.92	1.0	20	0	105	71 - 131				
1,1-Dichloropropene	19.44	1.0	20	0	97.2	78 - 125				
1,2,3-Trichlorobenzene	21.07	1.0	20	0	105	69 - 129				
1,2,3-Trichloropropane	20.06	1.0	20	0	100	73 - 122				
1,2,4-Trichlorobenzene	20.07	1.0	20	0	100	69 - 130				
1,2,4-Trimethylbenzene	18.7	1.0	20	0	93.5	76 - 124				
1,2-Dibromo-3-chloropropane	20.57	1.0	20	0	103	62 - 128				
1,2-Dibromoethane	17.91	1.0	20	0	89.6	77 - 121				
1,2-Dichlorobenzene	18.15	1.0	20	0	90.7	80 - 119				
1,2-Dichloroethane	17.56	1.0	20	0	87.8	73 - 128				
1,2-Dichloropropane	18.1	1.0	20	0	90.5	78 - 122				
1,3,5-Trimethylbenzene	18.75	1.0	20	0	93.7	75 - 124				
1,3-Dichlorobenzene	18.62	1.0	20	0.619	90.0	80 - 119				
1,3-Dichloropropane	18.78	1.0	20	0	93.9	80 - 119				
1,4-Dichlorobenzene	18.97	1.0	20	0	94.9	79 - 118				
2,2-Dichloropropane	19.07	1.0	20	0	95.3	60 - 139				
2-Butanone	40.06	2.0	40	0	100	56 - 143				
2-Chlorotoluene	19.58	1.0	20	0	97.9	79 - 122				
2-Hexanone	35.98	2.0	40	0	90.0	57 - 139				
4-Chlorotoluene	19.71	1.0	20	0	98.5	78 - 122				
4-Isopropyltoluene	19.52	1.0	20	0	97.6	77 - 127				
4-Methyl-2-pentanone	36.25	2.0	40	0	90.6	67 - 130				
Acetone	42.2	2.0	40	0	105	39 - 160				
Benzene	18.94	1.0	20	0	94.7	79 - 120				
Bromobenzene	17	1.0	20	0	85.0	80 - 120				
Bromochloromethane	16.86	1.0	20	0	84.3	78 - 123				
Bromodichloromethane	18.36	1.0	20	0	91.8	79 - 125				
Bromoform	17.93	1.0	20	0	89.6	66 - 130				
Bromomethane	20.38	1.0	20	0	102	53 - 141				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060929

QC BATCH REPORT

Batch ID: R341453 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MS Sample ID: **HS19060986-04MS** Units: **UG/L** Analysis Date: **27-Jun-2019 14:47**
Client ID: Run ID: **VOA6_341453** SeqNo: **5144208** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	35.55	2.0	40	0	88.9	64 - 133				
Carbon tetrachloride	19.35	1.0	20	0	96.8	72 - 136				
Chlorobenzene	17.87	1.0	20	0	89.3	82 - 118				
Chloroethane	19.94	1.0	20	0	99.7	60 - 138				
Chloroform	18.71	1.0	20	0	93.6	79 - 124				
Chloromethane	19.86	1.0	20	0	99.3	50 - 139				
cis-1,2-Dichloroethene	24.44	1.0	20	4.696	98.7	78 - 123				
cis-1,3-Dichloropropene	17.14	1.0	20	0	85.7	75 - 124				
Dibromochloromethane	17.35	1.0	20	0	86.8	74 - 126				
Dibromomethane	17.39	1.0	20	0	86.9	79 - 123				
Dichlorodifluoromethane	18.96	1.0	20	0	94.8	32 - 152				
Ethylbenzene	18.23	1.0	20	0	91.2	79 - 121				
Hexachlorobutadiene	22.45	1.0	20	0	112	66 - 134				
Isopropylbenzene	19.04	1.0	20	0	95.2	72 - 131				
m,p-Xylene	37.06	2.0	40	0	92.7	80 - 121				
Methylene chloride	17.62	2.0	20	0	88.1	74 - 124				
Naphthalene	20.33	1.0	20	0	102	61 - 128				
n-Butylbenzene	19.95	1.0	20	0	99.7	75 - 128				
n-Propylbenzene	20.39	1.0	20	0	102	76 - 126				
o-Xylene	17.97	1.0	20	0	89.9	78 - 122				
sec-Butylbenzene	20.69	1.0	20	0	103	77 - 126				
Styrene	18.28	1.0	20	0	91.4	78 - 123				
tert-Butylbenzene	20.4	1.0	20	0	102	78 - 124				
Tetrachloroethene	18.26	1.0	20	0	91.3	74 - 129				
Toluene	18.16	1.0	20	0	90.8	80 - 121				
trans-1,2-Dichloroethene	19.19	1.0	20	0	96.0	75 - 124				
trans-1,3-Dichloropropene	17.78	1.0	20	0	88.9	73 - 127				
Trichloroethene	32.63	1.0	20	13.8	94.2	79 - 123				
Trichlorofluoromethane	20.12	1.0	20	0	101	65 - 141				
Vinyl chloride	20.24	1.0	20	0	101	58 - 137				
Surr: 1,2-Dichloroethane-d4	*50.63*	*1.0*	*50*	*0*	*101*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*49.94*	*1.0*	*50*	*0*	*99.9*	*85 - 114*				
Surr: Dibromofluoromethane	*49.14*	*1.0*	*50*	*0*	*98.3*	*80 - 119*				
Surr: Toluene-d8	*48.68*	*1.0*	*50*	*0*	*97.4*	*89 - 112*				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060929

QC BATCH REPORT

Batch ID: R341453 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MSD Sample ID: **HS19060986-04MSD** Units: **UG/L** Analysis Date: **27-Jun-2019 15:10**
Client ID: Run ID: **VOA6_341453** SeqNo: **5144209** 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	17.76	1.0	20	0	88.8	78 - 124	17.6	0.896	20	
1,1,1-Trichloroethane	19.21	1.0	20	0	96.0	74 - 131	19.37	0.855	20	
1,1,2,2-Tetrachloroethane	20.67	1.0	20	0	103	71 - 121	19.88	3.87	20	
1,1,2-Trichloroethane	19.42	1.0	20	0	97.1	80 - 119	18.84	3.01	20	
1,1-Dichloroethane	20.68	1.0	20	0	103	77 - 125	20.52	0.772	20	
1,1-Dichloroethene	20.95	1.0	20	0	105	71 - 131	20.92	0.151	20	
1,1-Dichloropropene	19.47	1.0	20	0	97.4	78 - 125	19.44	0.197	20	
1,2,3-Trichlorobenzene	22.82	1.0	20	0	114	69 - 129	21.07	7.97	20	
1,2,3-Trichloropropane	20.8	1.0	20	0	104	73 - 122	20.06	3.63	20	
1,2,4-Trichlorobenzene	21.1	1.0	20	0	105	69 - 130	20.07	4.98	20	
1,2,4-Trimethylbenzene	19.03	1.0	20	0	95.2	76 - 124	18.7	1.75	20	
1,2-Dibromo-3-chloropropane	21.34	1.0	20	0	107	62 - 128	20.57	3.7	20	
1,2-Dibromoethane	18.27	1.0	20	0	91.4	77 - 121	17.91	1.99	20	
1,2-Dichlorobenzene	18.58	1.0	20	0	92.9	80 - 119	18.15	2.37	20	
1,2-Dichloroethane	17.68	1.0	20	0	88.4	73 - 128	17.56	0.689	20	
1,2-Dichloropropane	18.34	1.0	20	0	91.7	78 - 122	18.1	1.29	20	
1,3,5-Trimethylbenzene	18.93	1.0	20	0	94.7	75 - 124	18.75	0.991	20	
1,3-Dichlorobenzene	18.6	1.0	20	0.619	89.9	80 - 119	18.62	0.134	20	
1,3-Dichloropropane	18.98	1.0	20	0	94.9	80 - 119	18.78	1.08	20	
1,4-Dichlorobenzene	19.29	1.0	20	0	96.5	79 - 118	18.97	1.68	20	
2,2-Dichloropropane	18.72	1.0	20	0	93.6	60 - 139	19.07	1.86	20	
2-Butanone	41.72	2.0	40	0	104	56 - 143	40.06	4.07	20	
2-Chlorotoluene	19.83	1.0	20	0	99.2	79 - 122	19.58	1.26	20	
2-Hexanone	37.6	2.0	40	0	94.0	57 - 139	35.98	4.41	20	
4-Chlorotoluene	19.88	1.0	20	0	99.4	78 - 122	19.71	0.902	20	
4-Isopropyltoluene	19.73	1.0	20	0	98.7	77 - 127	19.52	1.07	20	
4-Methyl-2-pentanone	37.65	2.0	40	0	94.1	67 - 130	36.25	3.77	20	
Acetone	43.42	2.0	40	0	109	39 - 160	42.2	2.86	20	
Benzene	18.88	1.0	20	0	94.4	79 - 120	18.94	0.299	20	
Bromobenzene	17.22	1.0	20	0	86.1	80 - 120	17	1.29	20	
Bromochloromethane	17.4	1.0	20	0	87.0	78 - 123	16.86	3.17	20	
Bromodichloromethane	18.44	1.0	20	0	92.2	79 - 125	18.36	0.421	20	
Bromoform	18.53	1.0	20	0	92.6	66 - 130	17.93	3.28	20	
Bromomethane	19.72	1.0	20	0	98.6	53 - 141	20.38	3.28	20	

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060929

QC BATCH REPORT

Batch ID: R341453 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MSD Sample ID: **HS19060986-04MSD** Units: **UG/L** Analysis Date: **27-Jun-2019 15:10**
Client ID: Run ID: **VOA6_341453** SeqNo: **5144209** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Carbon disulfide	34.97	2.0	40	0	87.4	64 - 133	35.55	1.65	20	
Carbon tetrachloride	19.12	1.0	20	0	95.6	72 - 136	19.35	1.2	20	
Chlorobenzene	17.91	1.0	20	0	89.5	82 - 118	17.87	0.216	20	
Chloroethane	21.79	1.0	20	0	109	60 - 138	19.94	8.88	20	
Chloroform	18.72	1.0	20	0	93.6	79 - 124	18.71	0.043	20	
Chloromethane	18.15	1.0	20	0	90.8	50 - 139	19.86	8.97	20	
cis-1,2-Dichloroethene	24.78	1.0	20	4.696	100	78 - 123	24.44	1.39	20	
cis-1,3-Dichloropropene	17.28	1.0	20	0	86.4	75 - 124	17.14	0.79	20	
Dibromochloromethane	17.72	1.0	20	0	88.6	74 - 126	17.35	2.1	20	
Dibromomethane	18.15	1.0	20	0	90.8	79 - 123	17.39	4.3	20	
Dichlorodifluoromethane	18.36	1.0	20	0	91.8	32 - 152	18.96	3.24	20	
Ethylbenzene	18.31	1.0	20	0	91.6	79 - 121	18.23	0.456	20	
Hexachlorobutadiene	23.53	1.0	20	0	118	66 - 134	22.45	4.71	20	
Isopropylbenzene	18.92	1.0	20	0	94.6	72 - 131	19.04	0.611	20	
m,p-Xylene	37.08	2.0	40	0	92.7	80 - 121	37.06	0.0437	20	
Methylene chloride	17.83	2.0	20	0	89.2	74 - 124	17.62	1.2	20	
Naphthalene	21.72	1.0	20	0	109	61 - 128	20.33	6.62	20	
n-Butylbenzene	20.3	1.0	20	0	102	75 - 128	19.95	1.76	20	
n-Propylbenzene	20.51	1.0	20	0	103	76 - 126	20.39	0.609	20	
o-Xylene	17.89	1.0	20	0	89.5	78 - 122	17.97	0.445	20	
sec-Butylbenzene	21.03	1.0	20	0	105	77 - 126	20.69	1.6	20	
Styrene	18.48	1.0	20	0	92.4	78 - 123	18.28	1.12	20	
tert-Butylbenzene	20.44	1.0	20	0	102	78 - 124	20.4	0.178	20	
Tetrachloroethene	18.1	1.0	20	0	90.5	74 - 129	18.26	0.894	20	
Toluene	18.1	1.0	20	0	90.5	80 - 121	18.16	0.31	20	
trans-1,2-Dichloroethene	18.55	1.0	20	0	92.8	75 - 124	19.19	3.4	20	
trans-1,3-Dichloropropene	17.86	1.0	20	0	89.3	73 - 127	17.78	0.461	20	
Trichloroethene	32.01	1.0	20	13.8	91.0	79 - 123	32.63	1.94	20	
Trichlorofluoromethane	20.09	1.0	20	0	100	65 - 141	20.12	0.15	20	
Vinyl chloride	19.45	1.0	20	0	97.3	58 - 137	20.24	3.94	20	
Surr: 1,2-Dichloroethane-d4	*51.82*	*1.0*	*50*	*0*	*104*	*81 - 118*	*50.63*	*2.31*	*20*	
Surr: 4-Bromofluorobenzene	*49.79*	*1.0*	*50*	*0*	*99.6*	*85 - 114*	*49.94*	*0.285*	*20*	
Surr: Dibromofluoromethane	*49.79*	*1.0*	*50*	*0*	*99.6*	*80 - 119*	*49.14*	*1.3*	*20*	
Surr: Toluene-d8	*48.19*	*1.0*	*50*	*0*	*96.4*	*89 - 112*	*48.68*	*0.999*	*20*	

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060929

QC BATCH REPORT

Batch ID: R341453 (0)	Instrument: VOA6	Method: VOLATILES ORGANICS BY METHOD 8260C

The following samples were analyzed in this batch:

HS19060929-01	HS19060929-02	HS19060929-03	HS19060929-04
HS19060929-05	HS19060929-06	HS19060929-08	

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: **HS19060929**

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	20-Dec-2021
Kansas	E-10352 2018-2019	31-Jul-2019
Kentucky	123043, 2019-2020	30-Apr-2020
Louisiana	03087, 2019-2020	30-Jun-2020
Maryland	343, 2019-2020	30-Jun-2020
North Carolina	624-2019	31-Dec-2019
Oklahoma	2018-156	31-Aug-2019
Texas	TX104704231-19-23	30-Apr-2020

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Work Order: HS19060929

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19060929-01	MW7_061719	Login	18/06/2019 11:36:37	RPG	Sub
HS19060929-01	MW7_061719	Login	18/06/2019 11:36:37	RPG	EXT177
HS19060929-01	MW7_061719	Login	18/06/2019 11:36:37	RPG	VOA192
HS19060929-02	18CPTMW12DW_061719	Login	18/06/2019 11:36:37	RPG	MET023
HS19060929-02	18CPTMW12DW_061719	Login	18/06/2019 11:36:37	RPG	Sub
HS19060929-02	18CPTMW12DW_061719	Login	18/06/2019 11:36:37	RPG	EXT177
HS19060929-02	18CPTMW12DW_061719	Login	18/06/2019 11:36:37	RPG	VOA192

Revision:1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Sample Receipt Checklist

Client Name: Bhate Environmental
Work Order: HS19060929
Date/Time Received: **18-Jun-2019 08:51**
Received by: **RPG**

Checklist completed by: *Raegen Giga* eSignature 18-Jun-2019 Date
Reviewed by: *RJ Modashia* eSignature 18-Jun-2019 Date

Matrices: **GW**
Carrier name: **FedEx Priority Overnight**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	1.2c uc/c	IR 25
Cooler(s)/Kit(s):	44978	
Date/Time sample(s) sent to storage:	06/18/2019 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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bhate ENVIRONMENTAL CONSTRUCTION ENERGY
1608 13th Avenue South, Suite 300
Birmingham Alabama 35205
Tel: 205-918-4000
Fax: 205-918-4050

Chain of Custody and Analytical Request

Page: ____ of ____

Project/Phase No: NWO1312.0150

COC Number(1): ____

LIMS Number: ____

Facility/Base I.D.: LHAAP

Project/Site Name: LHAAP / Site 18/24

Client Name:

Collected by: Scott Beesinger

Field Sample ID (30 Characters Max)	ERPIMS LOCID (15 Characters Max)	Date Collected (dd-mmm-yyyy)	Time Collected (Military) (hhmm)	Sample Depth (beginning - ending)	SA Code (2)	Sample Number (3)	Sample Matrix (4)	Number of containers	VOC	PERCHLORATE	TOTAL METALS	1, 4 - DIOXANE	Ambient Blank Lot Control Number	Equipment Blank Lot Control Number	Trip Blank Lot Control Number	Cooler ID
MW7_061719		17 JUN 2019	0820	-	N		WG	5	X	X		X				
18CPTMW12DW_061719		17 JUN 2019	0915	-	N		WG	6	X	X	X	X				
18CPTMW12SW_061719		17 JUN 2019	1010	-	N		WG	6	X	X	X	X				
18CPTMW12SW_061719_FD		17 JUN 2019	1010		FD		WG	6	X	X	X	X				
18CPTMW23SW_061719		17 JUN 2019	1115		N		WG	5	X	X		X				
18CPTMW23_061719		17 JUN 2019	1205	-	N		WG	5	X	X		X				
18WWI4_061719		17 JUN 2019	1305	-	N		WG	2		X	X					
TRIP BLANK		17 JUN 2019		-	TB		W	2	X							
				-												
				-												
				-												

Sample Analysis Requested (5) | Quality Assurance Samples (6)

HS19060929

Bhate Environmental Associates, Inc.
LHAAP 18 24

COMMENTS: ____

Custody Transfers Prior to Receipt by Laboratory

Relinquished By (Signed)	Date	Time	Received by (signed)	Date	Time
1. Scott Beesinger	6/17/19	1430	1. R Cisa	6/18/19	08-51
2. ____			2. cooler # 44978		
3. ____			3. TEMP -- 1.2c IR225 CF0		

Sample Delivery Details / Laboratory Receipt

Delivered Directly to Lab: FEDEX shipped No.:

Method of Shipment: ____

Fed Ex Airbill Number: 4809 7834 3207

Analytical Lab: ALS 10450 Stancliff Rd. Suite 210 Houston, TX 77099 (281) 530-5656

ATTN: SONIA WEST Lab Recipient: Delivery Date/Time: 6/18/19 0851

1.) Chain of Custody Number = date collected + custody number (e.g. 09-02-1999-01)

2.) Sample Type (SA) Codes: N = Normal Sample, TB = Trip Blank (-c) Sample, FD = Field Duplicate (-a) Samples, FR = Field Replicate (-b) Samples, EB = Equipment Blank (-d) Samples, MS = Matrix Spike, SD = Matrix Spike Duplicate, AB = Ambient Blank (-e)

3.) Sample Number: Unique sample number collected from a particular location per day. (e.g. Groundwater sample collected from MW-1 on 10/10/99 = 01, if sampled again on 10/10/99 = 02, etc.)

4.) Matrix Codes: GS = Soil Gas, WG = Groundwater, WS = Surface Water, SO = Soil, SE = Sediment, SL = Sludge, SS = Surface Soil Samples, WQ = Aqueous Blank Samples (trip, equipment, ambient, etc), SQ = Soil Blanks

5.) Sample Analysis Requested: Analytical method requested and number of containers provided for each.

6.) Quality assurance samples are assigned by date (ddmmyy) and the sample number associated with the sample (01, 02, etc) (e.g. Equipment blank collected in association with MW-1 on 10/10/99 will be designated 10109901 in the Equipment Blank Lot Control

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

44978

CUSTODY SEAL

Date: 6/17/19 Time: 1430
Name: Scott Beesinger
Company: BHATE

Seal Broken By: SM
Date: 06/18/19

44978 JUN 18 2019

Must Deliver Next Business Day
Time and Tempature Sensitive!

44978

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: 24MAY19
ACTWGT: 1.00 LB MAN
CAD: 3001307CAFE3211
DIMS: 26x14x4 IN

TO CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099
(281) 530-5656
REF: LHAAP/18/24 & SURFACE WATER - RJ

RMA:

FedEx Express

FedEx TRK# 4809 7834 3207

TUE - 18 JUN 10:30A
PRIORITY OVERNIGHT

77099
TX-US
IAH

AB SGRA

FID 162705 17JUN19 GGGA 553C1/D210/0E0A

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Case Narrative

Method: 6850
Analysis: Perchlorate
Analysis SOP: LC-MS-CLO4
ALS WO ID(s): 1917488, 1917489, 1917672

Client: ALS Laboratories (Houston, TX)
Matrix: Water
ELMS Batch (HBN): 2264 (242398)

General Set Information: There were thirteen 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 samples 1917489001 and 1917672006 were analyzed and reported from 1:100 dilutions. Field sample 1917672001 was analyzed and reported from a 1:1,000 dilution. The reporting limits have been adjusted accordingly.

Method QC data: The method blank (LMB 660892) was less than 1/2 the CRDL. The recovery for the LCS (660893) was within acceptable parameters.

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MS/MSD Analysis: MS/MSD was performed on sample 1917488001 (Client ID: LH18/24-SP650_061219_BIX). 5.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. The spike target was 5.µg/L. The MS/MSD percent recoveries were within the performance limits. The MS/MSD failed QC acceptance criteria for relative percent difference. The Matrix Spike and Matrix Spike duplicate is reported for the clients' information only. The sample matrix may be inappropriate for the method selected.

Instrument QC: Instrument initial and continuing calibrations were performed in accordance with published procedures.

NC/CAR(s): NA

Sample Calculation: Samples were reported in 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 – 660890) is reported from the analysis of the Laboratory Control Sample (LCS – 660893) at a level of 4.0µg/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: 19MARI03) along with datafiles 27JUND03/12/20.

Thomas Bosch July 1, 2019
Analyst Date

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ANALYTICAL REPORT

Report Date: July 01, 2019

RJ Modashia
ALS Environmental (Houston)
10450 Stancliff Road
Suite 210
Houston, TX 77099

Phone: 281 530-5656

E-mail: RJ.Modashia@ALSGlobal.com

Workorder: **34-1917672**
Project ID: HS19060929
Purchase Order: HS19060929
Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
MW7_061719	1917672001	06/17/19	06/19/19	
18CPTMW12DW_061719	1917672002	06/17/19	06/19/19	
18CPTMW12SW_061719	1917672003	06/17/19	06/19/19	
18CPTMW12SW_061719_a	1917672004	06/17/19	06/19/19	
18CPTMW23SW_061719	1917672005	06/17/19	06/19/19	
18CPTMW23_061719	1917672006	06/17/19	06/19/19	
18W14_061719W_061719	1917672007	06/17/19	06/19/19	

ANALYTICAL REPORT

Workorder: 34-1917672
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **MW7_061719** | Sampling Site: NA | Collected: 06/17/2019
Lab ID: 1917672001 | Media: 125 mL Nalgene | Received: 06/19/2019
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/2264 (HBN: 242398) | **Percent Solid:** NA
Analyzed: 06/27/2019 11:33 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	**26000**	1000	2000	4000	1000	

Sample ID: **18CPTMW12DW_061719** | Sampling Site: NA | Collected: 06/17/2019
Lab ID: 1917672002 | Media: 125 mL Nalgene | Received: 06/19/2019
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/2264 (HBN: 242398) | **Percent Solid:** NA
Analyzed: 06/27/2019 11:47 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	1.2	1.0	2.0	4.0	1	J

Sample ID: **18CPTMW12SW_061719** | Sampling Site: NA | Collected: 06/17/2019
Lab ID: 1917672003 | Media: 125 mL Nalgene | Received: 06/19/2019
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/2264 (HBN: 242398) | **Percent Solid:** NA
Analyzed: 06/27/2019 12:15 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: **18CPTMW12SW_061719_a** | Sampling Site: NA | Collected: 06/17/2019
Lab ID: 1917672004 | Media: 125 mL Nalgene | Received: 06/19/2019
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/2264 (HBN: 242398) | **Percent Solid:** NA
Analyzed: 06/27/2019 12:29 | **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

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ANALYTICAL REPORT

Workorder: 34-1917672
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **18CPTMW23SW_061719** | Sampling Site: NA | Collected: 06/17/2019
Lab ID: 1917672005 | Media: 125 mL Nalgene | Received: 06/19/2019
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/2264 (HBN: 242398) | **Percent Solid:** NA
Analyzed: 06/27/2019 12:43 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: **18CPTMW23_061719** | Sampling Site: NA | Collected: 06/17/2019
Lab ID: 1917672006 | Media: 125 mL Nalgene | Received: 06/19/2019
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/2264 (HBN: 242398) | **Percent Solid:** NA
Analyzed: 06/27/2019 12:57 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	**2500**	100	200	400	100	

Sample ID: **18W14_061719W_061719** | Sampling Site: NA | Collected: 06/17/2019
Lab ID: 1917672007 | Media: 125 mL Nalgene | Received: 06/19/2019
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/2264 (HBN: 242398) | **Percent Solid:** NA
Analyzed: 06/27/2019 13:11 | **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

Comments

Quality Control: **EPA 6850, DoD QSM - (HBN: 242398)**

Field samples 1917489001 and 1917672006 were analyzed and reported from 1:100 dilutions. Field sample 1917672001 was analyzed and reported from a 1:1,000 dilution. The reporting limits have been adjusted accordingly.

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

Method	Analyst	Peer Review
EPA 6850, DoD QSM	/S/ Thomas Bosch 07/01/2019 10:47	/S/ Stephen Brose 07/01/2019 13:43

ANALYTICAL REPORT

Workorder: 34-1917672
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

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

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
	Nevada (TNI)	UT00953201-1	https://ndep.nv.gov/water/lab-certification
	Iowa (TNI)	IA# 376	http://www.shl.uiowa.edu/labcert/idnr/
	Kansas	E-10416	http://www.kdheks.gov/envlab/disclaimer.html
	Oklahoma (TNI)	IJ# 9980	http://www.deq.state.ok.us/CSDnew/labcert.htm
	Texas (TNI)	T104704456-18-9	https://www.tceq.texas.gov/assets/public/compliance/compliance_support/qa/txnelap_lab_list.pdf
Industrial Hygiene	AIHA (ISO 17025 & AIHA IHLAP)	101574	http://www.aihaaccreditedlabs.org
	DOECAP-AP	L18-606	http://www.pjlabs.com
	Washington	C596	https://ecology.wa.gov/Regulations-Permits/Permits-certifications/Laboratory-Accreditation
Dietary Supplements	PJLA (ISO 17025)	L17-507-R1	http://www.pjlabs.com

ANALYTICAL REPORT

Workorder: 34-1917672
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Result Symbol Definitions

MDL = Method Detection Limit, a statistical estimate of method/media/instrument sensitivity.
RL = Reporting Limit, a verified value of method/media/instrument sensitivity.
CRDL = Contract Required Detection Limit
Reg. Limit = Regulatory Limit.
ND = Not Detected, testing result not detected above the MDL or RL.
< Means this testing result is less than the numerical value.
** No result could be reported, see sample comments for details.

Qualifier Symbol Definitions

U = Qualifier indicates that the analyte was not detected above the MDL.
J = Qualifier Indicates that the analyte value is between the MDL and the RL. It is also used to indicate an estimated value for tentatively identified compounds in mass spectrometry where a 1:1 response is assumed.
B = Qualifier indicates that the analyte was detected in the blank.
E = Qualifier indicates that the analyte result exceeds calibration range.
P = Qualifier indicates that the RPD between the two columns is greater than 40%.

Quality Control Sample Batch Report

Analysis Information

Workorder: 1917672

Limits:	Client SOW/Contract Specified	**Analysis:**	EPA 6850, DoD QSM
Basis:	DoD QSM	**Batch:**	ELMS/2264 (HBN: 242398)
Preparation:	NA	**Analyzed By:**	Thomas Bosch
Batch:	NA		
Prepared By:	NA		

Blank

LMB: 660892
Analyzed: 06/27/2019 09:28
Units: ug/L

Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 660893
Analyzed: 06/27/2019 09:00
Dilution: 1
Units: ug/L

Analyte	Result	Target	% Rec	QC Limits	
Perchlorate	4.27	4.00	107	78.8	123.8

Matrix Spike - Matrix Spike Duplicate

Sample:	1917488001	**MS:**	660894
Analyzed:	06/27/2019 09:42	**Analyzed:**	06/27/2019 09:56
Dilution:	1	**Dilution:**	1
Units:	ug/L	**Units:**	ug/L

MSD:	660895	
Analyzed:	06/27/2019 10:10	
Dilution:	1	
Units:	ug/L	

Analyte	Result	Result	Target	% Rec	QC Limits		Result	% Rec		RPD	QC Limits	
Perchlorate	ND	5.13	5	103	78.8	123.8	4.06	81.2	#	23.3	0.0	20.0

Comments

Field samples 1917489001 and 1917672006 were analyzed and reported from 1:100 dilutions. Field sample 1917672001 was analyzed and reported from a 1:1,000 dilution. The reporting limits have been adjusted accordingly.

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

Analyst	Peer Review
/S/ Thomas Bosch	/S/ Stephen Brose
07/01/2019 10:55	07/01/2019 13:43

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

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10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

18698/#2

Subcontract Chain of Custody

SAMPLING STATE: **Texas**

COC ID: **11616**

1917672

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:	HS19060929
TSR:	Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS19060929-01**	**MW7_061719**	**Groundwater**	**17 Jun 2019 08:20**
	SUB_Perch-6850			02 Jul 2019
2.	**HS19060929-02**	**18cptMW12DW_061719**	**Groundwater**	**17 Jun 2019 09:15**
	SUB_Perch-6850			02 Jul 2019
3.	**HS19060929-03**	**18cptMW12SW_061719**	**Groundwater**	**17 Jun 2019 10:10**
	SUB_Perch-6850			02 Jul 2019
4.	**HS19060929-04**	**18cptMW12SW_061719_a**	**Groundwater**	**17 Jun 2019 10:10**
	SUB_Perch-6850			02 Jul 2019
5.	**HS19060929-05**	**18cptMW23SW_061719**	**Groundwater**	**17 Jun 2019 11:15**
	SUB_Perch-6850			02 Jul 2019
6.	**HS19060929-06**	**18cptMW23_061719**	**Groundwater**	**17 Jun 2019 12:05**
	SUB_Perch-6850			02 Jul 2019
7.	**HS19060929-07**	**18W14_061719W_061719**	**Groundwater**	**17 Jun 2019 13:05**
	SUB_Perch-6850			02 Jul 2019

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

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Subcontract Chain of Custody

SAMPLING STATE: **Texas** **COC ID:** **11616**

QC Level: DOD IV (DoD Data Package)

Relinquished By:		Date/Time:	6/18/19 1800.
Received By:		Date/Time:	6/19/19 10:05
Cooler ID(s):		Temperature(s):	

ALS Environmental

CHAIN-OF-CUSTODY

Project / Job / Task: HS19060929	*Split:*	**Workorder ID:** 1917672	Level: ENV_LVL4
Client: ALS Environmental (Houston)		**Account:** 8101	Type: 125Poly
Comments:			Preservatives: COOL

Item	Collect Date/Time	Sample ID	Lab ID	QC	Matrix	Containers ID(s)	Containers Count	Requested Analysis: EPA 6850, DoD QSM
1	06/17/2019 08:20	MW7_061719	1917672001		Water	A	1	A
2	06/17/2019 09:15	18CPTMW12DW_061719	1917672002		Water	A	1	A
3	06/17/2019 10:10	18CPTMW12SW_061719	1917672003		Water	A	1	A
4	06/17/2019 10:10	18CPTMW12SW_061719_a	1917672004		Water	A	1	A
5	06/17/2019 11:15	18CPTMW23SW_061719	1917672005		Water	A	1	A
6	06/17/2019 12:05	18CPTMW23_061719	1917672006		Water	A	1	A
7	06/17/2019 13:05	18W14_061719W_061719	1917672007		Water	A	1	A
8								
9								
10								

ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location
Warath, Julie	06/19/2019 10:05	ALS Sample Receiving	Sample Login
[signature] R33.1	6/19/2019 0840 6/26/19/0820	4C T. Bush	Storage 6850

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

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00940198

ALS-Salt Lake City-Related Information Report (CRIR)

Cooler or Container Information Checklist (Fill In or Circle)

Client Name: ALS Houston

Project/Task/Site: 1917672

Date/Time of Receipt: 6/19/19 10:05

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	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.
1	C199711	3 °C	4	C19	°C	7	C19	°C
2	C19	°C	5	C19	°C	8	C19	°C
3	C19	°C	6	C19	°C	9	C19	°C

Taken By: [signature] (Signature) Jaylynn Johnson (Printed Name) 6/19/19 (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: _____

CRIR.doc

Revised 01/01/2018

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Batch Worklist

Batch: ELMS/ 2264 **Created:** 6/27/2019 07:47 **Instrument:** **HBN:** 242398

Rule: EPA 6850, DoD QSM Water **Analyst:** T. Bosch **Status:** WP

Workorder: 1917488 [ENV_LVL4]
Workorder: 1917489 [ENV_LVL4]
Workorder: 1917672 [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	660889	CCV for HBN 242398 [ELMS/2264]				CCV	3		E685041C3Q	5311		7/1/2019	
2	660890	RLVS for HBN 242398 [ELMS/2264				RLVS	3		E685041C3Q	5311		7/1/2019	
3	660891	ICS for HBN 242398 [ELMS/2264]				ICS	3		E6850..D3Q	5311		7/1/2019	
4	660892	LMB for HBN 242398 [ELMS/2264]				LMB	3		E6850Q413Q	5311		7/1/2019	
5	660893	LCS for HBN 242398 [ELMS/2264]				LCS	3		E6850Q413Q	5311		7/1/2019	
6	1917488001	LH18/24-SP650_061219_BIX				SAMPLE	3	1917488001-A	E6850Q41.3	5480	7/10/2019	7/1/2019	
7	660894	LH18/24-SP650...(1917488001MS)				MS	3		E6850Q413Q	5311		7/1/2019	
8	660895	LH18/24-SP65...(1917488001MSD)				MSD	3		E6850Q413Q	5311		7/1/2019	
9	1917489001	18CPTMW22SW_061319				SAMPLE	3	1917489001-A	E6850Q41.3	5480	7/11/2019	7/1/2019	
10	1917489002	18CPTMW22DW_061319				SAMPLE	3	1917489002-A	E6850Q41.3	5480	7/11/2019	7/1/2019	
11	1917489003	18CPTMW22R_061319				SAMPLE	3	1917489003-A	E6850Q41.3	5480	7/11/2019	7/1/2019	
12	1917489004	MW20_061319				SAMPLE	3	1917489004-A	E6850Q41.3	5480	7/11/2019	7/1/2019	
13	1917489005	18CPTMW26SW_061319				SAMPLE	3	1917489005-A	E6850Q41.3	5480	7/11/2019	7/1/2019	
14	1917672001	MW7_061719				SAMPLE	3	1917672001-A	E6850Q41.3	5480	7/15/2019	7/3/2019	
15	1917672002	18CPTMW12DW_061719				SAMPLE	3	1917672002-A	E6850Q41.3	5480	7/15/2019	7/3/2019	
16	660896	CCV for HBN 242398 [ELMS/2264]				CCV	3		E685041C3Q	5311		7/1/2019	
17	1917672003	18CPTMW12SW_061719				SAMPLE	3	1917672003-A	E6850Q41.3	5480	7/15/2019	7/2/2019	
18	1917672004	18CPTMW12SW_061719_a				SAMPLE	3	1917672004-A	E6850Q41.3	5480	7/15/2019	7/2/2019	
19	1917672005	18CPTMW23SW_061719				SAMPLE	3	1917672005-A	E6850Q41.3	5480	7/15/2019	7/2/2019	
20	1917672006	18CPTMW23_061719				SAMPLE	3	1917672006-A	E6850Q41.3	5480	7/15/2019	7/2/2019	
21	1917672007	18W14_061719W_061719				SAMPLE	3	1917672007-A	E6850Q41.3	5480	7/15/2019	7/2/2019	
22	660897	CCV for HBN 242398 [ELMS/2264]				CCV	3		E685041C3Q	5311		7/1/2019	

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00940200

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

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ALS Work Order #'s & Sample #( )'s: 1917488 (001), 1917489 (001-05), 1917672 (001-07)
ELMS Batch/HBN ID: 2264 (242398)
Prep Date: 06/26/2019 Analysis Date: 06/27/2019 Analyst: T. Bosch
Analyte: **Perchlorate** Matrix: **Water** Method: **6850**
Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2019\JUN\27JUN19D.s
Reported DL: **1.0µg/L** Reported LOD: **2.0µg/L** Reported LOQ: **4.0µg/L**

SAMPLE PREPARATION/ANALYSIS:

Water: Samples were prepared by Thomas 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 AH015-4)/0.1% glacial acetic acid (JT-Baker Lot 04802).
Eluent B1: 95% ACN (B&J Lot AH015-4)/ 5% ASTM Type II water (ALS)/0.1% glacial acetic acid (JT-Baker Lot 04802).

STANDARDS: Internal Standard Spiking Solution Horizon# 43730. Dilutions of Working Standard Solution ID 43702 used for CCV's, LODV's, RLVS and IPC.

CALIBRATION CURVE: Used curve from 03/19/2019, sequence 19MAR19D.s Offline Quantitation Method: CLO4-DP2.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: 7 Injection Volume: 35µL
Column: KP-RPPX C8 separator, 250mm Mobile Phase: 70% Eluent A1; 30% Eluent B1

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: 4.0µL of QC Solution Horizon ID 47516 was used for LCS 660893; Target = 4.0µg/L. ASTM type II water was used for LMB 660892.

MS/MSD: The Matrix Spike and duplicate (MS/MSD) were performed on sample 1917488001 (Client ID: LH18/24-SP650_061219_BIX). 5.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. Spike target = 5.0µg/L.

COMMENTS:
1) Results reported in µg/L. Field samples 1917489001 and 1917672006 were analyzed and reported from 1:100 dilutions. Field sample 1917672001 was analyzed and reported from a 1:1,000 dilution. The reporting limits have been adjusted accordingly.
2) All QC, Blank, CCV, and MS/MSD results were within method parameters, except for the following. The MS/MSD – 660894/95 failed QC acceptance criteria for relative percent difference. The Matrix Spike and Matrix Spike duplicate is reported for the clients' information only. The sample matrix may be inappropriate for the method selected.
3) Sample data can be viewed at two directories within the ALS system: \\ALSLTWS013\LCMS\LCMS04\2019\JUN\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
4) Notebook: \\alsltws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2019\242398-DoD-ALS-Hstn LCMS4 or through \\ALSLTWS013\DATAREVIEW\HBN#
5) The Reporting Limit Verification Standard (RLVS – 660890) is reported from the analysis of the Laboratory Control Sample (LCS – 660893) at a level of 4.0µg/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: 19MARI03) along with datafiles 27JUND03/12/20.

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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: 2264 HBN: 242398 Sample Set IDs if Applicable: 1917488/1917489/1917672	Analyst Initials	Reviewer Initials
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
Method Blanks 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 flags applied on QC reports; LCSs analyzed and meet acceptance criteria when performed	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 checked	TB	SB
Preparation and analysis calculations checked	TB	SB
NCRs are completed as necessary NC/CAR#_____	—	—
Report forms are complete and accurate	TB	SB
Manual integrations checked	TB	SB

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STANDARD REPORT

Working Standard - CLO4 WRK

CLO4 WRK - Description - 6850 WKG Std 100.ug/L

Standard: 43702
MFG: ALS/SLC
MFG Lot: TNB: 09/18/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/18/2018 02:09PM

Amount: 10 mL
Expires: 09/18/2019
Usable: Yes
Lab Lot: CLO4 WRK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	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
43701	CLO4 INT	6850 Intermdt AccStd 10.ug/mL	CLO4 INT	0.1 mL	09/18/2019

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: No
Part ID: IC-PER-10X-1		Lab Lot: CLO4 STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	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			

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STANDARD REPORT

Constituent

Working Standard - CLO4 INT

CLO4 INT	Description - 6850 Intermdt AccStd 10.ug/mL

Standard: 43701
MFG: ALS/SLC
MFG Lot: TNB: 09/18/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/18/2018 02:09PM

Amount: 10 mL
Expires: 09/18/2019
Usable: Yes
Lab Lot: CLO4 INT

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
43659	CLO4 STOCK	6850 Stock AccStd 1,000ug/mL	CLO4 STOCK	0.1 mL	07/25/2020

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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

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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			

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STANDARD REPORT

Constituent

Stock Standard - CLO4 QCSTOCK

CLO4 QCSTOCK		**Description - 6850 QC Stock STD 1,000ug/mL**
Standard: 36748 MFG: Ultra Scientific MFG Lot: CP-0860 Part ID: ICC-013	Created By: Thomas Bosch Create Date: 05/11/2017 01:05PM	Amount: 100 mL Expires: 03/31/2020 Usable: Yes Lab Lot: CLO4 QC STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL

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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

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STANDARD REPORT

Working Standard - CLO4ISTDWRK

CLO4ISTDWRK — Description - Perchlorate ISTD Wrk 1,000ug/L

Standard: 43730	**Created By:** Thomas Bosch	**Amount:** 25 mL
MFG: ALS/SLC	**Create Date:** 09/20/2018 09:09AM	**Expires:** 09/20/2019
MFG Lot: TNB: 05/09/2018	**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
43729	CLO4ISTDSTK	Perchlorate ISTD Stock	CLO4ISTDSTK	0.25 mL	04/28/2026

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STANDARD REPORT

Constituent

Stock Standard - CLO4ISTDSTK

CLO4ISTDSTK		Description - Perchlorate ISTD Stock
Standard: 43729	Created By: Thomas Bosch	Amount: 1 mL
MFG: Cambridge Isotope	Create Date: 09/20/2018 09:09AM	Expires: 04/28/2026
MFG Lot: SDFF-012A	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

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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

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 ANAB ACCREDITED

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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

125 Market Street
New Haven, CT 06513
USA

Tel (203)786-5290
Fax (203)786-5287
www.AccuStandard.com

AccuStandard®

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*

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

GHS

Signal Word: None

Component		SRM #	Prepared Concentration (µg/mL)
ClO_4	Perchlorate	Ind. Std.	1000

The gravimetric uncertainty for this product is ±0.24%.
The final solution was checked against an independent standard to verify its concentration.
We use the highest purity raw materials available to minimize impurity levels in the final solution. Typically 99.999%+ pure starting materials are used as well as ASTM Type I 18 megohm deionized water.
All solutions are filtered through a 0.2 µm filter prior to being bottled.
All glassware used in preparation is Class A and calibrated regularly.
All weights are traceable through NIST Test No. 822-275872-11
All bottles are triple rinsed with deionized water prior to use.
Shake bottle prior to use and do not pipette directly out of the bottle. Use only cleaned Class A volumetric glassware.
We certify the accuracy of this standard to be ±0.5% of the stated value until its expiration date provided it is kept tightly capped and stored under the conditions stated above.

Certified By: Meigan O'Leary
Meigan O'Leary, Inorganic QC Manager

Page 1 of 1

For use in routine laboratory analysis.

AccuStandard is accredited to ISO 17034, ISO/IEC 17025 and certified to ISO 9001:2015
08-ORG/INO-001
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Cambridge Isotope Laboratories, Inc.

Certificate of Analysis

Quality Standards:
ISO Guide 34 • ISO/IEC 17025 • ISO 13485 • cGMP

23118

Product Name: (Isotopic Label & Enrichment Specification)	PERCHLORIC ACID, SODIUM SALT (18O4, 90%+) 100 UG/ML IN WATER
Lot Number:	SDDG-013
Catalog Number:	OLM-7310-S

Product Information

Chemical Purity Specification:	≥98%
Labeled CAS Number:	NA
Unlabeled CAS Number:	7601-89-0
MW*:	130.4
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.

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.

* *For isotopically labeled compounds, MW listed is for the fully enriched product.*

Approved by: T. J. Eckersley

Timothy I. Eckersley, Ph.D., Quality Assurance

Quality Control Tests and Results

QC Release Date	2/27/2014
Expiration Date	2/27/2024
Concentration Based on Gravimetry	102 µg/mL
Chemical Purity of Neat Material(s)	98%
LC/MS for Concentration	109.4 ± 2.8 µg/mL (k=2)

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ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

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Batch Report: C:\HPCHEM\1\DATA\27JUN19D\27JUN19S.B

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP2.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
*	660889 CCV@25	Vial 71	1	Control	1	1.82515e6	8.439	25.67350
*	660893 QC@4.0	Vial 72	1	Control	2	3.38083e5	8.214	4.26890
*	660891 ICS@4.0	Vial 73	1	Control	3	2.57330e5	7.965	3.92512
*	660892 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	1917488001	Vial 75	1	Sample	5	0.00000	0.000	0.00000
*	660894 174881S	Vial 76	1	Sample	6	2.62640e5	7.903	5.12768
*	660895 174881D	Vial 77	1	Sample	7	2.64844e5	7.941	4.05844
*	1917489001 100	Vial 78	1	Sample	8	4.17326e5	8.686	591.94538
*	1917489002	Vial 79	1	Sample	9	0.00000	0.000	0.00000
*	1917489003	Vial 80	1	Sample	10	0.00000	0.000	0.00000
*	1917489004	Vial 81	1	Sample	11	0.00000	0.000	0.00000
*	1917489005	Vial 82	1	Sample	12	0.00000	0.000	0.00000
*	1917672001 1K	Vial 83	1	Sample	13	1.57532e6	8.712	2.61220e4
*	1917672002	Vial 84	1	Sample	14	6.54028e4	7.973	1.24787
*	660896 CCV@25	Vial 71	1	Control	15	1.48921e6	8.624	25.51318
*	1917672003	Vial 85	1	Sample	16	0.00000	0.000	0.00000
*	1917672004	Vial 86	1	Sample	17	0.00000	0.000	0.00000
*	1917672005	Vial 87	1	Sample	18	0.00000	0.000	0.00000
*	1917672006 100	Vial 88	1	Sample	19	1.71986e6	8.736	2534.96449
*	1917672007	Vial 89	1	Sample	20	0.00000	0.000	0.00000
*	660897 CCV@25	Vial 71	1	Control	21	1.42516e6	8.651	24.42440

#*	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
*	660889 CCV@25	Vial 71	1	Control	1	5.48361e5	8.454	25.97496
*	660893 QC@4.0	Vial 72	1	Control	2	1.12796e5	8.202	4.63897
*	660891 ICS@4.0	Vial 73	1	Control	3	8.93833e4	7.980	4.42426
*	660892 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	1917488001	Vial 75	1	Sample	5	0.00000	0.000	0.00000
*	660894 174881S	Vial 76	1	Sample	6	8.68330e4	7.935	5.55768
*	660895 174881D	Vial 77	1	Sample	7	8.75585e4	7.960	4.36181
*	1917489001 100	Vial 78	1	Sample	8	1.40501e5	8.696	655.91363
*	1917489002	Vial 79	1	Sample	9	0.00000	0.000	0.00000
*	1917489003	Vial 80	1	Sample	10	0.00000	0.000	0.00000
*	1917489004	Vial 81	1	Sample	11	0.00000	0.000	0.00000
*	1917489005	Vial 82	1	Sample	12	0.00000	0.000	0.00000
*	1917672001 1K	Vial 83	1	Sample	13	4.80693e5	8.744	2.68224e4
*	1917672002	Vial 84	1	Sample	14	2.29889e4	7.974	1.29323
*	660896 CCV@25	Vial 71	1	Control	15	4.52707e5	8.622	26.10046
*	1917672003	Vial 85	1	Sample	16	0.00000	0.000	0.00000
*	1917672004	Vial 86	1	Sample	17	0.00000	0.000	0.00000
*	1917672005	Vial 87	1	Sample	18	0.00000	0.000	0.00000
*	1917672006 100	Vial 88	1	Sample	19	5.21595e5	8.762	2587.43586
*	1917672007	Vial 89	1	Sample	20	0.00000	0.000	0.00000
*	660897 CCV@25	Vial 71	1	Control	21	4.30118e5	8.688	24.80913

#*	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
*	660889 CCV@25	Vial 71	1	Control	1	2.15939e5	8.466	5.00000
*	660893 QC@4.0	Vial 72	1	Control	2	2.60134e5	8.243	5.00000
*	660891 ICS@4.0	Vial 73	1	Control	3	2.16232e5	7.969	5.00000
*	660892 LMB	Vial 74	1	Control	4	2.72547e5	8.630	5.00000
*	1917488001	Vial 75	1	Sample	5	2.27402e5	7.920	5.00000
*	660894 174881S	Vial 76	1	Sample	6	1.66848e5	7.932	5.00000
*	660895 174881D	Vial 77	1	Sample	7	2.14876e5	7.954	5.00000
*	1917489001 100	Vial 78	1	Sample	8	2.28283e5	8.729	500.00000
*	1917489002	Vial 79	1	Sample	9	2.07849e5	7.985	5.00000
*	1917489003	Vial 80	1	Sample	10	2.26487e5	8.403	5.00000

RIGHT SOLUTIONS | RIGHT PARTNER

Batch Report: C:\HPCHEM\1\DATA\27JUN19D\27JUN19S.B

#	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
*	1917489004	Vial 81	1	Sample	11	1.93008e5	7.993	5.00000
*	1917489005	Vial 82	1	Sample	12	1.81500e5	7.840	5.00000
*	1917672001 1K	Vial 83	1	Sample	13	1.82987e5	8.737	5000.00000
*	1917672002	Vial 84	1	Sample	14	1.91018e5	8.001	5.00000
*	660896 CCV@25	Vial 71	1	Control	15	1.77368e5	8.624	5.00000
*	1917672003	Vial 85	1	Sample	16	1.65261e5	7.950	5.00000
*	1917672004	Vial 86	1	Sample	17	1.47928e5	7.939	5.00000
*	1917672005	Vial 87	1	Sample	18	1.93450e5	8.278	5.00000
*	1917672006 100	Vial 88	1	Sample	19	2.06241e5	8.740	500.00000
*	1917672007	Vial 89	1	Sample	20	1.87344e5	7.970	5.00000
*	660897 CCV@25	Vial 71	1	Control	21	1.77769e5	8.693	5.00000

*** End of Report ***

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Sequence Table:

Method and Injection Info Part:

Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	660889 CCV@25	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	660893 QC@4.0	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	660891 ICS@4.0	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	660892 LMB	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	1917488001	CLO4-AQN	1	Sample		
6	Vial 76	660894 174881S	CLO4-AQN	1	Sample		
7	Vial 77	660895 174881D	CLO4-AQN	1	Sample		
8	Vial 78	1917489001 100	CLO4-AQN	1	Sample		
9	Vial 79	1917489002	CLO4-AQN	1	Sample		
10	Vial 80	1917489003	CLO4-AQN	1	Sample		
11	Vial 81	1917489004	CLO4-AQN	1	Sample		
12	Vial 82	1917489005	CLO4-AQN	1	Sample		
13	Vial 83	1917672001 1K	CLO4-AQN	1	Sample		
14	Vial 84	1917672002	CLO4-AQN	1	Sample		
15	Vial 71	660896 CCV@25	CLO4-AQN	1	Ctrl Samp		
16	Vial 85	1917672003	CLO4-AQN	1	Sample		
17	Vial 86	1917672004	CLO4-AQN	1	Sample		
18	Vial 87	1917672005	CLO4-AQN	1	Sample		
19	Vial 88	1917672006 100	CLO4-AQN	1	Sample		
20	Vial 89	1917672007	CLO4-AQN	1	Sample		
21	Vial 71	660897 CCV@25	CLO4-AQN	1	Ctrl Samp		

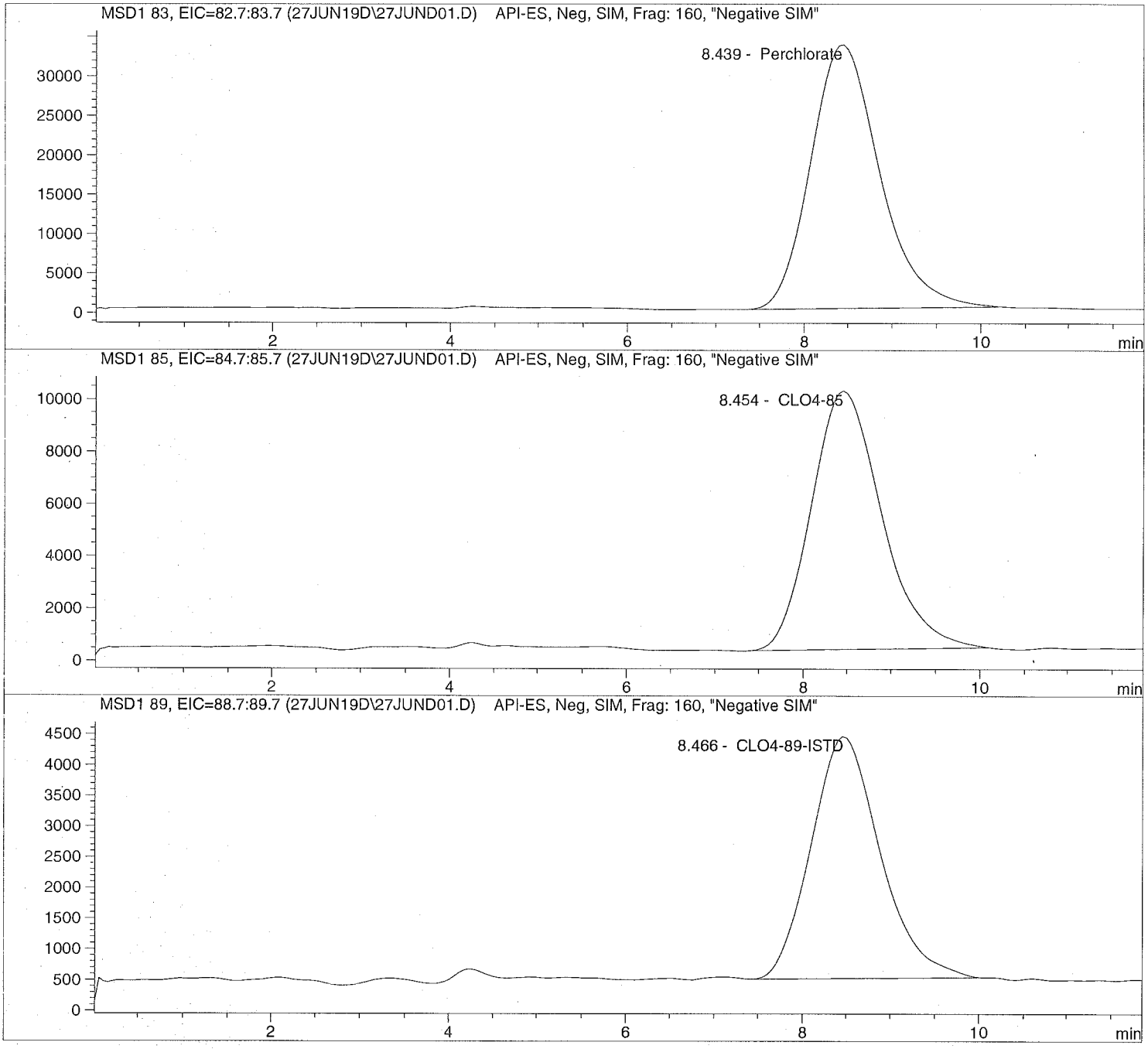
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND01.D Sample Name: 660889 CCV@25

Injection Date:	6/27/2019 08:45:38	Seq Line:	1
Sample Name:	660889 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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND01.D Sample Name: 660889 CCV@25

Injection Date:	6/27/2019 08:45:38	Seq Line:	1
Sample Name:	660889 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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.439	PBA	1825148.0	25.6735	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.454	PBA	548361.0	25.9750	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.466	PBA	215939.1	5.0000	CLO4-89-ISTD

*** End of Report ***

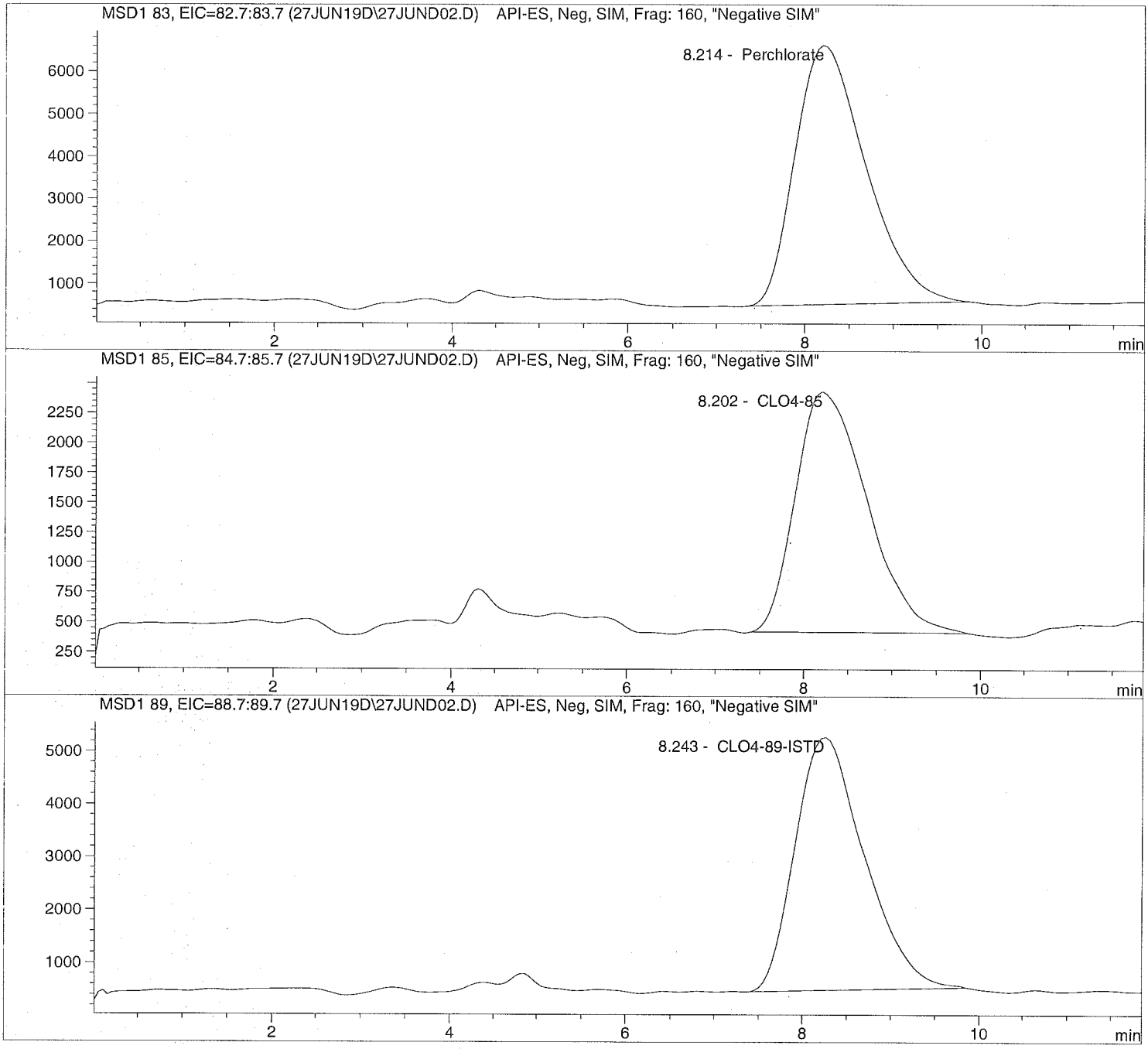
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND02.D Sample Name: 660893 QC@4.0

Injection Date:	6/27/2019 09:00:21	Seq Line:	2
Sample Name:	660893 QC@4.0	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND02.D Sample Name: 660893 QC@4.0

Injection Date:	6/27/2019 09:00:21	Seq Line:	2
Sample Name:	660893 QC@4.0	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.214	PBA	338083.1	4.2689	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.202	PBA	112796.3	4.6390	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.243	PBA	260134.2	5.0000	CLO4-89-ISTD

*** End of Report ***

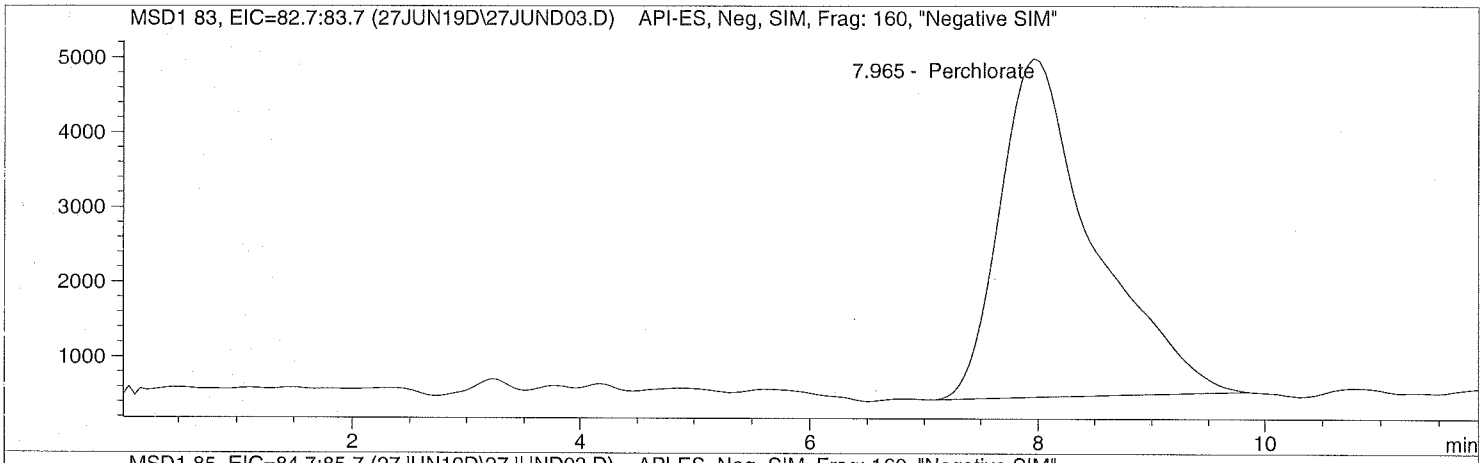
RIGHT SOLUTIONS | RIGHT PARTNER

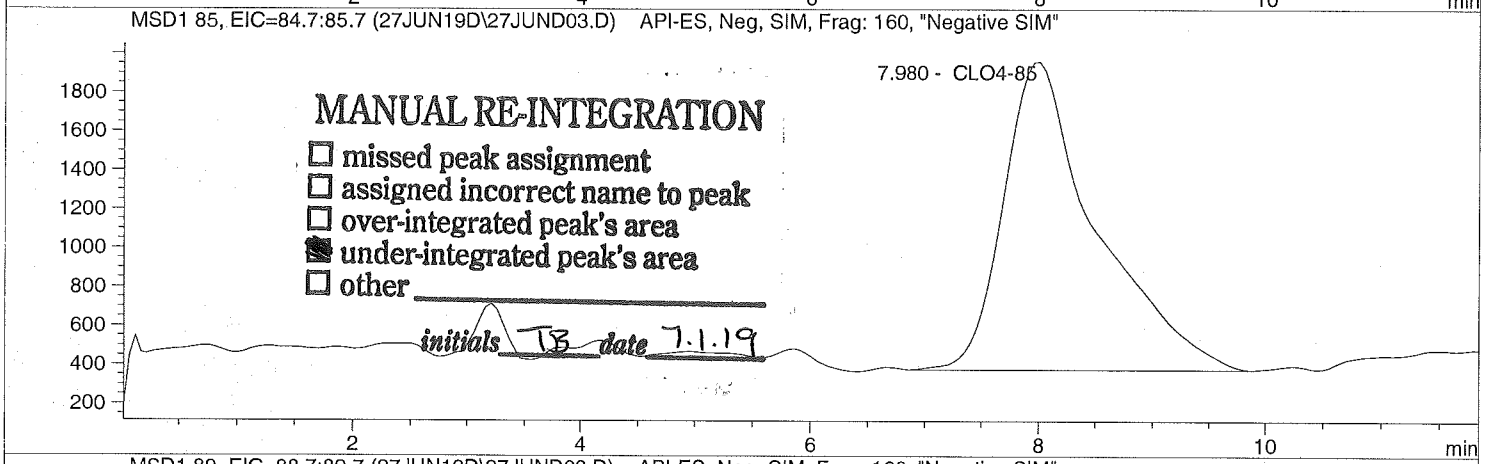
Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND03.D Sample Name: 660891 ICS@4.0

Injection Date:	6/27/2019 09:14:16	Seq Line:	3
Sample Name:	660891 ICS@4.0	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-DP2.M
Last Changed: 4/12/2019 07:54:13

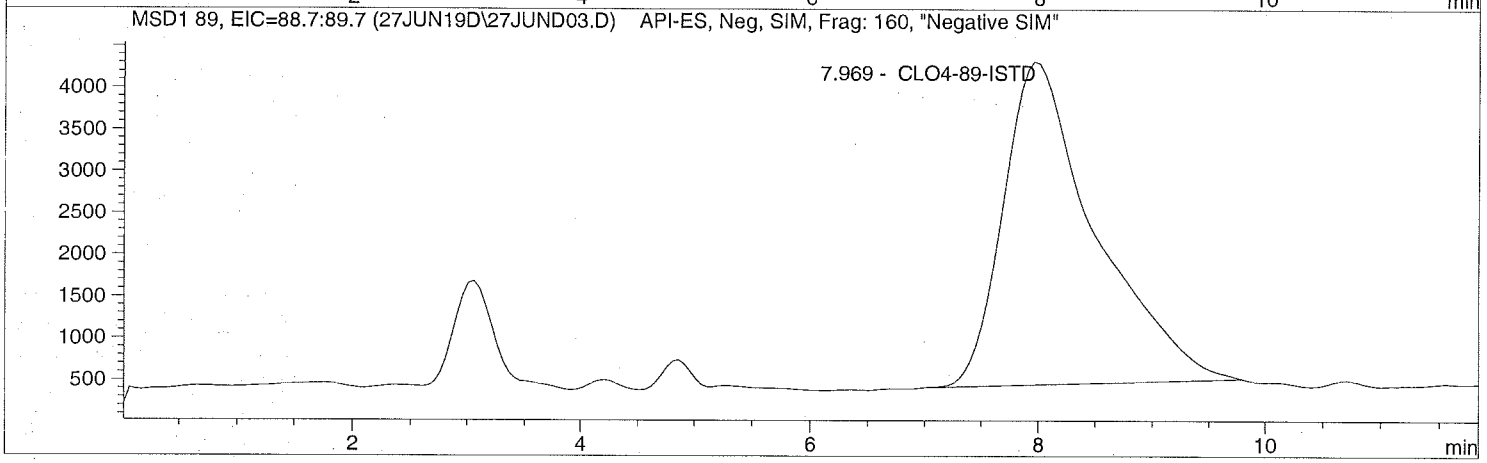
Perchlorate analysis





MANUAL RE-INTEGRATION
- ☐ missed peak assignment
- ☐ assigned incorrect name to peak
- ☐ over-integrated peak's area
- ☒ under-integrated peak's area
- ☐ other _____

initials TB date 7.1.19



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND03.D Sample Name: 660891 ICS@4.0

Injection Date:	6/27/2019 09:14:16	Seq Line:	3
Sample Name:	660891 ICS@4.0	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.965	PBA	257330.2	3.9251	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.980	MM	89383.3	4.4243	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.969	BBA	216232.2	5.0000	CLO4-89-ISTD

*** End of Report ***

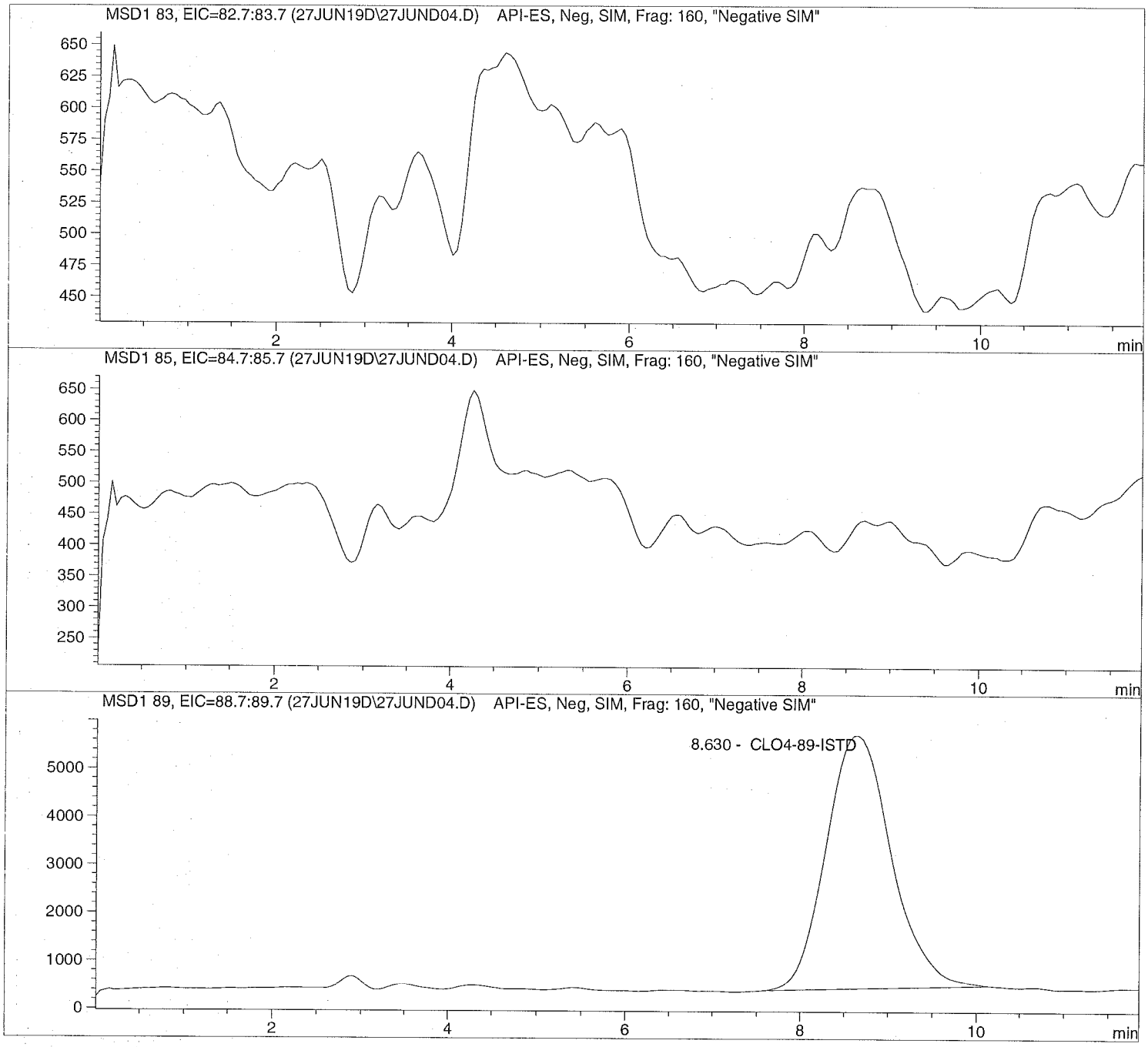
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND04.D Sample Name: 660892 LMB

Injection Date:	6/27/2019 09:28:13	Seq Line:	4
Sample Name:	660892 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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND04.D Sample Name: 660892 LMB

Injection Date:	6/27/2019 09:28:13	Seq Line:	4
Sample Name:	660892 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-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.630	PBA	272546.7	5.0000	CLO4-89-ISTD

*** End of Report ***

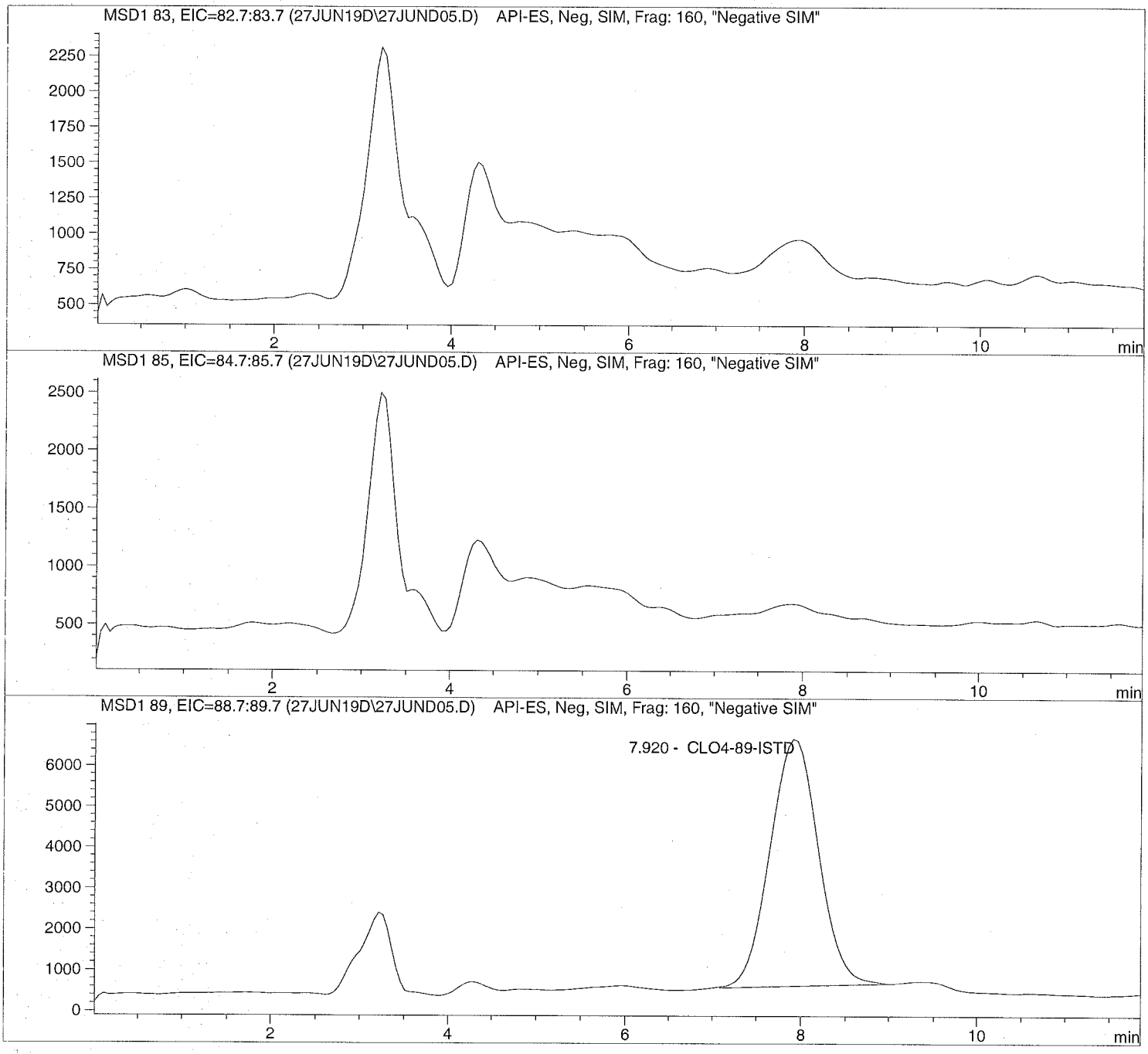
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND05.D Sample Name: 1917488001

Injection Date:	6/27/2019 09:42:40	Seq Line:	5
Sample Name:	1917488001	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND05.D Sample Name: 1917488001

Injection Date:	6/27/2019 09:42:40	Seq Line:	5
Sample Name:	1917488001	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
7.920	PBA	227402.2	5.0000	CLO4-89-ISTD

*** End of Report ***

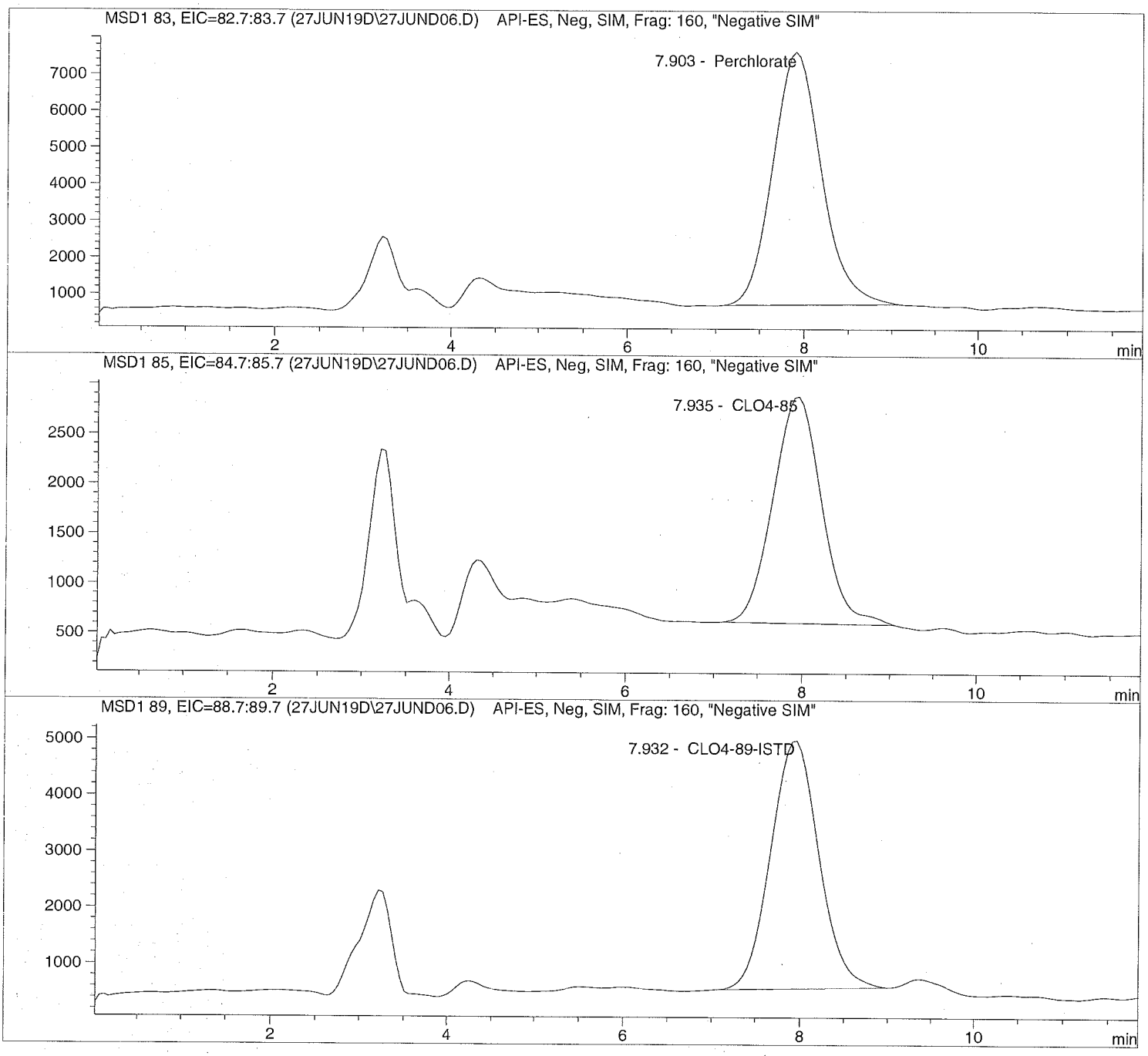
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND06.D Sample Name: 660894 174881S

Injection Date:	6/27/2019 09:56:36	Seq Line:	6
Sample Name:	660894 174881S	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND06.D Sample Name: 660894 174881S

Injection Date:	6/27/2019 09:56:36	Seq Line:	6
Sample Name:	660894 174881S	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-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
7.903	PBA	262639.7	5.1277	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.935	BBA	86833.0	5.5577	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.932	PBA	166848.2	5.0000	CLO4-89-ISTD

*** End of Report ***

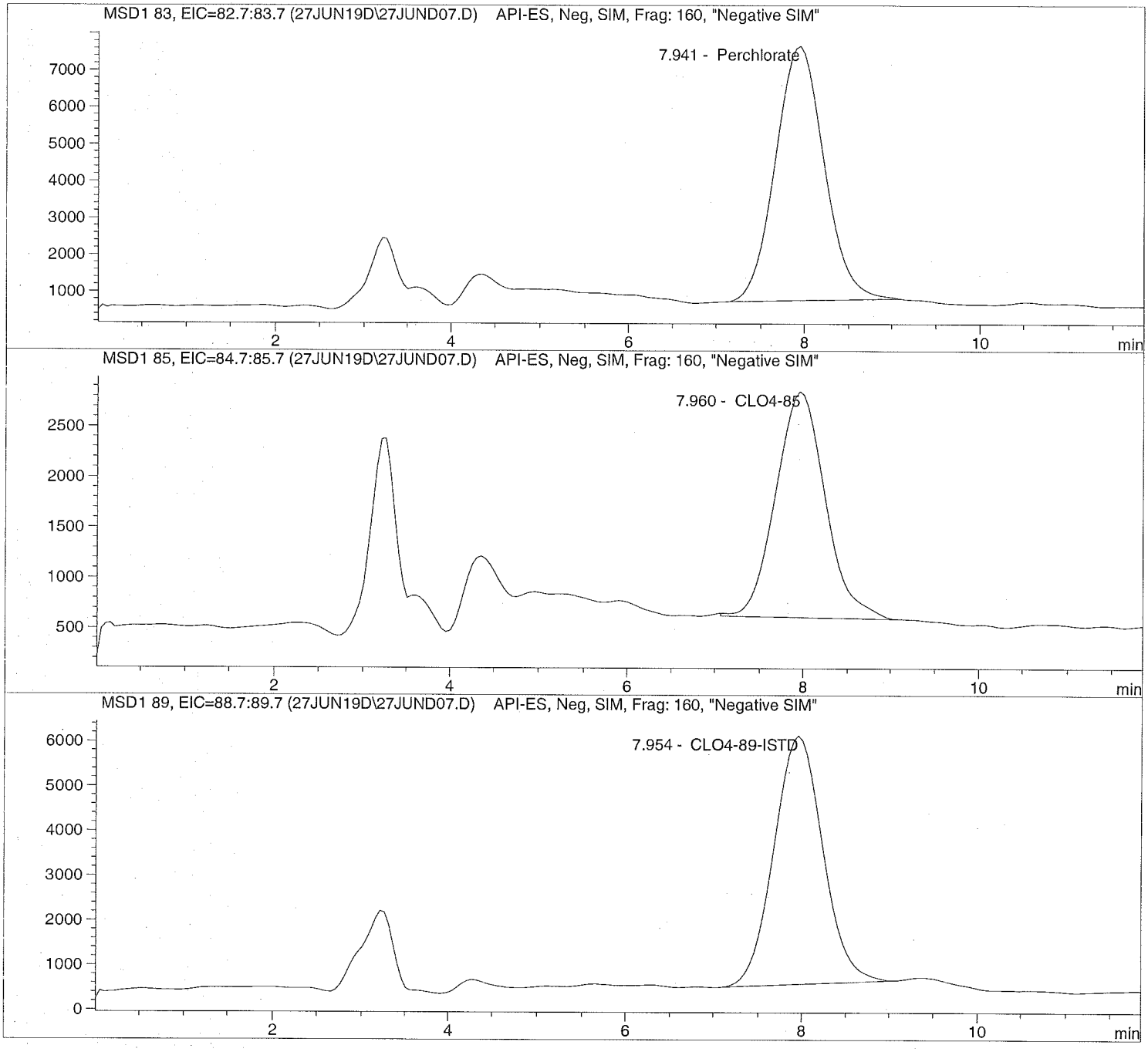
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND07.D Sample Name: 660895 174881D

Injection Date:	6/27/2019 10:10:32	Seq Line:	7
Sample Name:	660895 174881D	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND07.D Sample Name: 660895 174881D

Injection Date:	6/27/2019 10:10:32	Seq Line:	7
Sample Name:	660895 174881D	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-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
7.941	PBA	264844.2	4.0584	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.960	BBA	87558.5	4.3618	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.954	PBA	214876.4	5.0000	CLO4-89-ISTD

*** End of Report ***

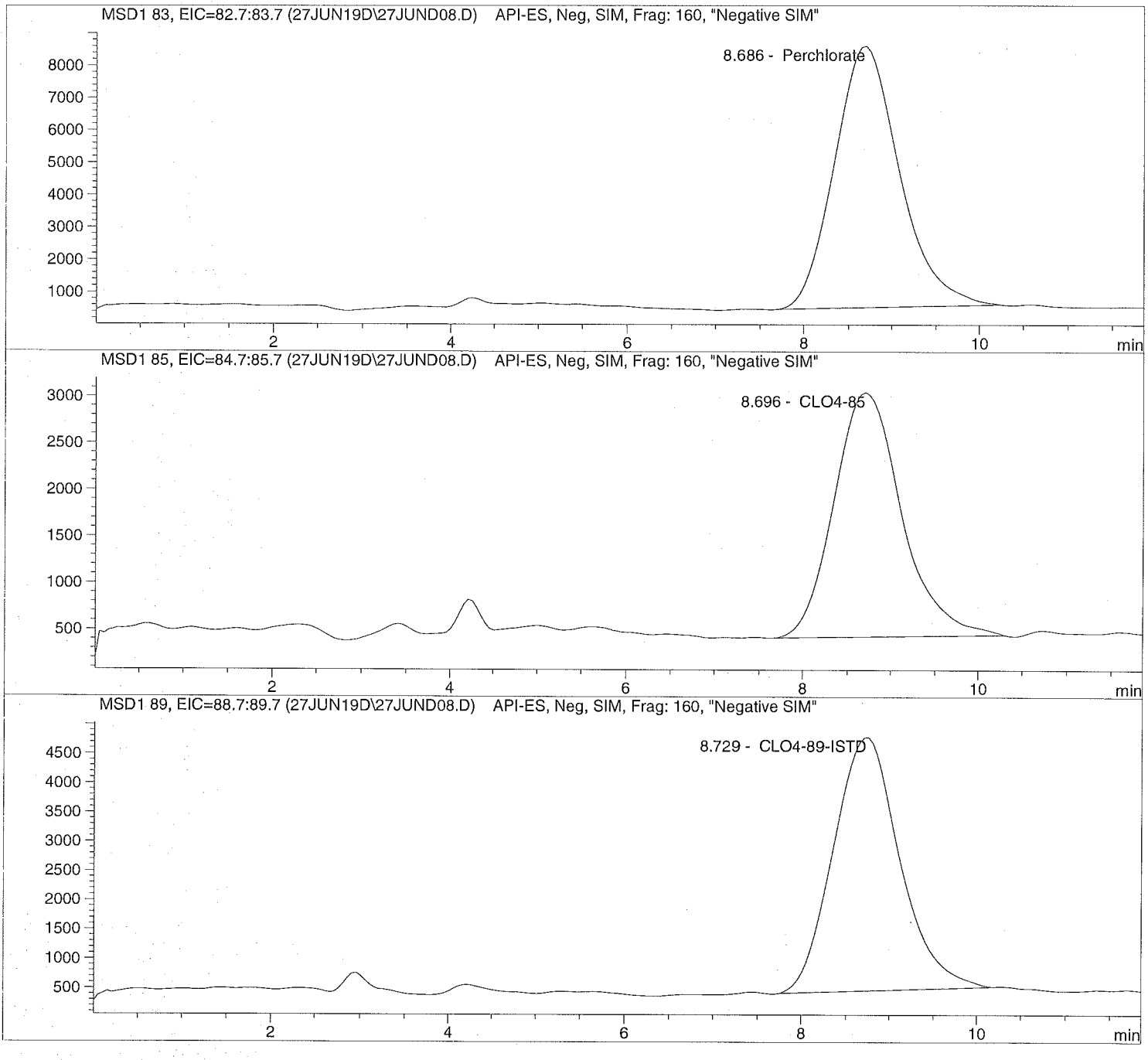
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND08.D Sample Name: 1917489001 100

Injection Date:	6/27/2019 10:24:27	Seq Line:	8
Sample Name:	1917489001 100	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND08.D Sample Name: 1917489001 100

Injection Date:	6/27/2019 10:24:27	Seq Line:	8
Sample Name:	1917489001 100	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.686	PBA	417326.3	591.9454	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.696	PBA	140501.0	655.9136	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.729	PBA	228282.9	500.0000	CLO4-89-ISTD

*** End of Report ***

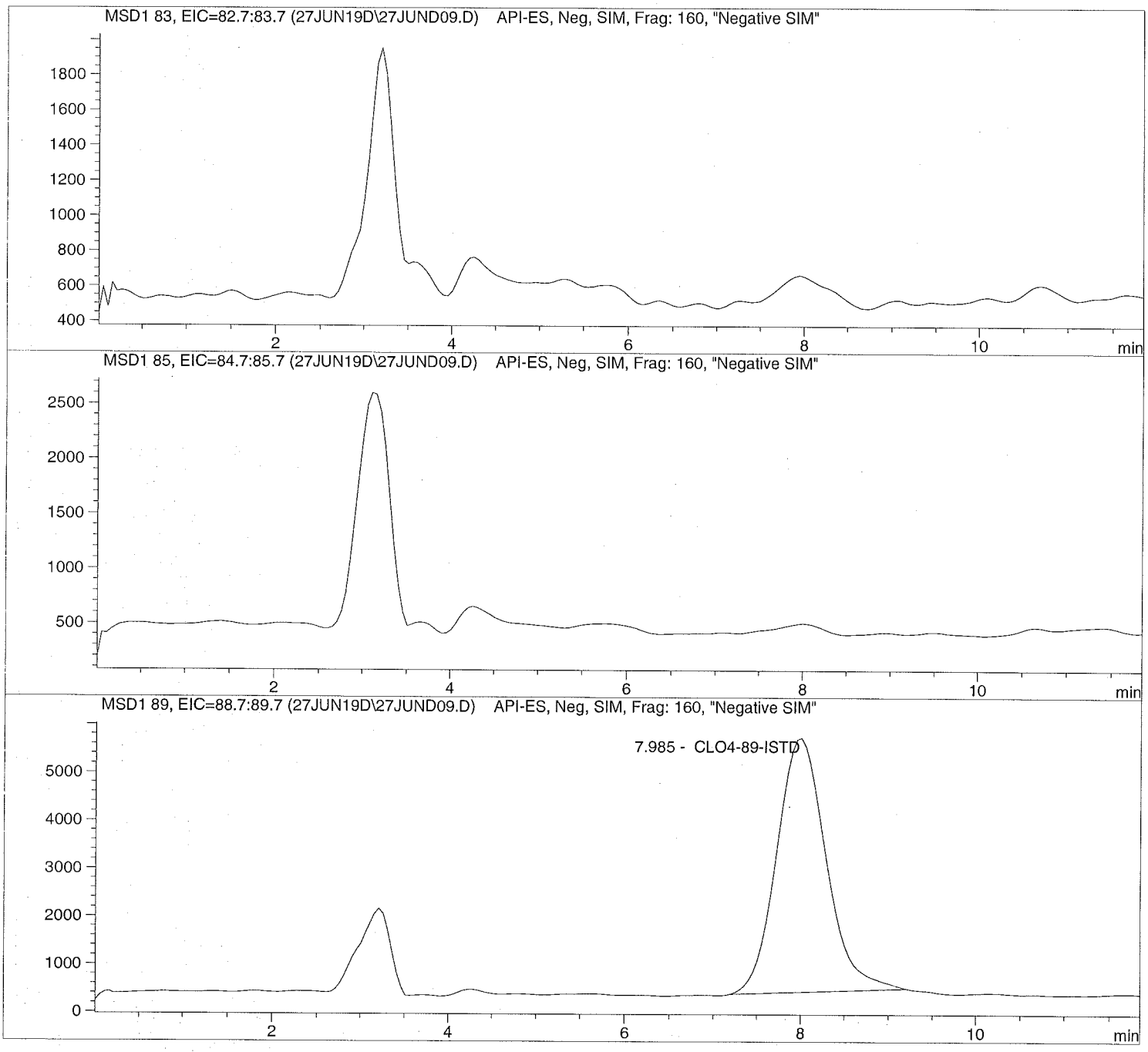
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND09.D Sample Name: 1917489002

Injection Date:	6/27/2019 10:38:23	Seq Line:	9
Sample Name:	1917489002	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND09.D Sample Name: 1917489002

Injection Date:	6/27/2019 10:38:23	Seq Line:	9
Sample Name:	1917489002	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
7.985	BBA	207849.5	5.0000	CLO4-89-ISTD

*** End of Report ***

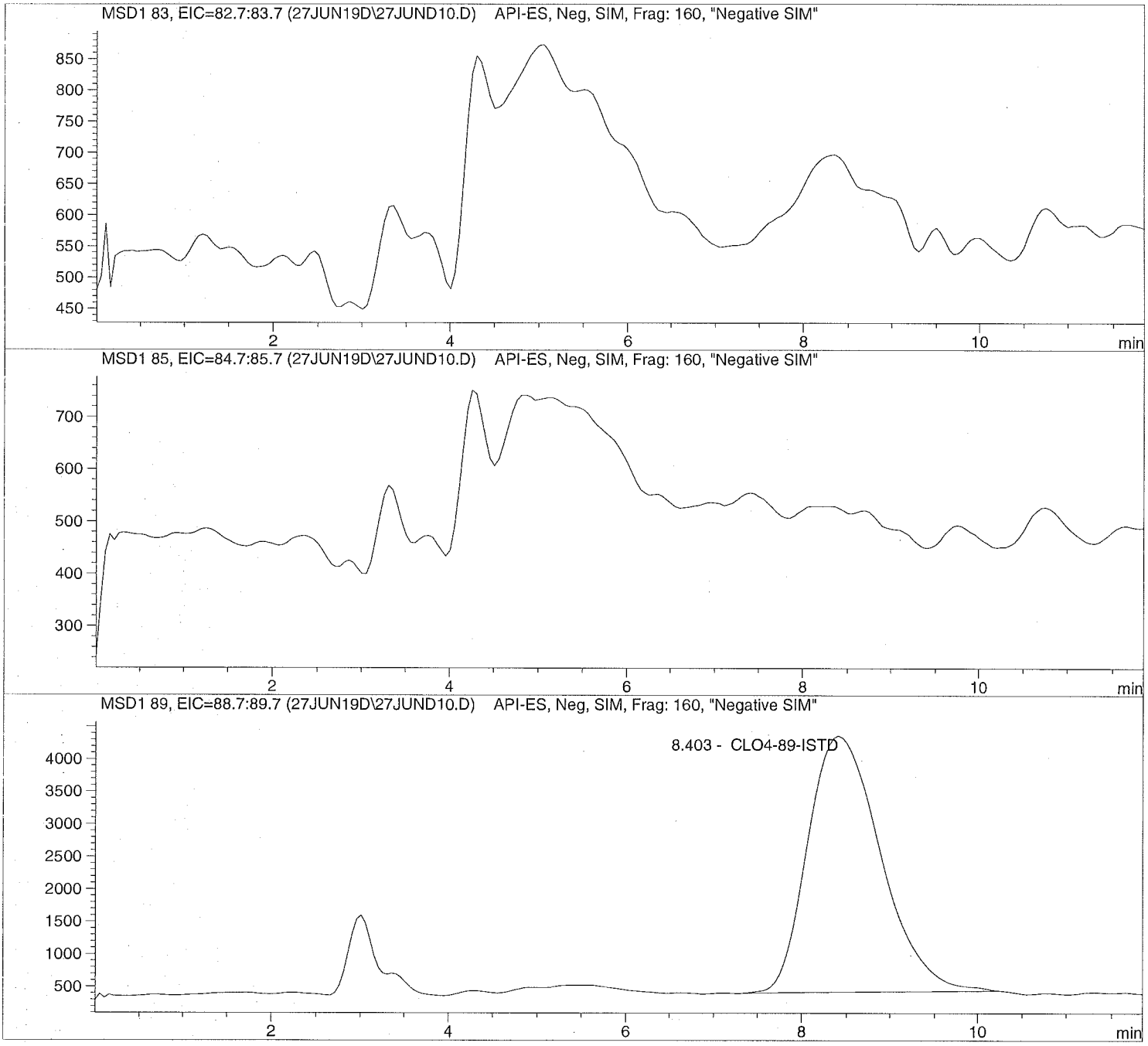
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND10.D Sample Name: 1917489003

Injection Date:	6/27/2019 10:52:17	Seq Line:	10
Sample Name:	1917489003	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND10.D Sample Name: 1917489003

Injection Date:	6/27/2019 10:52:17	Seq Line:	10
Sample Name:	1917489003	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.403	PBA	226487.0	5.0000	CLO4-89-ISTD

*** End of Report ***

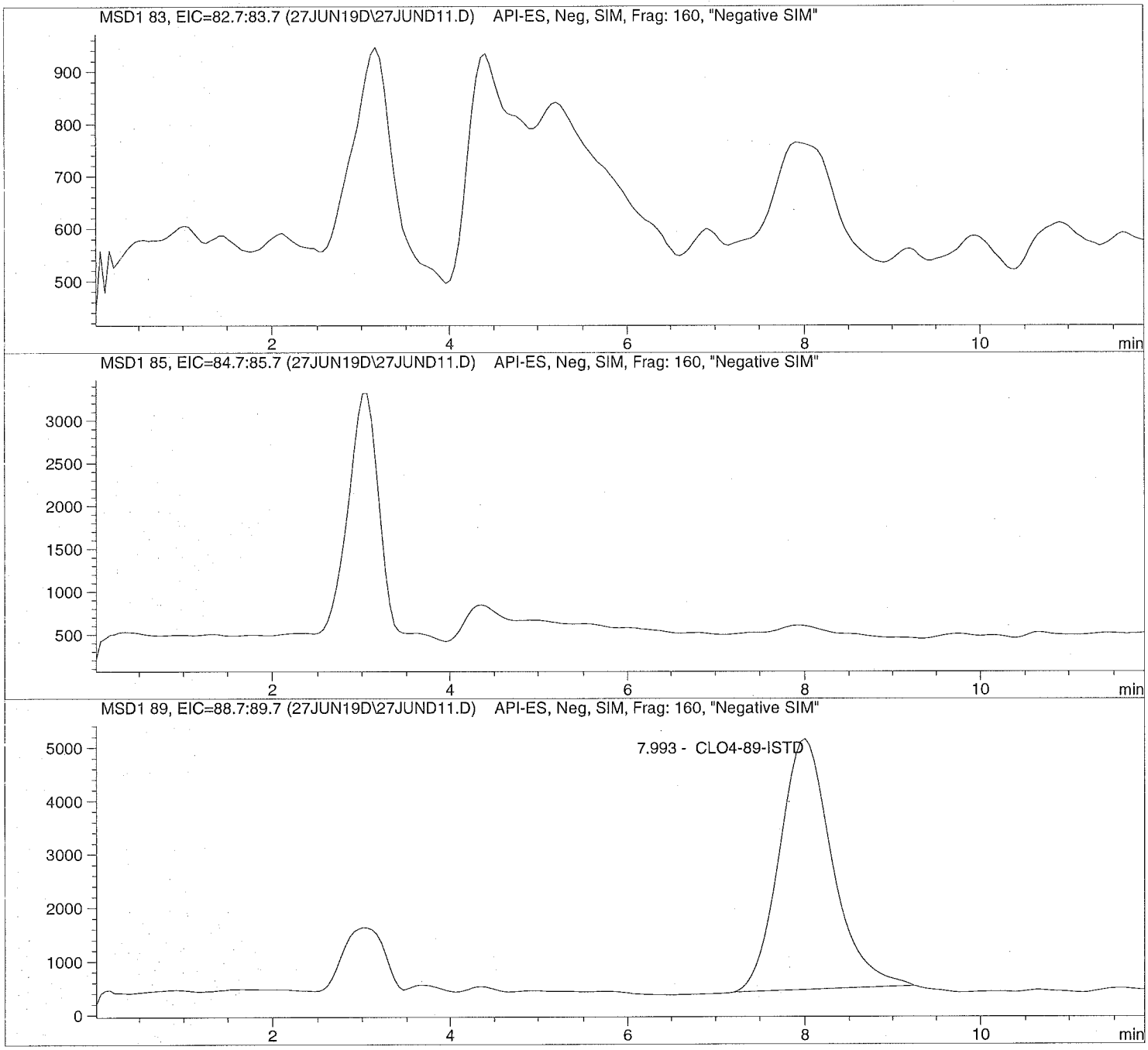
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND11.D Sample Name: 1917489004

Injection Date:	6/27/2019 11:06:11	Seq Line:	11
Sample Name:	1917489004	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND11.D Sample Name: 1917489004

Injection Date:	6/27/2019 11:06:11	Seq Line:	11
Sample Name:	1917489004	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
7.993	BBA	193007.7	5.0000	CLO4-89-ISTD

*** End of Report ***

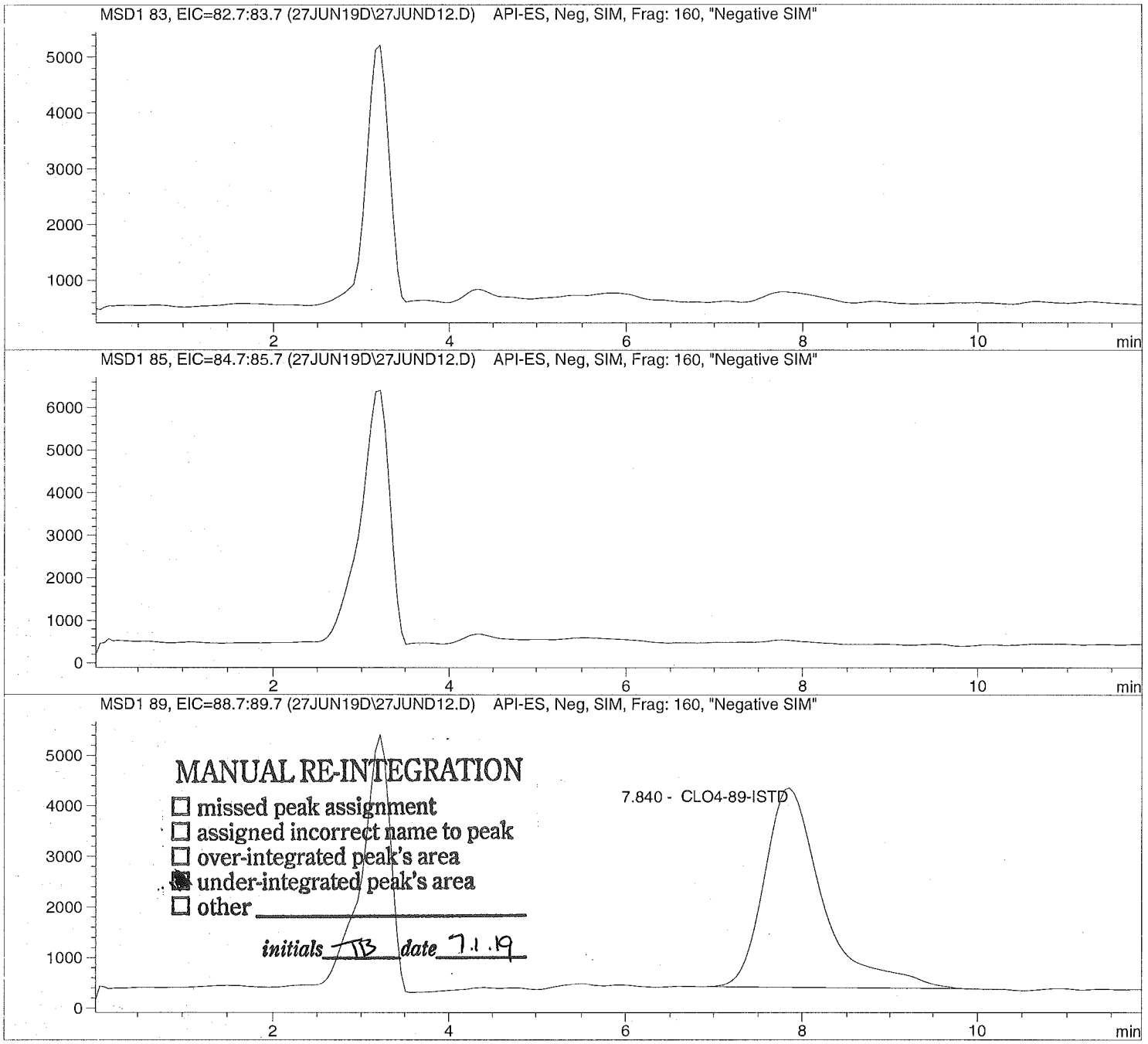
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND12.D Sample Name: 1917489005

Injection Date:	6/27/2019 11:20:03	Seq Line:	12
Sample Name:	1917489005	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND12.D Sample Name: 1917489005

Injection Date:	6/27/2019 11:20:03	Seq Line:	12
Sample Name:	1917489005	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
7.840	MM	181499.8	5.0000	CLO4-89-ISTD

*** End of Report ***

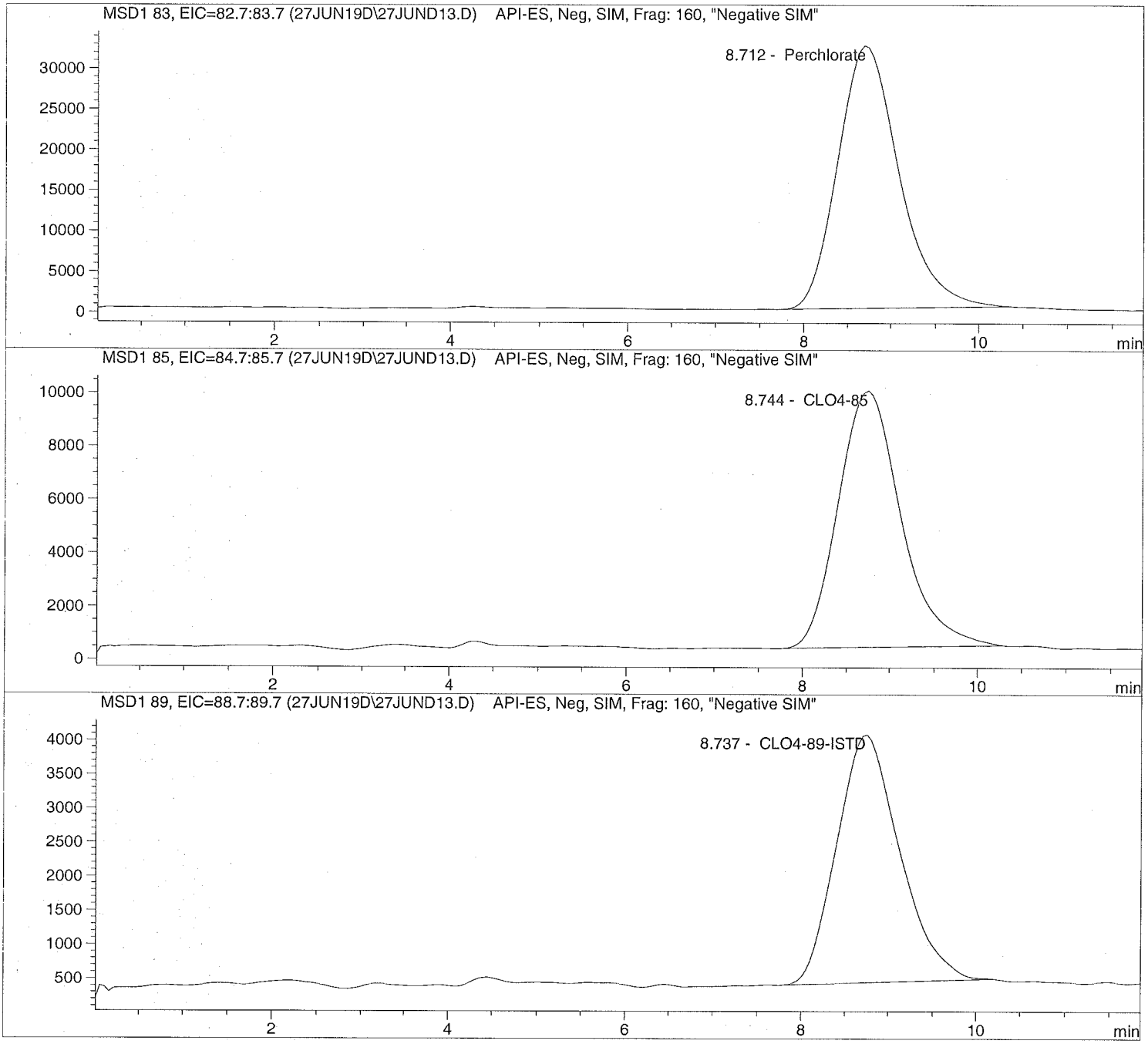
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND13.D Sample Name: 1917672001 1K

Injection Date:	6/27/2019 11:33:53	Seq Line:	13
Sample Name:	1917672001 1K	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND13.D Sample Name: 1917672001 1K

Injection Date:	6/27/2019 11:33:53	Seq Line:	13
Sample Name:	1917672001 1K	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.712	PBA	1575319.3	26121.9614	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.744	PBA	480692.7	26822.4361	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.737	PBA	182986.5	5000.0000	CLO4-89-ISTD

*** End of Report ***

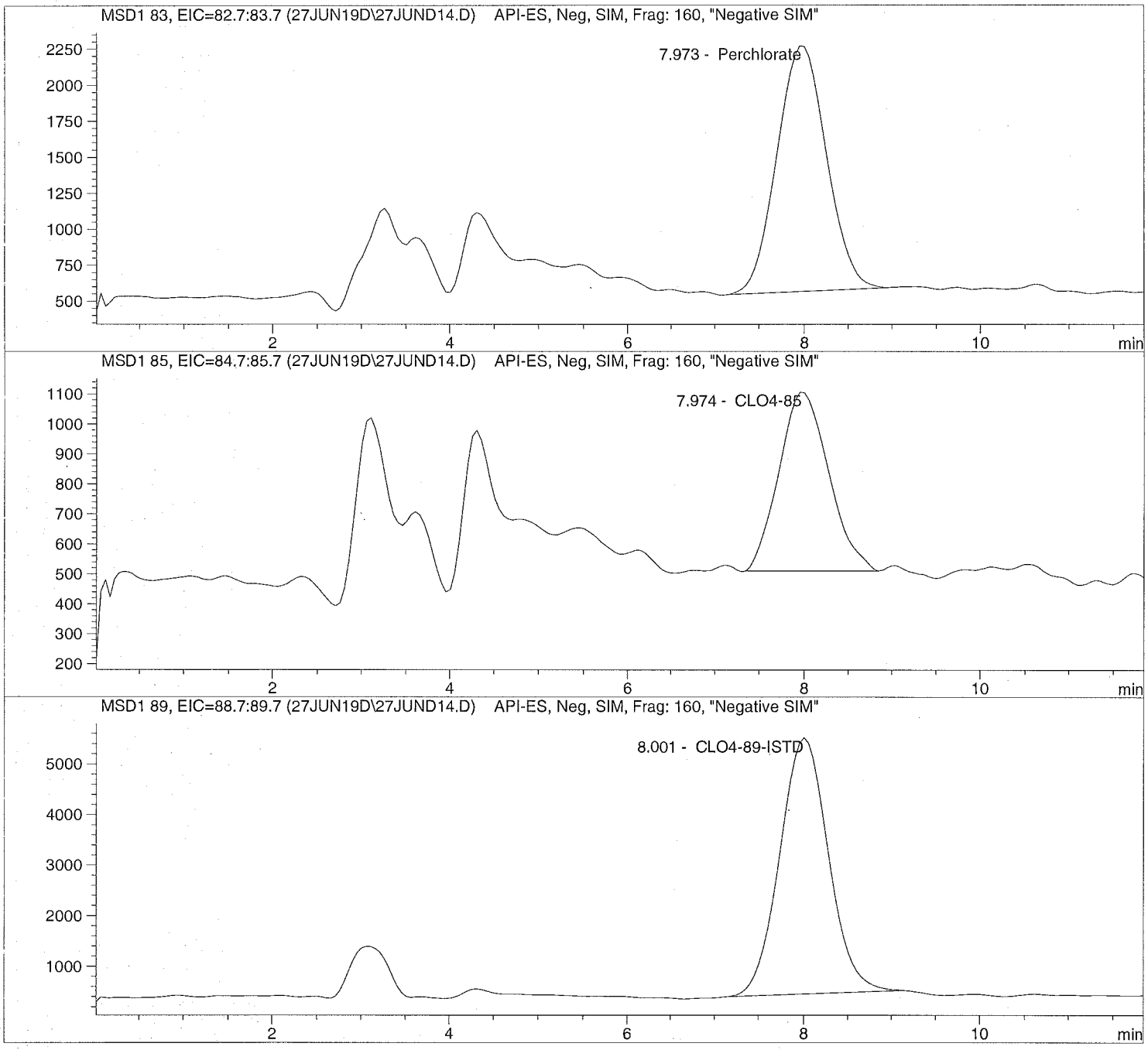
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND14.D Sample Name: 1917672002

Injection Date:	6/27/2019 11:47:53	Seq Line:	14
Sample Name:	1917672002	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND14.D Sample Name: 1917672002

Injection Date:	6/27/2019 11:47:53	Seq Line:	14
Sample Name:	1917672002	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
7.973	PBA	65402.8	1.2479	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.974	PBA	22988.9	1.2932	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.001	PBA	191017.5	5.0000	CLO4-89-ISTD

*** End of Report ***

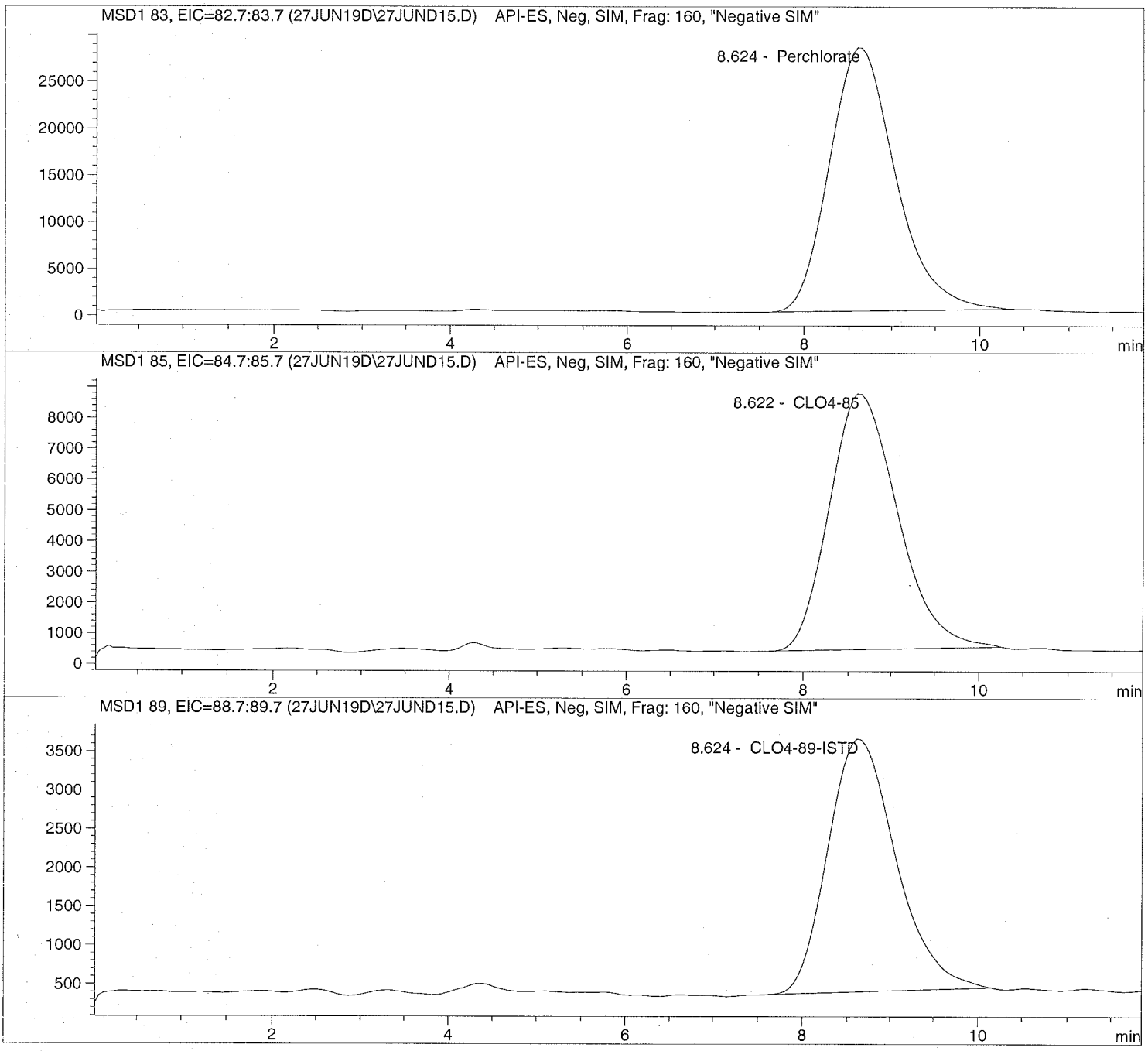
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND15.D Sample Name: 660896 CCV@25

Injection Date:	6/27/2019 12:01:48	Seq Line:	15
Sample Name:	660896 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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND15.D Sample Name: 660896 CCV@25

Injection Date:	6/27/2019 12:01:48	Seq Line:	15
Sample Name:	660896 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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.624	PBA	1489207.3	25.5132	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.622	PBA	452707.0	26.1005	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.624	PBA	177367.7	5.0000	CLO4-89-ISTD

*** End of Report ***

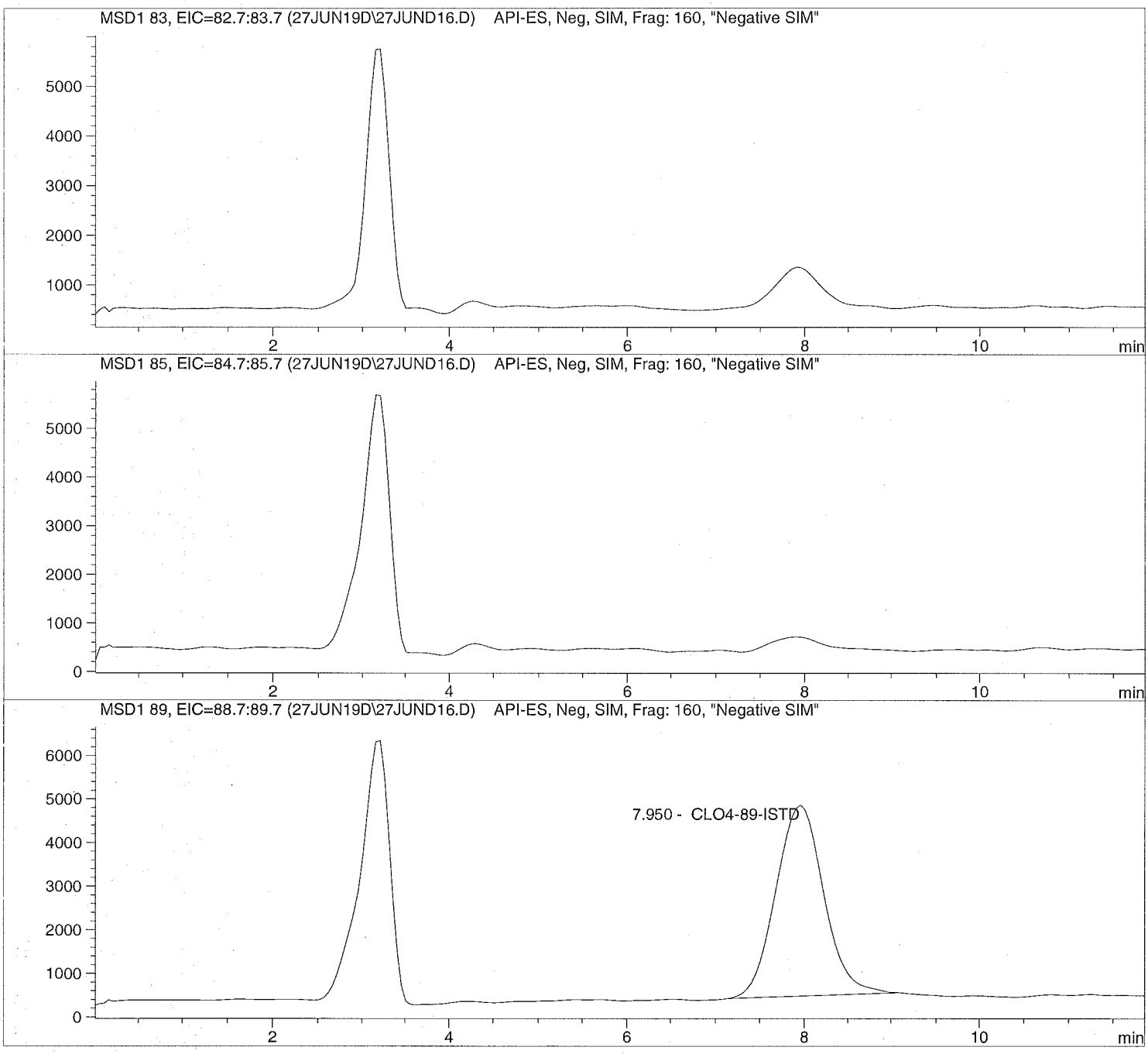
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND16.D Sample Name: 1917672003

Injection Date:	6/27/2019 12:15:39	Seq Line:	16
Sample Name:	1917672003	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND16.D Sample Name: 1917672003

Injection Date:	6/27/2019 12:15:39	Seq Line:	16
Sample Name:	1917672003	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
7.950	PBA	165260.9	5.0000	CLO4-89-ISTD

*** End of Report ***

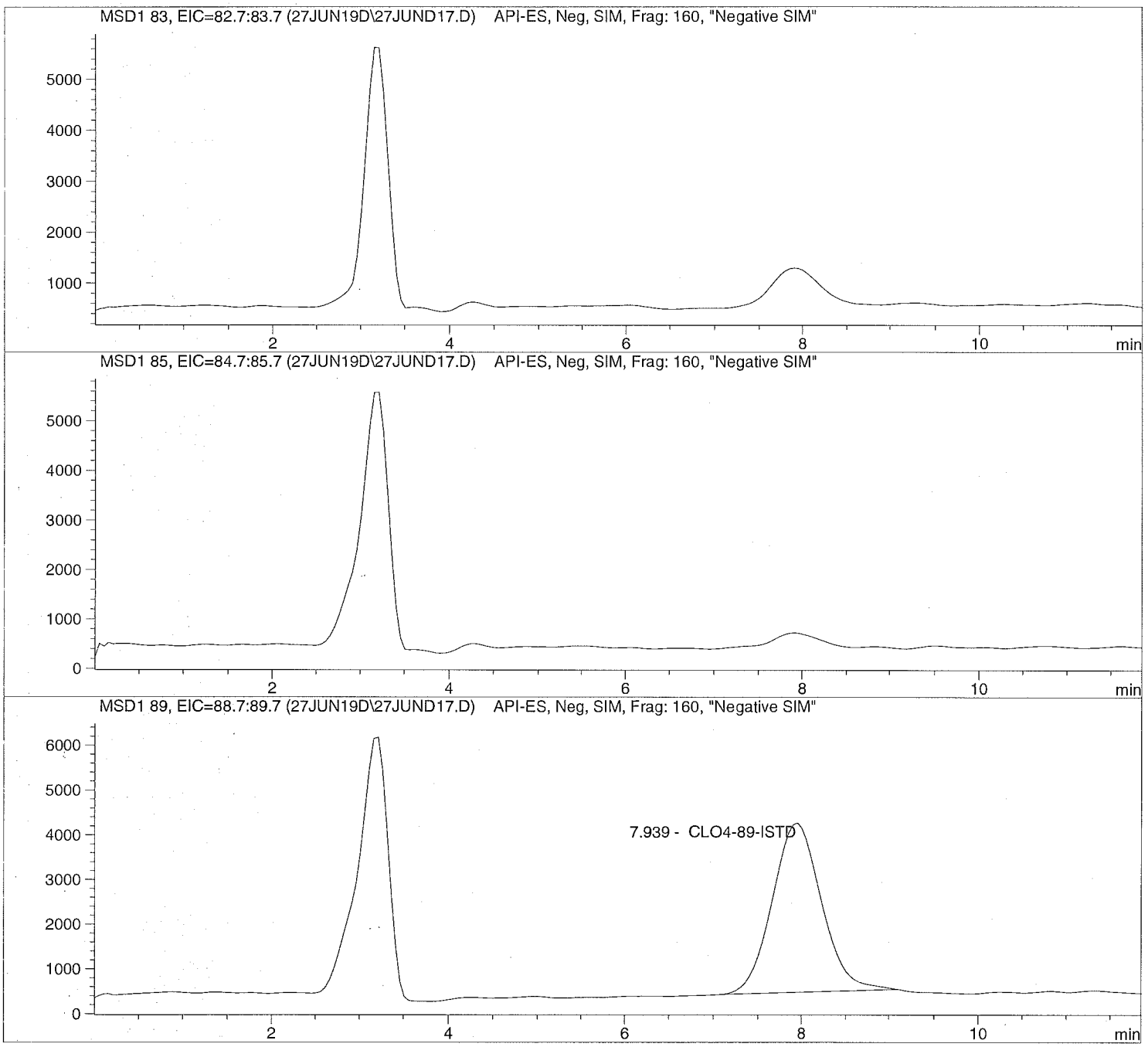
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND17.D Sample Name: 1917672004

Injection Date:	6/27/2019 12:29:33	Seq Line:	17
Sample Name:	1917672004	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND17.D Sample Name: 1917672004

Injection Date:	6/27/2019 12:29:33	Seq Line:	17
Sample Name:	1917672004	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
7.939	BBA	147927.7	5.0000	CLO4-89-ISTD

*** End of Report ***

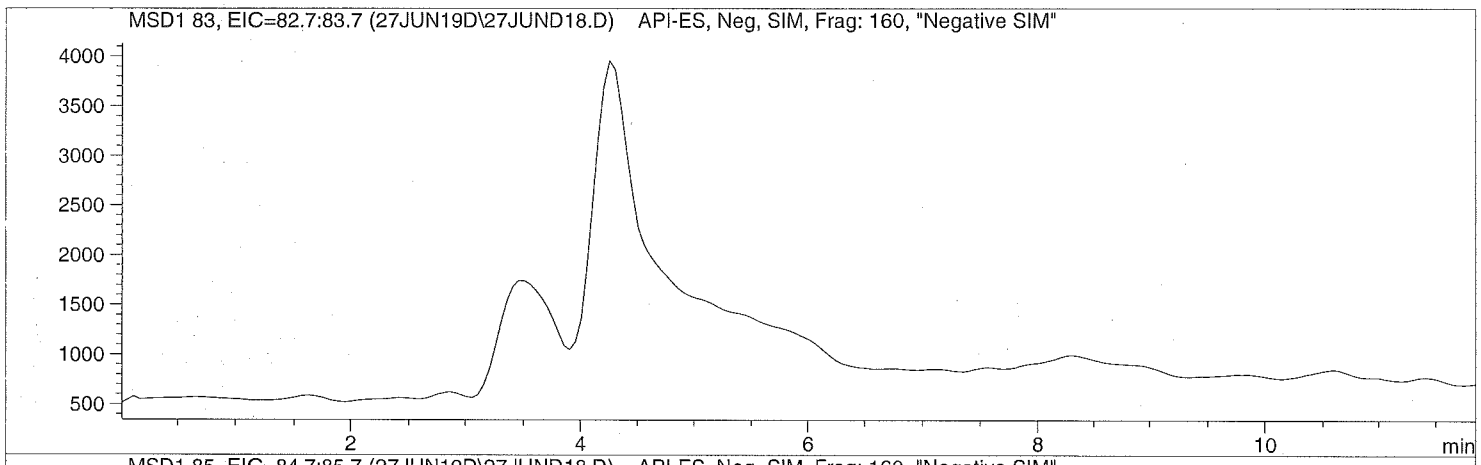
RIGHT SOLUTIONS | RIGHT PARTNER

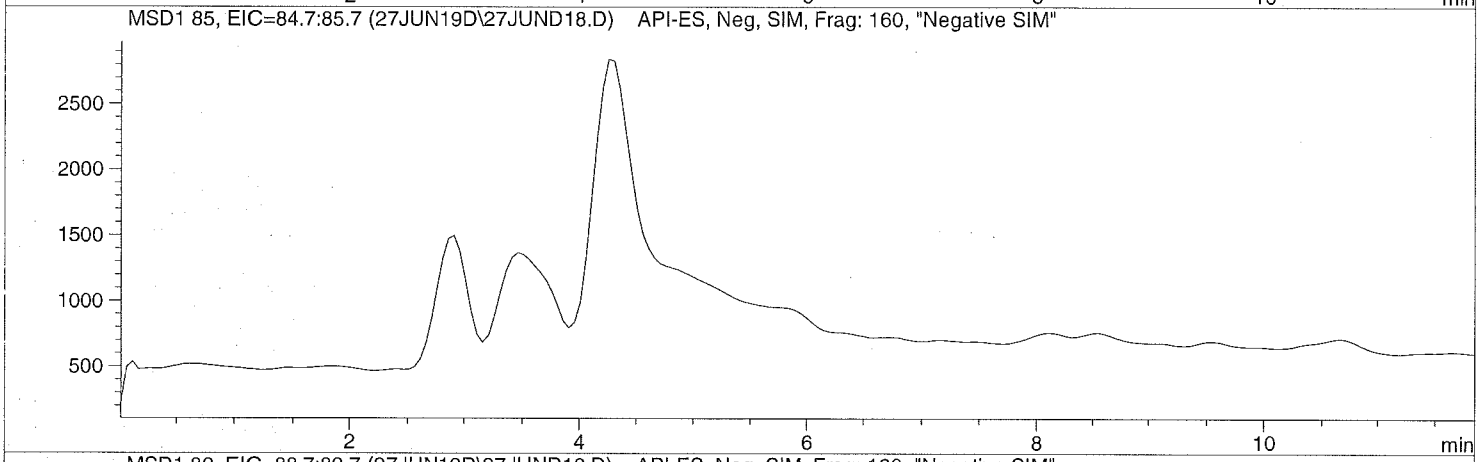
Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND18.D Sample Name: 1917672005

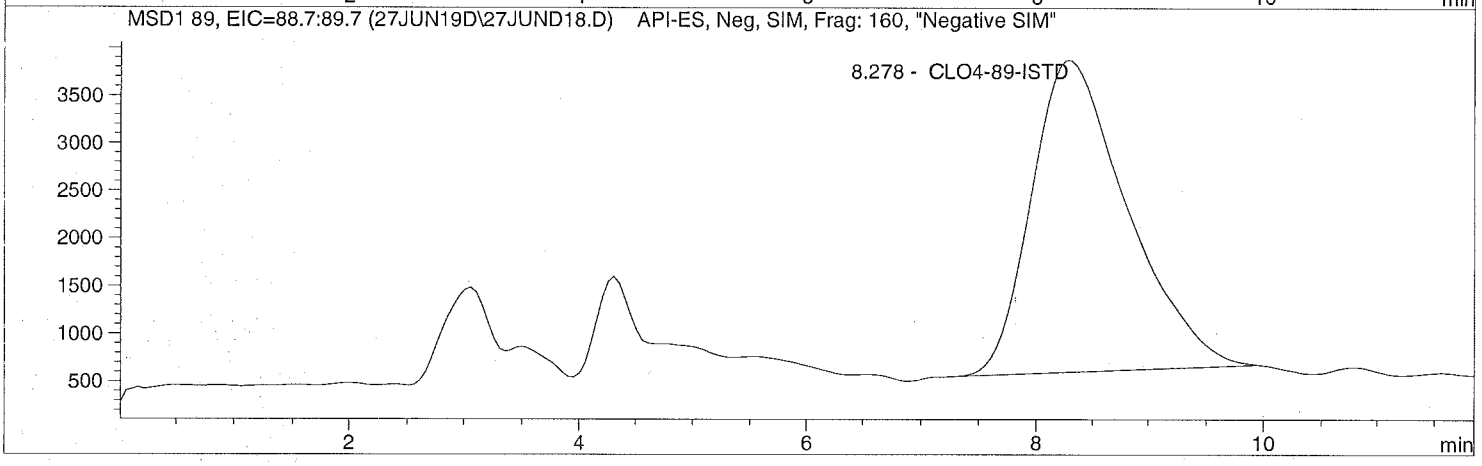
Injection Date:	6/27/2019 12:43:25	Seq Line:	18
Sample Name:	1917672005	Location:	Vial 87
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







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Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND18.D Sample Name: 1917672005

Injection Date:	6/27/2019 12:43:25	Seq Line:	18
Sample Name:	1917672005	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-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.278	PBA	193450.5	5.0000	CLO4-89-ISTD

*** End of Report ***

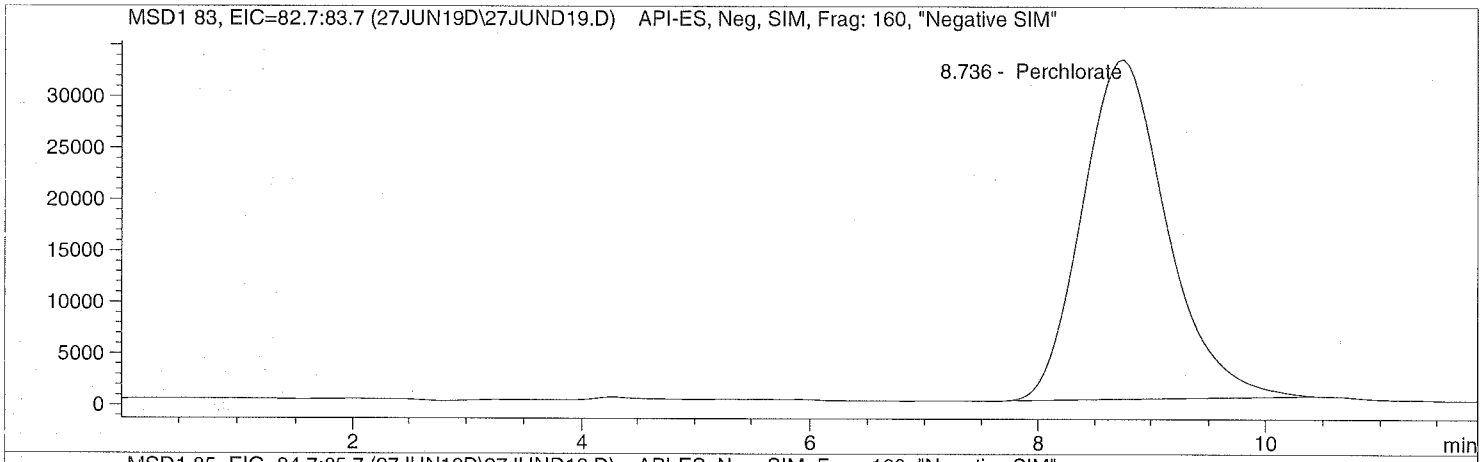
RIGHT SOLUTIONS | RIGHT PARTNER

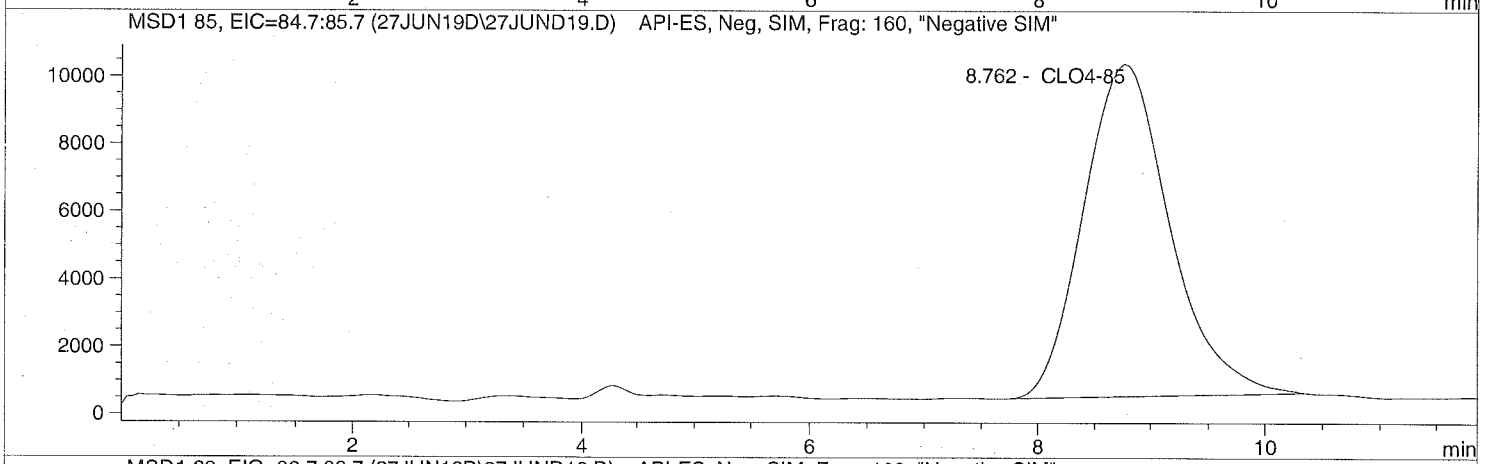
Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND19.D Sample Name: 1917672006 100

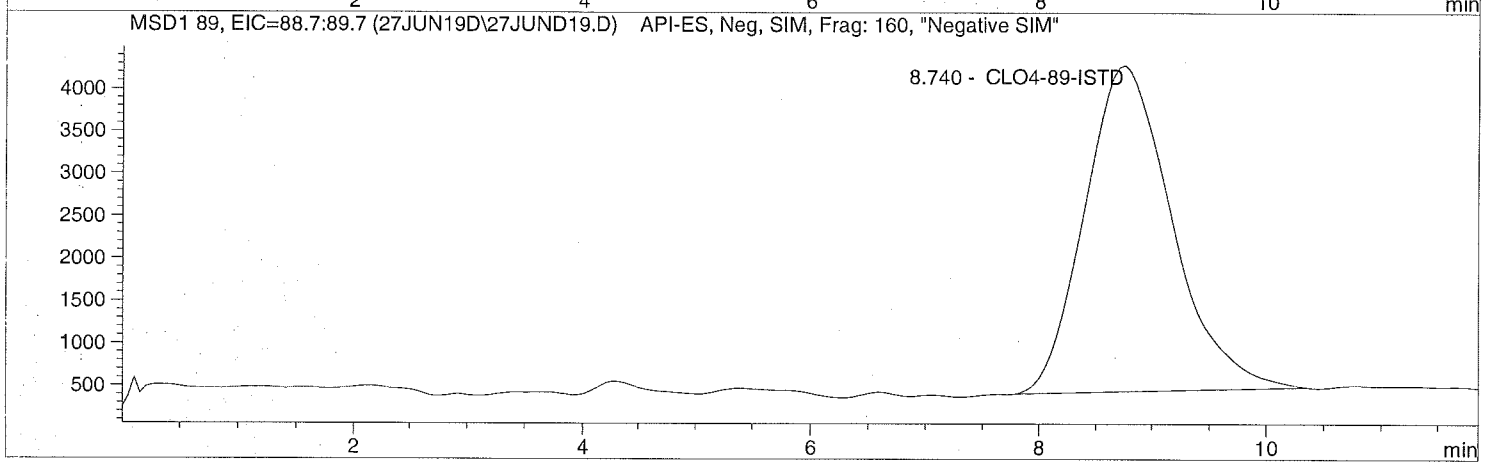
Injection Date:	6/27/2019 12:57:19	Seq Line:	19
Sample Name:	1917672006 100	Location:	Vial 88
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







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Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND19.D Sample Name: 1917672006 100

Injection Date:	6/27/2019 12:57:19	Seq Line:	19
Sample Name:	1917672006 100	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.736	PBA	1719861.8	2534.9645	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.762	PBA	521595.0	2587.4359	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.740	BBA	206241.0	500.0000	CLO4-89-ISTD

*** End of Report ***

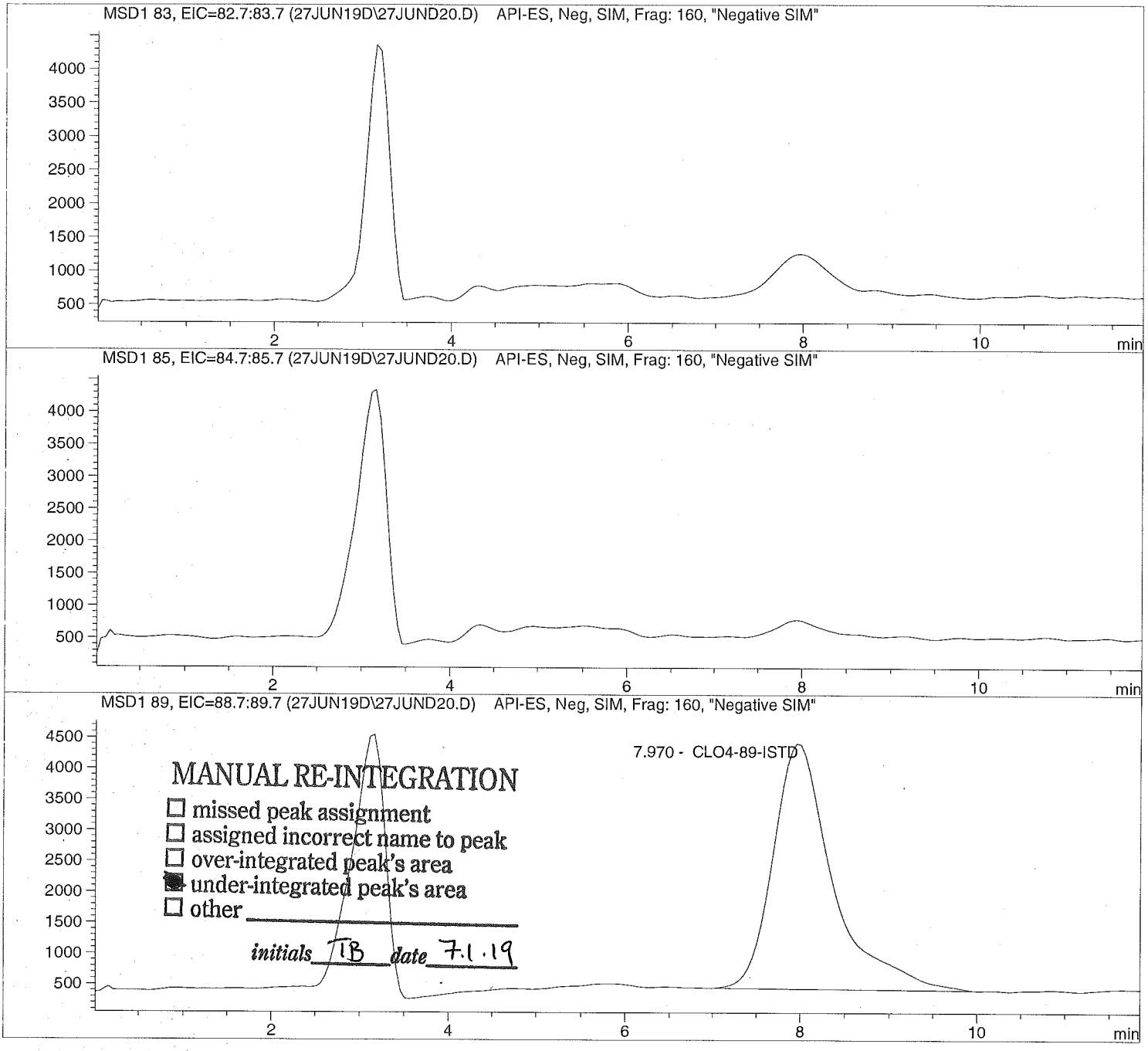
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Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND20.D Sample Name: 1917672007

Injection Date:	6/27/2019 13:11:15	Seq Line:	20
Sample Name:	1917672007	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



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Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND20.D Sample Name: 1917672007

Injection Date:	6/27/2019 13:11:15	Seq Line:	20
Sample Name:	1917672007	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
7.970	MM	187343.8	5.0000	CLO4-89-ISTD

*** End of Report ***

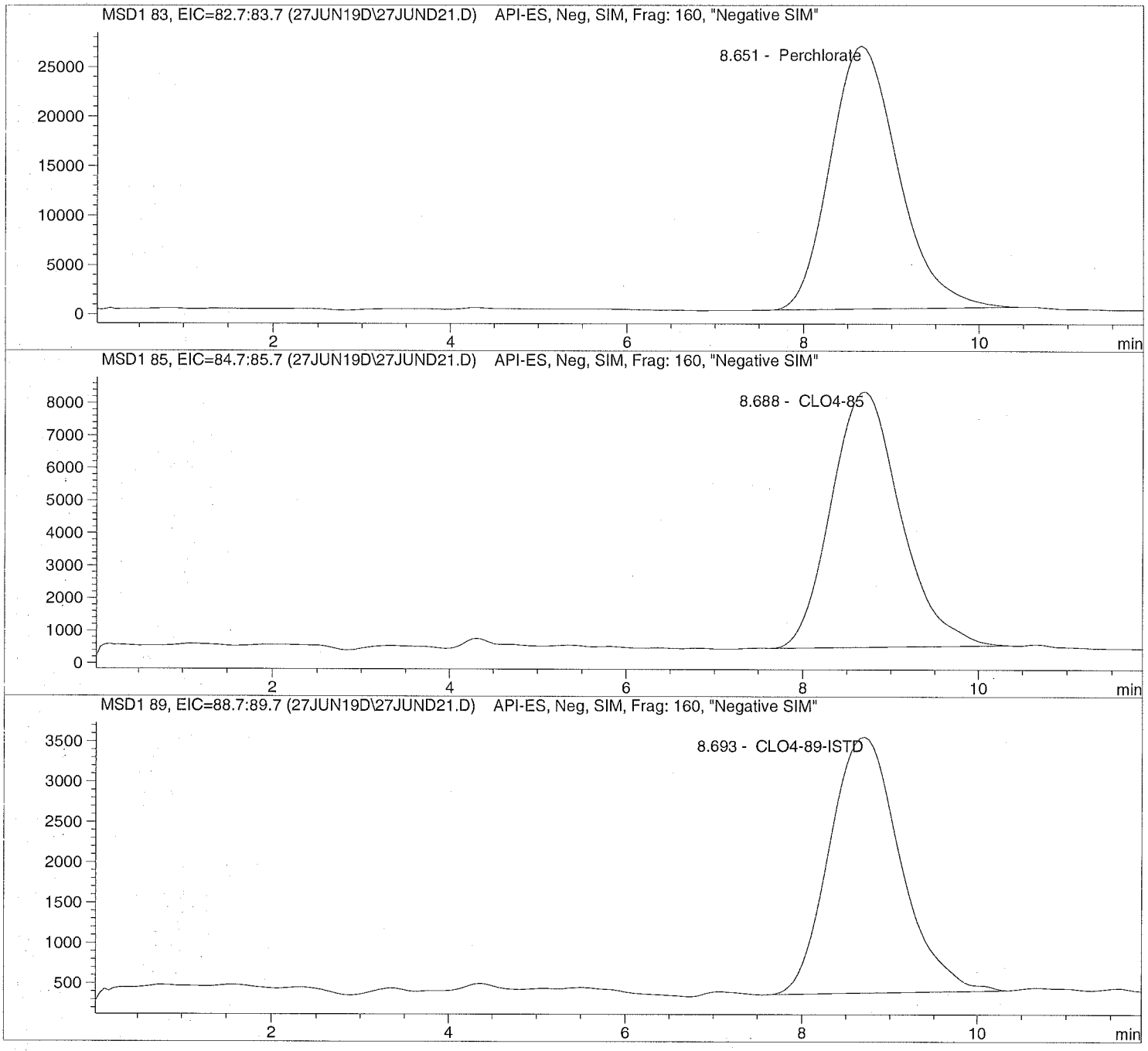
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Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND21.D Sample Name: 660897 CCV@25

Injection Date:	6/27/2019 13:28:58	Seq Line:	21
Sample Name:	660897 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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



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Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND21.D Sample Name: 660897 CCV@25

Injection Date:	6/27/2019 13:28:58	Seq Line:	21
Sample Name:	660897 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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.651	PBA	1425160.6	24.4244	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.688	PBA	430117.7	24.8091	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.693	PBA	177769.0	5.0000	CLO4-89-ISTD

*** End of Report ***

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ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Initial Calibration

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Calibration Table

Perchlorate

Calib. Data Modified : 3/19/2019 2:35:19 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
8.744	1	1	1.00000	7.76074e4	1.28854e-5		1	Perchlorate
		2	2.00000	1.35273e5	1.47849e-5			
		3	5.00000	3.37764e5	1.48033e-5			
		4	10.00000	6.83454e5	1.46316e-5			
		5	25.00000	2.08433e6	1.19943e-5			
		6	50.00000	4.13334e6	1.20968e-5			
		7	75.00000	5.99313e6	1.25143e-5			
8.755	2	1	1.00000	2.36780e4	4.22333e-5		1	CLO4-85
		2	2.00000	4.69486e4	4.25998e-5			
		3	5.00000	1.06124e5	4.71147e-5			
		4	10.00000	2.13523e5	4.68335e-5			
		5	25.00000	6.14295e5	4.06971e-5			
		6	50.00000	1.19814e6	4.17315e-5			
		7	75.00000	1.78355e6	4.20509e-5			
8.766	3	1	5.00000	2.73208e5	1.83011e-5	+I1		CLO4-89-ISTD
		2	5.00000	2.24886e5	2.22335e-5			
		3	5.00000	2.33196e5	2.14412e-5			
		4	5.00000	2.34454e5	2.13262e-5			
		5	5.00000	2.50568e5	1.99547e-5			
		6	5.00000	2.30977e5	2.16472e-5			

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RetTime [min]	Sig	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
		7	5.00000	2.21504e5	2.25729e-5			

More compound-specific settings:

Compound: Perchlorate
- Time Window : From 6.654 min To 12.544 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 0.5
  - Level 3 : 0.2
  - Level 4 : 0.1
  - Level 5 : 0.04
  - Level 6 : 0.02
  - Level 7 : 0.013333

Compound: CLO4-85
- Time Window : From 6.650 min To 12.505 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 0.5
  - Level 3 : 0.2
  - Level 4 : 0.1
  - Level 5 : 0.04
  - Level 6 : 0.02
  - Level 7 : 0.013333

Compound: CLO4-89-ISTD
- Time Window : From 6.659 min To 12.466 min
- Curve Type : Linear
- Origin : Included
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 1
  - Level 3 : 1
  - Level 4 : 1
  - Level 5 : 1
  - Level 6 : 1
  - Level 7 : 1

Peak Sum Table

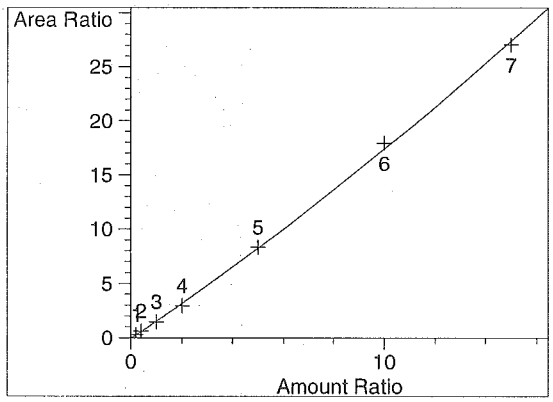
No Entries in table

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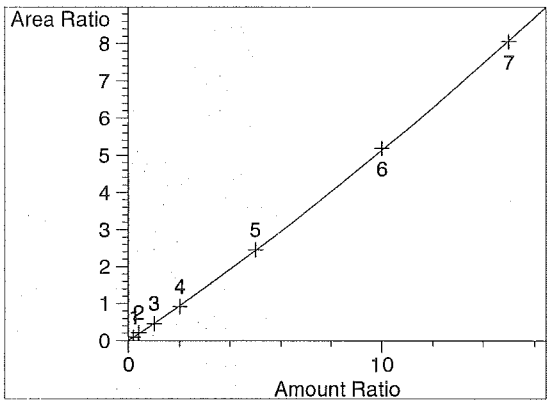
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Calibration Curves

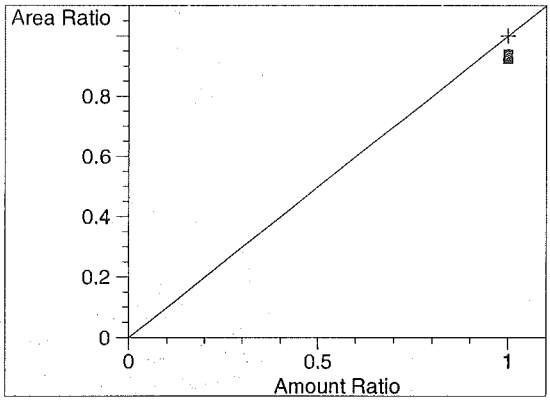
==========



Perchlorate at exp. RT: 8.744
MSD1 83, EIC=82.7:83.7
Correlation: 0.99957
Residual Std. Dev.: 0.30744
Formula: $y = ax^2 + bx + c$
a: 1.76988e-2
b: 1.56480
c: -4.92430e-2
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.5
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.013333



CLO4-85 at exp. RT: 8.755
MSD1 85, EIC=84.7:85.7
Correlation: 0.99983
Residual Std. Dev.: 0.03473
Formula: $y = ax^2 + bx + c$
a: 5.13396e-3
b: 4.62055e-1
c: 4.97209e-4
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.5
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.013333



CLO4-89-ISTD at exp. RT: 8.766
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 1 : 1
Level 2 : 1
Level 3 : 1
Level 4 : 1
Level 5 : 1
Level 6 : 1
Level 7 : 1

==========

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Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP2.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	7.76074e4	8.744	1.06245
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	1.35273e5	8.992	2.06969
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	3.37764e5	8.586	4.73474
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	6.83454e5	8.698	9.27727
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.08433e6	8.451	25.29036
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	4.13334e6	8.810	51.36844
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	5.99313e6	8.586	74.16754
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	7.34719e5	8.702	9.25940

#	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.36780e4	8.755	9.30535e-1
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	4.69486e4	9.012	2.24255
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	1.06124e5	8.602	4.86656
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.13523e5	8.713	9.64312
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	6.14295e5	8.468	25.12159
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	1.19814e6	8.825	50.46721
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	1.78355e6	8.603	74.72019
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.27495e5	8.721	9.54024

#	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	2.73208e5	8.766	5.00000
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	2.24886e5	9.012	5.00000
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	2.33196e5	8.609	5.00000
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.34454e5	8.716	5.00000
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.50568e5	8.472	5.00000
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	2.30977e5	8.825	5.00000
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	2.21504e5	8.610	5.00000
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.52544e5	8.725	5.00000

*** End of Report ***

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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 80	ICAL Verf@10ug/L	CLO4-AQN	1	Ctrl Samp		

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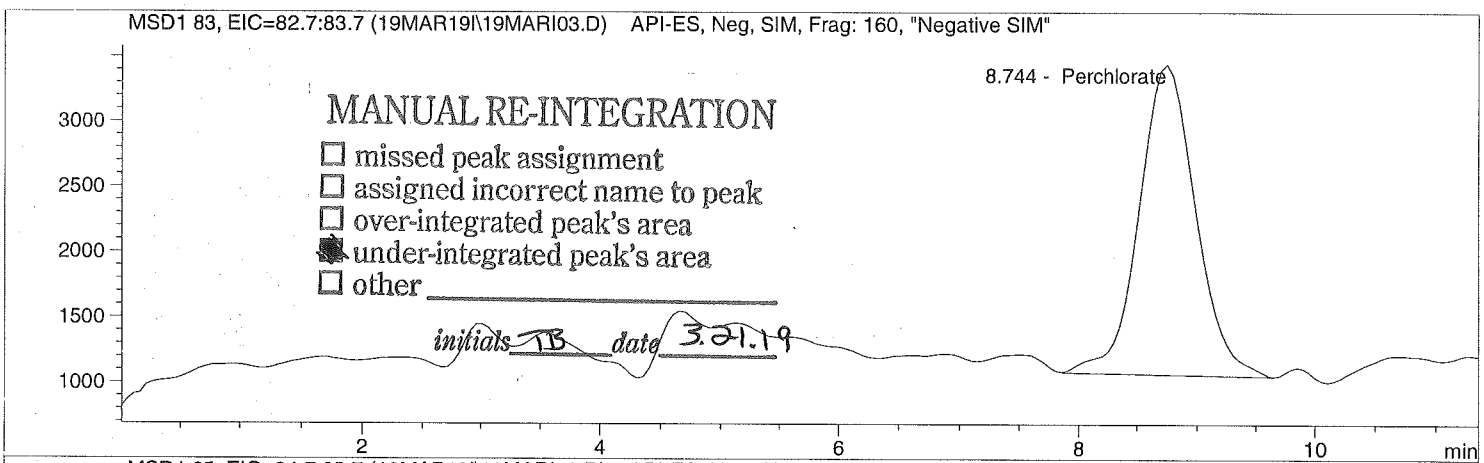
00940270

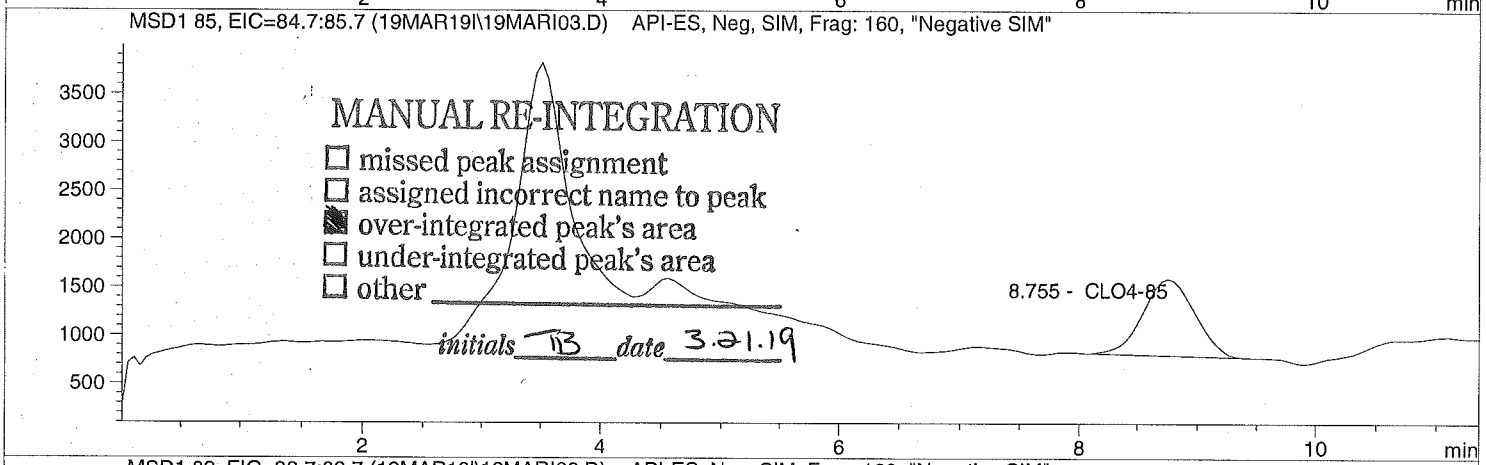
Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

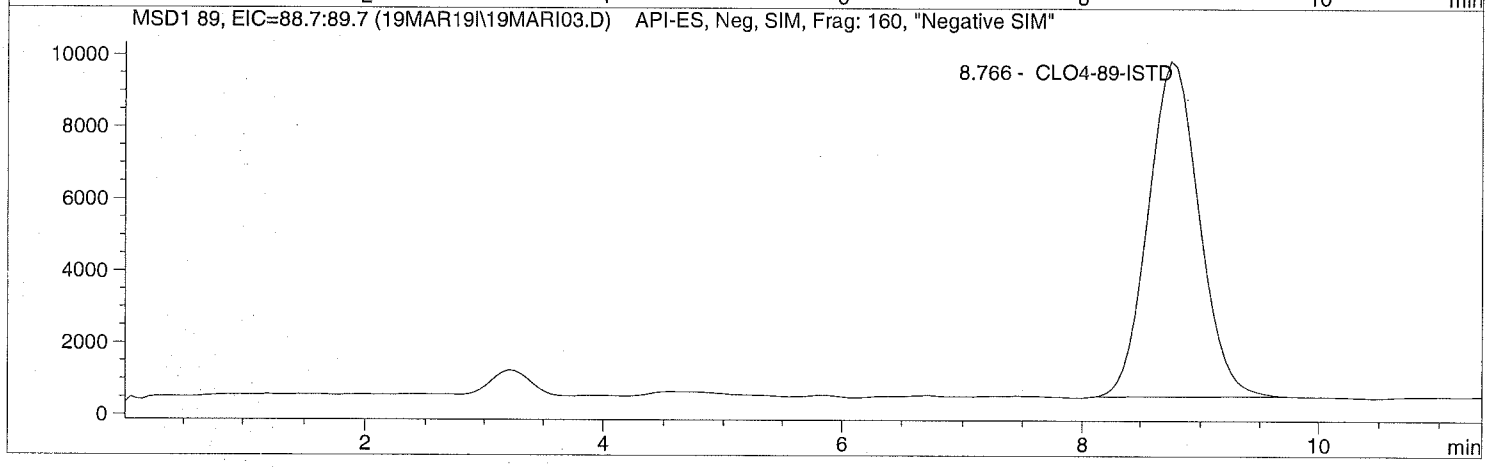
Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 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
8.744	MM	77607.4	1.0625	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	MM	23678.0	0.9305	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

*** End of Report ***

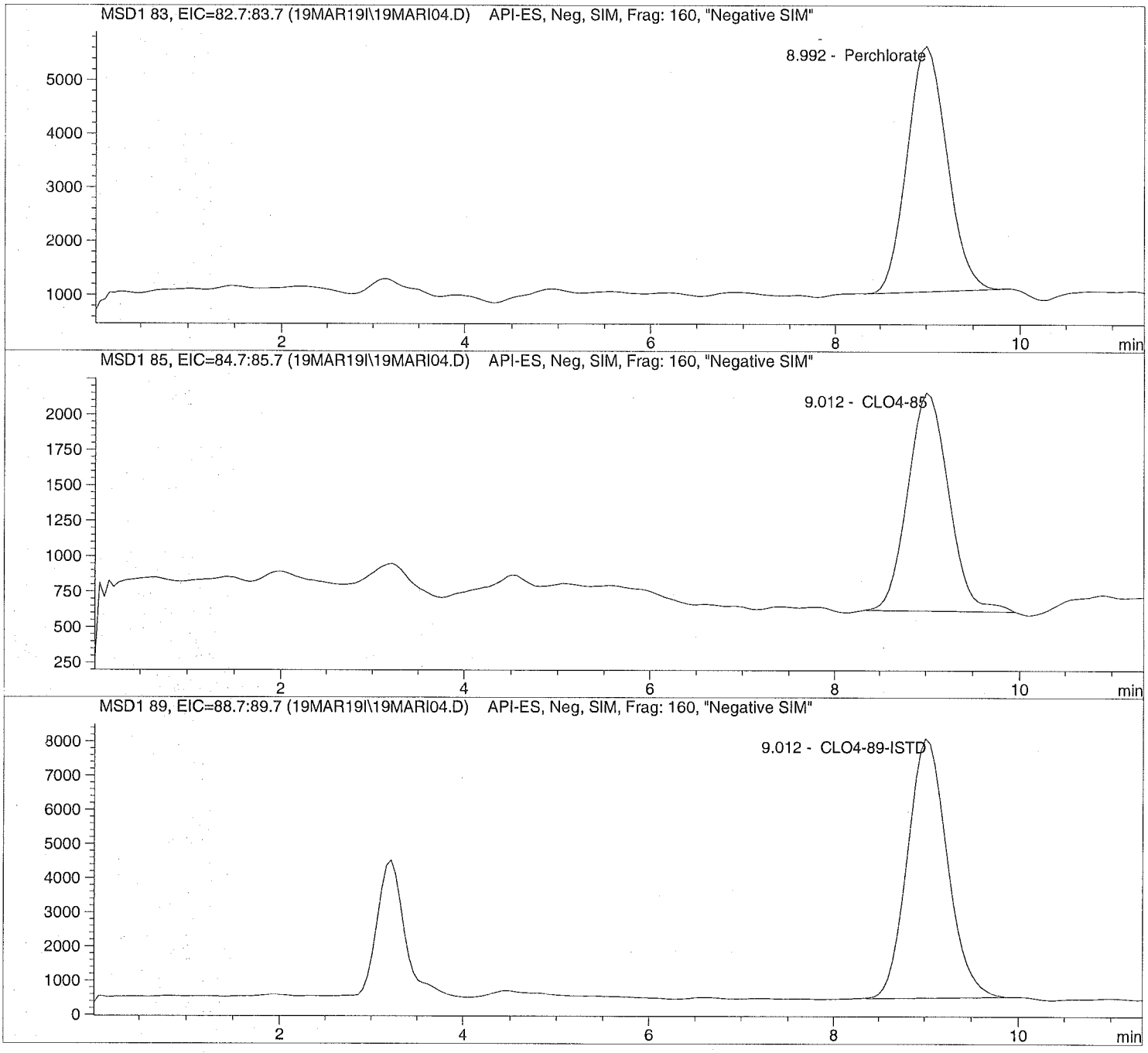
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	3/19/2019 09:53:00	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	3/19/2019 09:53:00	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 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
8.992	BBA	135272.8	2.0697	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	46948.6	2.2425	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	224885.9	5.0000	CLO4-89-ISTD

*** End of Report ***

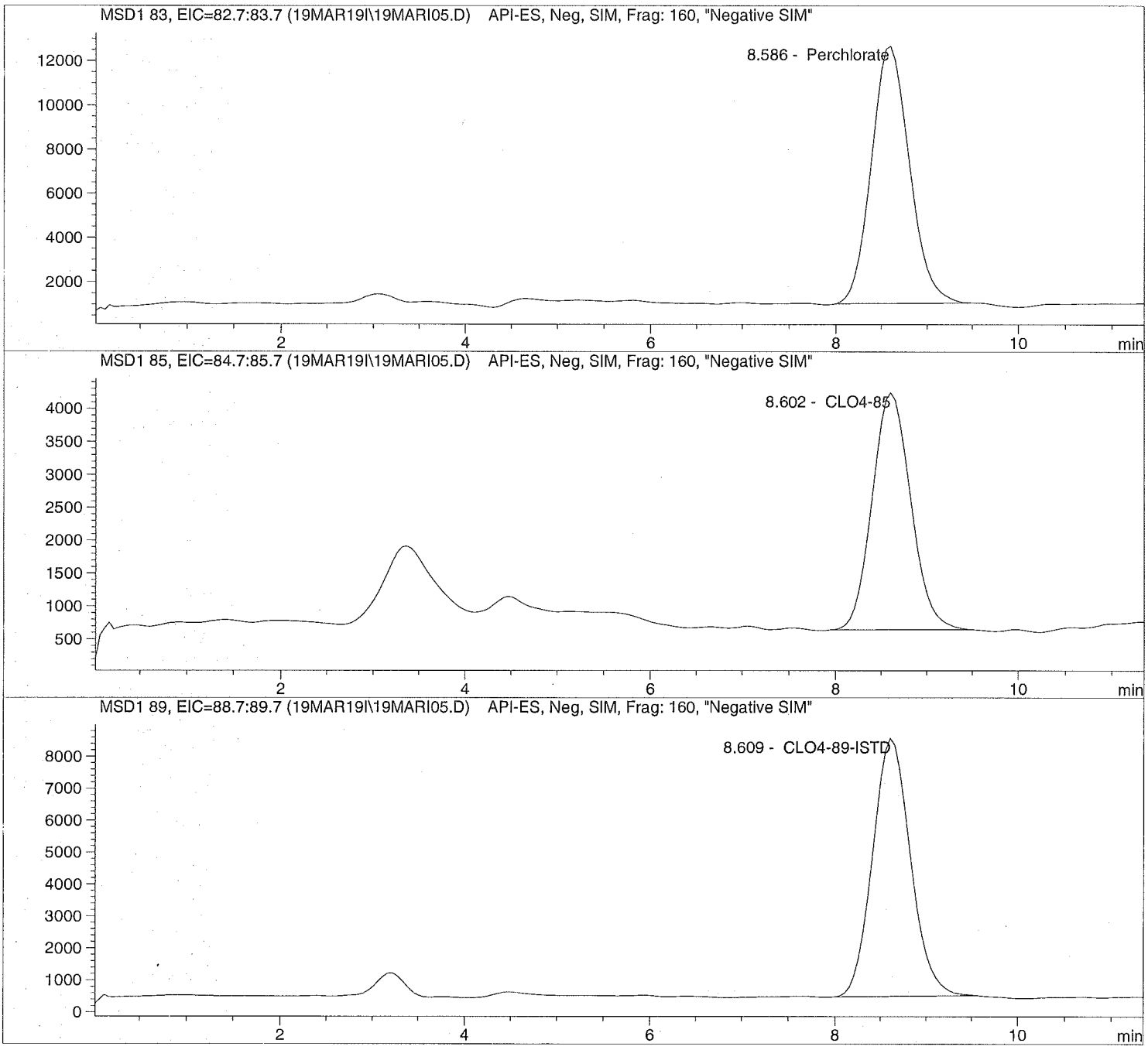
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	3/19/2019 10:06:16	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	3/19/2019 10:06:16	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 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
8.586	PBA	337763.6	4.7347	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.602	PBA	106124.0	4.8666	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.609	PBA	233196.3	5.0000	CLO4-89-ISTD

*** End of Report ***

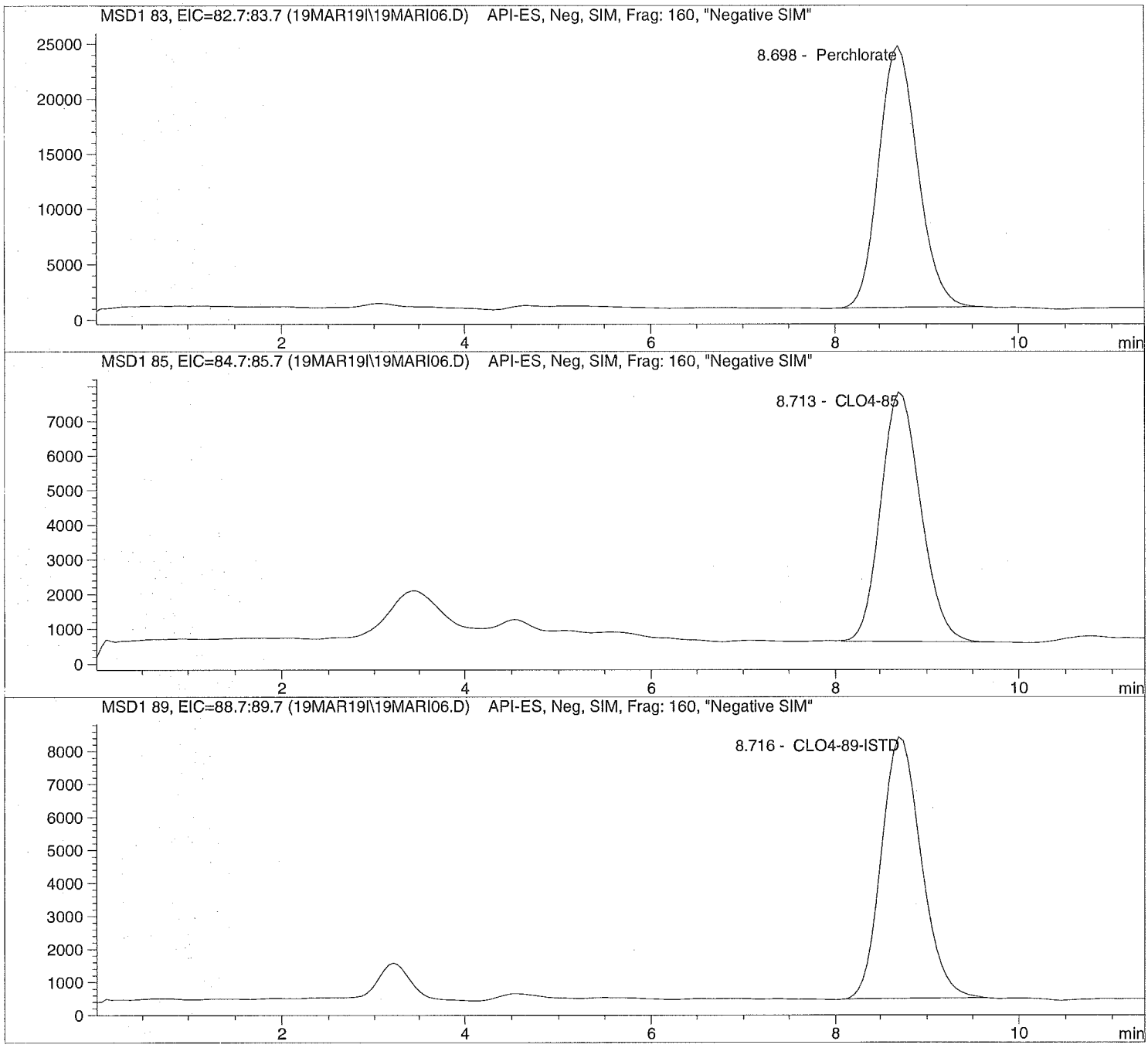
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	3/19/2019 10:19:32	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	3/19/2019 10:19:32	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 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
8.698	PBA	683454.4	9.2773	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.713	BBA	213522.6	9.6431	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.716	PBA	234453.6	5.0000	CLO4-89-ISTD

*** End of Report ***

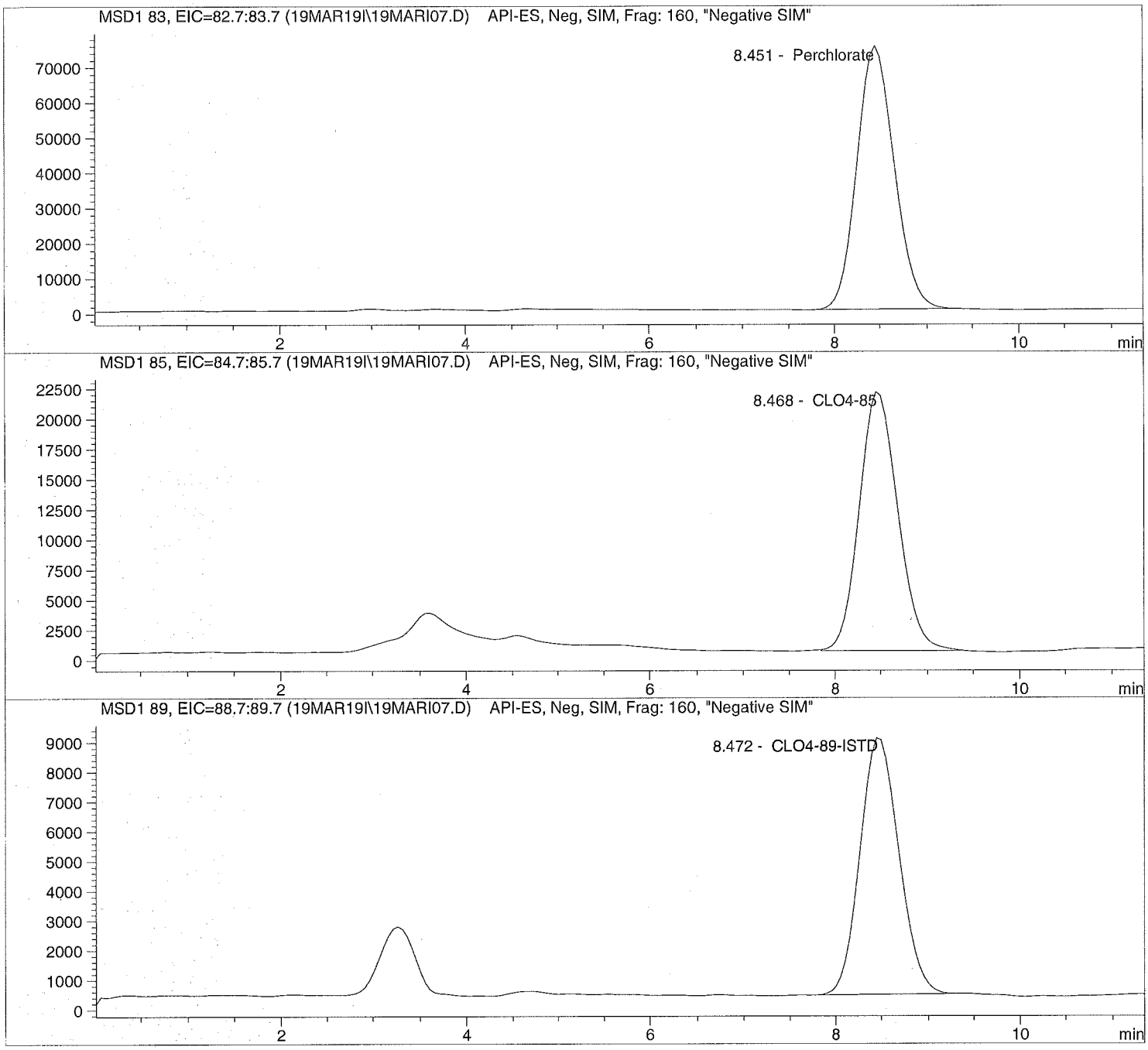
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	3/19/2019 10:32:49	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	3/19/2019 10:32:49	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 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
8.451	PBA	2084327.4	25.2904	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.468	BBA	614294.8	25.1216	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.472	BBA	250568.0	5.0000	CLO4-89-ISTD

*** End of Report ***

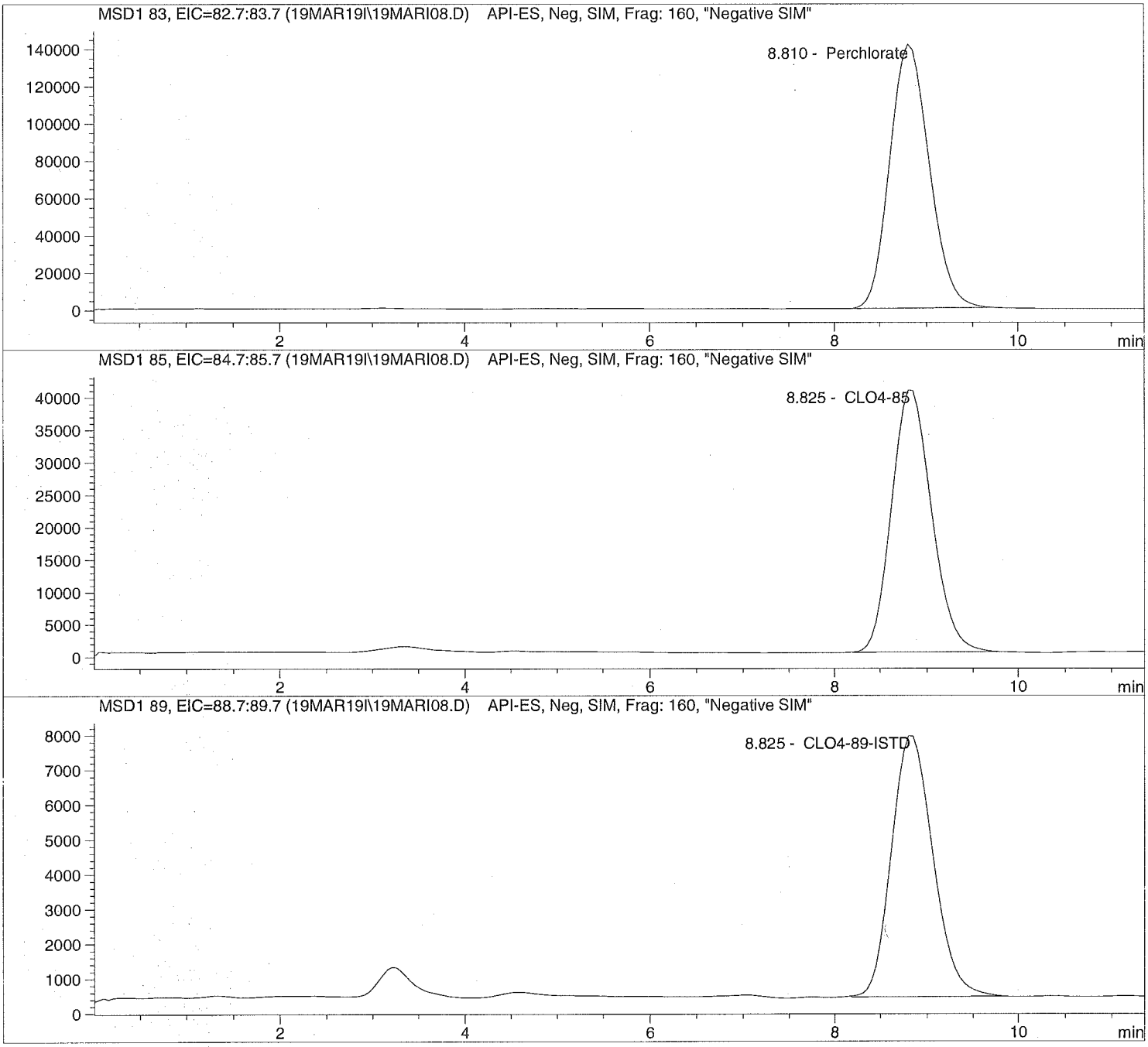
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	3/19/2019 10:46:05	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	3/19/2019 10:46:05	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 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
8.810	PBA	4133340.5	51.3684	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	1198135.6	50.4672	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	230976.7	5.0000	CLO4-89-ISTD

*** End of Report ***

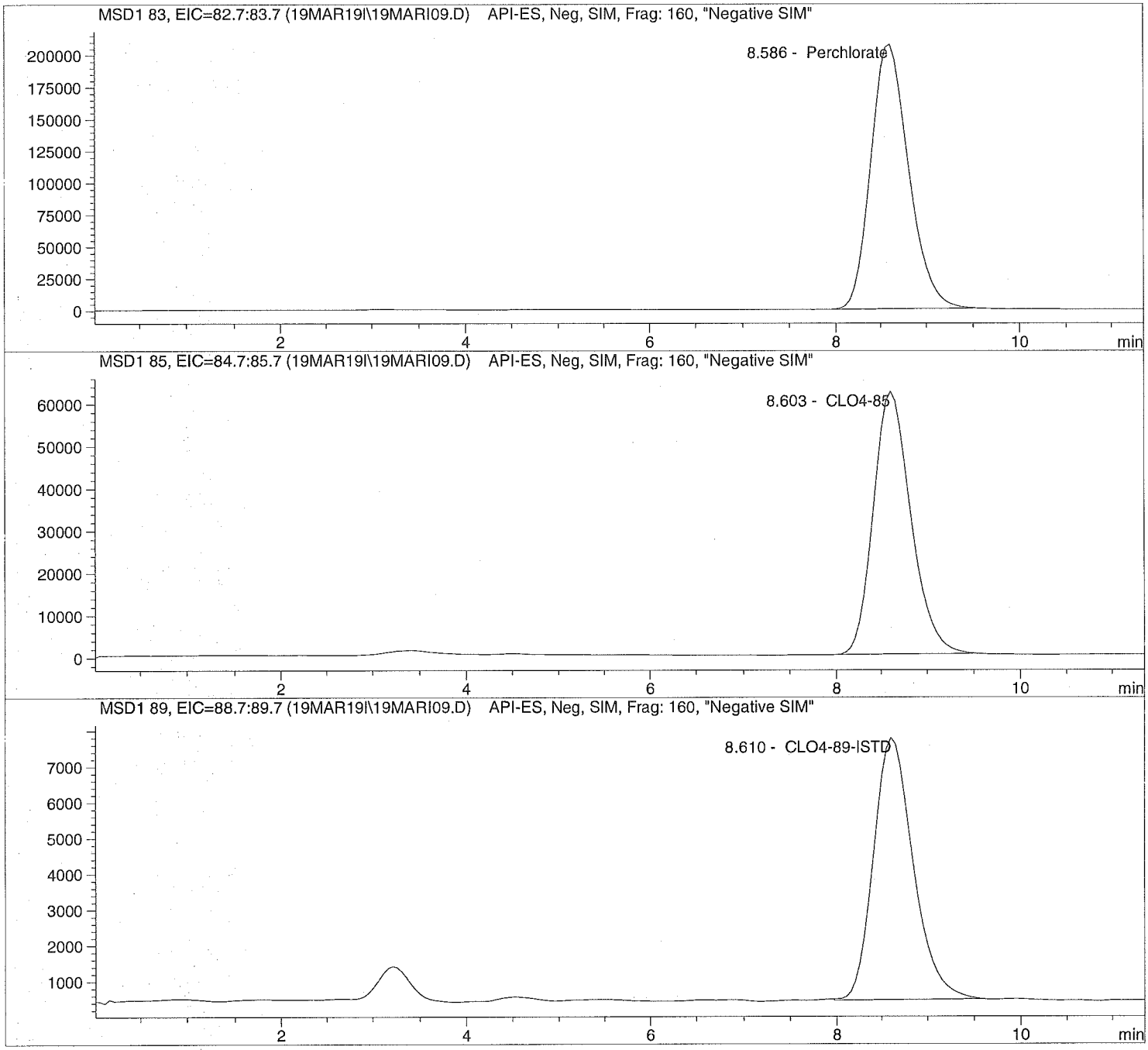
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	3/19/2019 10:59:22	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	3/19/2019 10:59:22	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 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
8.586	PBA	5993128.0	74.1675	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.603	PBA	1783554.4	74.7202	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.610	BBA	221504.5	5.0000	CLO4-89-ISTD

*** End of Report ***

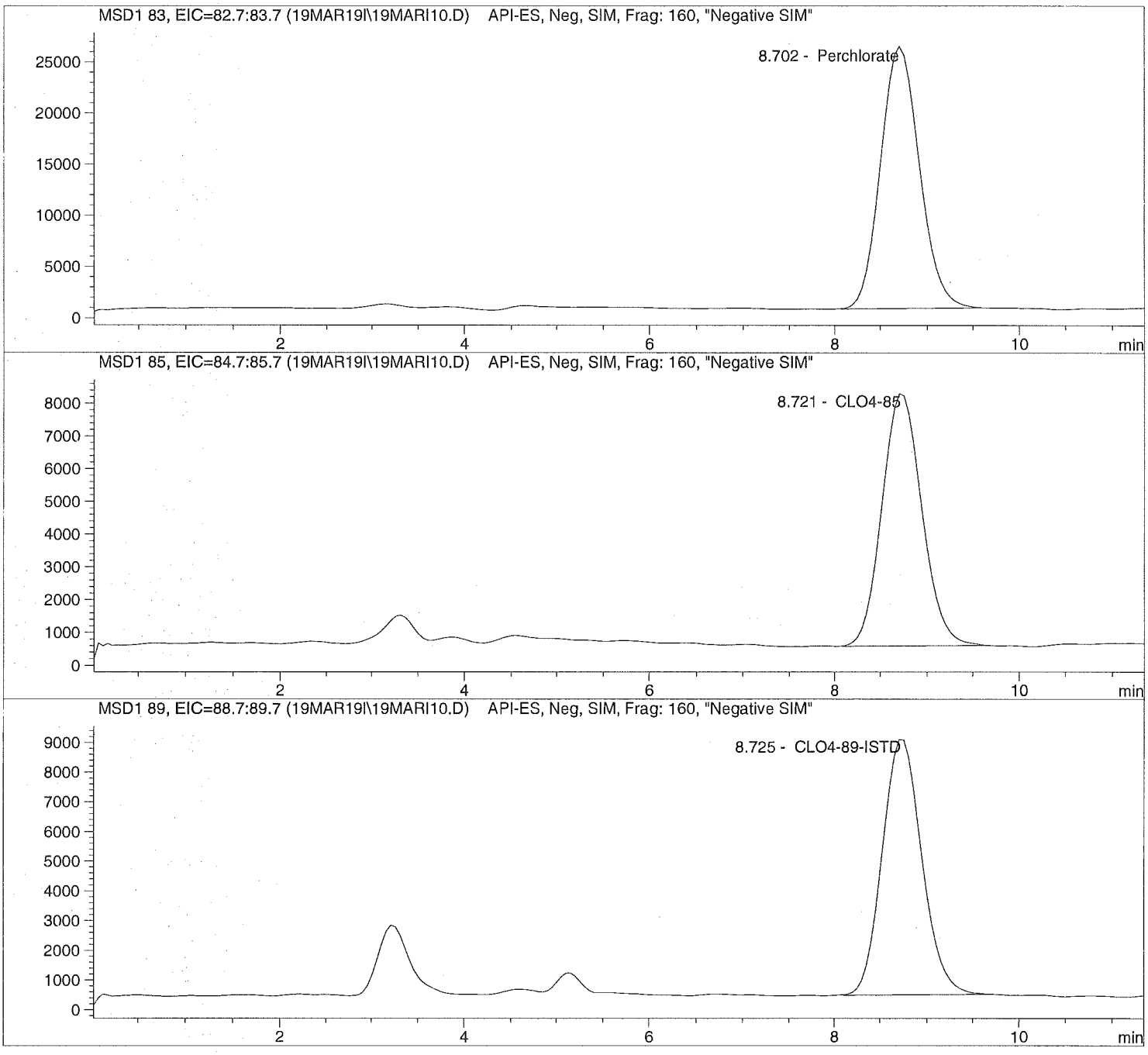
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L

Injection Date:	3/19/2019 11:12:42	Seq Line:	10
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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L

Injection Date:	3/19/2019 11:12:42	Seq Line:	10
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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 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
8.702	PBA	734718.7	9.2594	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.721	PBA	227494.7	9.5402	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.725	BBA	252544.4	5.0000	CLO4-89-ISTD

*** End of Report ***

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Unmodified

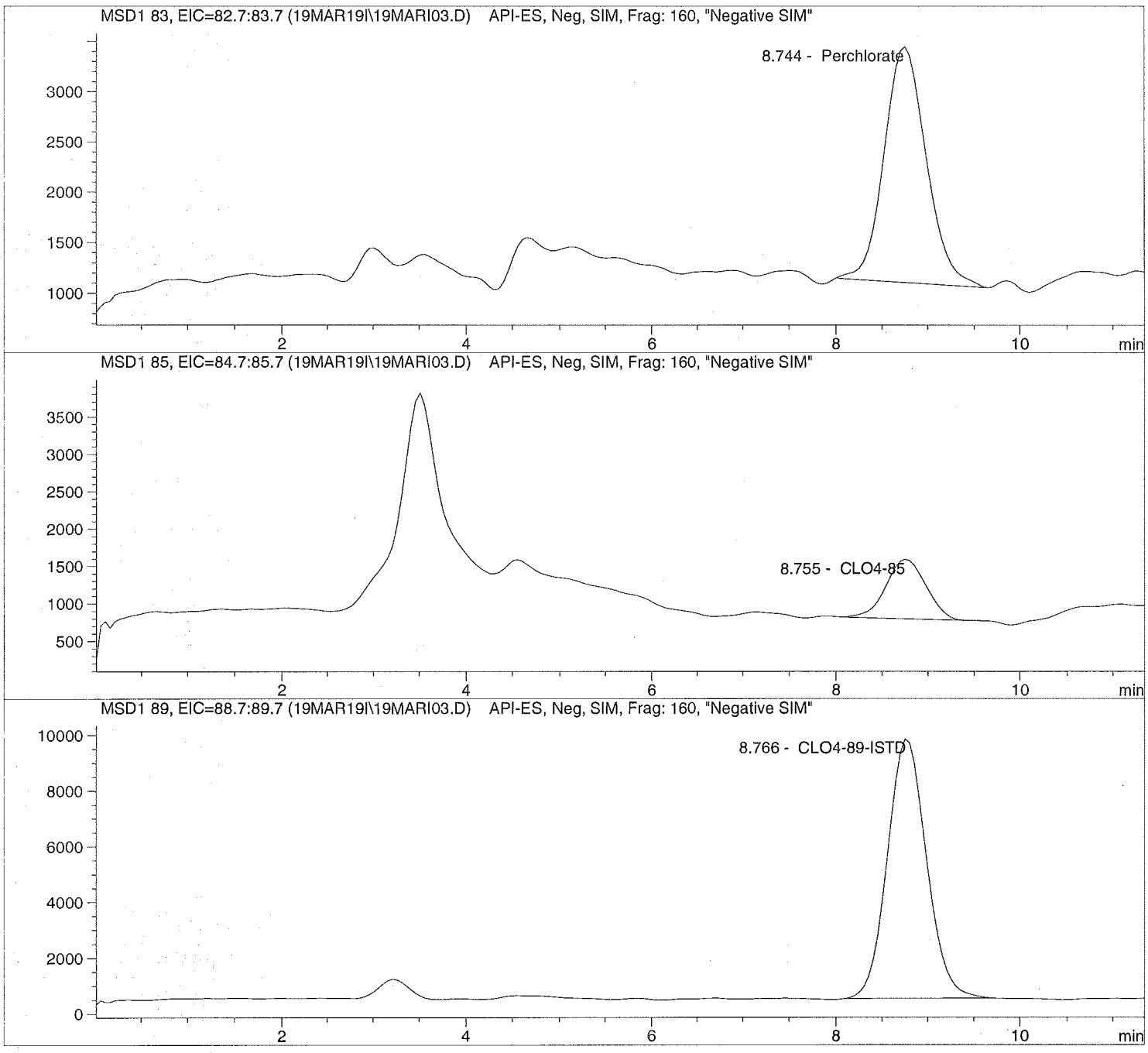
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	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-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	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-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 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
8.744	BBA	74166.3	1.0224	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	BBA	24138.1	0.9487	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

*** End of Report ***

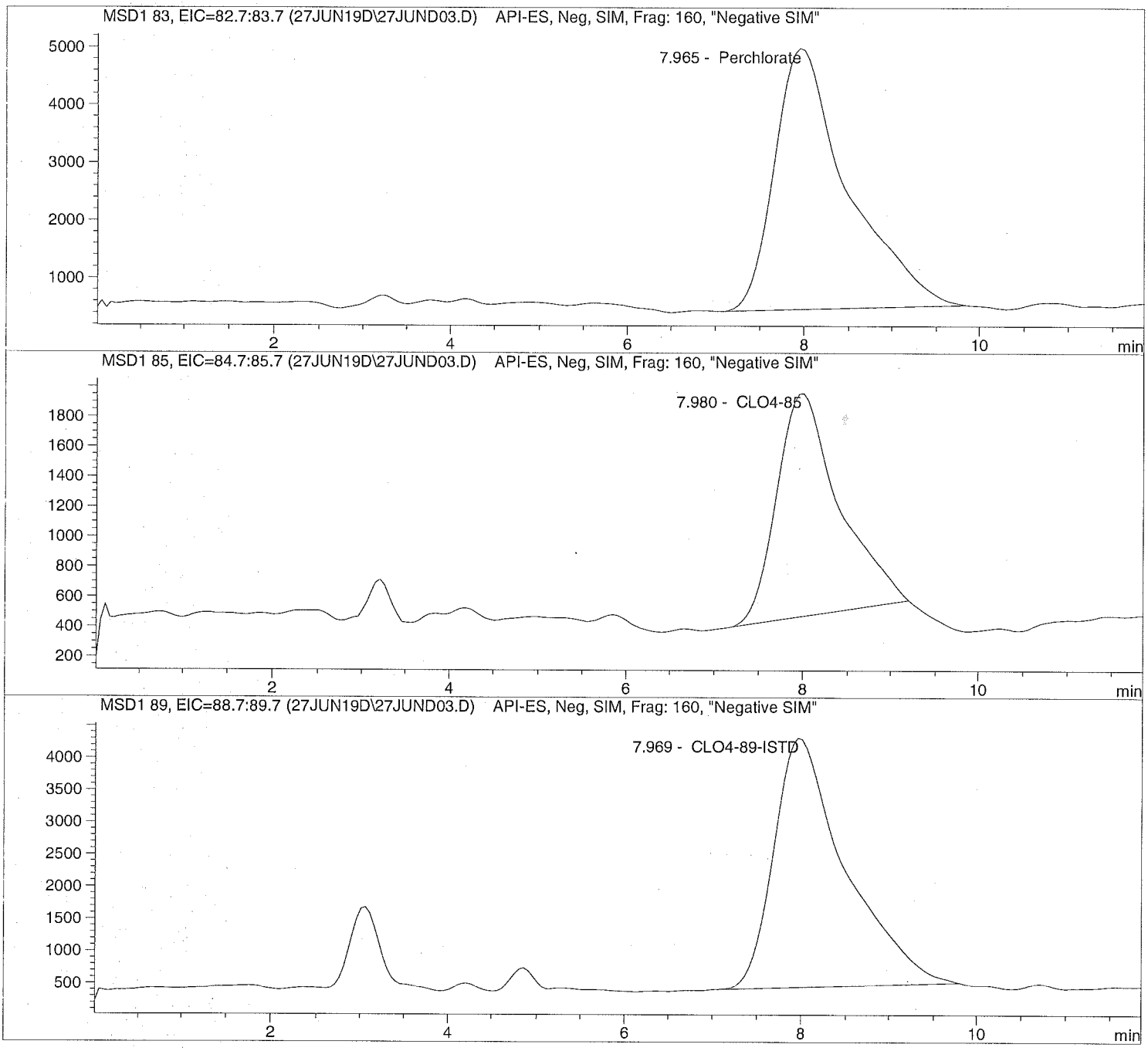
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND03.D Sample Name: 660891 ICS@4.0

Injection Date:	6/27/2019 09:14:16	Seq Line:	3
Sample Name:	660891 ICS@4.0	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND03.D Sample Name: 660891 ICS@4.0

Injection Date:	6/27/2019 09:14:16	Seq Line:	3
Sample Name:	660891 ICS@4.0	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.965	PBA	257330.2	3.9251	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.980	PBA	71973.3	3.5682	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.969	BBA	216232.2	5.0000	CLO4-89-ISTD

*** End of Report ***

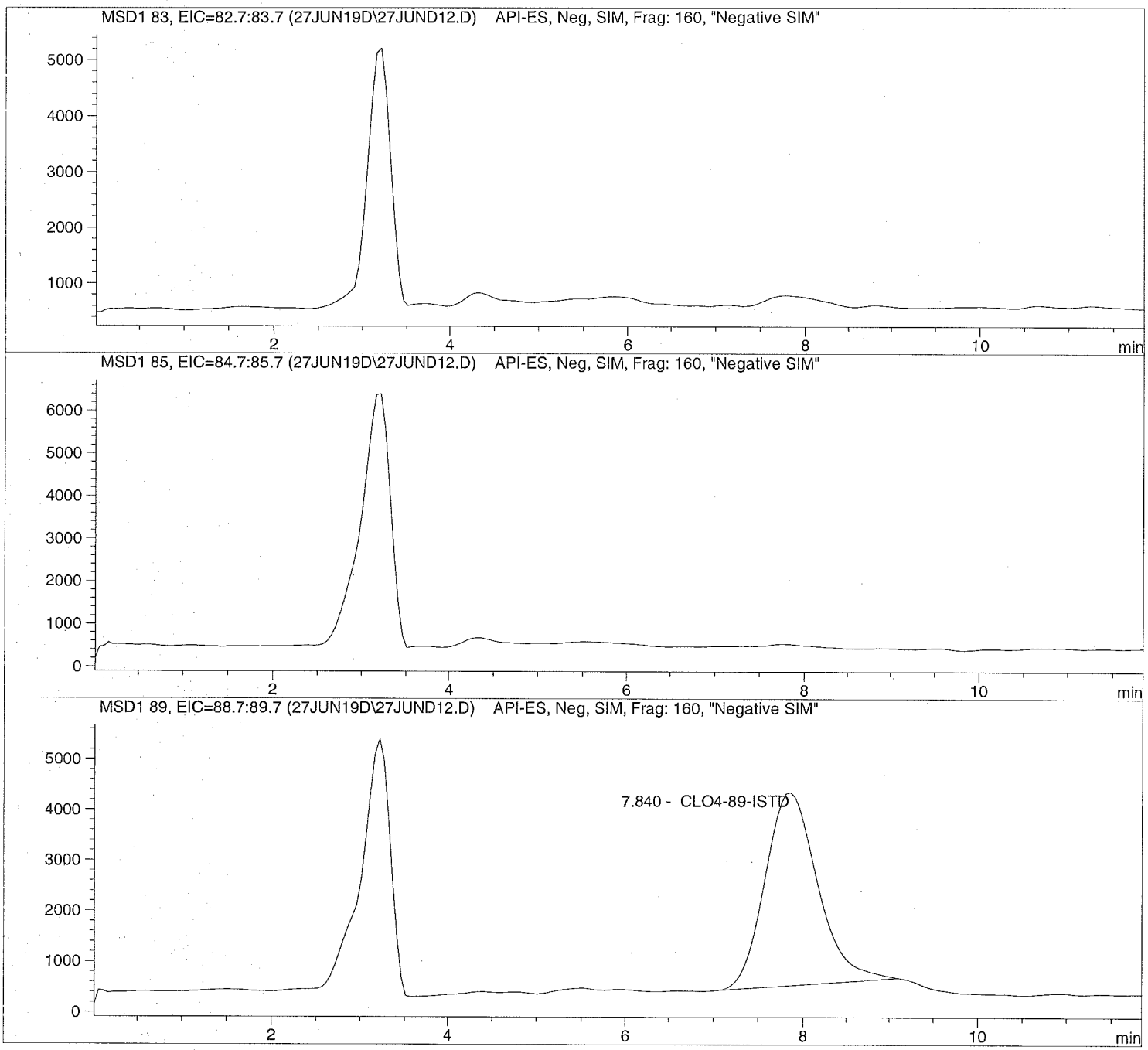
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND12.D Sample Name: 1917489005

Injection Date:	6/27/2019 11:20:03	Seq Line:	12
Sample Name:	1917489005	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND12.D Sample Name: 1917489005

Injection Date:	6/27/2019 11:20:03	Seq Line:	12
Sample Name:	1917489005	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-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
7.840	PBA	156379.6	5.0000	CLO4-89-ISTD

*** End of Report ***

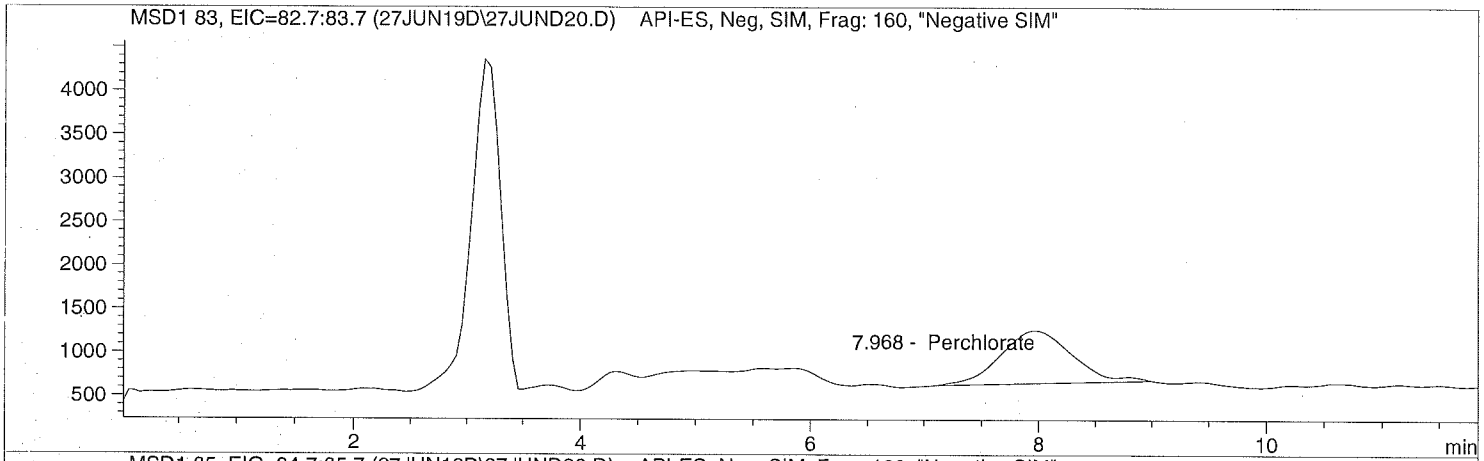
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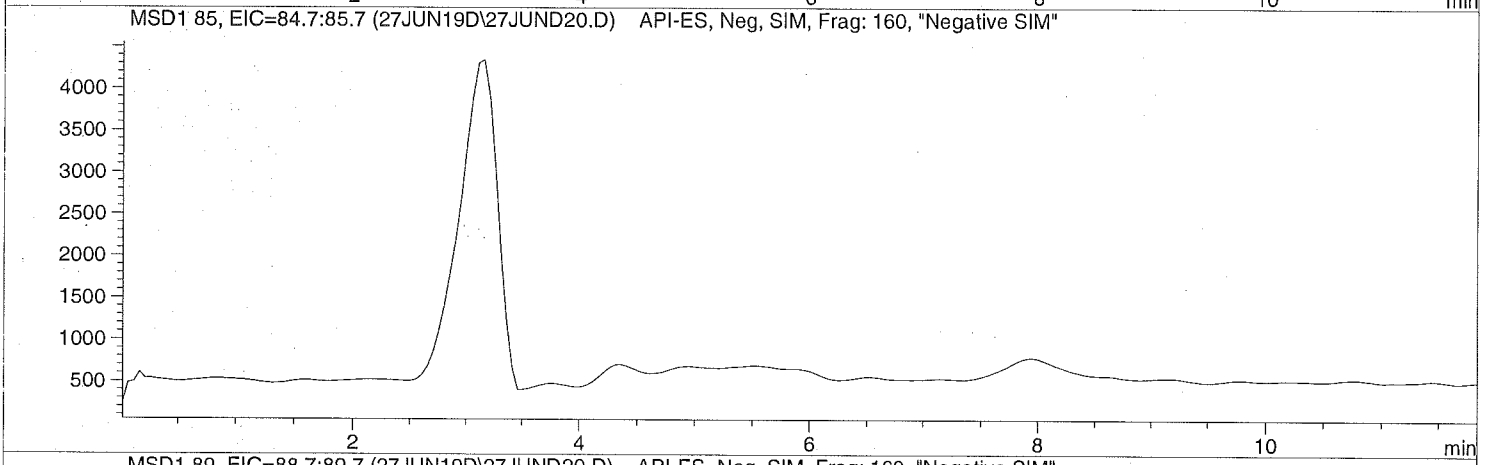
Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND20.D Sample Name: 1917672007

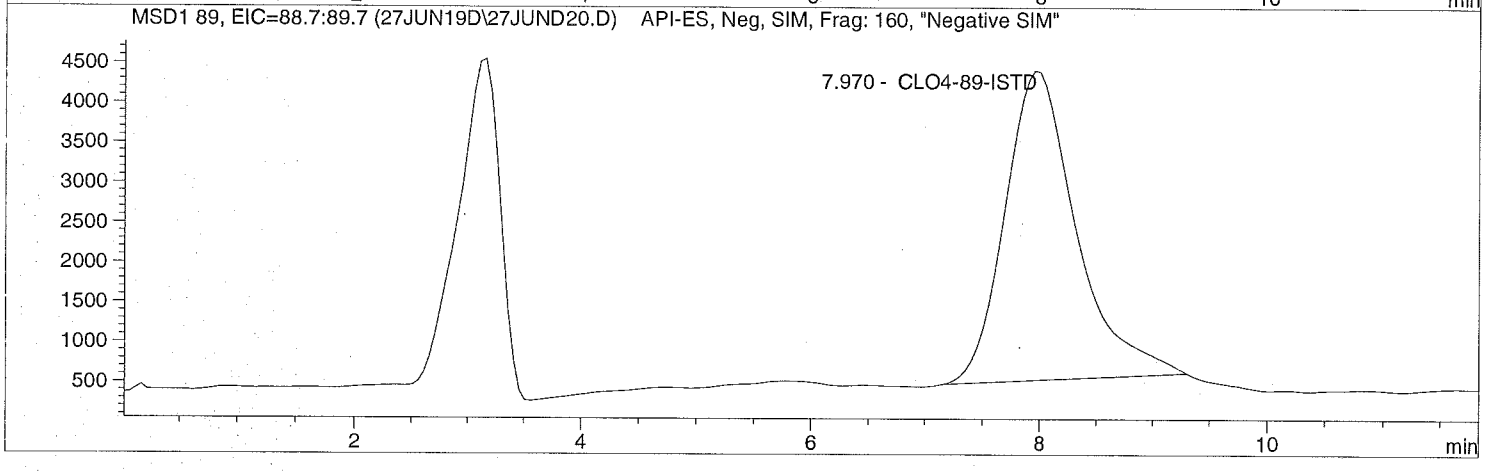
Injection Date:	6/27/2019 13:11:15	Seq Line:	20
Sample Name:	1917672007	Location:	Vial 89
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







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Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND20.D Sample Name: 1917672007

Injection Date:	6/27/2019 13:11:15	Seq Line:	20
Sample Name:	1917672007	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Fri, 12. Apr. 2019,07:52:58 am
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
7.968	PBA	26504.7	0.6583	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
7.970	PBA	168729.9	5.0000	CLO4-89-ISTD

*** End of Report ***

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Work Order: HS19060835

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19060835-01	18CPTMW22SW_061319	Groundwater		13-Jun-2019 10:30	14-Jun-2019 08:45	☐
HS19060835-02	18CPTMW22DW_061319	Groundwater		13-Jun-2019 11:20	14-Jun-2019 08:45	☐
HS19060835-03	18CPTMW22R_061319	Groundwater		13-Jun-2019 12:10	14-Jun-2019 08:45	☐
HS19060835-04	MW20_061319	Groundwater		13-Jun-2019 12:55	14-Jun-2019 08:45	☐
HS19060835-05	18CPTMW26SW_061319	Groundwater		13-Jun-2019 13:45	14-Jun-2019 08:45	☐

Revision:1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Work Order: HS19060835

CASE NARRATIVE

Work Order Comments

• Revised to correct the reporting limit for Mercury

Work Order Comments

• The analyses for Perchlorate was subcontracted to ALS Environmental in Salt Lake City, UT. Final Report attached.

GCMS Semivolatiles by Method SW8270SIM

Batch ID: 142169

Sample ID: LCSD-142169

• LCS/LCSD RPD recovered above the RPD limit. The individual recoveries met acceptance criteria (Surrogate 4-Terphenyl-d14)

GCMS Volatiles by Method SW8260

Batch ID: R341453

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

Metals by Method SW6020

Batch ID: 142427

Sample ID: HS19060986-04MS

• MS and MSD are for an unrelated sample

Metals by Method SW7470

Batch ID: 142083

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW22SW_061319
Collection Date: 13-Jun-2019 10:30

ANALYTICAL REPORT
WorkOrder:HS19060835
Lab ID:HS19060835-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 11:35
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 11:35
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 11:35
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 11:35
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 11:35
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 11:35
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 11:35
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 11:35
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 11:35
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 11:35
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 11:35
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 11:35
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 11:35
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 11:35
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 11:35
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 11:35
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 11:35
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 11:35
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 11:35
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 11:35
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 11:35
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	27-Jun-2019 11:35
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 11:35
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	27-Jun-2019 11:35
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 11:35
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 11:35
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	27-Jun-2019 11:35
Acetone	**3.4**		**0.40**	**1.0**	**2.0**	**UG/L**	1	27-Jun-2019 11:35
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 11:35
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 11:35
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 11:35
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 11:35
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 11:35
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 11:35
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	27-Jun-2019 11:35
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 11:35
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 11:35
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 11:35
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 11:35

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW22SW_061319
Collection Date: 13-Jun-2019 10:30

ANALYTICAL REPORT
WorkOrder:HS19060835
Lab ID:HS19060835-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 11:35
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 11:35
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	27-Jun-2019 11:35
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 11:35
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 11:35
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 11:35
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 11:35
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	27-Jun-2019 11:35
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 11:35
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	27-Jun-2019 11:35
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	27-Jun-2019 11:35
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 11:35
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 11:35
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 11:35
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 11:35
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 11:35
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 11:35
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 11:35
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 11:35
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 11:35
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 11:35
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 11:35
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 11:35
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 11:35
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 11:35
Surr: 1,2-Dichloroethane-d4	*103*			**0**	*81-118*	*%REC*	*1*	*27-Jun-2019 11:35*
Surr: 4-Bromofluorobenzene	*96.9*			**0**	*85-114*	*%REC*	*1*	*27-Jun-2019 11:35*
Surr: Dibromofluoromethane	*95.2*			**0**	*80-119*	*%REC*	*1*	*27-Jun-2019 11:35*
Surr: Toluene-d8	*100*			**0**	*89-112*	*%REC*	*1*	*27-Jun-2019 11:35*
SEMIVOLATILES SIM		**Method:SW8270SIM**				Prep:SW3510 / 19-Jun-2019		Analyst: LG
1,4-Dioxane	**0.95**		**0.050**	**0.050**	**0.050**	**ug/L**	5	27-Jun-2019 18:04
Surr: 2-Fluorobiphenyl	*55.3*			**0**	*40-140*	*%REC*	*5*	*27-Jun-2019 18:04*
Surr: 4-Terphenyl-d14	*63.1*			**0**	*40-140*	*%REC*	*5*	*27-Jun-2019 18:04*
Surr: Nitrobenzene-d5	*55.7*			**0**	*40-140*	*%REC*	*5*	*27-Jun-2019 18:04*

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW22SW_061319
Collection Date: 13-Jun-2019 10:30

ANALYTICAL REPORT
WorkOrder:HS19060835
Lab ID:HS19060835-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 25-Jun-2019		Analyst: JHD
Aluminum	**0.284**		**0.00180**	**0.00500**	**0.0100**	**mg/L**	1	27-Jun-2019 17:30
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	27-Jun-2019 17:30
Arsenic	**0.00358**	J	**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 17:30
Barium	**0.0799**		**0.00190**	**0.00250**	**0.00500**	**mg/L**	1	27-Jun-2019 17:30
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	28-Jun-2019 15:29
Cadmium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Jun-2019 17:30
Calcium	**24.5**		**0.0340**	**0.0500**	**0.500**	**mg/L**	1	27-Jun-2019 17:30
Chromium	**0.0486**		**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 17:30
Cobalt	0.000500	U	0.000100	0.000500	0.00500	mg/L	1	27-Jun-2019 17:30
Copper	0.00100	U	0.00100	0.00100	0.00500	mg/L	1	27-Jun-2019 17:30
Iron	**0.0723**	J	**0.0120**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 17:30
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	27-Jun-2019 17:30
Magnesium	**2.20**		**0.0100**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 17:30
Manganese	**0.0223**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 17:30
Nickel	**0.00100**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 17:30
Potassium	**379**		**0.180**	**0.500**	**2.00**	**mg/L**	10	28-Jun-2019 15:20
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	27-Jun-2019 17:30
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	27-Jun-2019 17:30
Sodium	**313**		**0.140**	**0.500**	**2.00**	**mg/L**	10	28-Jun-2019 15:20
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Jun-2019 17:30
Vanadium	**0.00200**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 17:30
Zinc	**0.0294**		**0.00200**	**0.00200**	**0.00500**	**mg/L**	1	27-Jun-2019 17:30
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 17-Jun-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	17-Jun-2019 15:18
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	03-Jul-2019 09:32

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW22DW_061319
Collection Date: 13-Jun-2019 11:20

ANALYTICAL REPORT
WorkOrder:HS19060835
Lab ID:HS19060835-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 11:59
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 11:59
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 11:59
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 11:59
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 11:59
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 11:59
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 11:59
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 11:59
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 11:59
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 11:59
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 11:59
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 11:59
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 11:59
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 11:59
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 11:59
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 11:59
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 11:59
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 11:59
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 11:59
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 11:59
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 11:59
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	27-Jun-2019 11:59
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 11:59
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	27-Jun-2019 11:59
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 11:59
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 11:59
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	27-Jun-2019 11:59
Acetone	**2.8**		**0.40**	**1.0**	**2.0**	**UG/L**	1	27-Jun-2019 11:59
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 11:59
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 11:59
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 11:59
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 11:59
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 11:59
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 11:59
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	27-Jun-2019 11:59
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 11:59
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 11:59
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 11:59
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 11:59

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW22DW_061319
Collection Date: 13-Jun-2019 11:20

ANALYTICAL REPORT
WorkOrder:HS19060835
Lab ID:HS19060835-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 11:59
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 11:59
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	27-Jun-2019 11:59
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 11:59
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 11:59
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 11:59
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 11:59
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	27-Jun-2019 11:59
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 11:59
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	27-Jun-2019 11:59
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	27-Jun-2019 11:59
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 11:59
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 11:59
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 11:59
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 11:59
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 11:59
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 11:59
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 11:59
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 11:59
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 11:59
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 11:59
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 11:59
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 11:59
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 11:59
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 11:59
Surr: 1,2-Dichloroethane-d4	*99.9*			**0**	*81-118*	*%REC*	*1*	*27-Jun-2019 11:59*
Surr: 4-Bromofluorobenzene	*95.4*			**0**	*85-114*	*%REC*	*1*	*27-Jun-2019 11:59*
Surr: Dibromofluoromethane	*93.7*			**0**	*80-119*	*%REC*	*1*	*27-Jun-2019 11:59*
Surr: Toluene-d8	*99.1*			**0**	*89-112*	*%REC*	*1*	*27-Jun-2019 11:59*
SEMIVOLATILES SIM		**Method:SW8270SIM**				Prep:SW3510 / 19-Jun-2019		Analyst: LG
1,4-Dioxane	**0.15**		**0.010**	**0.010**	**0.010**	**ug/L**	1	27-Jun-2019 12:53
Surr: 2-Fluorobiphenyl	*78.9*			**0**	*40-140*	*%REC*	*1*	*27-Jun-2019 12:53*
Surr: 4-Terphenyl-d14	*90.0*			**0**	*40-140*	*%REC*	*1*	*27-Jun-2019 12:53*
Surr: Nitrobenzene-d5	*110*			**0**	*40-140*	*%REC*	*1*	*27-Jun-2019 12:53*

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW22DW_061319
Collection Date: 13-Jun-2019 11:20

ANALYTICAL REPORT
WorkOrder:HS19060835
Lab ID:HS19060835-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 25-Jun-2019		Analyst: JHD
Aluminum	**0.133**		**0.00180**	**0.00500**	**0.0100**	**mg/L**	1	27-Jun-2019 17:32
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	27-Jun-2019 17:32
Arsenic	**0.00316**	J	**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 17:32
Barium	**0.0930**		**0.00190**	**0.00250**	**0.00500**	**mg/L**	1	27-Jun-2019 17:32
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Jun-2019 17:32
Cadmium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Jun-2019 17:32
Calcium	**12.4**		**0.0340**	**0.0500**	**0.500**	**mg/L**	1	27-Jun-2019 17:32
Chromium	**0.000531**	J	**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 17:32
Cobalt	**0.000402**	J	**0.000100**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 17:32
Copper	0.00100	U	0.00100	0.00100	0.00500	mg/L	1	27-Jun-2019 17:32
Iron	**0.832**		**0.0120**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 17:32
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	27-Jun-2019 17:32
Magnesium	**6.18**		**0.0100**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 17:32
Manganese	**0.0603**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 17:32
Nickel	**0.000918**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 17:32
Potassium	**2.85**		**0.0180**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 17:32
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	27-Jun-2019 17:32
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	27-Jun-2019 17:32
Sodium	**234**		**0.140**	**0.500**	**2.00**	**mg/L**	10	28-Jun-2019 15:31
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Jun-2019 17:32
Vanadium	**0.00216**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 17:32
Zinc	**0.0220**		**0.00200**	**0.00200**	**0.00500**	**mg/L**	1	27-Jun-2019 17:32
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 17-Jun-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	17-Jun-2019 18:42
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	03-Jul-2019 09:32

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW22R_061319
Collection Date: 13-Jun-2019 12:10

ANALYTICAL REPORT
WorkOrder:HS19060835
Lab ID:HS19060835-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 12:23
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 12:23
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 12:23
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 12:23
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 12:23
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 12:23
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 12:23
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 12:23
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 12:23
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 12:23
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 12:23
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 12:23
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 12:23
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 12:23
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 12:23
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 12:23
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 12:23
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 12:23
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 12:23
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 12:23
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 12:23
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	27-Jun-2019 12:23
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 12:23
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	27-Jun-2019 12:23
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 12:23
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 12:23
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	27-Jun-2019 12:23
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	27-Jun-2019 12:23
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 12:23
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 12:23
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 12:23
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 12:23
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 12:23
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 12:23
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	27-Jun-2019 12:23
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 12:23
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 12:23
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 12:23
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 12:23

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW22R_061319
Collection Date: 13-Jun-2019 12:10

ANALYTICAL REPORT
WorkOrder:HS19060835
Lab ID:HS19060835-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 12:23
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 12:23
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	27-Jun-2019 12:23
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 12:23
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 12:23
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 12:23
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 12:23
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	27-Jun-2019 12:23
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 12:23
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	27-Jun-2019 12:23
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	27-Jun-2019 12:23
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 12:23
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 12:23
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 12:23
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 12:23
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 12:23
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 12:23
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 12:23
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 12:23
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 12:23
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 12:23
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 12:23
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 12:23
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 12:23
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 12:23
Surr: 1,2-Dichloroethane-d4	*103*			**0**	*81-118*	*%REC*	*1*	*27-Jun-2019 12:23*
Surr: 4-Bromofluorobenzene	*95.6*			**0**	*85-114*	*%REC*	*1*	*27-Jun-2019 12:23*
Surr: Dibromofluoromethane	*95.4*			**0**	*80-119*	*%REC*	*1*	*27-Jun-2019 12:23*
Surr: Toluene-d8	*98.0*			**0**	*89-112*	*%REC*	*1*	*27-Jun-2019 12:23*
SEMIVOLATILES SIM		**Method:SW8270SIM**				Prep:SW3510 / 19-Jun-2019		Analyst: LG
1,4-Dioxane	0.010	U	0.010	0.010	0.010	ug/L	1	27-Jun-2019 13:13
Surr: 2-Fluorobiphenyl	*81.2*			**0**	*40-140*	*%REC*	*1*	*27-Jun-2019 13:13*
Surr: 4-Terphenyl-d14	*115*			**0**	*40-140*	*%REC*	*1*	*27-Jun-2019 13:13*
Surr: Nitrobenzene-d5	*108*			**0**	*40-140*	*%REC*	*1*	*27-Jun-2019 13:13*

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW22R_061319
Collection Date: 13-Jun-2019 12:10

ANALYTICAL REPORT
WorkOrder:HS19060835
Lab ID:HS19060835-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 25-Jun-2019		Analyst: JHD
Aluminum	**1.54**		**0.0180**	**0.0500**	**0.100**	**mg/L**	10	28-Jun-2019 15:33
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	27-Jun-2019 17:34
Arsenic	**0.00317**	J	**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 17:34
Barium	**0.0493**		**0.00190**	**0.00250**	**0.00500**	**mg/L**	1	27-Jun-2019 17:34
Beryllium	**0.000337**	J	**0.000200**	**0.000500**	**0.00200**	**mg/L**	1	27-Jun-2019 17:34
Cadmium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Jun-2019 17:34
Calcium	**0.683**		**0.0340**	**0.0500**	**0.500**	**mg/L**	1	27-Jun-2019 17:34
Chromium	**0.00400**	J	**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 17:34
Cobalt	**0.00659**		**0.000100**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 17:34
Copper	**0.00172**	J	**0.00100**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 17:34
Iron	**2.90**		**0.0120**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 17:34
Lead	**0.000894**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 17:34
Magnesium	**0.800**		**0.0100**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 17:34
Manganese	**0.0807**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 17:34
Nickel	**0.00370**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 17:34
Potassium	**0.542**		**0.0180**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 17:34
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	27-Jun-2019 17:34
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	27-Jun-2019 17:34
Sodium	**20.8**		**0.0140**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 17:34
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Jun-2019 17:34
Vanadium	**0.00954**		**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 17:34
Zinc	**0.0183**		**0.00200**	**0.00200**	**0.00500**	**mg/L**	1	27-Jun-2019 17:34
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 17-Jun-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	17-Jun-2019 18:44
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	03-Jul-2019 09:32

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: MW20_061319
Collection Date: 13-Jun-2019 12:55

ANALYTICAL REPORT
WorkOrder:HS19060835
Lab ID:HS19060835-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 12:47
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 12:47
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 12:47
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 12:47
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 12:47
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 12:47
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 12:47
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 12:47
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 12:47
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 12:47
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 12:47
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 12:47
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 12:47
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 12:47
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 12:47
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 12:47
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 12:47
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 12:47
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 12:47
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 12:47
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 12:47
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	27-Jun-2019 12:47
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 12:47
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	27-Jun-2019 12:47
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 12:47
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 12:47
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	27-Jun-2019 12:47
Acetone	**2.1**		**0.40**	**1.0**	**2.0**	**UG/L**	1	27-Jun-2019 12:47
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 12:47
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 12:47
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 12:47
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 12:47
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 12:47
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 12:47
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	27-Jun-2019 12:47
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 12:47
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 12:47
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 12:47
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 12:47

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
ANALYTICAL REPORT
Project: LHAAP 18 24
WorkOrder:HS19060835
Sample ID: MW20_061319
Lab ID:HS19060835-04
Collection Date: 13-Jun-2019 12:55
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 12:47
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 12:47
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	27-Jun-2019 12:47
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 12:47
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 12:47
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 12:47
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 12:47
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	27-Jun-2019 12:47
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 12:47
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	27-Jun-2019 12:47
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	27-Jun-2019 12:47
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 12:47
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 12:47
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 12:47
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 12:47
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 12:47
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 12:47
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 12:47
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 12:47
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 12:47
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 12:47
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 12:47
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 12:47
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 12:47
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 12:47
Surr: 1,2-Dichloroethane-d4	*106*			**0**	*81-118*	*%REC*	*1*	*27-Jun-2019 12:47*
Surr: 4-Bromofluorobenzene	*96.9*			**0**	*85-114*	*%REC*	*1*	*27-Jun-2019 12:47*
Surr: Dibromofluoromethane	*97.9*			**0**	*80-119*	*%REC*	*1*	*27-Jun-2019 12:47*
Surr: Toluene-d8	*99.3*			**0**	*89-112*	*%REC*	*1*	*27-Jun-2019 12:47*

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: MW20_061319
Collection Date: 13-Jun-2019 12:55

ANALYTICAL REPORT
WorkOrder:HS19060835
Lab ID:HS19060835-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 25-Jun-2019		Analyst: JHD
Aluminum	**1.12**		**0.0180**	**0.0500**	**0.100**	**mg/L**	10	28-Jun-2019 15:34
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	27-Jun-2019 17:35
Arsenic	**0.00104**	J	**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 17:35
Barium	**0.479**		**0.00190**	**0.00250**	**0.00500**	**mg/L**	1	27-Jun-2019 17:35
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Jun-2019 17:35
Cadmium	**0.000359**	J	**0.000200**	**0.000500**	**0.00200**	**mg/L**	1	27-Jun-2019 17:35
Calcium	**44.7**		**0.0340**	**0.0500**	**0.500**	**mg/L**	1	27-Jun-2019 17:35
Chromium	**0.0188**		**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 17:35
Cobalt	**0.0154**		**0.000100**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 17:35
Copper	**0.00576**		**0.00100**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 17:35
Iron	**3.14**		**0.0120**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 17:35
Lead	**0.00155**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 17:35
Magnesium	**12.5**		**0.0100**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 17:35
Manganese	**0.274**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 17:35
Nickel	**0.540**		**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 17:35
Potassium	**0.862**		**0.0180**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 17:35
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	27-Jun-2019 17:35
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	27-Jun-2019 17:35
Sodium	**48.6**		**0.0140**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 17:35
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Jun-2019 17:35
Vanadium	**0.00507**		**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 17:35
Zinc	**0.102**		**0.00200**	**0.00200**	**0.00500**	**mg/L**	1	27-Jun-2019 17:35
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 17-Jun-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	17-Jun-2019 18:45
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	03-Jul-2019 09:32

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW26SW_061319
Collection Date: 13-Jun-2019 13:45

ANALYTICAL REPORT
WorkOrder:HS19060835
Lab ID:HS19060835-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 13:11
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 13:11
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 13:11
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 13:11
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 13:11
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 13:11
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 13:11
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 13:11
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 13:11
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 13:11
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 13:11
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 13:11
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 13:11
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 13:11
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 13:11
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 13:11
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 13:11
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 13:11
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 13:11
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 13:11
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 13:11
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	27-Jun-2019 13:11
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 13:11
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	27-Jun-2019 13:11
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 13:11
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 13:11
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	27-Jun-2019 13:11
Acetone	**4.2**		**0.40**	**1.0**	**2.0**	**UG/L**	1	27-Jun-2019 13:11
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 13:11
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 13:11
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 13:11
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 13:11
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 13:11
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 13:11
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	27-Jun-2019 13:11
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 13:11
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 13:11
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 13:11
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 13:11

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW26SW_061319
Collection Date: 13-Jun-2019 13:45

ANALYTICAL REPORT
WorkOrder:HS19060835
Lab ID:HS19060835-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 13:11
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 13:11
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	27-Jun-2019 13:11
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 13:11
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 13:11
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 13:11
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 13:11
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	27-Jun-2019 13:11
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 13:11
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	27-Jun-2019 13:11
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	27-Jun-2019 13:11
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 13:11
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 13:11
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 13:11
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 13:11
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 13:11
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 13:11
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 13:11
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 13:11
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 13:11
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 13:11
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 13:11
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 13:11
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 13:11
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 13:11
Surr: 1,2-Dichloroethane-d4	*106*			**0**	*81-118*	*%REC*	*1*	*27-Jun-2019 13:11*
Surr: 4-Bromofluorobenzene	*96.8*			**0**	*85-114*	*%REC*	*1*	*27-Jun-2019 13:11*
Surr: Dibromofluoromethane	*97.1*			**0**	*80-119*	*%REC*	*1*	*27-Jun-2019 13:11*
Surr: Toluene-d8	*101*			**0**	*89-112*	*%REC*	*1*	*27-Jun-2019 13:11*
SEMIVOLATILES SIM		**Method:SW8270SIM**				Prep:SW3510 / 19-Jun-2019		Analyst: LG
1,4-Dioxane	**0.024**		**0.010**	**0.010**	**0.010**	**ug/L**	1	27-Jun-2019 13:34
Surr: 2-Fluorobiphenyl	*83.1*			**0**	*40-140*	*%REC*	*1*	*27-Jun-2019 13:34*
Surr: 4-Terphenyl-d14	*103*			**0**	*40-140*	*%REC*	*1*	*27-Jun-2019 13:34*
Surr: Nitrobenzene-d5	*102*			**0**	*40-140*	*%REC*	*1*	*27-Jun-2019 13:34*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	03-Jul-2019 09:32

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

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WEIGHT LOG

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060835

Batch ID: 142083 **Method:** MERCURY BY SW7470A **Prep:** HG_WPR

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19060835-01	1	10 (mL)	10 (mL)	1
HS19060835-02	1	10 (mL)	10 (mL)	1
HS19060835-03	1	10 (mL)	10 (mL)	1
HS19060835-04	1	10 (mL)	10 (mL)	1

Batch ID: 142169 **Method:** SEMIVOLATILES SIM **Prep:** 3510_B_SIM

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19060835-01	1	1000	1 (mL)	0.001
HS19060835-02	1	1000	1 (mL)	0.001
HS19060835-03	1	1000	1 (mL)	0.001
HS19060835-05	1	1000	1 (mL)	0.001

Batch ID: 142427 **Method:** METALS BY ICPMS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19060835-01	1	10	10 (mL)	1
HS19060835-02	1	10	10 (mL)	1
HS19060835-03	1	10	10 (mL)	1
HS19060835-04	1	10	10 (mL)	1

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060835

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID: 142083 (0)	**Test Name :** MERCURY BY SW7470A				**Matrix:** Groundwater	
HS19060835-01	18CPTMW22SW_061319	13 Jun 2019 10:30		17 Jun 2019 11:00	17 Jun 2019 15:18	1
HS19060835-02	18CPTMW22DW_061319	13 Jun 2019 11:20		17 Jun 2019 11:00	17 Jun 2019 18:42	1
HS19060835-03	18CPTMW22R_061319	13 Jun 2019 12:10		17 Jun 2019 11:00	17 Jun 2019 18:44	1
HS19060835-04	MW20_061319	13 Jun 2019 12:55		17 Jun 2019 11:00	17 Jun 2019 18:45	1
Batch ID: 142169 (0)	**Test Name :** SEMIVOLATILES SIM				**Matrix:** Groundwater	
HS19060835-01	18CPTMW22SW_061319	13 Jun 2019 10:30		19 Jun 2019 09:21	27 Jun 2019 18:04	5
HS19060835-02	18CPTMW22DW_061319	13 Jun 2019 11:20		19 Jun 2019 09:21	27 Jun 2019 12:53	1
HS19060835-03	18CPTMW22R_061319	13 Jun 2019 12:10		19 Jun 2019 09:21	27 Jun 2019 13:13	1
HS19060835-05	18CPTMW26SW_061319	13 Jun 2019 13:45		19 Jun 2019 09:21	27 Jun 2019 13:34	1
Batch ID: 142427 (0)	**Test Name :** METALS BY ICPMS BY SW6020A				**Matrix:** Groundwater	
HS19060835-01	18CPTMW22SW_061319	13 Jun 2019 10:30		25 Jun 2019 11:30	28 Jun 2019 15:29	1
HS19060835-01	18CPTMW22SW_061319	13 Jun 2019 10:30		25 Jun 2019 11:30	28 Jun 2019 15:20	10
HS19060835-01	18CPTMW22SW_061319	13 Jun 2019 10:30		25 Jun 2019 11:30	27 Jun 2019 17:30	1
HS19060835-02	18CPTMW22DW_061319	13 Jun 2019 11:20		25 Jun 2019 11:30	28 Jun 2019 15:31	10
HS19060835-02	18CPTMW22DW_061319	13 Jun 2019 11:20		25 Jun 2019 11:30	27 Jun 2019 17:32	1
HS19060835-03	18CPTMW22R_061319	13 Jun 2019 12:10		25 Jun 2019 11:30	28 Jun 2019 15:33	10
HS19060835-03	18CPTMW22R_061319	13 Jun 2019 12:10		25 Jun 2019 11:30	27 Jun 2019 17:34	1
HS19060835-04	MW20_061319	13 Jun 2019 12:55		25 Jun 2019 11:30	28 Jun 2019 15:34	10
HS19060835-04	MW20_061319	13 Jun 2019 12:55		25 Jun 2019 11:30	27 Jun 2019 17:35	1
Batch ID: R341453 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS19060835-01	18CPTMW22SW_061319	13 Jun 2019 10:30			27 Jun 2019 11:35	1
HS19060835-02	18CPTMW22DW_061319	13 Jun 2019 11:20			27 Jun 2019 11:59	1
HS19060835-03	18CPTMW22R_061319	13 Jun 2019 12:10			27 Jun 2019 12:23	1
HS19060835-04	MW20_061319	13 Jun 2019 12:55			27 Jun 2019 12:47	1
HS19060835-05	18CPTMW26SW_061319	13 Jun 2019 13:45			27 Jun 2019 13:11	1
Batch ID: R341759 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** Groundwater	
HS19060835-01	18CPTMW22SW_061319	13 Jun 2019 10:30			03 Jul 2019 09:32	1
HS19060835-02	18CPTMW22DW_061319	13 Jun 2019 11:20			03 Jul 2019 09:32	1
HS19060835-03	18CPTMW22R_061319	13 Jun 2019 12:10			03 Jul 2019 09:32	1
HS19060835-04	MW20_061319	13 Jun 2019 12:55			03 Jul 2019 09:32	1
HS19060835-05	18CPTMW26SW_061319	13 Jun 2019 13:45			03 Jul 2019 09:32	1

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060835

QC BATCH REPORT

Batch ID: 142083 (0) **Instrument: HG03** **Method: MERCURY BY SW7470A**

MBLK Sample ID: **MBLK-142083** Units: **mg/L** Analysis Date: **17-Jun-2019 15:15**
Client ID: Run ID: **HG03_340651** SeqNo: **5125721** PrepDate: **17-Jun-2019** 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-142083** Units: **mg/L** Analysis Date: **17-Jun-2019 15:16**
Client ID: Run ID: **HG03_340651** SeqNo: **5125722** PrepDate: **17-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00486	0.000200	0.005	0	97.2	80 - 120				

MS Sample ID: **HS19060835-01MS** Units: **mg/L** Analysis Date: **17-Jun-2019 15:21**
Client ID: **18CPTMW22SW_061319** Run ID: **HG03_340651** SeqNo: **5125724** PrepDate: **17-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00000512	0.000000200	5e-006	0.0000000360	102	75 - 125				

MSD Sample ID: **HS19060835-01MSD** Units: **mg/L** Analysis Date: **17-Jun-2019 15:23**
Client ID: **18CPTMW22SW_061319** Run ID: **HG03_340651** SeqNo: **5125725** PrepDate: **17-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00000539	0.000000200	5e-006	0.0000000360	107	75 - 125	0.000005120	5.14	20	

The following samples were analyzed in this batch: HS19060835-01 HS19060835-02 HS19060835-03 HS19060835-04

Revision: 1

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ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060835

QC BATCH REPORT

Batch ID: 142427 (0) **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

MBLK Sample ID: **MBLK-142427** Units: **mg/L** Analysis Date: **27-Jun-2019 17:22**
Client ID: Run ID: **ICPMS06_341376** SeqNo: **5145221** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.002457	0.0100								J
Antimony	0.000500	0.00500								U
Arsenic	0.000500	0.00500								U
Barium	0.00250	0.00500								U
Beryllium	0.000500	0.00200								U
Cadmium	0.000500	0.00200								U
Calcium	0.0500	0.500								U
Chromium	0.000500	0.00500								U
Cobalt	0.000500	0.00500								U
Copper	0.001932	0.00500								J
Iron	0.0500	0.200								U
Lead	0.00100	0.00500								U
Magnesium	0.0500	0.200								U
Manganese	0.00100	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	0.02437	0.200								J
Thallium	0.000500	0.00200								U
Vanadium	0.001051	0.00500								J
Zinc	0.00200	0.00500								U

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060835

QC BATCH REPORT

Batch ID: 142427 (0) **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

LCS Sample ID: **LCS-142427** Units: **mg/L** Analysis Date: **27-Jun-2019 16:58**
Client ID: Run ID: **ICPMS06_341376** SeqNo: **5145214** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.1091	0.0100	0.1	0	109	84 - 117				
Antimony	0.0559	0.00500	0.05	0	112	85 - 117				
Arsenic	0.05618	0.00500	0.05	0	112	84 - 116				
Barium	0.05364	0.00500	0.05	0	107	86 - 114				
Beryllium	0.05694	0.00200	0.05	0	114	83 - 121				
Cadmium	0.05632	0.00200	0.05	0	113	87 - 115				
Calcium	5.323	0.500	5	0	106	87 - 118				
Chromium	0.05591	0.00500	0.05	0	112	85 - 116				
Cobalt	0.05561	0.00500	0.05	0	111	86 - 115				
Copper	0.05732	0.00500	0.05	0	115	85 - 118				
Iron	5.504	0.200	5	0	110	87 - 118				
Lead	0.05401	0.00500	0.05	0	108	88 - 115				
Magnesium	5.42	0.200	5	0	108	83 - 118				
Manganese	0.05651	0.00500	0.05	0	113	87 - 115				
Nickel	0.05699	0.00500	0.05	0	114	85 - 117				
Potassium	5.366	0.200	5	0	107	87 - 115				
Selenium	0.05781	0.00500	0.05	0	116	80 - 120				
Silver	0.05393	0.00500	0.05	0	108	85 - 116				
Sodium	5.418	0.200	5	0	108	85 - 117				
Thallium	0.05098	0.00200	0.05	0	102	82 - 116				
Vanadium	0.05441	0.00500	0.05	0	109	86 - 115				
Zinc	0.05821	0.00500	0.05	0	116	83 - 119				

Revision: 1

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ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060835

QC BATCH REPORT

Batch ID: 142427 (0) **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

MS Sample ID: **HS19060986-04MS** Units: **mg/L** Analysis Date: **27-Jun-2019 17:03**
Client ID: Run ID: **ICPMS06_341376** SeqNo: **5145217** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.116	0.0100	0.1	0.01515	101	84 - 117				
Antimony	0.05308	0.00500	0.05	0.000258	106	85 - 117				
Arsenic	0.05627	0.00500	0.05	0.002036	108	84 - 116				
Barium	0.8428	0.00500	0.05	0.8565	-27.4	86 - 114				SO
Beryllium	0.05294	0.00200	0.05	0.000048	106	83 - 121				
Cadmium	0.05116	0.00200	0.05	0.000205	102	87 - 115				
Calcium	35.9	0.500	5	33.03	57.3	87 - 118				SO
Chromium	0.3735	0.00500	0.05	0.2809	185	85 - 116				SO
Cobalt	0.0563	0.00500	0.05	0.005607	101	86 - 115				
Copper	0.058	0.00500	0.05	0.005199	106	85 - 118				
Iron	7.669	0.200	5	2.556	102	87 - 118				
Lead	0.05089	0.00500	0.05	0.000094	102	88 - 115				
Magnesium	31.26	0.200	5	27.76	69.9	83 - 118				SO
Manganese	0.2154	0.00500	0.05	0.164	103	87 - 115				
Nickel	0.2401	0.00500	0.05	0.2011	78.0	85 - 117				SO
Potassium	7.654	0.200	5	2.639	100	87 - 115				
Selenium	0.05384	0.00500	0.05	0.000343	107	80 - 120				
Silver	0.04654	0.00500	0.05	0.000013	93.1	85 - 116				
Sodium	233.3	0.200	5	245	-233	85 - 117				SEO
Thallium	0.04975	0.00200	0.05	0.000043	99.4	82 - 116				
Vanadium	0.0572	0.00500	0.05	0.003781	107	86 - 115				
Zinc	0.07874	0.00500	0.05	0.03582	85.8	83 - 119				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060835

QC BATCH REPORT

Batch ID: 142427 (0) **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

MSD Sample ID: **HS19060986-04MSD** Units: **mg/L** Analysis Date: **27-Jun-2019 17:05**
Client ID: Run ID: **ICPMS06_341376** SeqNo: **5145218** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.1062	0.0100	0.1	0.01515	91.1	84 - 117	0.116	8.82	20	
Antimony	0.04965	0.00500	0.05	0.000258	98.8	85 - 117	0.05308	6.66	20	
Arsenic	0.05281	0.00500	0.05	0.002036	102	84 - 116	0.05627	6.34	20	
Barium	0.8139	0.00500	0.05	0.8565	-85.2	86 - 114	0.8428	3.49	20	SO
Beryllium	0.05024	0.00200	0.05	0.000048	100	83 - 121	0.05294	5.24	20	
Cadmium	0.04833	0.00200	0.05	0.000205	96.2	87 - 115	0.05116	5.7	20	
Calcium	33.36	0.500	5	33.03	6.56	87 - 118	35.9	7.33	20	SO
Cobalt	0.0531	0.00500	0.05	0.005607	95.0	86 - 115	0.0563	5.85	20	
Copper	0.05342	0.00500	0.05	0.005199	96.4	85 - 118	0.058	8.23	20	
Iron	7.023	0.200	5	2.556	89.3	87 - 118	7.669	8.8	20	
Lead	0.04808	0.00500	0.05	0.000094	96.0	88 - 115	0.05089	5.67	20	
Magnesium	28.94	0.200	5	27.76	23.5	83 - 118	31.26	7.71	20	SO
Manganese	0.1904	0.00500	0.05	0.164	52.8	87 - 115	0.2154	12.4	20	S
Nickel	0.2255	0.00500	0.05	0.2011	48.7	85 - 117	0.2401	6.29	20	SO
Potassium	7.309	0.200	5	2.639	93.4	87 - 115	7.654	4.62	20	
Selenium	0.05051	0.00500	0.05	0.000343	100	80 - 120	0.05384	6.37	20	
Silver	0.04575	0.00500	0.05	0.000013	91.5	85 - 116	0.04654	1.71	20	
Sodium	224.6	0.200	5	245	-407	85 - 117	233.3	3.8	20	SEO
Thallium	0.04905	0.00200	0.05	0.000043	98.0	82 - 116	0.04975	1.42	20	
Vanadium	0.05284	0.00500	0.05	0.003781	98.1	86 - 115	0.0572	7.93	20	
Zinc	0.08005	0.00500	0.05	0.03582	88.5	83 - 119	0.07874	1.66	20	

MSD Sample ID: **HS19060986-04MSD** Units: **mg/L** Analysis Date: **28-Jun-2019 15:07**
Client ID: Run ID: **ICPMS06_341483** SeqNo: **5145651** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium	0.343	0.00500	0.05	0.2809	124	85 - 116	0.3735	8.51	20	SO

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060835

QC BATCH REPORT

Batch ID: 142427 (0) **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

PDS Sample ID: **HS19060986-04PDS** Units: **mg/L** Analysis Date: **27-Jun-2019 17:07**
Client ID: Run ID: **ICPMS06_341376** SeqNo: **5145219** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.1008	0.0100	0.1	0.01515	85.7	80 - 120				
Antimony	0.08752	0.00500	0.1	0.000258	87.3	80 - 120				
Arsenic	0.09313	0.00500	0.1	0.002036	91.1	80 - 120				
Beryllium	0.09784	0.00200	0.1	0.000048	97.8	80 - 120				
Cadmium	0.09096	0.00200	0.1	0.000205	90.8	80 - 120				
Cobalt	0.09093	0.00500	0.1	0.005607	85.3	80 - 120				
Copper	0.09101	0.00500	0.1	0.005199	85.8	80 - 120				
Iron	10.93	0.200	10	2.556	83.8	80 - 120				
Lead	0.09017	0.00500	0.1	0.000094	90.1	80 - 120				
Potassium	11.36	0.200	10	2.639	87.2	80 - 120				
Selenium	0.09025	0.00500	0.1	0.000343	89.9	80 - 120				
Silver	0.08464	0.00500	0.1	0.000013	84.6	80 - 120				
Thallium	0.08892	0.00200	0.1	0.000043	88.9	80 - 120				
Vanadium	0.09309	0.00500	0.1	0.003781	89.3	80 - 120				
Zinc	0.1183	0.00500	0.1	0.03582	82.5	80 - 120				

PDS Sample ID: **HS19060986-04PDS** Units: **mg/L** Analysis Date: **28-Jun-2019 15:14**
Client ID: Run ID: **ICPMS06_341483** SeqNo: **5145655** PrepDate: **25-Jun-2019** DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Barium	1.703	0.0500	1	0.7	100	80 - 120				
Calcium	129.7	5.00	100	26.89	103	80 - 120				
Chromium	1.283	0.0500	1	0.2283	105	80 - 120				
Iron	107.4	2.00	100	2.151	105	80 - 120				
Magnesium	125.2	2.00	100	22.92	102	80 - 120				
Manganese	1.175	0.0500	1	0.1367	104	80 - 120				
Nickel	1.217	0.0500	1	0.1678	105	80 - 120				
Potassium	106.9	2.00	100	2.16	105	80 - 120				
Sodium	299.8	2.00	100	202.9	96.9	80 - 120				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060835

QC BATCH REPORT

Batch ID: 142427 (0) **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

SD Sample ID: **HS19060986-04SD** Units: **mg/L** Analysis Date: **27-Jun-2019 17:02**
Client ID: Run ID: **ICPMS06_341376** SeqNo: **5145216** PrepDate: **25-Jun-2019** DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Aluminum	0.01988	0.0500					0.01515	0	10	J
Antimony	0.00250	0.0250					0.000258	0	10	U
Arsenic	0.002183	0.0250					0.002036	0	10	J
Beryllium	0.00250	0.0100					0.000048	0	10	U
Cadmium	0.00250	0.0100					0.000205	0	10	U
Cobalt	0.004619	0.0250					0.005607	0	10	J
Copper	0.00500	0.0250					0.005199	0	10	U
Lead	0.00500	0.0250					0.000094	0	10	U
Selenium	0.0125	0.0250					0.000343	0	10	U
Silver	0.00250	0.0250					0.000013	0	10	U
Thallium	0.00250	0.0100					0.000043	0	10	U
Vanadium	0.01164	0.0250					0.003781	0	10	J
Zinc	0.038	0.0250					0.03582	6.07	10	

SD Sample ID: **HS19060986-04SD** Units: **mg/L** Analysis Date: **28-Jun-2019 15:13**
Client ID: Run ID: **ICPMS06_341483** SeqNo: **5145654** PrepDate: **25-Jun-2019** DF: **50**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Barium	0.6998	0.250					0.7	0.0306	10	
Calcium	27.1	25.0					26.89	0.761	10	
Chromium	0.234	0.250					0.2283	0	10	J
Iron	2.19	10.0					2.151	0	10	J
Magnesium	22.74	10.0					22.92	0.776	10	
Manganese	0.1567	0.250					0.1367	0	10	J
Nickel	0.1736	0.250					0.1678	0	10	J
Potassium	2.068	10.0					2.16	0	10	J
Sodium	207.1	10.0					202.9	2.06	10	

The following samples were analyzed in this batch: HS19060835-01 HS19060835-02 HS19060835-03 HS19060835-04

Revision: 1

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ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060835

QC BATCH REPORT

Batch ID: 142169 (0) **Instrument: SV-5** **Method: SEMIVOLATILES SIM**

MBLK Sample ID: **MBLK-142169** Units: **ug/L** Analysis Date: **27-Jun-2019 11:30**
Client ID: Run ID: **SV-5_341496** SeqNo: **5145167** PrepDate: **19-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.010	0.010								U
Surr: 2-Fluorobiphenyl	*0.07589*	*0*	*0.08*	*0*	*94.9*	*40 - 140*				
Surr: 4-Terphenyl-d14	*0.09153*	*0*	*0.08*	*0*	*114*	*40 - 140*				
Surr: Nitrobenzene-d5	*0.09043*	*0*	*0.08*	*0*	*113*	*40 - 140*				

LCS Sample ID: **LCS-142169** Units: **ug/L** Analysis Date: **27-Jun-2019 11:51**
Client ID: Run ID: **SV-5_341496** SeqNo: **5145168** PrepDate: **19-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.07581	0.010	0.08	0	94.8	40 - 140				
Surr: 2-Fluorobiphenyl	*0.0738*	*0*	*0.08*	*0*	*92.2*	*40 - 140*				
Surr: 4-Terphenyl-d14	*0.07856*	*0*	*0.08*	*0*	*98.2*	*40 - 140*				
Surr: Nitrobenzene-d5	*0.08245*	*0*	*0.08*	*0*	*103*	*40 - 140*				

LCSD Sample ID: **LCSD-142169** Units: **ug/L** Analysis Date: **27-Jun-2019 12:11**
Client ID: Run ID: **SV-5_341496** SeqNo: **5145169** PrepDate: **19-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.07894	0.010	0.08	0	98.7	40 - 140	0.07581	4.05	20	
Surr: 2-Fluorobiphenyl	*0.07855*	*0*	*0.08*	*0*	*98.2*	*40 - 140*	*0.0738*	*6.23*	*20*	
Surr: 4-Terphenyl-d14	*0.1075*	*0*	*0.08*	*0*	*134*	*40 - 140*	*0.07856*	*31.1*	*20*	R
Surr: Nitrobenzene-d5	*0.08954*	*0*	*0.08*	*0*	*112*	*40 - 140*	*0.08245*	*8.25*	*20*	

The following samples were analyzed in this batch: HS19060835-01 HS19060835-02 HS19060835-03 HS19060835-05

Revision: 1

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ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060835

QC BATCH REPORT

Batch ID: R341453 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-190627** Units: **UG/L** Analysis Date: **27-Jun-2019 11:11**
Client ID: Run ID: **VOA6_341453** SeqNo: **5144199** 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

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060835

QC BATCH REPORT

Batch ID: R341453 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-190627** Units: **UG/L** Analysis Date: **27-Jun-2019 11:11**
Client ID: Run ID: **VOA6_341453** SeqNo: **5144199** 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	*49.36*	*1.0*	*50*	*0*	*98.7*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*47.49*	*1.0*	*50*	*0*	*95.0*	*85 - 114*				
Surr: Dibromofluoromethane	*46.28*	*1.0*	*50*	*0*	*92.6*	*80 - 119*				
Surr: Toluene-d8	*49.04*	*1.0*	*50*	*0*	*98.1*	*89 - 112*				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060835

QC BATCH REPORT

Batch ID: R341453 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

LCS Sample ID: **VLCSW-190627** Units: **UG/L** Analysis Date: **27-Jun-2019 10:23**
Client ID: Run ID: **VOA6_341453** SeqNo: **5144198** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	18.77	1.0	20	0	93.8	78 - 124				
1,1,1-Trichloroethane	19.61	1.0	20	0	98.1	74 - 131				
1,1,2,2-Tetrachloroethane	20.69	1.0	20	0	103	71 - 121				
1,1,2-Trichloroethane	20.36	1.0	20	0	102	80 - 119				
1,1-Dichloroethane	19.43	1.0	20	0	97.1	77 - 125				
1,1-Dichloroethene	19.6	1.0	20	0	98.0	71 - 131				
1,1-Dichloropropene	19.74	1.0	20	0	98.7	78 - 125				
1,2,3-Trichlorobenzene	23.06	1.0	20	0	115	69 - 129				
1,2,3-Trichloropropane	21.25	1.0	20	0	106	73 - 122				
1,2,4-Trichlorobenzene	20.84	1.0	20	0	104	69 - 130				
1,2,4-Trimethylbenzene	18.56	1.0	20	0	92.8	76 - 124				
1,2-Dibromo-3-chloropropane	21.57	1.0	20	0	108	62 - 128				
1,2-Dibromoethane	19.54	1.0	20	0	97.7	77 - 121				
1,2-Dichlorobenzene	18.49	1.0	20	0	92.4	80 - 119				
1,2-Dichloroethane	18.7	1.0	20	0	93.5	73 - 128				
1,2-Dichloropropane	19.06	1.0	20	0	95.3	78 - 122				
1,3,5-Trimethylbenzene	18.18	1.0	20	0	90.9	75 - 124				
1,3-Dichlorobenzene	18.01	1.0	20	0	90.1	80 - 119				
1,3-Dichloropropane	19.83	1.0	20	0	99.1	80 - 119				
1,4-Dichlorobenzene	19.42	1.0	20	0	97.1	79 - 118				
2,2-Dichloropropane	20.55	1.0	20	0	103	60 - 139				
2-Butanone	45.99	2.0	40	0	115	56 - 143				
2-Chlorotoluene	19.68	1.0	20	0	98.4	79 - 122				
2-Hexanone	39.89	2.0	40	0	99.7	57 - 139				
4-Chlorotoluene	19.71	1.0	20	0	98.5	78 - 122				
4-Isopropyltoluene	18.53	1.0	20	0	92.6	77 - 127				
4-Methyl-2-pentanone	39.77	2.0	40	0	99.4	67 - 130				
Acetone	49.5	2.0	40	0	124	39 - 160				
Benzene	19.65	1.0	20	0	98.2	79 - 120				
Bromobenzene	17.92	1.0	20	0	89.6	80 - 120				
Bromochloromethane	18.73	1.0	20	0	93.7	78 - 123				
Bromodichloromethane	19.3	1.0	20	0	96.5	79 - 125				
Bromoform	19.68	1.0	20	0	98.4	66 - 130				
Bromomethane	21.59	1.0	20	0	108	53 - 141				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060835

QC BATCH REPORT

Batch ID: R341453 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-190627** Units: **UG/L** Analysis Date: **27-Jun-2019 10:23**
Client ID: Run ID: **VOA6_341453** SeqNo: **5144198** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	35.73	2.0	40	0	89.3	64 - 133				
Carbon tetrachloride	19.41	1.0	20	0	97.0	72 - 136				
Chlorobenzene	18.46	1.0	20	0	92.3	82 - 118				
Chloroethane	20.98	1.0	20	0	105	60 - 138				
Chloroform	19.78	1.0	20	0	98.9	79 - 124				
Chloromethane	18.51	1.0	20	0	92.5	50 - 139				
cis-1,2-Dichloroethene	19.31	1.0	20	0	96.6	78 - 123				
cis-1,3-Dichloropropene	19.08	1.0	20	0	95.4	75 - 124				
Dibromochloromethane	18.87	1.0	20	0	94.4	74 - 126				
Dibromomethane	19.13	1.0	20	0	95.6	79 - 123				
Dichlorodifluoromethane	19.8	1.0	20	0	99.0	32 - 152				
Ethylbenzene	18.41	1.0	20	0	92.0	79 - 121				
Hexachlorobutadiene	23.02	1.0	20	0	115	66 - 134				
Isopropylbenzene	18.47	1.0	20	0	92.4	72 - 131				
m,p-Xylene	37.16	2.0	40	0	92.9	80 - 121				
Methylene chloride	18.91	2.0	20	0	94.5	74 - 124				
Naphthalene	21.45	1.0	20	0	107	61 - 128				
n-Butylbenzene	18.85	1.0	20	0	94.2	75 - 128				
n-Propylbenzene	19.66	1.0	20	0	98.3	76 - 126				
o-Xylene	18.48	1.0	20	0	92.4	78 - 122				
sec-Butylbenzene	19.8	1.0	20	0	99.0	77 - 126				
Styrene	19.29	1.0	20	0	96.4	78 - 123				
tert-Butylbenzene	19.57	1.0	20	0	97.8	78 - 124				
Tetrachloroethene	18.01	1.0	20	0	90.1	74 - 129				
Toluene	18.39	1.0	20	0	91.9	80 - 121				
trans-1,2-Dichloroethene	19.44	1.0	20	0	97.2	75 - 124				
trans-1,3-Dichloropropene	19.45	1.0	20	0	97.3	73 - 127				
Trichloroethene	18.29	1.0	20	0	91.4	79 - 123				
Trichlorofluoromethane	20.3	1.0	20	0	102	65 - 141				
Vinyl chloride	19.44	1.0	20	0	97.2	58 - 137				
Surr: 1,2-Dichloroethane-d4	*53.25*	*1.0*	*50*	*0*	*106*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*51.3*	*1.0*	*50*	*0*	*103*	*85 - 114*				
Surr: Dibromofluoromethane	*51.63*	*1.0*	*50*	*0*	*103*	*80 - 119*				
Surr: Toluene-d8	*49.81*	*1.0*	*50*	*0*	*99.6*	*89 - 112*				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060835

QC BATCH REPORT

Batch ID: R341453 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MS Sample ID: **HS19060986-04MS** Units: **UG/L** Analysis Date: **27-Jun-2019 14:47**
Client ID: Run ID: **VOA6_341453** SeqNo: **5144208** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	17.6	1.0	20	0	88.0	78 - 124				
1,1,1-Trichloroethane	19.37	1.0	20	0	96.9	74 - 131				
1,1,2,2-Tetrachloroethane	19.88	1.0	20	0	99.4	71 - 121				
1,1,2-Trichloroethane	18.84	1.0	20	0	94.2	80 - 119				
1,1-Dichloroethane	20.52	1.0	20	0	103	77 - 125				
1,1-Dichloroethene	20.92	1.0	20	0	105	71 - 131				
1,1-Dichloropropene	19.44	1.0	20	0	97.2	78 - 125				
1,2,3-Trichlorobenzene	21.07	1.0	20	0	105	69 - 129				
1,2,3-Trichloropropane	20.06	1.0	20	0	100	73 - 122				
1,2,4-Trichlorobenzene	20.07	1.0	20	0	100	69 - 130				
1,2,4-Trimethylbenzene	18.7	1.0	20	0	93.5	76 - 124				
1,2-Dibromo-3-chloropropane	20.57	1.0	20	0	103	62 - 128				
1,2-Dibromoethane	17.91	1.0	20	0	89.6	77 - 121				
1,2-Dichlorobenzene	18.15	1.0	20	0	90.7	80 - 119				
1,2-Dichloroethane	17.56	1.0	20	0	87.8	73 - 128				
1,2-Dichloropropane	18.1	1.0	20	0	90.5	78 - 122				
1,3,5-Trimethylbenzene	18.75	1.0	20	0	93.7	75 - 124				
1,3-Dichlorobenzene	18.62	1.0	20	0.619	90.0	80 - 119				
1,3-Dichloropropane	18.78	1.0	20	0	93.9	80 - 119				
1,4-Dichlorobenzene	18.97	1.0	20	0	94.9	79 - 118				
2,2-Dichloropropane	19.07	1.0	20	0	95.3	60 - 139				
2-Butanone	40.06	2.0	40	0	100	56 - 143				
2-Chlorotoluene	19.58	1.0	20	0	97.9	79 - 122				
2-Hexanone	35.98	2.0	40	0	90.0	57 - 139				
4-Chlorotoluene	19.71	1.0	20	0	98.5	78 - 122				
4-Isopropyltoluene	19.52	1.0	20	0	97.6	77 - 127				
4-Methyl-2-pentanone	36.25	2.0	40	0	90.6	67 - 130				
Acetone	42.2	2.0	40	0	105	39 - 160				
Benzene	18.94	1.0	20	0	94.7	79 - 120				
Bromobenzene	17	1.0	20	0	85.0	80 - 120				
Bromochloromethane	16.86	1.0	20	0	84.3	78 - 123				
Bromodichloromethane	18.36	1.0	20	0	91.8	79 - 125				
Bromoform	17.93	1.0	20	0	89.6	66 - 130				
Bromomethane	20.38	1.0	20	0	102	53 - 141				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060835

QC BATCH REPORT

Batch ID: R341453 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MS Sample ID: **HS19060986-04MS** Units: **UG/L** Analysis Date: **27-Jun-2019 14:47**
Client ID: Run ID: **VOA6_341453** SeqNo: **5144208** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	35.55	2.0	40	0	88.9	64 - 133				
Carbon tetrachloride	19.35	1.0	20	0	96.8	72 - 136				
Chlorobenzene	17.87	1.0	20	0	89.3	82 - 118				
Chloroethane	19.94	1.0	20	0	99.7	60 - 138				
Chloroform	18.71	1.0	20	0	93.6	79 - 124				
Chloromethane	19.86	1.0	20	0	99.3	50 - 139				
cis-1,2-Dichloroethene	24.44	1.0	20	4.696	98.7	78 - 123				
cis-1,3-Dichloropropene	17.14	1.0	20	0	85.7	75 - 124				
Dibromochloromethane	17.35	1.0	20	0	86.8	74 - 126				
Dibromomethane	17.39	1.0	20	0	86.9	79 - 123				
Dichlorodifluoromethane	18.96	1.0	20	0	94.8	32 - 152				
Ethylbenzene	18.23	1.0	20	0	91.2	79 - 121				
Hexachlorobutadiene	22.45	1.0	20	0	112	66 - 134				
Isopropylbenzene	19.04	1.0	20	0	95.2	72 - 131				
m,p-Xylene	37.06	2.0	40	0	92.7	80 - 121				
Methylene chloride	17.62	2.0	20	0	88.1	74 - 124				
Naphthalene	20.33	1.0	20	0	102	61 - 128				
n-Butylbenzene	19.95	1.0	20	0	99.7	75 - 128				
n-Propylbenzene	20.39	1.0	20	0	102	76 - 126				
o-Xylene	17.97	1.0	20	0	89.9	78 - 122				
sec-Butylbenzene	20.69	1.0	20	0	103	77 - 126				
Styrene	18.28	1.0	20	0	91.4	78 - 123				
tert-Butylbenzene	20.4	1.0	20	0	102	78 - 124				
Tetrachloroethene	18.26	1.0	20	0	91.3	74 - 129				
Toluene	18.16	1.0	20	0	90.8	80 - 121				
trans-1,2-Dichloroethene	19.19	1.0	20	0	96.0	75 - 124				
trans-1,3-Dichloropropene	17.78	1.0	20	0	88.9	73 - 127				
Trichloroethene	32.63	1.0	20	13.8	94.2	79 - 123				
Trichlorofluoromethane	20.12	1.0	20	0	101	65 - 141				
Vinyl chloride	20.24	1.0	20	0	101	58 - 137				
Surr: 1,2-Dichloroethane-d4	*50.63*	*1.0*	*50*	*0*	*101*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*49.94*	*1.0*	*50*	*0*	*99.9*	*85 - 114*				
Surr: Dibromofluoromethane	*49.14*	*1.0*	*50*	*0*	*98.3*	*80 - 119*				
Surr: Toluene-d8	*48.68*	*1.0*	*50*	*0*	*97.4*	*89 - 112*				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060835

QC BATCH REPORT

Batch ID: R341453 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MSD Sample ID: **HS19060986-04MSD** Units: **UG/L** Analysis Date: **27-Jun-2019 15:10**
Client ID: Run ID: **VOA6_341453** SeqNo: **5144209** 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	17.76	1.0	20	0	88.8	78 - 124	17.6	0.896	20	
1,1,1-Trichloroethane	19.21	1.0	20	0	96.0	74 - 131	19.37	0.855	20	
1,1,2,2-Tetrachloroethane	20.67	1.0	20	0	103	71 - 121	19.88	3.87	20	
1,1,2-Trichloroethane	19.42	1.0	20	0	97.1	80 - 119	18.84	3.01	20	
1,1-Dichloroethane	20.68	1.0	20	0	103	77 - 125	20.52	0.772	20	
1,1-Dichloroethene	20.95	1.0	20	0	105	71 - 131	20.92	0.151	20	
1,1-Dichloropropene	19.47	1.0	20	0	97.4	78 - 125	19.44	0.197	20	
1,2,3-Trichlorobenzene	22.82	1.0	20	0	114	69 - 129	21.07	7.97	20	
1,2,3-Trichloropropane	20.8	1.0	20	0	104	73 - 122	20.06	3.63	20	
1,2,4-Trichlorobenzene	21.1	1.0	20	0	105	69 - 130	20.07	4.98	20	
1,2,4-Trimethylbenzene	19.03	1.0	20	0	95.2	76 - 124	18.7	1.75	20	
1,2-Dibromo-3-chloropropane	21.34	1.0	20	0	107	62 - 128	20.57	3.7	20	
1,2-Dibromoethane	18.27	1.0	20	0	91.4	77 - 121	17.91	1.99	20	
1,2-Dichlorobenzene	18.58	1.0	20	0	92.9	80 - 119	18.15	2.37	20	
1,2-Dichloroethane	17.68	1.0	20	0	88.4	73 - 128	17.56	0.689	20	
1,2-Dichloropropane	18.34	1.0	20	0	91.7	78 - 122	18.1	1.29	20	
1,3,5-Trimethylbenzene	18.93	1.0	20	0	94.7	75 - 124	18.75	0.991	20	
1,3-Dichlorobenzene	18.6	1.0	20	0.619	89.9	80 - 119	18.62	0.134	20	
1,3-Dichloropropane	18.98	1.0	20	0	94.9	80 - 119	18.78	1.08	20	
1,4-Dichlorobenzene	19.29	1.0	20	0	96.5	79 - 118	18.97	1.68	20	
2,2-Dichloropropane	18.72	1.0	20	0	93.6	60 - 139	19.07	1.86	20	
2-Butanone	41.72	2.0	40	0	104	56 - 143	40.06	4.07	20	
2-Chlorotoluene	19.83	1.0	20	0	99.2	79 - 122	19.58	1.26	20	
2-Hexanone	37.6	2.0	40	0	94.0	57 - 139	35.98	4.41	20	
4-Chlorotoluene	19.88	1.0	20	0	99.4	78 - 122	19.71	0.902	20	
4-Isopropyltoluene	19.73	1.0	20	0	98.7	77 - 127	19.52	1.07	20	
4-Methyl-2-pentanone	37.65	2.0	40	0	94.1	67 - 130	36.25	3.77	20	
Acetone	43.42	2.0	40	0	109	39 - 160	42.2	2.86	20	
Benzene	18.88	1.0	20	0	94.4	79 - 120	18.94	0.299	20	
Bromobenzene	17.22	1.0	20	0	86.1	80 - 120	17	1.29	20	
Bromochloromethane	17.4	1.0	20	0	87.0	78 - 123	16.86	3.17	20	
Bromodichloromethane	18.44	1.0	20	0	92.2	79 - 125	18.36	0.421	20	
Bromoform	18.53	1.0	20	0	92.6	66 - 130	17.93	3.28	20	
Bromomethane	19.72	1.0	20	0	98.6	53 - 141	20.38	3.28	20	

Revision: 1

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ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060835

QC BATCH REPORT

Batch ID: R341453 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MSD Sample ID: **HS19060986-04MSD** Units: **UG/L** Analysis Date: **27-Jun-2019 15:10**
Client ID: Run ID: **VOA6_341453** SeqNo: **5144209** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Carbon disulfide	34.97	2.0	40	0	87.4	64 - 133	35.55	1.65	20	
Carbon tetrachloride	19.12	1.0	20	0	95.6	72 - 136	19.35	1.2	20	
Chlorobenzene	17.91	1.0	20	0	89.5	82 - 118	17.87	0.216	20	
Chloroethane	21.79	1.0	20	0	109	60 - 138	19.94	8.88	20	
Chloroform	18.72	1.0	20	0	93.6	79 - 124	18.71	0.043	20	
Chloromethane	18.15	1.0	20	0	90.8	50 - 139	19.86	8.97	20	
cis-1,2-Dichloroethene	24.78	1.0	20	4.696	100	78 - 123	24.44	1.39	20	
cis-1,3-Dichloropropene	17.28	1.0	20	0	86.4	75 - 124	17.14	0.79	20	
Dibromochloromethane	17.72	1.0	20	0	88.6	74 - 126	17.35	2.1	20	
Dibromomethane	18.15	1.0	20	0	90.8	79 - 123	17.39	4.3	20	
Dichlorodifluoromethane	18.36	1.0	20	0	91.8	32 - 152	18.96	3.24	20	
Ethylbenzene	18.31	1.0	20	0	91.6	79 - 121	18.23	0.456	20	
Hexachlorobutadiene	23.53	1.0	20	0	118	66 - 134	22.45	4.71	20	
Isopropylbenzene	18.92	1.0	20	0	94.6	72 - 131	19.04	0.611	20	
m,p-Xylene	37.08	2.0	40	0	92.7	80 - 121	37.06	0.0437	20	
Methylene chloride	17.83	2.0	20	0	89.2	74 - 124	17.62	1.2	20	
Naphthalene	21.72	1.0	20	0	109	61 - 128	20.33	6.62	20	
n-Butylbenzene	20.3	1.0	20	0	102	75 - 128	19.95	1.76	20	
n-Propylbenzene	20.51	1.0	20	0	103	76 - 126	20.39	0.609	20	
o-Xylene	17.89	1.0	20	0	89.5	78 - 122	17.97	0.445	20	
sec-Butylbenzene	21.03	1.0	20	0	105	77 - 126	20.69	1.6	20	
Styrene	18.48	1.0	20	0	92.4	78 - 123	18.28	1.12	20	
tert-Butylbenzene	20.44	1.0	20	0	102	78 - 124	20.4	0.178	20	
Tetrachloroethene	18.1	1.0	20	0	90.5	74 - 129	18.26	0.894	20	
Toluene	18.1	1.0	20	0	90.5	80 - 121	18.16	0.31	20	
trans-1,2-Dichloroethene	18.55	1.0	20	0	92.8	75 - 124	19.19	3.4	20	
trans-1,3-Dichloropropene	17.86	1.0	20	0	89.3	73 - 127	17.78	0.461	20	
Trichloroethene	32.01	1.0	20	13.8	91.0	79 - 123	32.63	1.94	20	
Trichlorofluoromethane	20.09	1.0	20	0	100	65 - 141	20.12	0.15	20	
Vinyl chloride	19.45	1.0	20	0	97.3	58 - 137	20.24	3.94	20	
Surr: 1,2-Dichloroethane-d4	*51.82*	*1.0*	*50*	*0*	*104*	*81 - 118*	*50.63*	*2.31*	*20*	
Surr: 4-Bromofluorobenzene	*49.79*	*1.0*	*50*	*0*	*99.6*	*85 - 114*	*49.94*	*0.285*	*20*	
Surr: Dibromofluoromethane	*49.79*	*1.0*	*50*	*0*	*99.6*	*80 - 119*	*49.14*	*1.3*	*20*	
Surr: Toluene-d8	*48.19*	*1.0*	*50*	*0*	*96.4*	*89 - 112*	*48.68*	*0.999*	*20*	

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060835

QC BATCH REPORT

Batch ID: R341453 (0)	Instrument: VOA6	Method: VOLATILES ORGANICS BY METHOD 8260C

The following samples were analyzed in this batch:				
HS19060835-01	HS19060835-02	HS19060835-03	HS19060835-04	HS19060835-05

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: **HS19060835**

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	20-Dec-2021
Kansas	E-10352 2018-2019	31-Jul-2019
Kentucky	123043, 2019-2020	30-Apr-2020
Louisiana	03087, 2019-2020	30-Jun-2020
Maryland	343, 2019-2020	30-Jun-2020
North Carolina	624-2019	31-Dec-2019
Oklahoma	2018-156	31-Aug-2019
Texas	TX104704231-19-23	30-Apr-2020

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ALS Houston, US Date: 10-Jul-19

Sample Receipt Checklist

Client Name: Bhate Environmental
Work Order: HS19060835
Date/Time Received: **14-Jun-2019 08:45**
Received by: **JRM**

Checklist completed by: *Paresh M. Giga* eSignature 15-Jun-2019 Date
Reviewed by: *RJ Modashia* eSignature 17-Jun-2019 Date

Matrices: **Groundwater**
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):	1.3c U/c	IR25
Cooler(s)/Kit(s):	43893	
Date/Time sample(s) sent to storage:	6/14/19 18:00	

Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes: Trip Blank not received

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

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bhate ENVIRONMENTAL CONSTRUCTION ENERGY

1608 13th Avenue South, Suite 300
Birmingham Alabama 35205
Tel: 205-918-4000
Fax: 205-918-4050

Chain of Custody and Analytical Request

Page: _____ of _____

Project/Phase No: NWO1312.0150

COC Number(1): _____

LIMS Number: _____

Facility/Base I.D.: LHAAP

Project/Site Name: LHAAP / Site 18/24

Client Name:

Collected by: Scott Beesinger

Field Sample ID (30 Characters Max)	ERPIMS LOCID (15 Characters Max)	Date Collected (dd-mmm-yyyy)	Time Collected (Military) (hhmm)	Sample Depth (beginning - ending)	SA Code (2)	Sample Number (3)	Sample Matrix (4)	Number of containers	VOC	PERCHLORATE	TOTAL METALS	1, 4 - DIOXANE									Ambient Blank Lot Control Number	Equipment Blank Lot Control Number	Trip Blank Lot Control Number	Cooler ID
								Sample Analysis Requested (5)													Quality Assurance Samples (6)			
18CPTMW22SW_061319		13 JUN 2019	1030	-	N		WG	6	X	X	X	X												
18CPTMW22DW_061319		13 JUN 2019	1120	-	N		WG	6	X	X	X	X												
18CPTMW22R_061319		13 JUN 2019	1210	-	N		WG	6	X	X	X	X												
MW20_061319		13 JUN 2019	1255		N		WG	5	X	X	X													
18CPTMW26SW_061319		13 JUN 2019	1345		N		WG	5	X	X		X												
TRIP BLANK		13 JUN 2019		-	TB		W	2	X															
				-																				
				-																				
				-																				
				-																				
				-																				

HS19060835
Bhate Environmental Associates, Inc.
LHAAP 18 24

COMMENTS: _____

Custody Transfers Prior to Receipt by Laboratory

	Relinquished By (Signed)	Date	Time	Received by (signed)	Date	Time
1.	Scott Beesinger	6/13/19	1430	J. Mumm	6/14/19	08:45
2.						
3.						

Sample Delivery Details / Laboratory Receipt

Delivered Directly to Lab: _____ Shipped No.:

_____ Method of Shipment: _____

_____ Fed Ex _____ Airbill Number:

_____ Analytical Lab: ALS 10450 Stancliff Rd. Suite 210 Houston, TX 77099 (281) 530-5656

ATTN: SONIA WEST Lab Recipient: Delivery Date/Time:

1.) Chain of Custody Number = date collected + custody number (e.g. 09-02-1999-01)

2.) Sample Type (SA) Codes: N = Normal Sample, TB = Trip Blank (-c) Sample, FD = Field Duplicate (-a) Samples, FR = Field Replicate (-b) Samples, EB = Equipment Blank (-d) Samples, MS = Matrix Spike, SD = Matrix Spike Duplicate, AB = Ambient Blank (-e)

3.) Sample Number: Unique sample number collected from a particular location per day. (e.g. Groundwater sample collected from MW-1 on 10/10/99 = 01, if sampled again on 10/10/99 = 02, etc.)

4.) Matrix Codes: GS = Soil Gas, WG = Groundwater, WS = Surface Water, SO = Soil, SE = Sediment, SL = Sludge, SS = Surface Soil Samples, WQ = Aqueous Blank Samples (trip, equipment, ambient, etc), SQ = Soil Blanks

5.) Sample Analysis Requested: Analytical method requested and number of containers provided for each.

6.) Quality assurance samples are assigned by date (ddmmyy) and the sample number associated with the sample (01, 02, etc) (e.g. Equipment blank collected in association with MW-1 on 10/10/99 will be designated 10109901 in the Equipment Blank Lot Control

Cooler 43893 IR25
Temp 1.3 CF0.0

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00940333

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

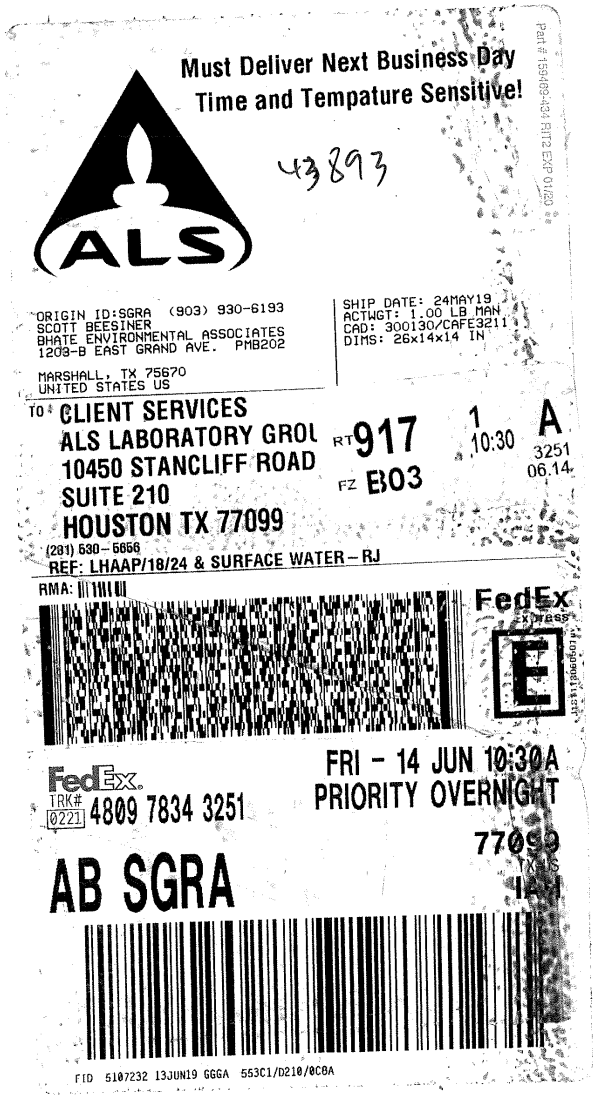
43893

CUSTODY SEAL

Date: 6/13/19 Time: 1430
Name: Scott Beesinger
Company: BHATE

Seal Broken By: SM
Date: 06/14/19

43893 JUN 14 2019



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Case Narrative

Method: 6850
Analysis: Perchlorate
Analysis SOP: LC-MS-CLO4
ALS WO ID(s): 1917488, 1917489, 1917672

Client: ALS Laboratories (Houston, TX)
Matrix: Water
ELMS Batch (HBN): 2264 (242398)

General Set Information: There were thirteen 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 samples 1917489001 and 1917672006 were analyzed and reported from 1:100 dilutions. Field sample 1917672001 was analyzed and reported from a 1:1,000 dilution. The reporting limits have been adjusted accordingly.

Method QC data: The method blank (LMB 660892) was less than 1/2 the CRDL. The recovery for the LCS (660893) was within acceptable parameters.

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MS/MSD Analysis: MS/MSD was performed on sample 1917488001 (Client ID: LH18/24-SP650_061219_BIX). 5.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. The spike target was 5.µg/L. The MS/MSD percent recoveries were within the performance limits. The MS/MSD failed QC acceptance criteria for relative percent difference. The Matrix Spike and Matrix Spike duplicate is reported for the clients' information only. The sample matrix may be inappropriate for the method selected.

Instrument QC: Instrument initial and continuing calibrations were performed in accordance with published procedures.

NC/CAR(s): NA

Sample Calculation: Samples were reported in 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 – 660890) is reported from the analysis of the Laboratory Control Sample (LCS – 660893) at a level of 4.0µg/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: 19MARI03) along with datafiles 27JUND03/12/20.

Thomas Bosch July 1, 2019
Analyst Date

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ANALYTICAL REPORT

Report Date: July 01, 2019

RJ Modashia
ALS Environmental (Houston)
10450 Stancliff Road
Suite 210
Houston, TX 77099

Phone: 281 530-5656

E-mail: RJ.Modashia@ALSGlobal.com

Workorder: **34-1917489**
Project ID: HS19060835
Purchase Order: HS19060835
Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
18CPTMW22SW_061319	1917489001	06/13/19	06/18/19	
18CPTMW22DW_061319	1917489002	06/13/19	06/18/19	
18CPTMW22R_061319	1917489003	06/13/19	06/18/19	
MW20_061319	1917489004	06/13/19	06/18/19	
18CPTMW26SW_061319	1917489005	06/13/19	06/18/19	

ANALYTICAL REPORT

Workorder: 34-1917489
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **18CPTMW22SW_061319** | Sampling Site: NA | Collected: 06/13/2019
Lab ID: 1917489001 | Media: 125 mL Nalgene | Received: 06/18/2019
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/2264 (HBN: 242398) | **Percent Solid:** NA
Analyzed: 06/27/2019 10:24 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	**590**	100	200	400	100	

Sample ID: **18CPTMW22DW_061319** | Sampling Site: NA | Collected: 06/13/2019
Lab ID: 1917489002 | Media: 125 mL Nalgene | Received: 06/18/2019
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/2264 (HBN: 242398) | **Percent Solid:** NA
Analyzed: 06/27/2019 10:38 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: **18CPTMW22R_061319** | Sampling Site: NA | Collected: 06/13/2019
Lab ID: 1917489003 | Media: 125 mL Nalgene | Received: 06/18/2019
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/2264 (HBN: 242398) | **Percent Solid:** NA
Analyzed: 06/27/2019 10:52 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: **MW20_061319** | Sampling Site: NA | Collected: 06/13/2019
Lab ID: 1917489004 | Media: 125 mL Nalgene | Received: 06/18/2019
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/2264 (HBN: 242398) | **Percent Solid:** NA
Analyzed: 06/27/2019 11:06 | **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

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ANALYTICAL REPORT

Workorder: 34-1917489
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **18CPTMW26SW_061319**	Sampling Site: NA	Collected: 06/13/2019
Lab ID: 1917489005	Media: 125 mL Nalgene	Received: 06/18/2019
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/2264 (HBN: 242398)	**Percent Solid:** NA
	Analyzed: 06/27/2019 11:20	**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

Comments

Quality Control: EPA 6850, DoD QSM - (HBN: 242398)

Field samples 1917489001 and 1917672006 were analyzed and reported from 1:100 dilutions. Field sample 1917672001 was analyzed and reported from a 1:1,000 dilution. The reporting limits have been adjusted accordingly.

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

Method	Analyst	Peer Review
EPA 6850, DoD QSM	/S/ Thomas Bosch 07/01/2019 10:47	/S/ Stephen Brose 07/01/2019 13:43

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: 34-1917489
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
	Nevada (TNI)	UT00953201-1	https://ndep.nv.gov/water/lab-certification
	Iowa (TNI)	IA# 376	http://www.shl.uiowa.edu/labcert/idnr/
	Kansas	E-10416	http://www.kdheks.gov/envlab/disclaimer.html
	Oklahoma (TNI)	IJ# 9980	http://www.deq.state.ok.us/CSDnew/labcert.htm
	Texas (TNI)	T104704456-18-9	https://www.tceq.texas.gov/assets/public/compliance/compliance_support/qa/txnelap_lab_list.pdf
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: 1917489

Limits:	Client SOW/Contract Specified	**Analysis:**	EPA 6850, DoD QSM
Basis:	DoD QSM	**Batch:**	ELMS/2264 (HBN: 242398)
Preparation:	NA	**Analyzed By:**	Thomas Bosch
Batch:	NA		
Prepared By:	NA		

Blank

LMB: 660892
Analyzed: 06/27/2019 09:28
Units: ug/L

Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 660893
Analyzed: 06/27/2019 09:00
Dilution: 1
Units: ug/L

Analyte	Result	Target	% Rec	QC Limits	
Perchlorate	4.27	4.00	107	78.8	123.8

Matrix Spike - Matrix Spike Duplicate

	Sample	MS	MSD
	1917488001	660894	660895
Analyzed:	06/27/2019 09:42	06/27/2019 09:56	06/27/2019 10:10
Dilution:	1	1	1
Units:	ug/L	ug/L	ug/L

Analyte	Result	Result	Target	% Rec	QC Limits		Result	% Rec		RPD	QC Limits	
Perchlorate	ND	5.13	5	103	78.8	123.8	4.06	81.2	#	23.3	0.0	20.0

Comments

Field samples 1917489001 and 1917672006 were analyzed and reported from 1:100 dilutions. Field sample 1917672001 was analyzed and reported from a 1:1,000 dilution. The reporting limits have been adjusted accordingly.

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

Analyst	Peer Review
/S/ Thomas Bosch	/S/ Stephen Brose
07/01/2019 10:55	07/01/2019 13:43

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

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10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

18693/2

1917489

# of Custody

SAMPLING STATE: **Texas**

COC ID: **11600**

1917489

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:	HS19060835
TSR:	Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS19060835-01**	**18CPTMW22SW_061319**	**Groundwater**	**13 Jun 2019 10:30**
	SUB_Perch-6850			24 Jun 2019
2.	**HS19060835-02**	**18CPTMW22DW_061319**	**Groundwater**	**13 Jun 2019 11:20**
	SUB_Perch-6850			24 Jun 2019
3.	**HS19060835-03**	**18CPTMW22R_061319**	**Groundwater**	**13 Jun 2019 12:10**
	SUB_Perch-6850			24 Jun 2019
4.	**HS19060835-04**	**MW20_061319**	**Groundwater**	**13 Jun 2019 12:55**
	SUB_Perch-6850			24 Jun 2019
5.	**HS19060835-05**	**18CPTMW26SW_061319**	**Groundwater**	**13 Jun 2019 13:45**
	SUB_Perch-6850			24 Jun 2019

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

QC Level: DOD IV (DoD Data Package)

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Subcontract Chain of Custody

SAMPLING STATE: **Texas**

COC ID: **11600**

Relinquished By: _____ Date/Time: 6/17/19 1800

Received By: Tami Van Fossen Date/Time: 06-18-19 9:58

Cooler ID(s): _____ Temperature(s): _____

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ALS Environmental

CHAIN-OF-CUSTODY

Project / Job / Task: HS19060835	Split:	Workorder ID: 1917489	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	06/13/2019 10:30	18CPTMW22SW_061319	1917489001		Water	A	1	A
2	06/13/2019 11:20	18CPTMW22DW_061319	1917489002		Water	A	1	A
3	06/13/2019 11:10	18CPTMW22R_061319	1917489003		Water	A	1	A
4	06/13/2019 12:55	MW20_061319	1917489004		Water	A	1	A
5	06/13/2019 13:45	18CPTMW26SW_061319	1917489005		Water	A	1	A
6								
7								
8								
9								
10								

ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location
Warath, Julie	06/18/2019 09:58	ALS Sample Receiving	Sample Login
Julie Warath	6/18/19 1440	4C	Storage
R.Bl	6/26-19/0820	T.Bond	6850

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

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00940344

ALS-Salt Lake City-Related Information Report (CRIR)

Cooler or Container Information Checklist (Fill In or Circle)

Client Name: ALS Houston — Project/Task/Site: 197489

Date/Time of Receipt: 06-18-19 9:58 — 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	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.
1	C19 9706	1 °C	4	C19	°C	7	C19	°C
2	C19	°C	5	C19	°C	8	C19	°C
3	C19	°C	6	C19	°C	9	C19	°C

Taken By: [signature] (Signature) T. Vantassell (Printed Name) 06-18-19 (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 ☐

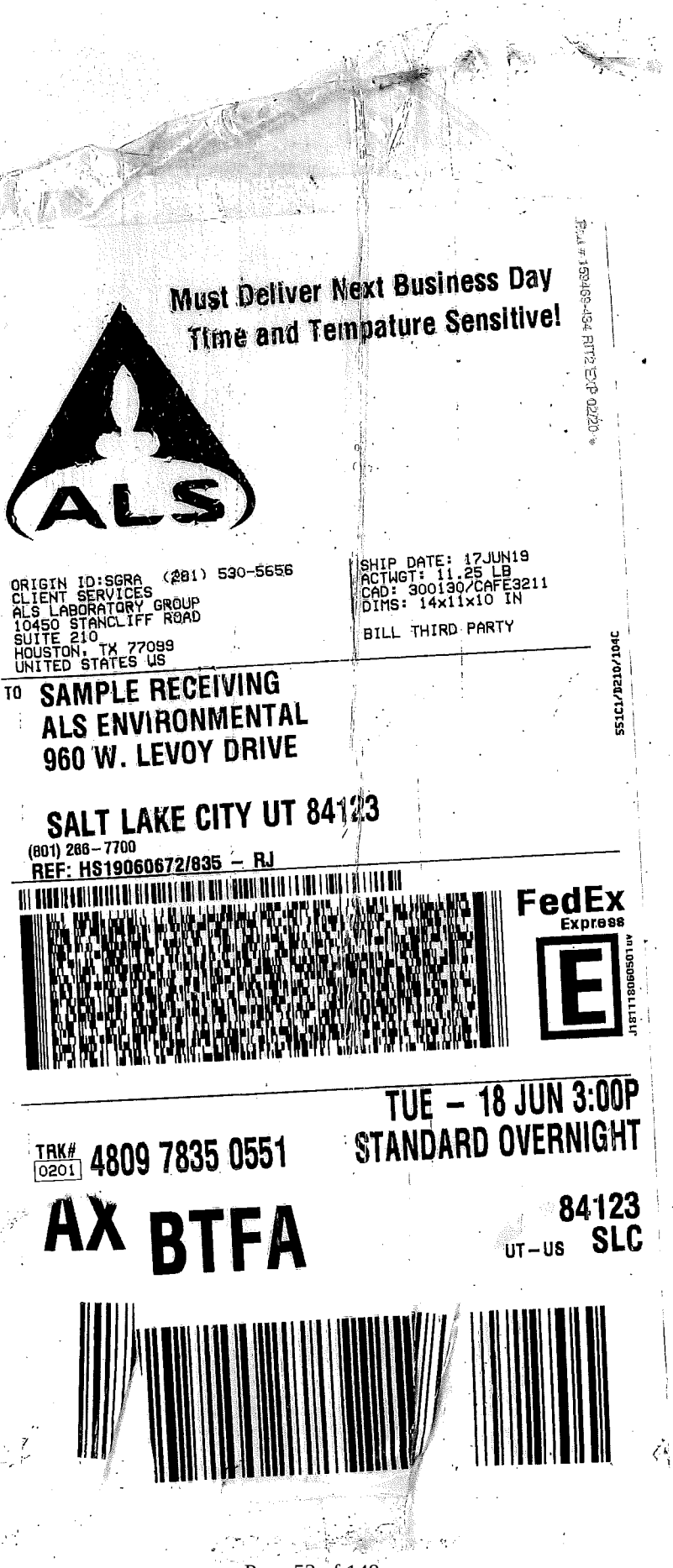
Response Required Within 24 Hours

Project Management

Project Manager Comments:

ALS Project Manager: _____ (Printed Name) Returned to Sample Receipt by: _____ (Signature) Date: _____

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Batch Worklist

Batch: ELMS/ 2264 **Created:** 6/27/2019 07:47 **Instrument:** HBN: 242398

Rule: EPA 6850, DoD QSM Water **Analyst:** T. Bosch **Status:** WP

Workorder: 1917488 [ENV_LVL4]
Workorder: 1917489 [ENV_LVL4]
Workorder: 1917672 [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	660889	CCV for HBN 242398 [ELMS/2264]				CCV	3		E685041C3Q	5311		7/1/2019	
2	660890	RLVS for HBN 242398 [ELMS/2264				RLVS	3		E685041C3Q	5311		7/1/2019	
3	660891	ICS for HBN 242398 [ELMS/2264]				ICS	3		E6850..D3Q	5311		7/1/2019	
4	660892	LMB for HBN 242398 [ELMS/2264]				LMB	3		E6850Q413Q	5311		7/1/2019	
5	660893	LCS for HBN 242398 [ELMS/2264]				LCS	3		E6850Q413Q	5311		7/1/2019	
6	1917488001	LH18/24-SP650_061219_BIX				SAMPLE	3	1917488001-A	E6850Q41.3	5480	7/10/2019	7/1/2019	
7	660894	LH18/24-SP650...(1917488001MS)				MS	3		E6850Q413Q	5311		7/1/2019	
8	660895	LH18/24-SP65...(1917488001MSD)				MSD	3		E6850Q413Q	5311		7/1/2019	
9	1917489001	18CPTMW22SW_061319				SAMPLE	3	1917489001-A	E6850Q41.3	5480	7/11/2019	7/1/2019	
10	1917489002	18CPTMW22DW_061319				SAMPLE	3	1917489002-A	E6850Q41.3	5480	7/11/2019	7/1/2019	
11	1917489003	18CPTMW22R_061319				SAMPLE	3	1917489003-A	E6850Q41.3	5480	7/11/2019	7/1/2019	
12	1917489004	MW20_061319				SAMPLE	3	1917489004-A	E6850Q41.3	5480	7/11/2019	7/1/2019	
13	1917489005	18CPTMW26SW_061319				SAMPLE	3	1917489005-A	E6850Q41.3	5480	7/11/2019	7/1/2019	
14	1917672001	MW7_061719				SAMPLE	3	1917672001-A	E6850Q41.3	5480	7/15/2019	7/3/2019	
15	1917672002	18CPTMW12DW_061719				SAMPLE	3	1917672002-A	E6850Q41.3	5480	7/15/2019	7/3/2019	
16	660896	CCV for HBN 242398 [ELMS/2264]				CCV	3		E685041C3Q	5311		7/1/2019	
17	1917672003	18CPTMW12SW_061719				SAMPLE	3	1917672003-A	E6850Q41.3	5480	7/15/2019	7/2/2019	
18	1917672004	18CPTMW12SW_061719_a				SAMPLE	3	1917672004-A	E6850Q41.3	5480	7/15/2019	7/2/2019	
19	1917672005	18CPTMW23SW_061719				SAMPLE	3	1917672005-A	E6850Q41.3	5480	7/15/2019	7/2/2019	
20	1917672006	18CPTMW23_061719				SAMPLE	3	1917672006-A	E6850Q41.3	5480	7/15/2019	7/2/2019	
21	1917672007	18W14_061719W_061719				SAMPLE	3	1917672007-A	E6850Q41.3	5480	7/15/2019	7/2/2019	
22	660897	CCV for HBN 242398 [ELMS/2264]				CCV	3		E685041C3Q	5311		7/1/2019	

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00940347

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

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ALS Work Order #'s & Sample #( )'s: 1917488 (001), 1917489 (001-05), 1917672 (001-07)
ELMS Batch/HBN ID: 2264 (242398)
Prep Date: 06/26/2019 Analysis Date: 06/27/2019 Analyst: T. Bosch
Analyte: **Perchlorate** Matrix: **Water** Method: **6850**
Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2019\JUN\27JUN19D.s
Reported DL: **1.0µg/L** Reported LOD: **2.0µg/L** Reported LOQ: **4.0µg/L**

SAMPLE PREPARATION/ANALYSIS:

Water: Samples were prepared by Thomas 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 AH015-4)/0.1% glacial acetic acid (JT-Baker Lot 04802).
Eluent B1: 95% ACN (B&J Lot AH015-4)/ 5% ASTM Type II water (ALS)/0.1% glacial acetic acid (JT-Baker Lot 04802).

STANDARDS: Internal Standard Spiking Solution Horizon# 43730. Dilutions of Working Standard Solution ID 43702 used for CCV's, LODV's, RLVS and IPC.

CALIBRATION CURVE: Used curve from 03/19/2019, sequence 19MAR19D.s Offline Quantitation Method: CLO4-DP2.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: 7 Injection Volume: 35µL
Column: KP-RPPX C8 separator, 250mm Mobile Phase: 70% Eluent A1; 30% Eluent B1

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: 4.0µL of QC Solution Horizon ID 47516 was used for LCS 660893; Target = 4.0µg/L. ASTM type II water was used for LMB 660892.

MS/MSD: The Matrix Spike and duplicate (MS/MSD) were performed on sample 1917488001 (Client ID: LH18/24-SP650_061219_BIX). 5.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. Spike target = 5.0µg/L.

COMMENTS:
1) Results reported in µg/L. Field samples 1917489001 and 1917672006 were analyzed and reported from 1:100 dilutions. Field sample 1917672001 was analyzed and reported from a 1:1,000 dilution. The reporting limits have been adjusted accordingly.
2) All QC, Blank, CCV, and MS/MSD results were within method parameters, except for the following. The MS/MSD – 660894/95 failed QC acceptance criteria for relative percent difference. The Matrix Spike and Matrix Spike duplicate is reported for the clients' information only. The sample matrix may be inappropriate for the method selected.
3) Sample data can be viewed at two directories within the ALS system: \\ALSLTWS013\LCMS\LCMS04\2019\JUN\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
4) Notebook: \\alsltws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2019\242398-DoD-ALS-Hstn LCMS4 or through \\ALSLTWS013\DATAREVIEW\HBN#
5) The Reporting Limit Verification Standard (RLVS – 660890) is reported from the analysis of the Laboratory Control Sample (LCS – 660893) at a level of 4.0µg/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: 19MARI03) along with datafiles 27JUND03/12/20.

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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: 2264 HBN: 242398 Sample Set IDs if Applicable: 1917488/1917489/1917672	Analyst Initials	Reviewer Initials
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
Method Blanks 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 flags applied on QC reports; LCSs analyzed and meet acceptance criteria when performed	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 checked	TB	SB
Preparation and analysis calculations checked	TB	SB
NCRs are completed as necessary NC/CAR#_____	—	—
Report forms are complete and accurate	TB	SB
Manual integrations checked	TB	SB

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STANDARD REPORT

Working Standard - CLO4 WRK

CLO4 WRK - Description - 6850 WKG Std 100.ug/L

Standard: 43702
MFG: ALS/SLC
MFG Lot: TNB: 09/18/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/18/2018 02:09PM

Amount: 10 mL
Expires: 09/18/2019
Usable: Yes
Lab Lot: CLO4 WRK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	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
43701	CLO4 INT	6850 Intermdt AccStd 10.ug/mL	CLO4 INT	0.1 mL	09/18/2019

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: No
Lab Lot: CLO4 STOCK

Pos.	Analyte	Name	Concentration
			1000 ug/mL
1	14797-73-0	Perchlorate	

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			

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STANDARD REPORT

Constituent

Working Standard - CLO4 INT

CLO4 INT	Description - 6850 Intermdt AccStd 10.ug/mL

Standard: 43701
MFG: ALS/SLC
MFG Lot: TNB: 09/18/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/18/2018 02:09PM

Amount: 10 mL
Expires: 09/18/2019
Usable: Yes
Lab Lot: CLO4 INT

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
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

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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			

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STANDARD REPORT

Constituent

Stock Standard - CLO4 QCSTOCK

CLO4 QCSTOCK — Description - 6850 QC Stock STD 1,000ug/mL

Standard: 36748
MFG: Ultra Scientific
MFG Lot: CP-0860
Part ID: ICC-013

Created By: Thomas Bosch
Create Date: 05/11/2017 01:05PM

Amount: 100 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL

STANDARD REPORT

Constituent

Working Standard - CLO4 QC INT

CLO4 QC INT — Description - 6850 QC Intrmdt Std-QC 10ug/mL

Standard: 47515
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

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STANDARD REPORT

Working Standard - CLO4ISTDWRK

CLO4ISTDWRK — Description - Perchlorate ISTD Wrk 1,000ug/L

Standard: 43730	**Created By:** Thomas Bosch	**Amount:** 25 mL
MFG: ALS/SLC	**Create Date:** 09/20/2018 09:09AM	**Expires:** 09/20/2019
MFG Lot: TNB: 05/09/2018	**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
43729	CLO4ISTDSTK	Perchlorate ISTD Stock	CLO4ISTDSTK	0.25 mL	04/28/2026

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STANDARD REPORT

Constituent

Stock Standard - CLO4ISTDSTK

CLO4ISTDSTK — Description - Perchlorate ISTD Stock

Standard: 43729
MFG: Cambridge Isotope
MFG Lot: SDFF-012A
Part ID: OLM-7310-S

Created By: Thomas Bosch
Create Date: 09/20/2018 09:09AM
Verified By: Thomas Bosch
Verify Date:

Amount: 1 mL
Expires: 04/28/2026
Usable: Yes
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

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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

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 ANAB ACCREDITED

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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

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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*

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

GHS

Signal Word: None

Component		SRM #	Prepared Concentration (µg/mL)
ClO_4	Perchlorate	Ind. Std.	1000

The gravimetric uncertainty for this product is ±0.24%.
The final solution was checked against an independent standard to verify its concentration.
We use the highest purity raw materials available to minimize impurity levels in the final solution. Typically 99.999%+ pure starting materials are used as well as ASTM Type I 18 megohm deionized water.
All solutions are filtered through a 0.2 µm filter prior to being bottled.
All glassware used in preparation is Class A and calibrated regularly.
All weights are traceable through NIST, Test No. 822-275872-11
All bottles are triple rinsed with deionized water prior to use.
Shake bottle prior to use and do not pipette directly out of the bottle. Use only cleaned Class A volumetric glassware.
We certify the accuracy of this standard to be ±0.5% of the stated value until its expiration date provided it is kept tightly capped and stored under the conditions stated above.

Certified By: Meigan O'Leary
Meigan O'Leary, Inorganic QC Manager

For use in routine laboratory analysis.

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

QR-ORG/IND-001
Rev. 5/18

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Cambridge Isotope Laboratories, Inc.

Certificate of Analysis

Quality Standards:
ISO Guide 34 • ISO/IEC 17025 • ISO 13485 • cGMP

23118

Product Name: (Isotopic Label & Enrichment Specification)	PERCHLORIC ACID, SODIUM SALT (18O4, 90%+) 100 UG/ML IN WATER
Lot Number:	SDDG-013
Catalog Number:	OLM-7310-S

Product Information

Chemical Purity Specification:	≥98%
Labeled CAS Number:	NA
Unlabeled CAS Number:	7601-89-0
MW*:	130.4
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.

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.

* *For isotopically labeled compounds, MW listed is for the fully enriched product.*

Approved by: T. J. Eckersley

Timothy I. Eckersley, Ph.D., Quality Assurance

Quality Control Tests and Results

QC Release Date	2/27/2014
Expiration Date	2/27/2024
Concentration Based on Gravimetry	102 µg/mL
Chemical Purity of Neat Material(s)	98%
LC/MS for Concentration	109.4 ± 2.8 µg/mL (k=2)

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ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

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Batch Report: C:\HPCHEM\1\DATA\27JUN19D\27JUN19S.B

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP2.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
*	660889 CCV@25	Vial 71	1	Control	1	1.82515e6	8.439	25.67350
*	660893 QC@4.0	Vial 72	1	Control	2	3.38083e5	8.214	4.26890
*	660891 ICS@4.0	Vial 73	1	Control	3	2.57330e5	7.965	3.92512
*	660892 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	1917488001	Vial 75	1	Sample	5	0.00000	0.000	0.00000
*	660894 174881S	Vial 76	1	Sample	6	2.62640e5	7.903	5.12768
*	660895 174881D	Vial 77	1	Sample	7	2.64844e5	7.941	4.05844
*	1917489001 100	Vial 78	1	Sample	8	4.17326e5	8.686	591.94538
*	1917489002	Vial 79	1	Sample	9	0.00000	0.000	0.00000
*	1917489003	Vial 80	1	Sample	10	0.00000	0.000	0.00000
*	1917489004	Vial 81	1	Sample	11	0.00000	0.000	0.00000
*	1917489005	Vial 82	1	Sample	12	0.00000	0.000	0.00000
*	1917672001 1K	Vial 83	1	Sample	13	1.57532e6	8.712	2.61220e4
*	1917672002	Vial 84	1	Sample	14	6.54028e4	7.973	1.24787
*	660896 CCV@25	Vial 71	1	Control	15	1.48921e6	8.624	25.51318
*	1917672003	Vial 85	1	Sample	16	0.00000	0.000	0.00000
*	1917672004	Vial 86	1	Sample	17	0.00000	0.000	0.00000
*	1917672005	Vial 87	1	Sample	18	0.00000	0.000	0.00000
*	1917672006 100	Vial 88	1	Sample	19	1.71986e6	8.736	2534.96449
*	1917672007	Vial 89	1	Sample	20	0.00000	0.000	0.00000
*	660897 CCV@25	Vial 71	1	Control	21	1.42516e6	8.651	24.42440

#*	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
*	660889 CCV@25	Vial 71	1	Control	1	5.48361e5	8.454	25.97496
*	660893 QC@4.0	Vial 72	1	Control	2	1.12796e5	8.202	4.63897
*	660891 ICS@4.0	Vial 73	1	Control	3	8.93833e4	7.980	4.42426
*	660892 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	1917488001	Vial 75	1	Sample	5	0.00000	0.000	0.00000
*	660894 174881S	Vial 76	1	Sample	6	8.68330e4	7.935	5.55768
*	660895 174881D	Vial 77	1	Sample	7	8.75585e4	7.960	4.36181
*	1917489001 100	Vial 78	1	Sample	8	1.40501e5	8.696	655.91363
*	1917489002	Vial 79	1	Sample	9	0.00000	0.000	0.00000
*	1917489003	Vial 80	1	Sample	10	0.00000	0.000	0.00000
*	1917489004	Vial 81	1	Sample	11	0.00000	0.000	0.00000
*	1917489005	Vial 82	1	Sample	12	0.00000	0.000	0.00000
*	1917672001 1K	Vial 83	1	Sample	13	4.80693e5	8.744	2.68224e4
*	1917672002	Vial 84	1	Sample	14	2.29889e4	7.974	1.29323
*	660896 CCV@25	Vial 71	1	Control	15	4.52707e5	8.622	26.10046
*	1917672003	Vial 85	1	Sample	16	0.00000	0.000	0.00000
*	1917672004	Vial 86	1	Sample	17	0.00000	0.000	0.00000
*	1917672005	Vial 87	1	Sample	18	0.00000	0.000	0.00000
*	1917672006 100	Vial 88	1	Sample	19	5.21595e5	8.762	2587.43586
*	1917672007	Vial 89	1	Sample	20	0.00000	0.000	0.00000
*	660897 CCV@25	Vial 71	1	Control	21	4.30118e5	8.688	24.80913

#*	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
*	660889 CCV@25	Vial 71	1	Control	1	2.15939e5	8.466	5.00000
*	660893 QC@4.0	Vial 72	1	Control	2	2.60134e5	8.243	5.00000
*	660891 ICS@4.0	Vial 73	1	Control	3	2.16232e5	7.969	5.00000
*	660892 LMB	Vial 74	1	Control	4	2.72547e5	8.630	5.00000
*	1917488001	Vial 75	1	Sample	5	2.27402e5	7.920	5.00000
*	660894 174881S	Vial 76	1	Sample	6	1.66848e5	7.932	5.00000
*	660895 174881D	Vial 77	1	Sample	7	2.14876e5	7.954	5.00000
*	1917489001 100	Vial 78	1	Sample	8	2.28283e5	8.729	500.00000
*	1917489002	Vial 79	1	Sample	9	2.07849e5	7.985	5.00000
*	1917489003	Vial 80	1	Sample	10	2.26487e5	8.403	5.00000

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Batch Report: C:\HPCHEM\1\DATA\27JUN19D\27JUN19S.B

#*	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
*	1917489004	Vial 81	1	Sample	11	1.93008e5	7.993	5.00000
*	1917489005	Vial 82	1	Sample	12	1.81500e5	7.840	5.00000
*	1917672001 1K	Vial 83	1	Sample	13	1.82987e5	8.737	5000.00000
*	1917672002	Vial 84	1	Sample	14	1.91018e5	8.001	5.00000
*	660896 CCV@25	Vial 71	1	Control	15	1.77368e5	8.624	5.00000
*	1917672003	Vial 85	1	Sample	16	1.65261e5	7.950	5.00000
*	1917672004	Vial 86	1	Sample	17	1.47928e5	7.939	5.00000
*	1917672005	Vial 87	1	Sample	18	1.93450e5	8.278	5.00000
*	1917672006 100	Vial 88	1	Sample	19	2.06241e5	8.740	500.00000
*	1917672007	Vial 89	1	Sample	20	1.87344e5	7.970	5.00000
*	660897 CCV@25	Vial 71	1	Control	21	1.77769e5	8.693	5.00000

*** End of Report ***

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Sequence Table:

Method and Injection Info Part:

Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	660889 CCV@25	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	660893 QC@4.0	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	660891 ICS@4.0	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	660892 LMB	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	1917488001	CLO4-AQN	1	Sample		
6	Vial 76	660894 174881S	CLO4-AQN	1	Sample		
7	Vial 77	660895 174881D	CLO4-AQN	1	Sample		
8	Vial 78	1917489001 100	CLO4-AQN	1	Sample		
9	Vial 79	1917489002	CLO4-AQN	1	Sample		
10	Vial 80	1917489003	CLO4-AQN	1	Sample		
11	Vial 81	1917489004	CLO4-AQN	1	Sample		
12	Vial 82	1917489005	CLO4-AQN	1	Sample		
13	Vial 83	1917672001 1K	CLO4-AQN	1	Sample		
14	Vial 84	1917672002	CLO4-AQN	1	Sample		
15	Vial 71	660896 CCV@25	CLO4-AQN	1	Ctrl Samp		
16	Vial 85	1917672003	CLO4-AQN	1	Sample		
17	Vial 86	1917672004	CLO4-AQN	1	Sample		
18	Vial 87	1917672005	CLO4-AQN	1	Sample		
19	Vial 88	1917672006 100	CLO4-AQN	1	Sample		
20	Vial 89	1917672007	CLO4-AQN	1	Sample		
21	Vial 71	660897 CCV@25	CLO4-AQN	1	Ctrl Samp		

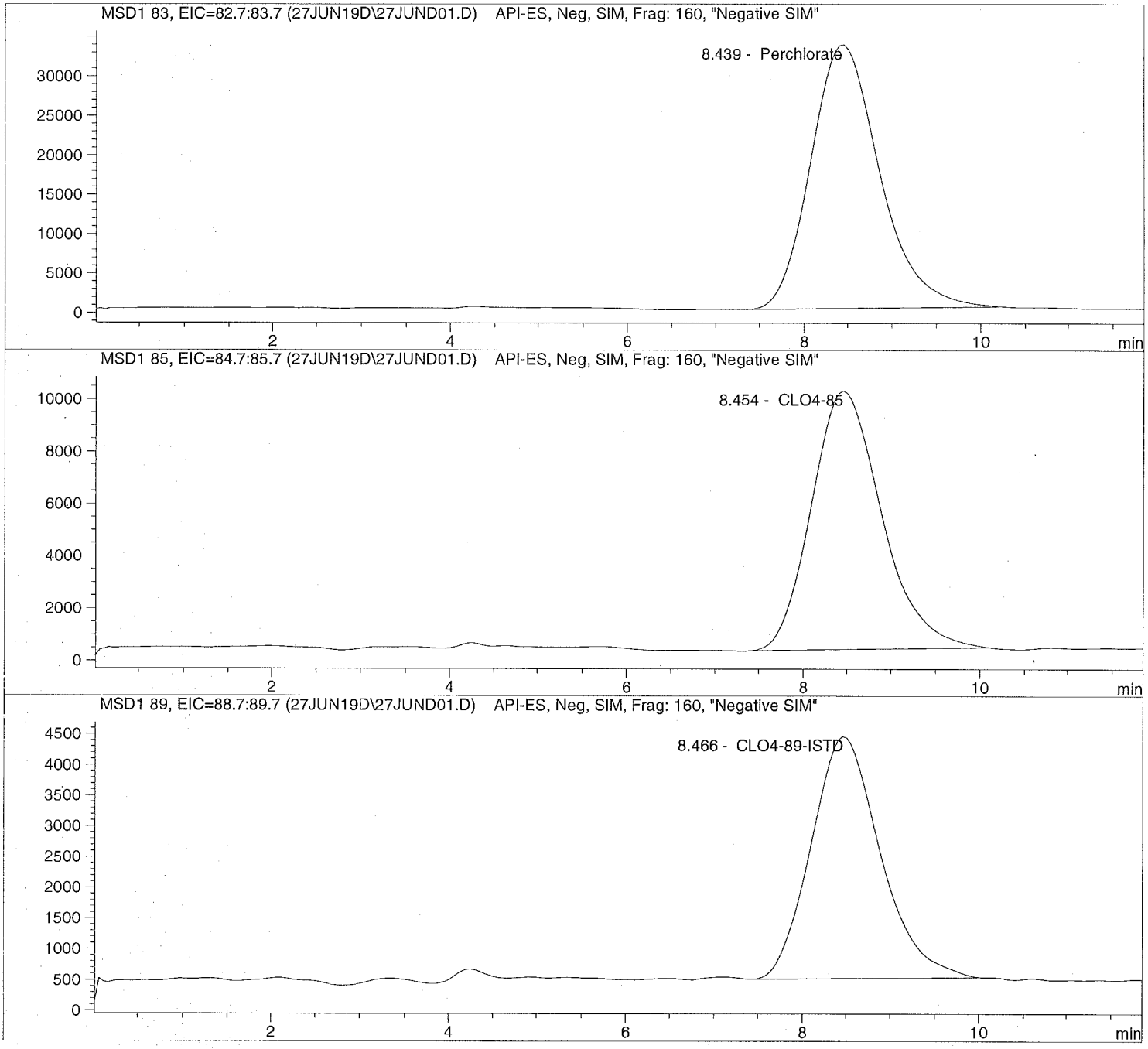
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Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND01.D Sample Name: 660889 CCV@25

Injection Date:	6/27/2019 08:45:38	Seq Line:	1
Sample Name:	660889 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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



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Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND01.D Sample Name: 660889 CCV@25

Injection Date:	6/27/2019 08:45:38	Seq Line:	1
Sample Name:	660889 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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.439	PBA	1825148.0	25.6735	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.454	PBA	548361.0	25.9750	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.466	PBA	215939.1	5.0000	CLO4-89-ISTD

*** End of Report ***

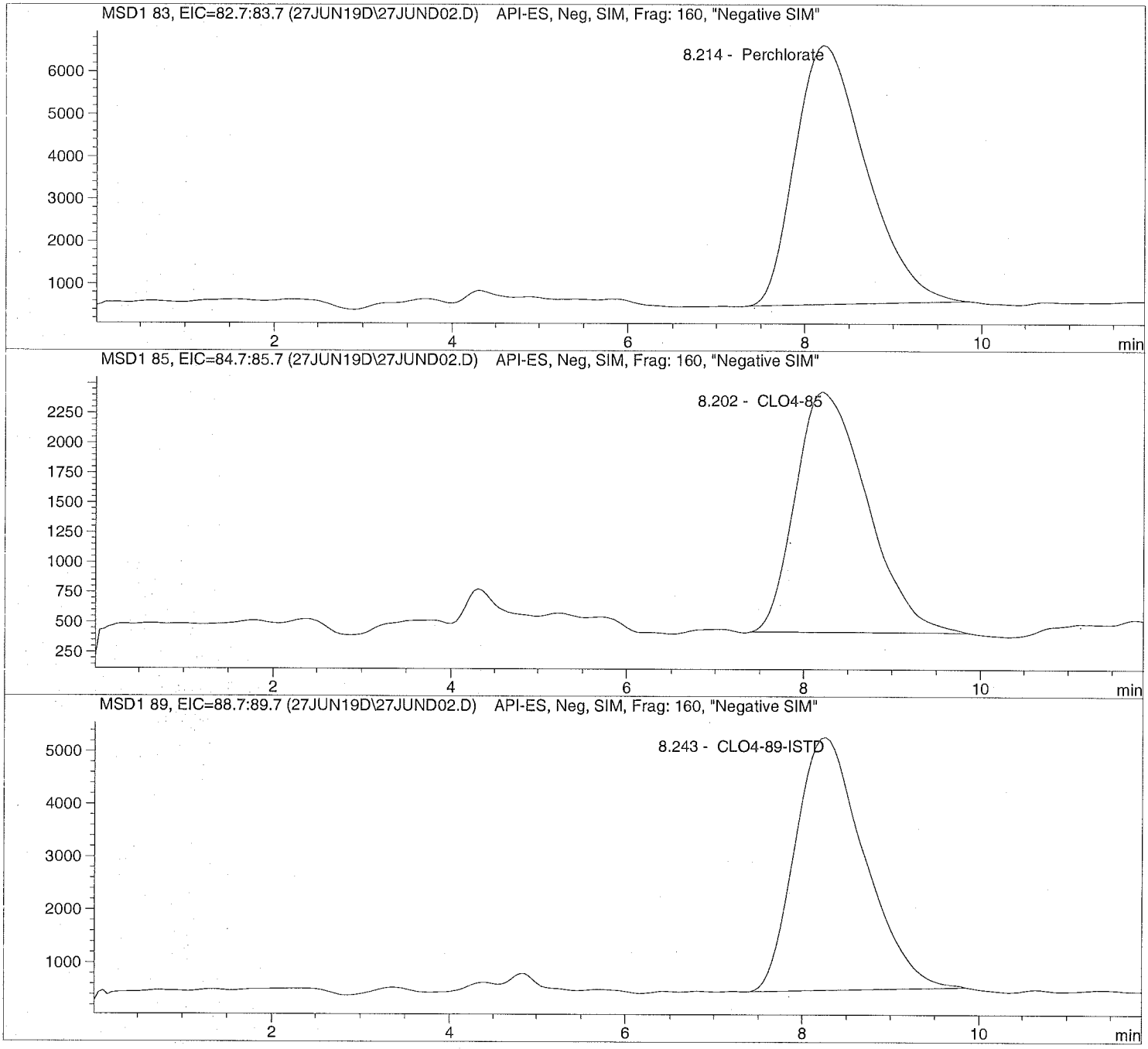
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND02.D Sample Name: 660893 QC@4.0

Injection Date:	6/27/2019 09:00:21	Seq Line:	2
Sample Name:	660893 QC@4.0	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



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Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND02.D Sample Name: 660893 QC@4.0

Injection Date:	6/27/2019 09:00:21	Seq Line:	2
Sample Name:	660893 QC@4.0	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.214	PBA	338083.1	4.2689	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.202	PBA	112796.3	4.6390	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.243	PBA	260134.2	5.0000	CLO4-89-ISTD

*** End of Report ***

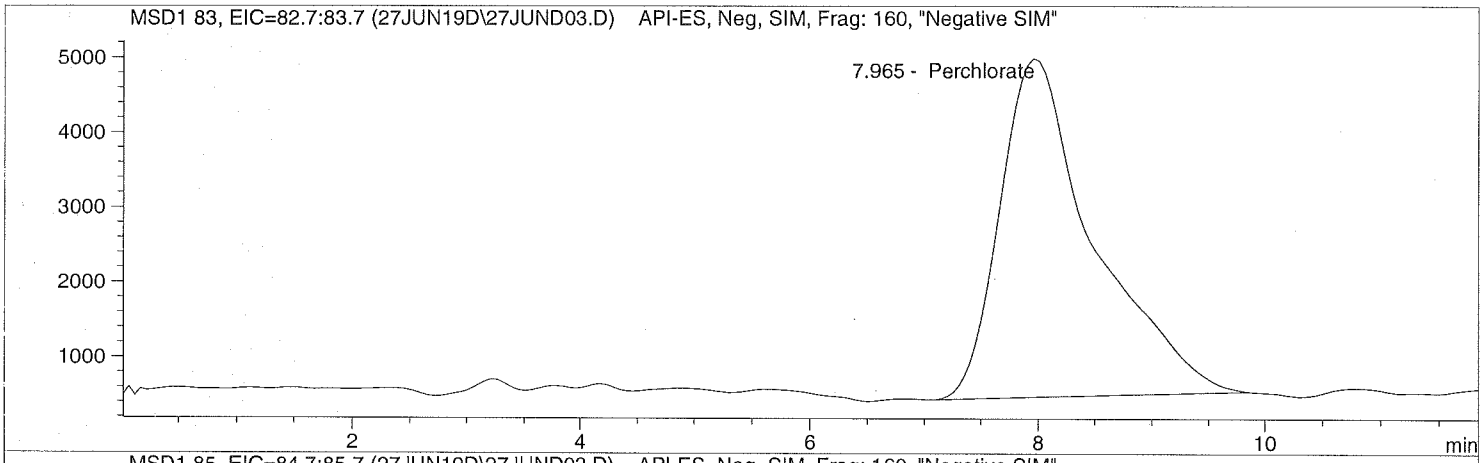
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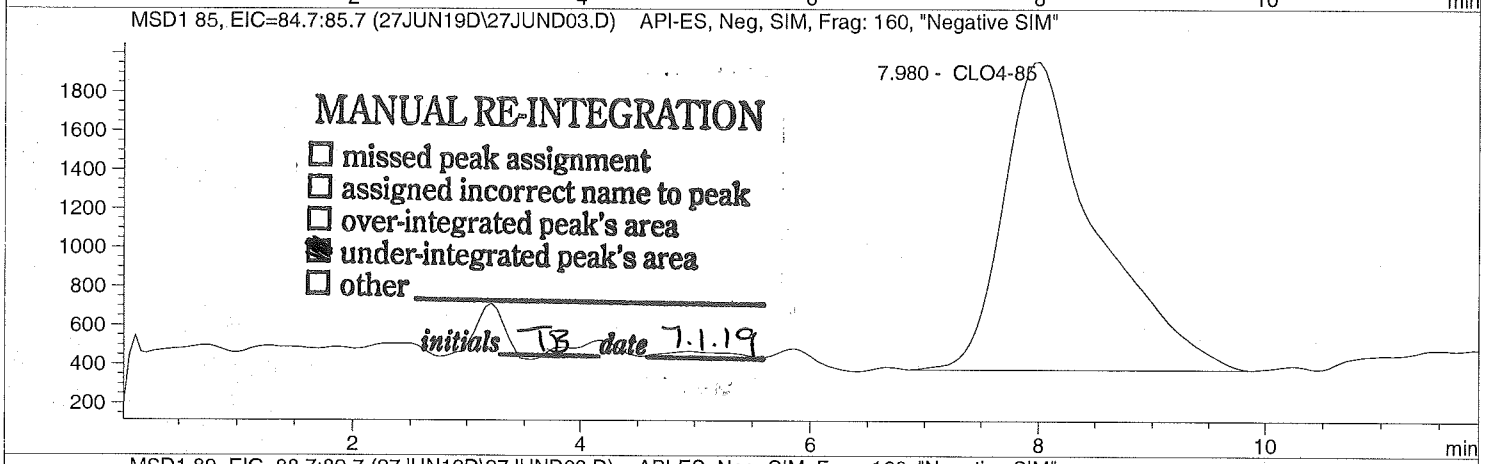
Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND03.D Sample Name: 660891 ICS@4.0

Injection Date:	6/27/2019 09:14:16	Seq Line:	3
Sample Name:	660891 ICS@4.0	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-DP2.M
Last Changed: 4/12/2019 07:54:13

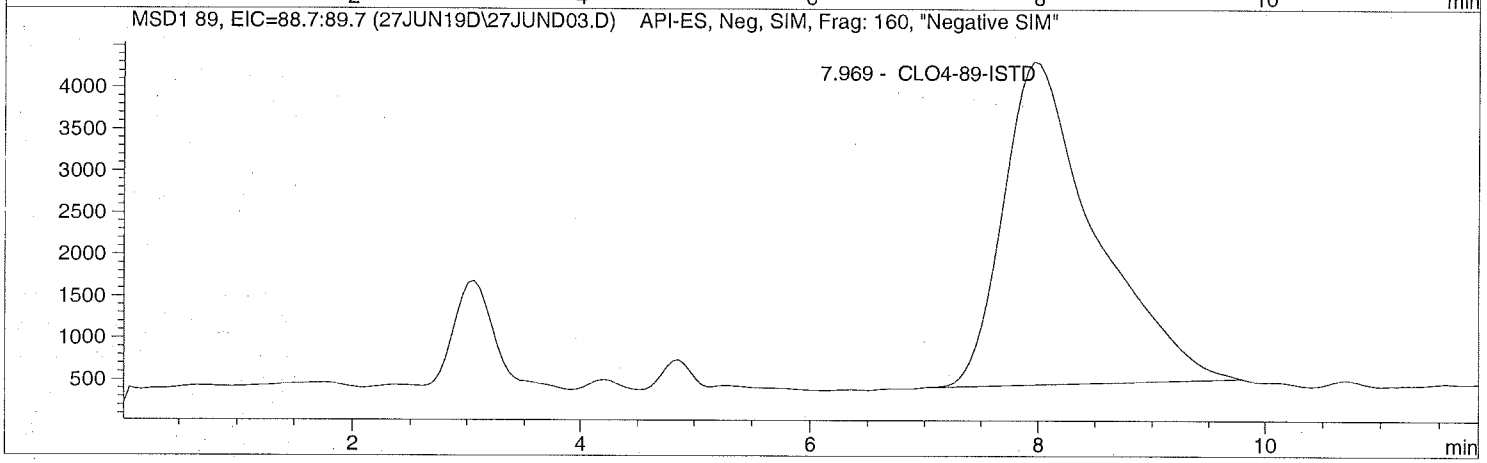
Perchlorate analysis





MANUAL RE-INTEGRATION
- ☐ missed peak assignment
- ☐ assigned incorrect name to peak
- ☐ over-integrated peak's area
- ☒ under-integrated peak's area
- ☐ other _____

initials TB date 7.1.19



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND03.D Sample Name: 660891 ICS@4.0

Injection Date:	6/27/2019 09:14:16	Seq Line:	3
Sample Name:	660891 ICS@4.0	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.965	PBA	257330.2	3.9251	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.980	MM	89383.3	4.4243	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.969	BBA	216232.2	5.0000	CLO4-89-ISTD

*** End of Report ***

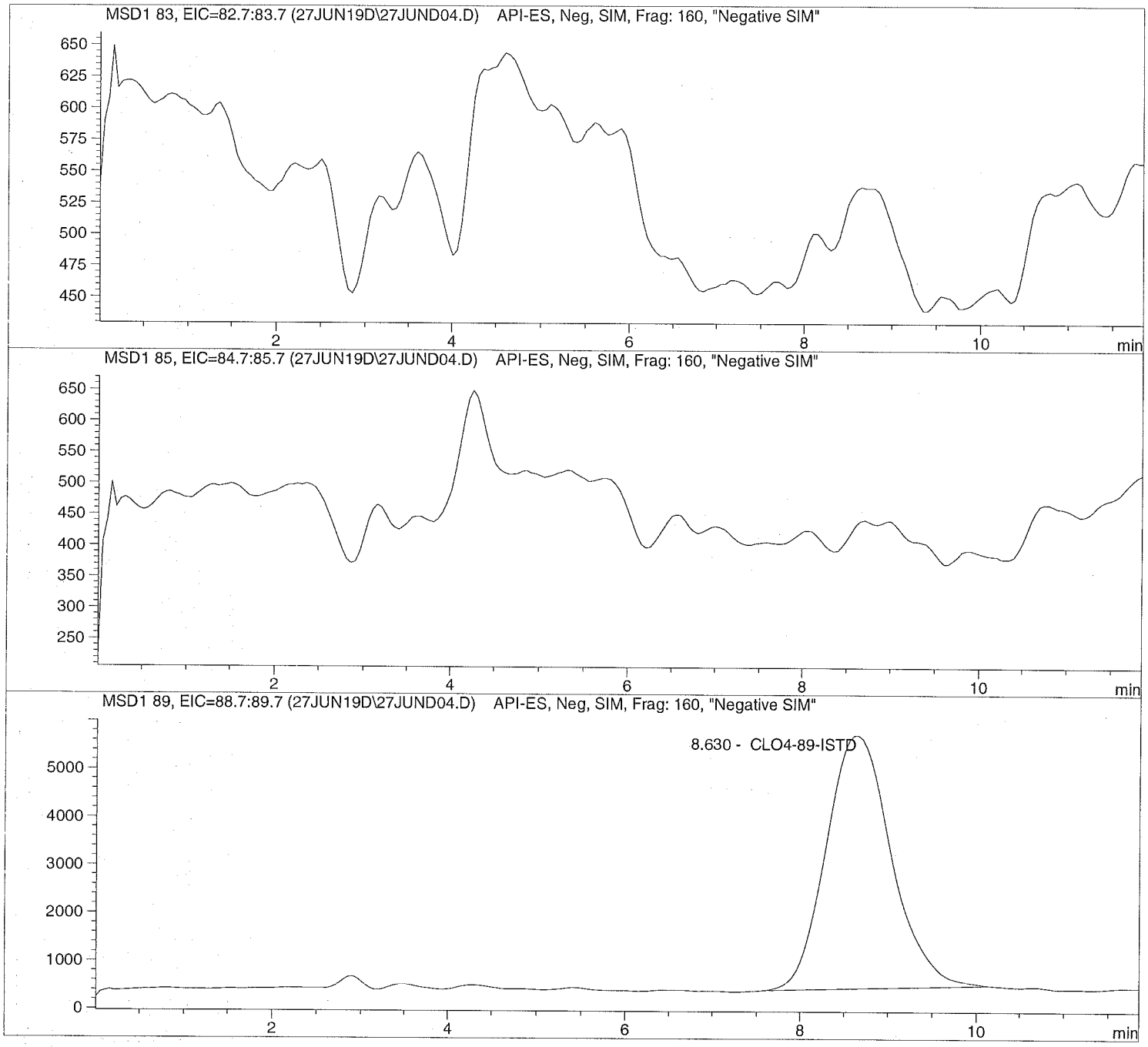
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND04.D Sample Name: 660892 LMB

Injection Date:	6/27/2019 09:28:13	Seq Line:	4
Sample Name:	660892 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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND04.D Sample Name: 660892 LMB

Injection Date:	6/27/2019 09:28:13	Seq Line:	4
Sample Name:	660892 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-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.630	PBA	272546.7	5.0000	CLO4-89-ISTD

*** End of Report ***

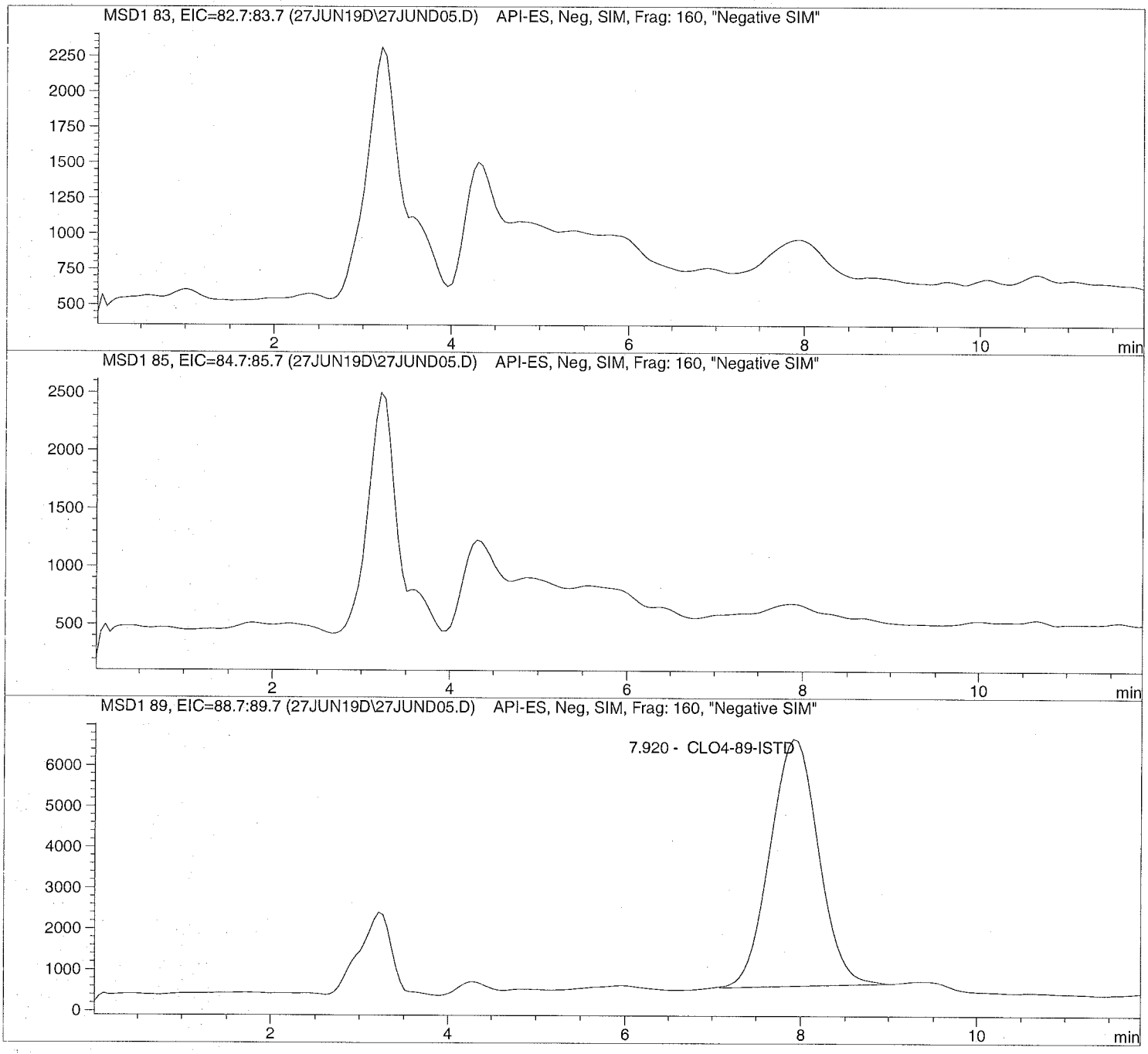
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND05.D Sample Name: 1917488001

Injection Date:	6/27/2019 09:42:40	Seq Line:	5
Sample Name:	1917488001	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND05.D Sample Name: 1917488001

Injection Date:	6/27/2019 09:42:40	Seq Line:	5
Sample Name:	1917488001	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
7.920	PBA	227402.2	5.0000	CLO4-89-ISTD

*** End of Report ***

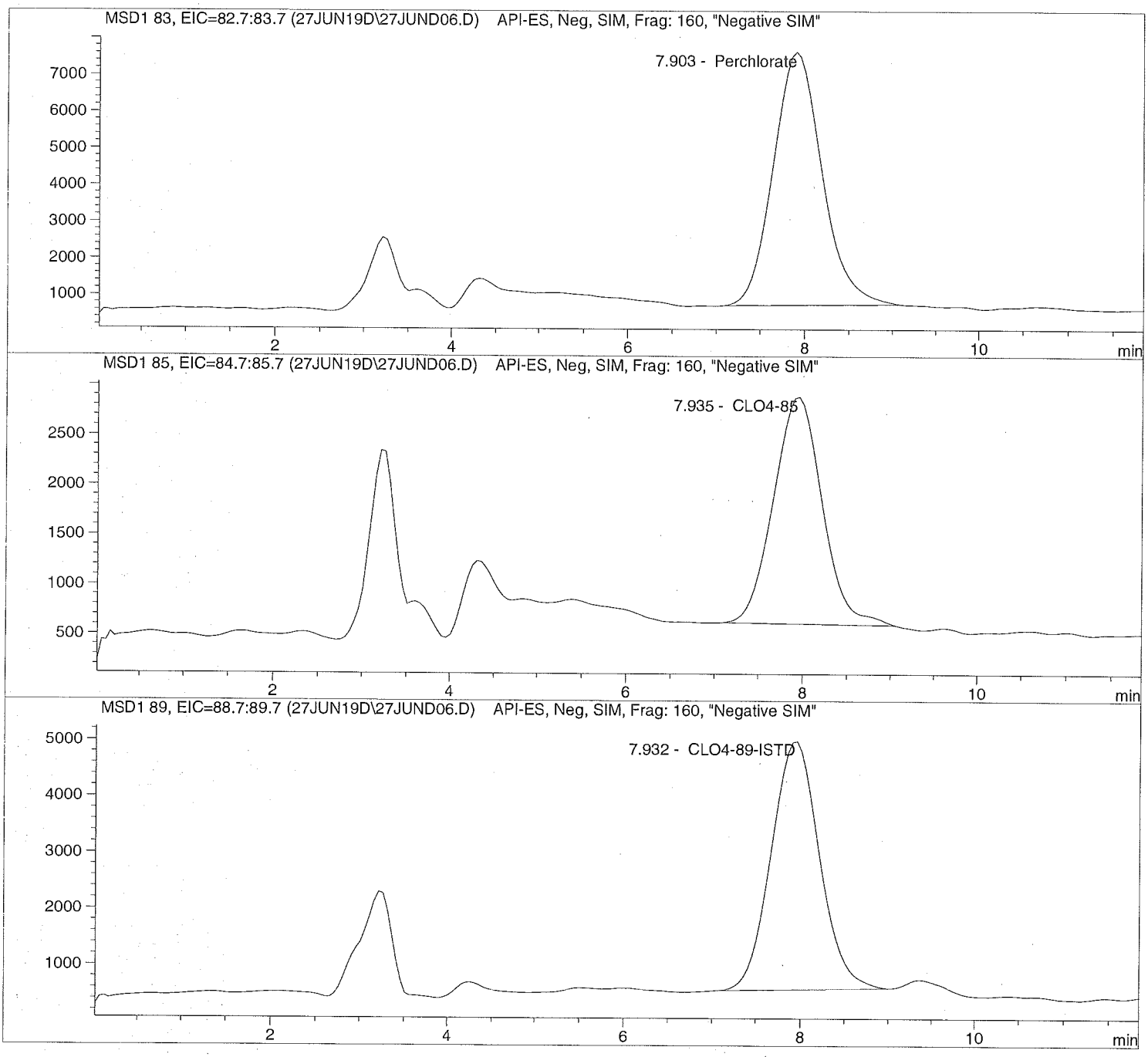
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND06.D Sample Name: 660894 174881S

Injection Date:	6/27/2019 09:56:36	Seq Line:	6
Sample Name:	660894 174881S	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



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RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND06.D Sample Name: 660894 174881S

Injection Date:	6/27/2019 09:56:36	Seq Line:	6
Sample Name:	660894 174881S	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
7.903	PBA	262639.7	5.1277	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.935	BBA	86833.0	5.5577	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.932	PBA	166848.2	5.0000	CLO4-89-ISTD

*** End of Report ***

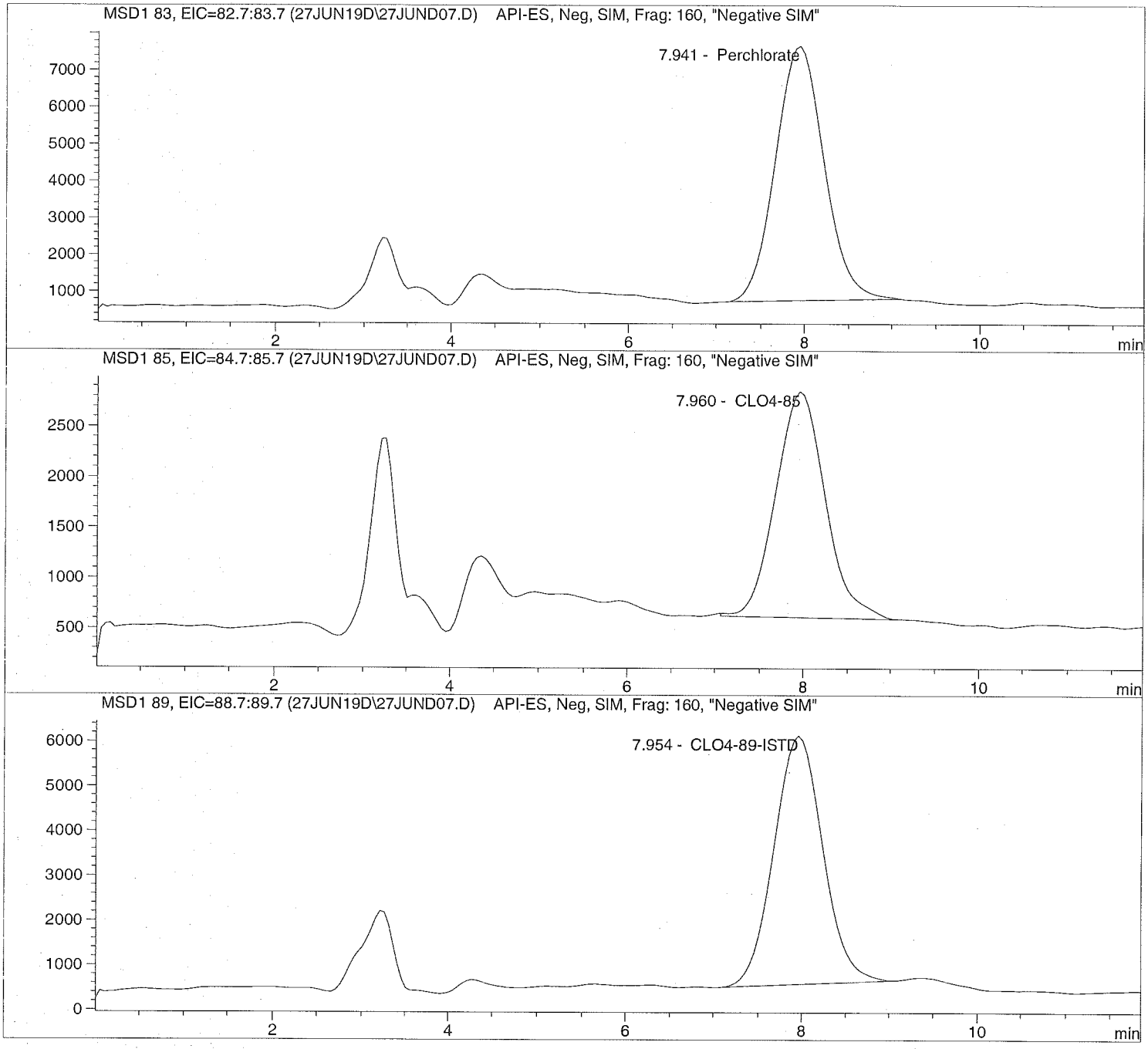
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND07.D Sample Name: 660895 174881D

Injection Date:	6/27/2019 10:10:32	Seq Line:	7
Sample Name:	660895 174881D	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND07.D Sample Name: 660895 174881D

Injection Date:	6/27/2019 10:10:32	Seq Line:	7
Sample Name:	660895 174881D	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
7.941	PBA	264844.2	4.0584	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.960	BBA	87558.5	4.3618	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.954	PBA	214876.4	5.0000	CLO4-89-ISTD

*** End of Report ***

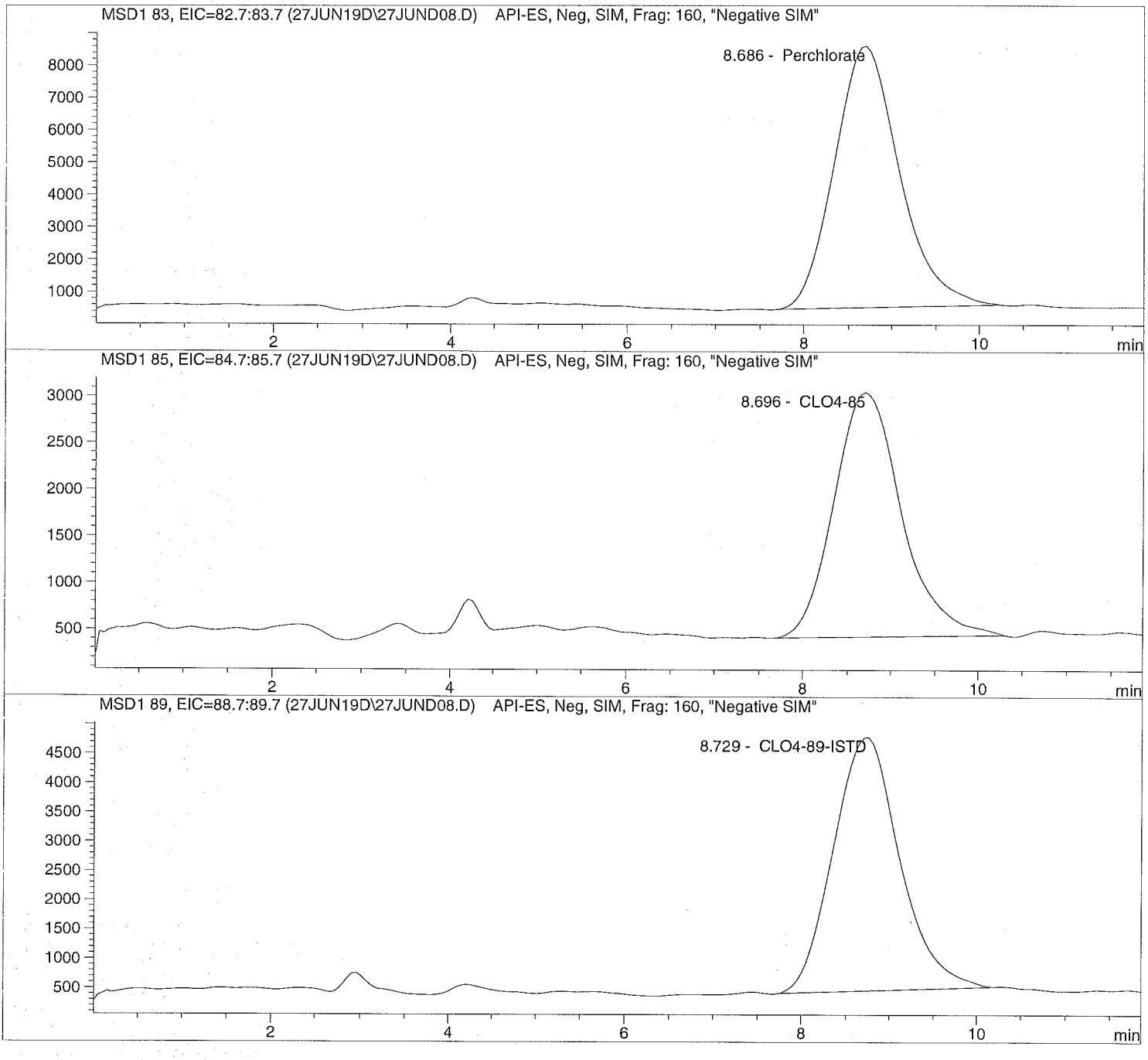
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND08.D Sample Name: 1917489001 100

Injection Date:	6/27/2019 10:24:27	Seq Line:	8
Sample Name:	1917489001 100	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND08.D Sample Name: 1917489001 100

Injection Date:	6/27/2019 10:24:27	Seq Line:	8
Sample Name:	1917489001 100	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.686	PBA	417326.3	591.9454	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.696	PBA	140501.0	655.9136	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.729	PBA	228282.9	500.0000	CLO4-89-ISTD

*** End of Report ***

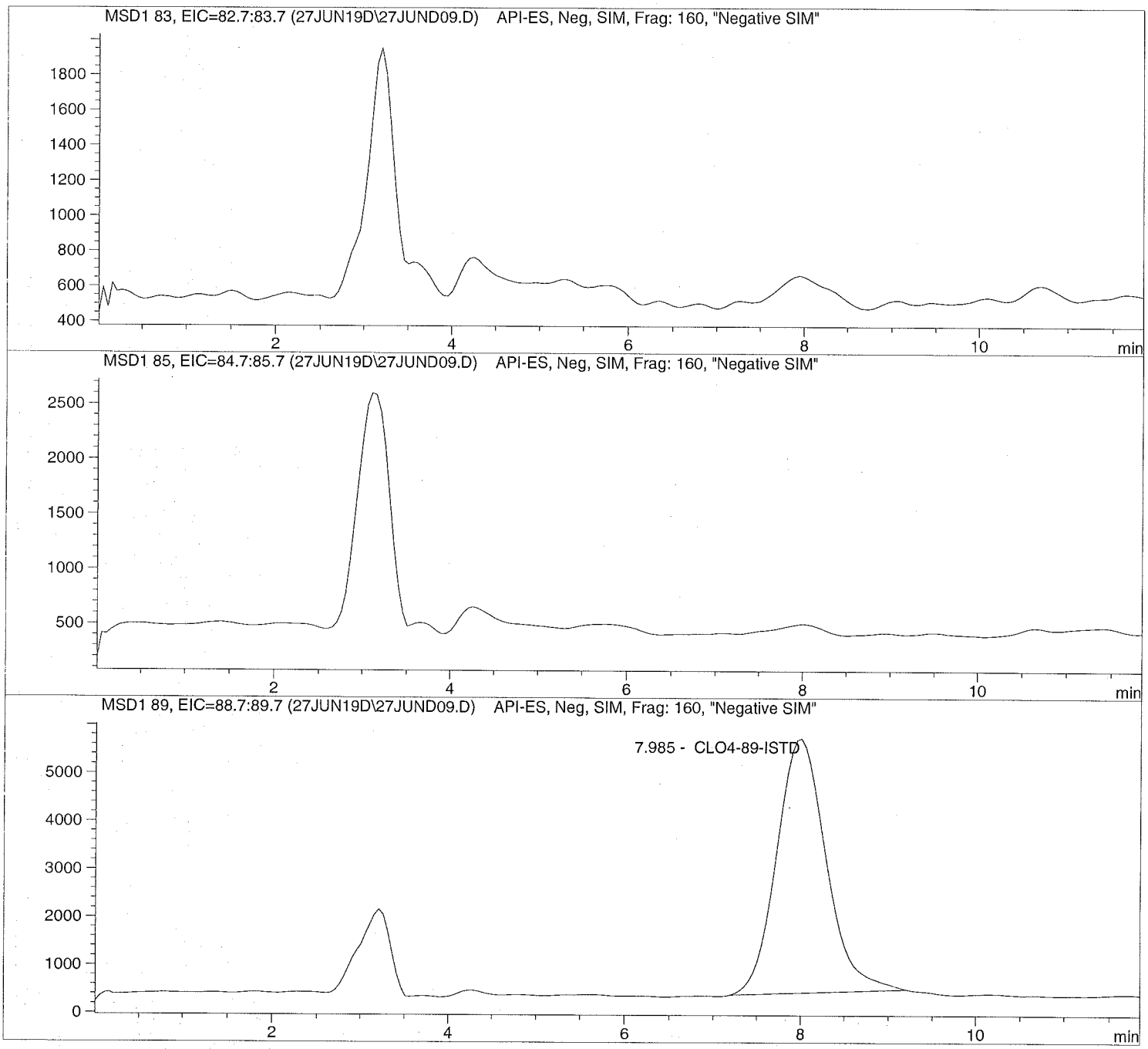
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND09.D Sample Name: 1917489002

Injection Date:	6/27/2019 10:38:23	Seq Line:	9
Sample Name:	1917489002	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



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RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND09.D Sample Name: 1917489002

Injection Date:	6/27/2019 10:38:23	Seq Line:	9
Sample Name:	1917489002	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
7.985	BBA	207849.5	5.0000	CLO4-89-ISTD

*** End of Report ***

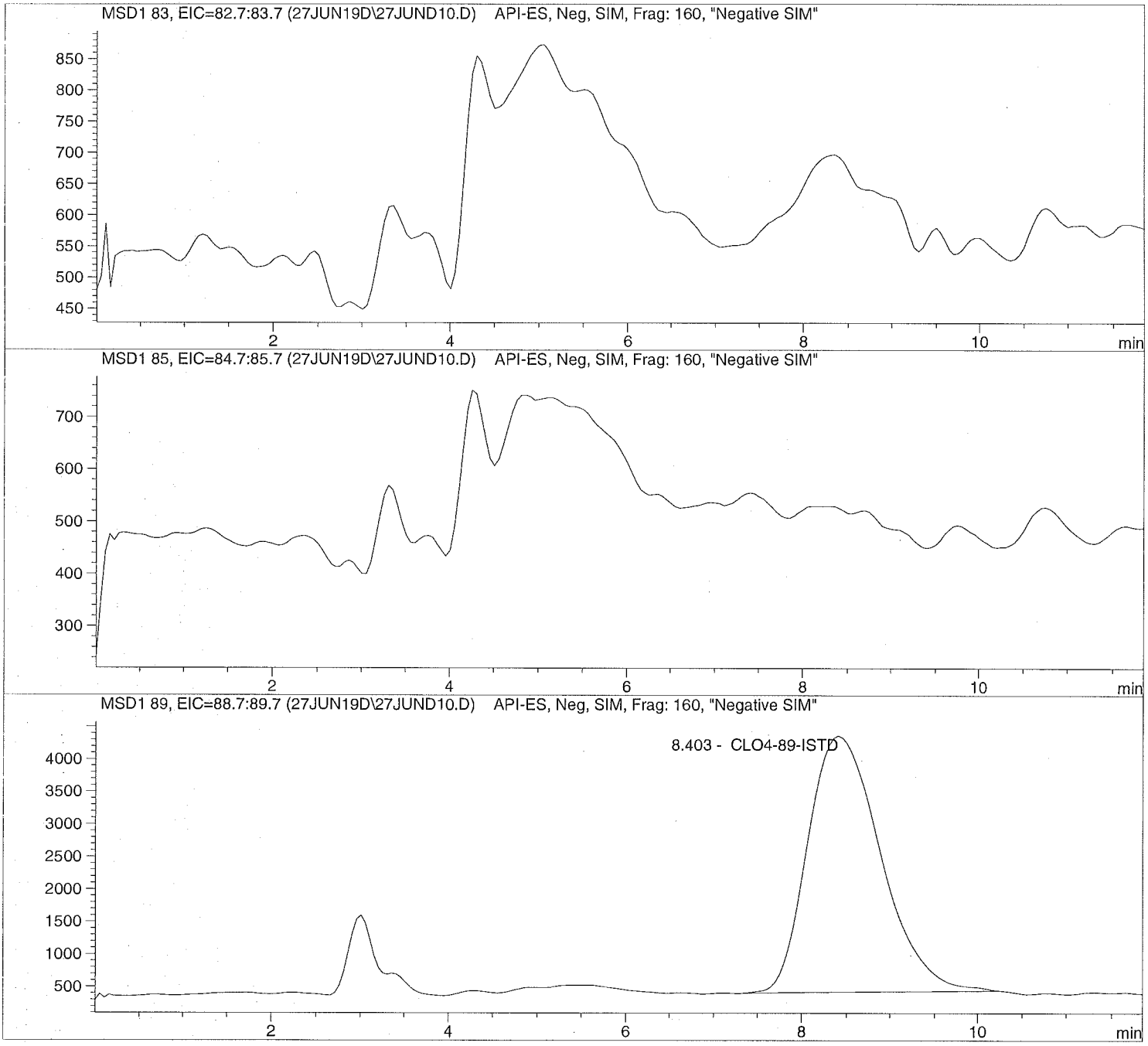
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND10.D Sample Name: 1917489003

Injection Date:	6/27/2019 10:52:17	Seq Line:	10
Sample Name:	1917489003	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND10.D Sample Name: 1917489003

Injection Date:	6/27/2019 10:52:17	Seq Line:	10
Sample Name:	1917489003	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.403	PBA	226487.0	5.0000	CLO4-89-ISTD

*** End of Report ***

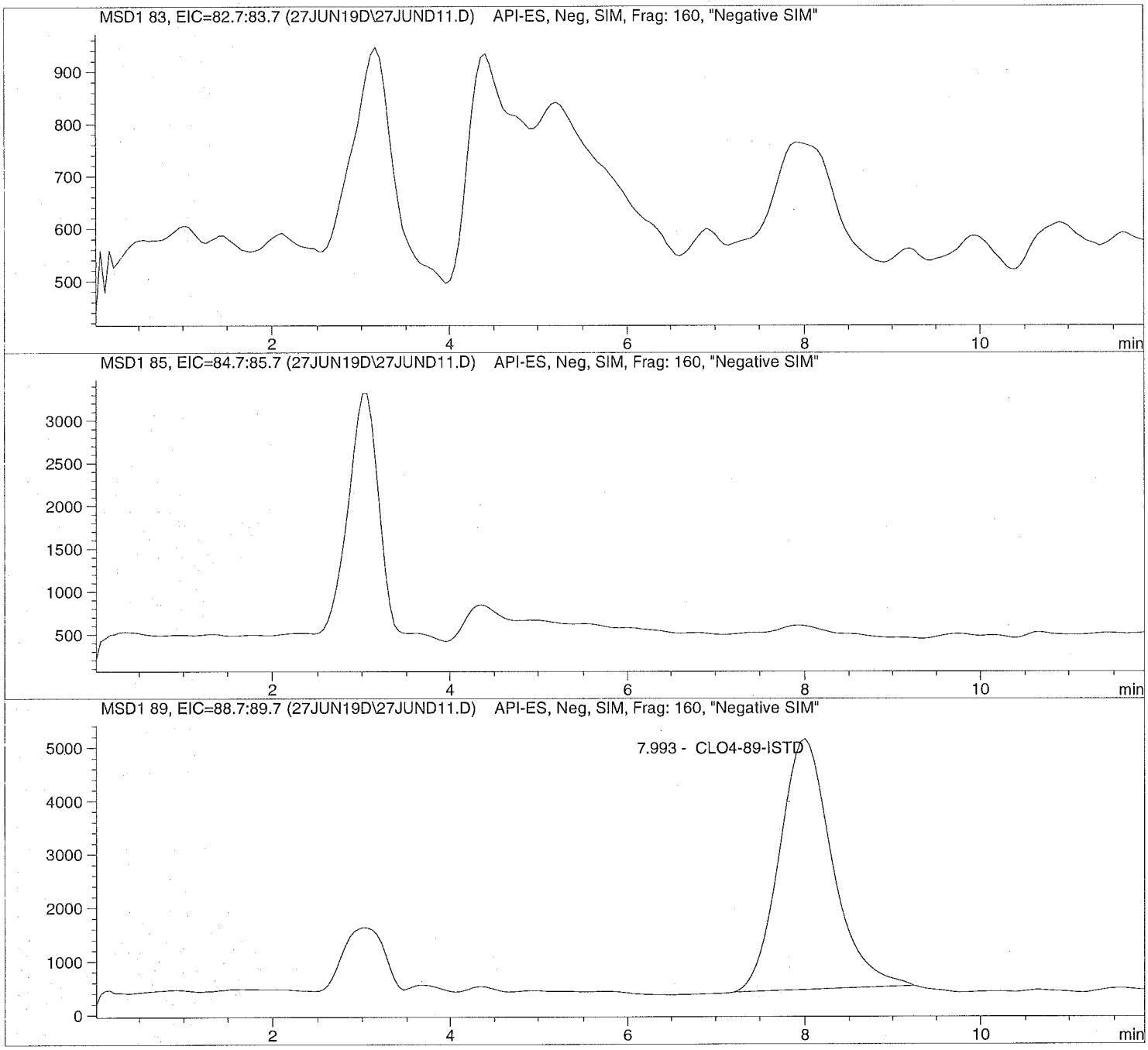
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND11.D Sample Name: 1917489004

Injection Date:	6/27/2019 11:06:11	Seq Line:	11
Sample Name:	1917489004	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND11.D Sample Name: 1917489004

Injection Date:	6/27/2019 11:06:11	Seq Line:	11
Sample Name:	1917489004	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
7.993	BBA	193007.7	5.0000	CLO4-89-ISTD

*** End of Report ***

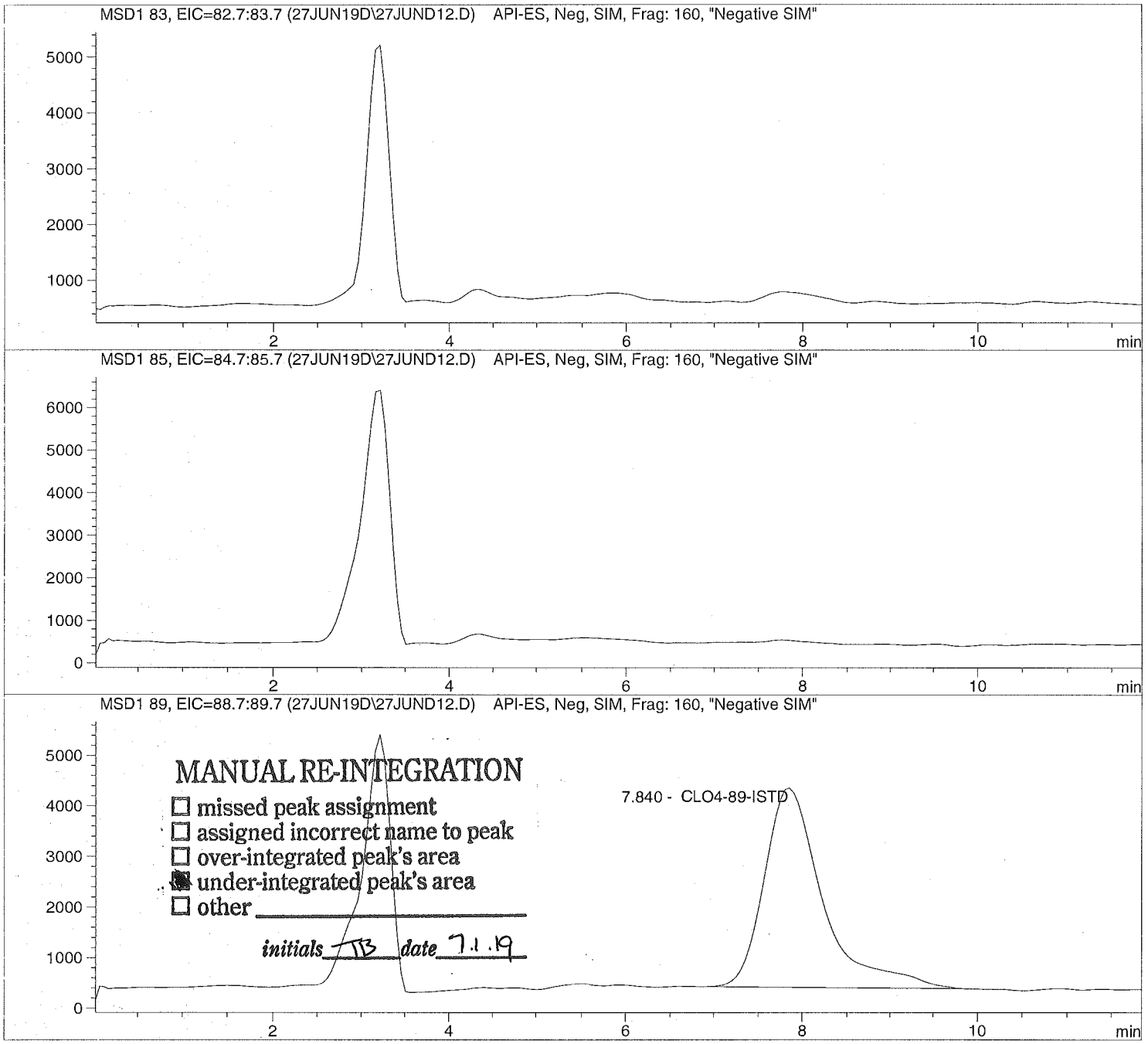
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND12.D Sample Name: 1917489005

Injection Date:	6/27/2019 11:20:03	Seq Line:	12
Sample Name:	1917489005	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



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RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND12.D Sample Name: 1917489005

Injection Date:	6/27/2019 11:20:03	Seq Line:	12
Sample Name:	1917489005	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-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
7.840	MM	181499.8	5.0000	CLO4-89-ISTD

*** End of Report ***

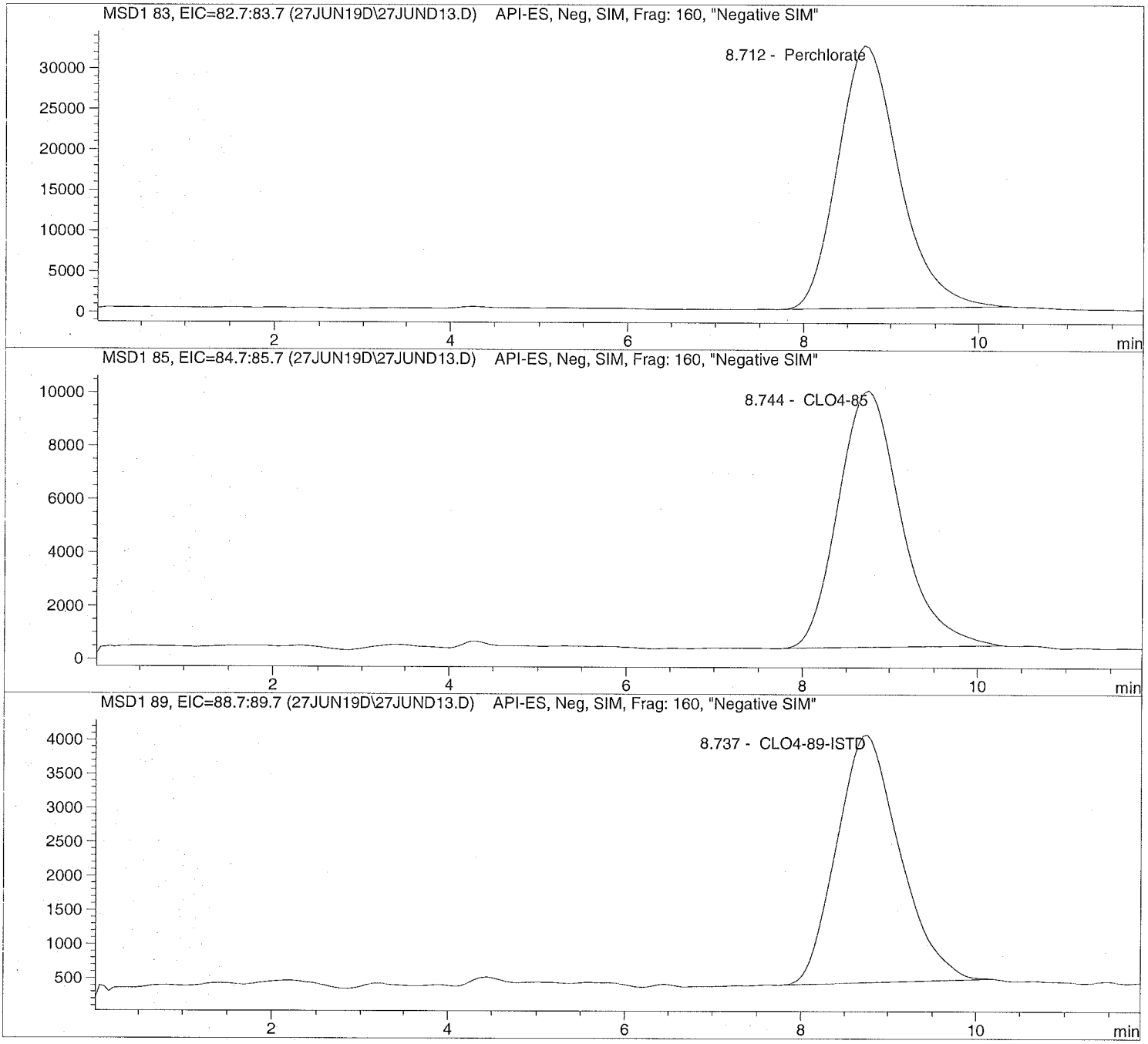
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND13.D Sample Name: 1917672001 1K

Injection Date:	6/27/2019 11:33:53	Seq Line:	13
Sample Name:	1917672001 1K	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND13.D Sample Name: 1917672001 1K

Injection Date:	6/27/2019 11:33:53	Seq Line:	13
Sample Name:	1917672001 1K	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.712	PBA	1575319.3	26121.9614	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.744	PBA	480692.7	26822.4361	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.737	PBA	182986.5	5000.0000	CLO4-89-ISTD

*** End of Report ***

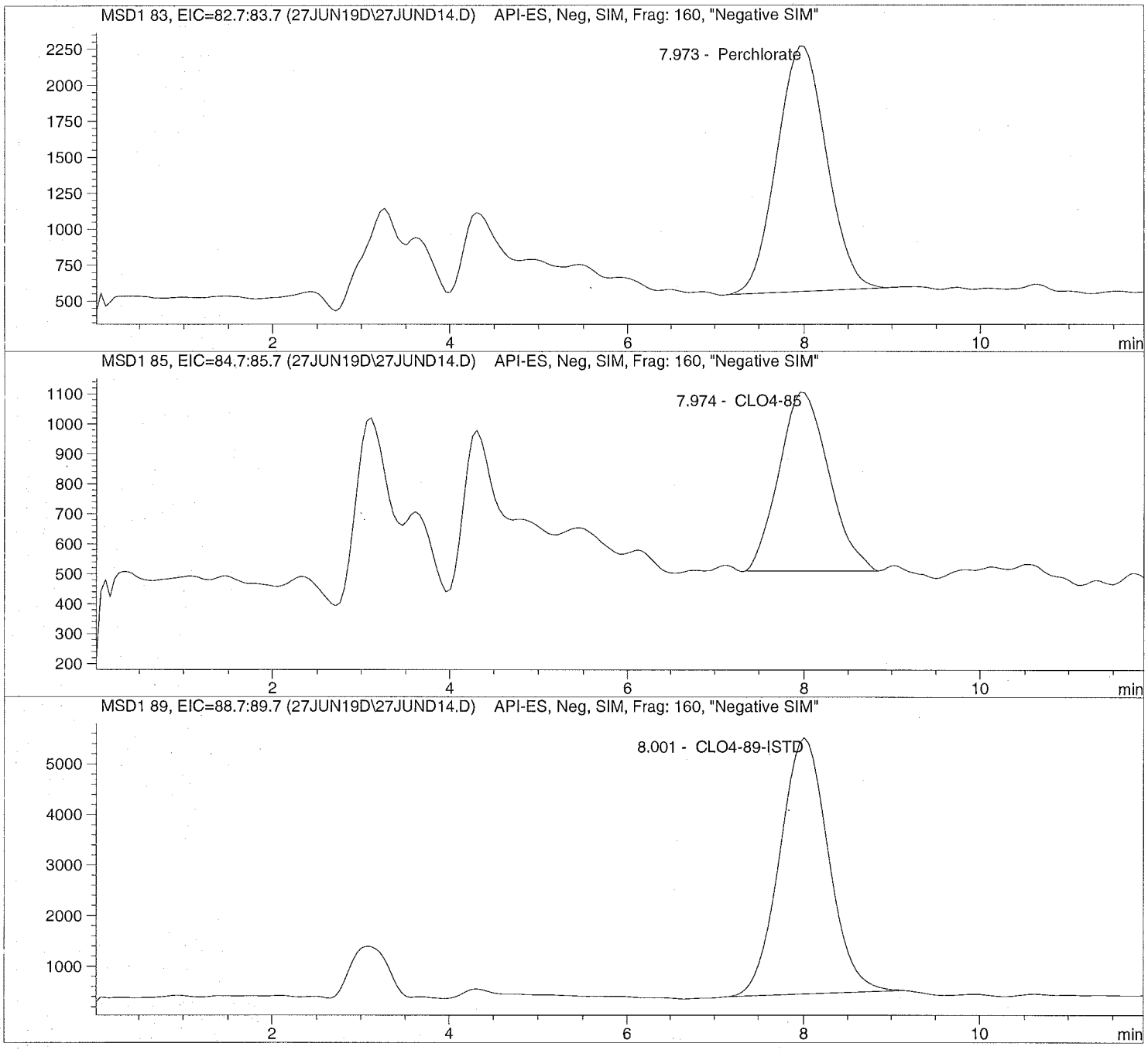
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND14.D Sample Name: 1917672002

Injection Date:	6/27/2019 11:47:53	Seq Line:	14
Sample Name:	1917672002	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND14.D Sample Name: 1917672002

Injection Date:	6/27/2019 11:47:53	Seq Line:	14
Sample Name:	1917672002	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
7.973	PBA	65402.8	1.2479	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.974	PBA	22988.9	1.2932	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.001	PBA	191017.5	5.0000	CLO4-89-ISTD

*** End of Report ***

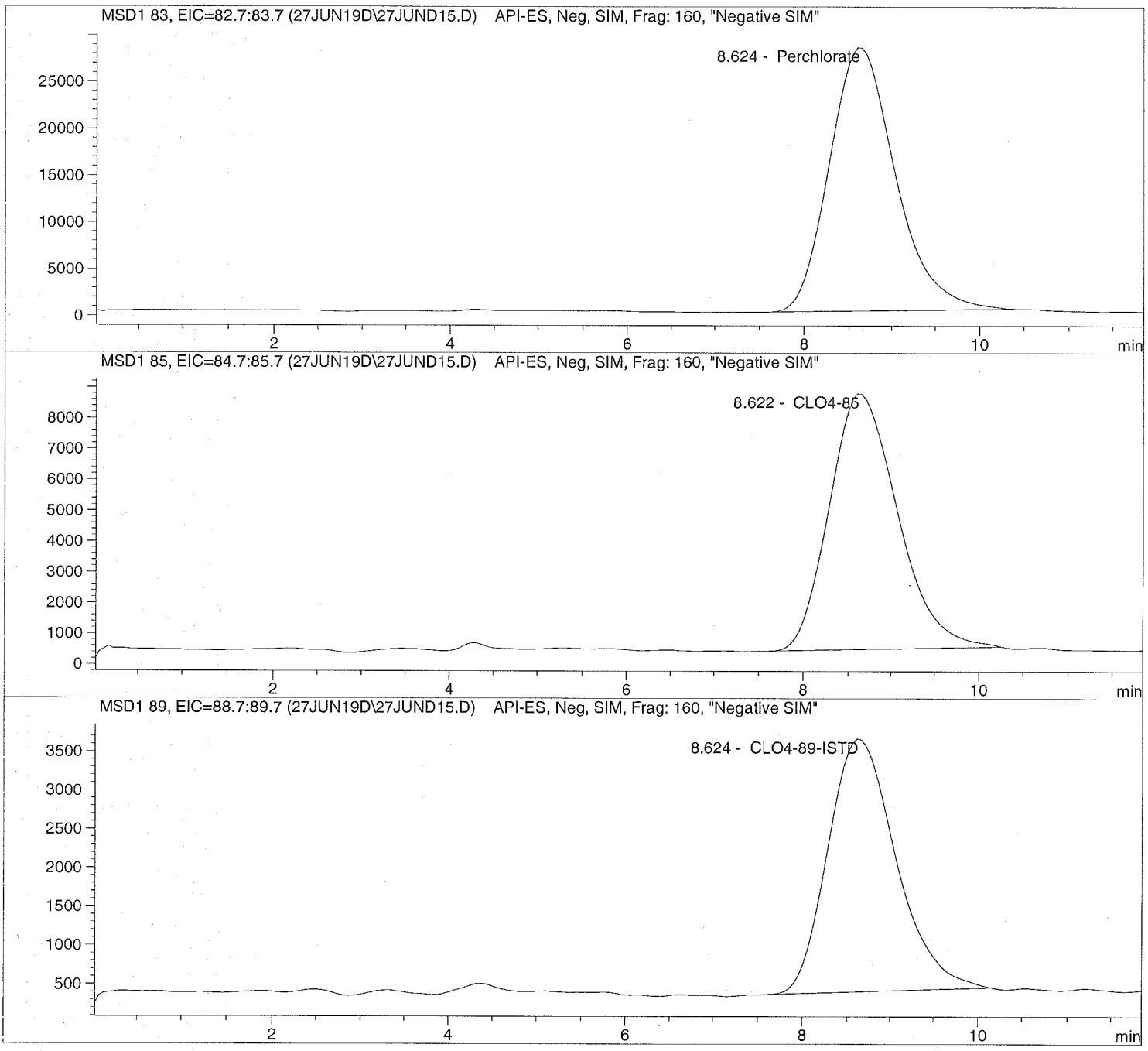
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND15.D Sample Name: 660896 CCV@25

Injection Date:	6/27/2019 12:01:48	Seq Line:	15
Sample Name:	660896 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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND15.D Sample Name: 660896 CCV@25

Injection Date:	6/27/2019 12:01:48	Seq Line:	15
Sample Name:	660896 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-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.624	PBA	1489207.3	25.5132	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.622	PBA	452707.0	26.1005	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.624	PBA	177367.7	5.0000	CLO4-89-ISTD

*** End of Report ***

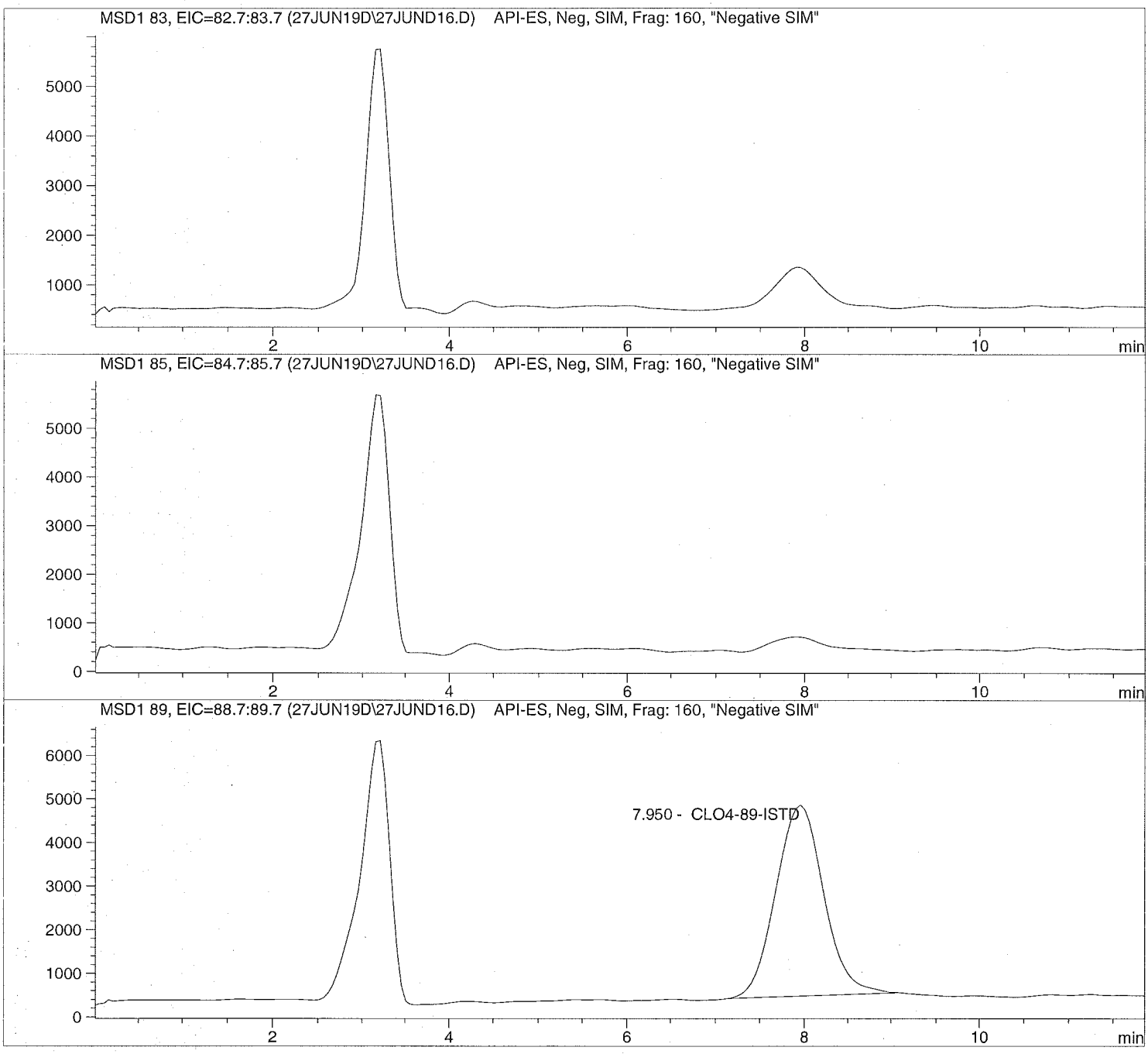
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND16.D Sample Name: 1917672003

Injection Date:	6/27/2019 12:15:39	Seq Line:	16
Sample Name:	1917672003	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND16.D Sample Name: 1917672003

Injection Date:	6/27/2019 12:15:39	Seq Line:	16
Sample Name:	1917672003	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
7.950	PBA	165260.9	5.0000	CLO4-89-ISTD

*** End of Report ***

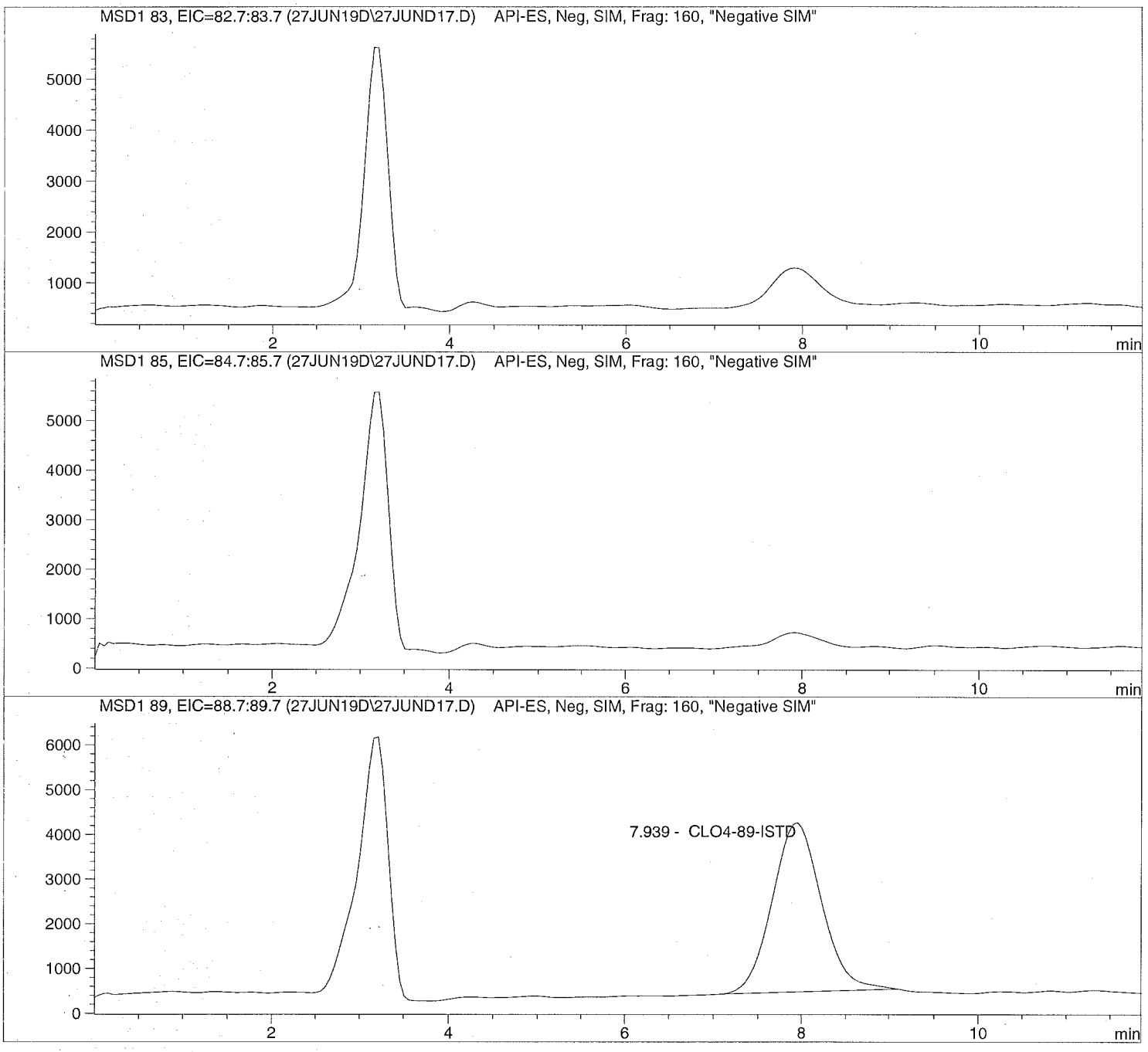
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND17.D Sample Name: 1917672004

Injection Date:	6/27/2019 12:29:33	Seq Line:	17
Sample Name:	1917672004	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND17.D Sample Name: 1917672004

Injection Date:	6/27/2019 12:29:33	Seq Line:	17
Sample Name:	1917672004	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
7.939	BBA	147927.7	5.0000	CLO4-89-ISTD

*** End of Report ***

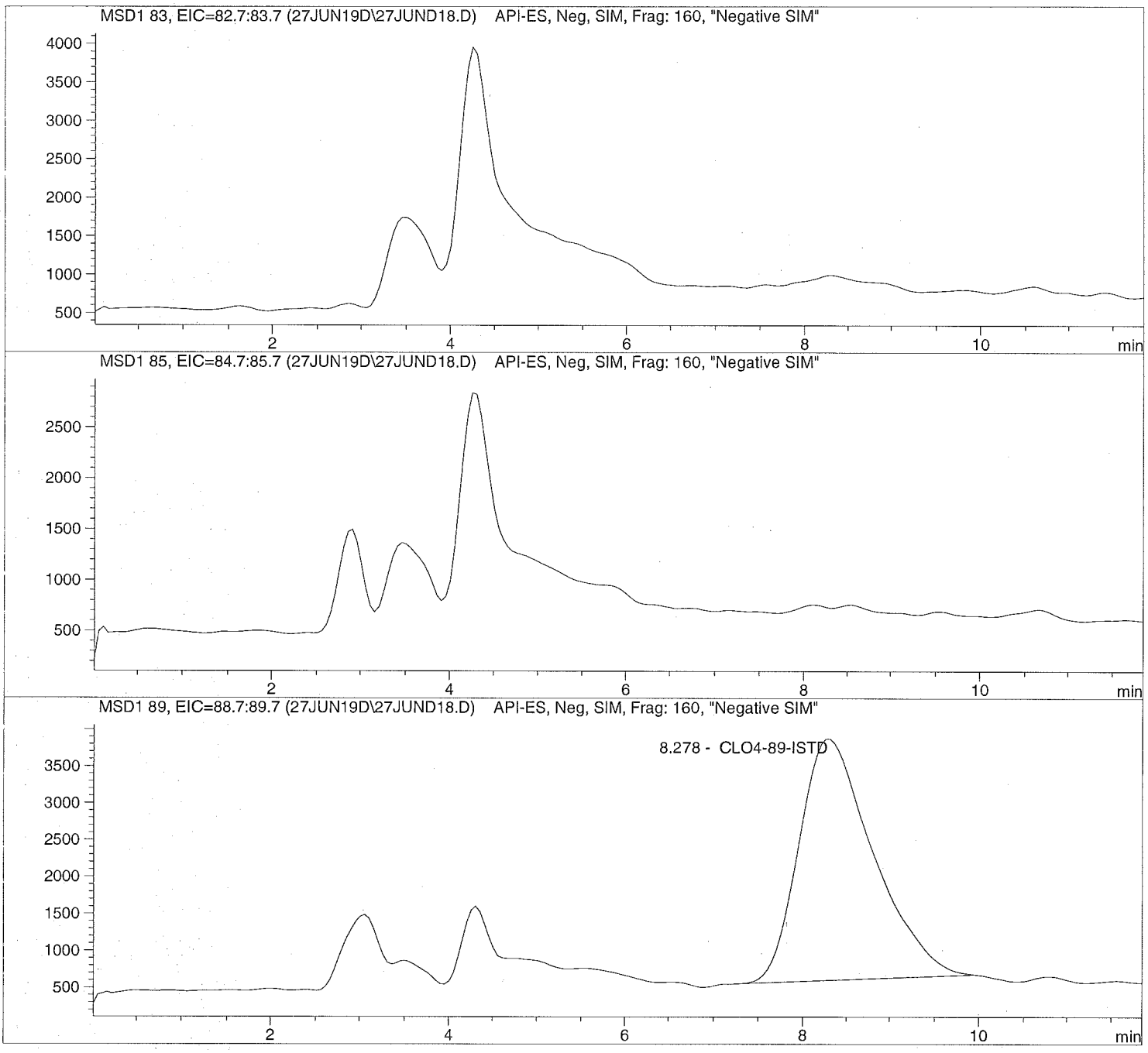
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND18.D Sample Name: 1917672005

Injection Date:	6/27/2019 12:43:25	Seq Line:	18
Sample Name:	1917672005	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND18.D Sample Name: 1917672005

Injection Date:	6/27/2019 12:43:25	Seq Line:	18
Sample Name:	1917672005	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.278	PBA	193450.5	5.0000	CLO4-89-ISTD

*** End of Report ***

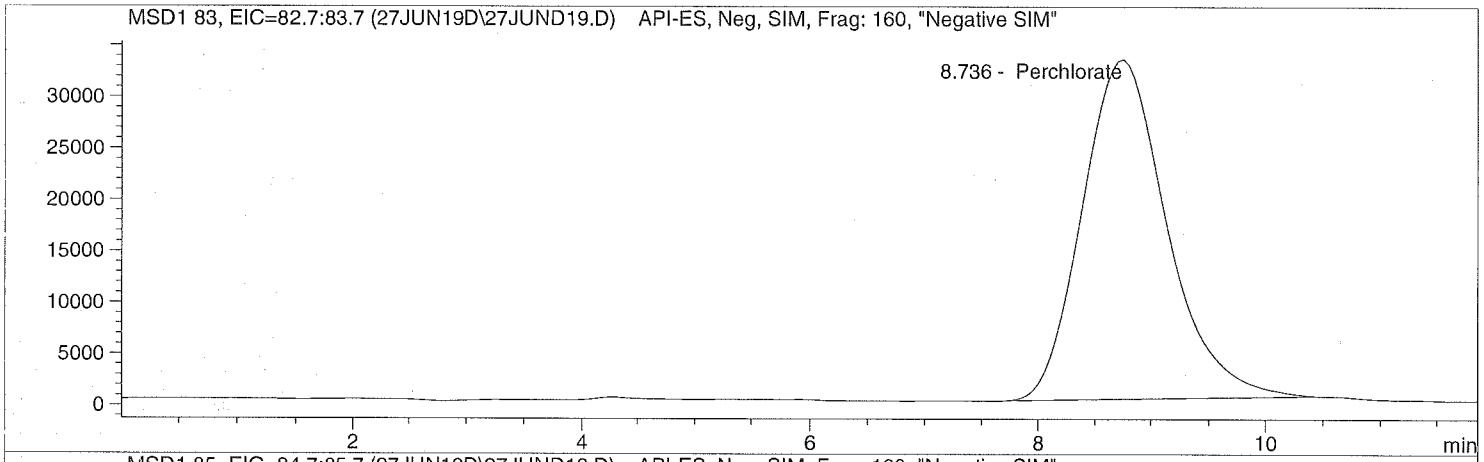
RIGHT SOLUTIONS | RIGHT PARTNER

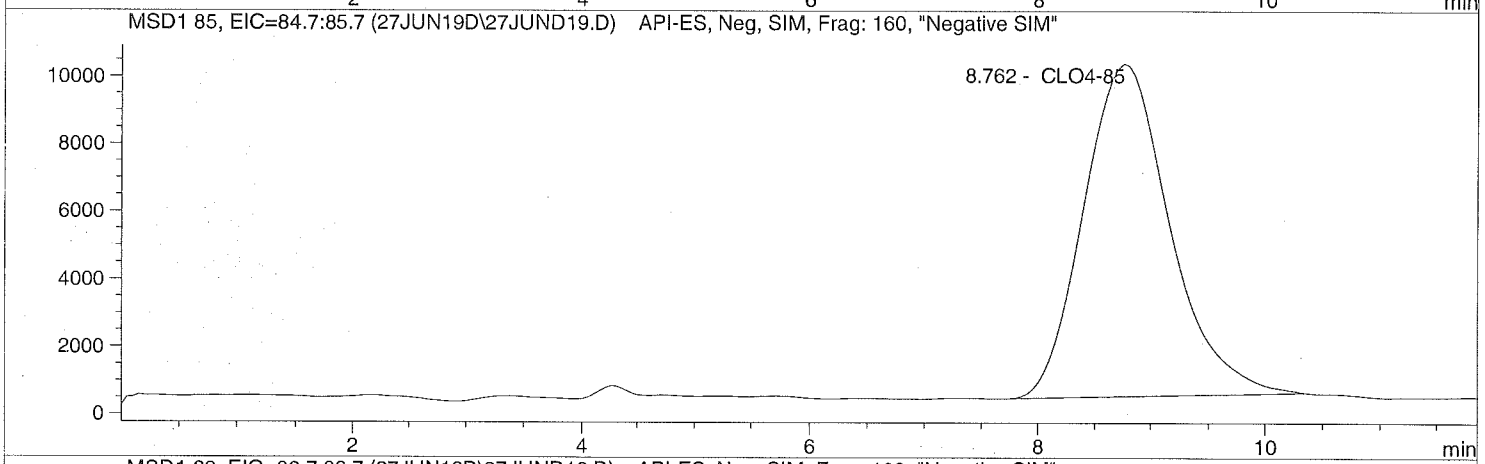
Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND19.D Sample Name: 1917672006 100

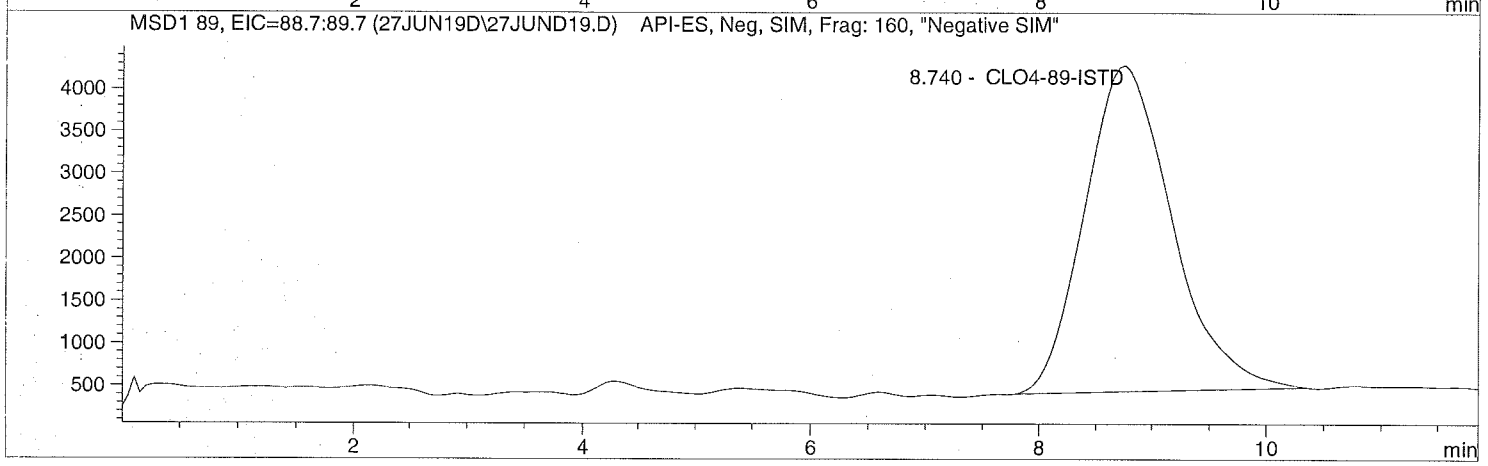
Injection Date:	6/27/2019 12:57:19	Seq Line:	19
Sample Name:	1917672006 100	Location:	Vial 88
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







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Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND19.D Sample Name: 1917672006 100

Injection Date:	6/27/2019 12:57:19	Seq Line:	19
Sample Name:	1917672006 100	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.736	PBA	1719861.8	2534.9645	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.762	PBA	521595.0	2587.4359	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.740	BBA	206241.0	500.0000	CLO4-89-ISTD

*** End of Report ***

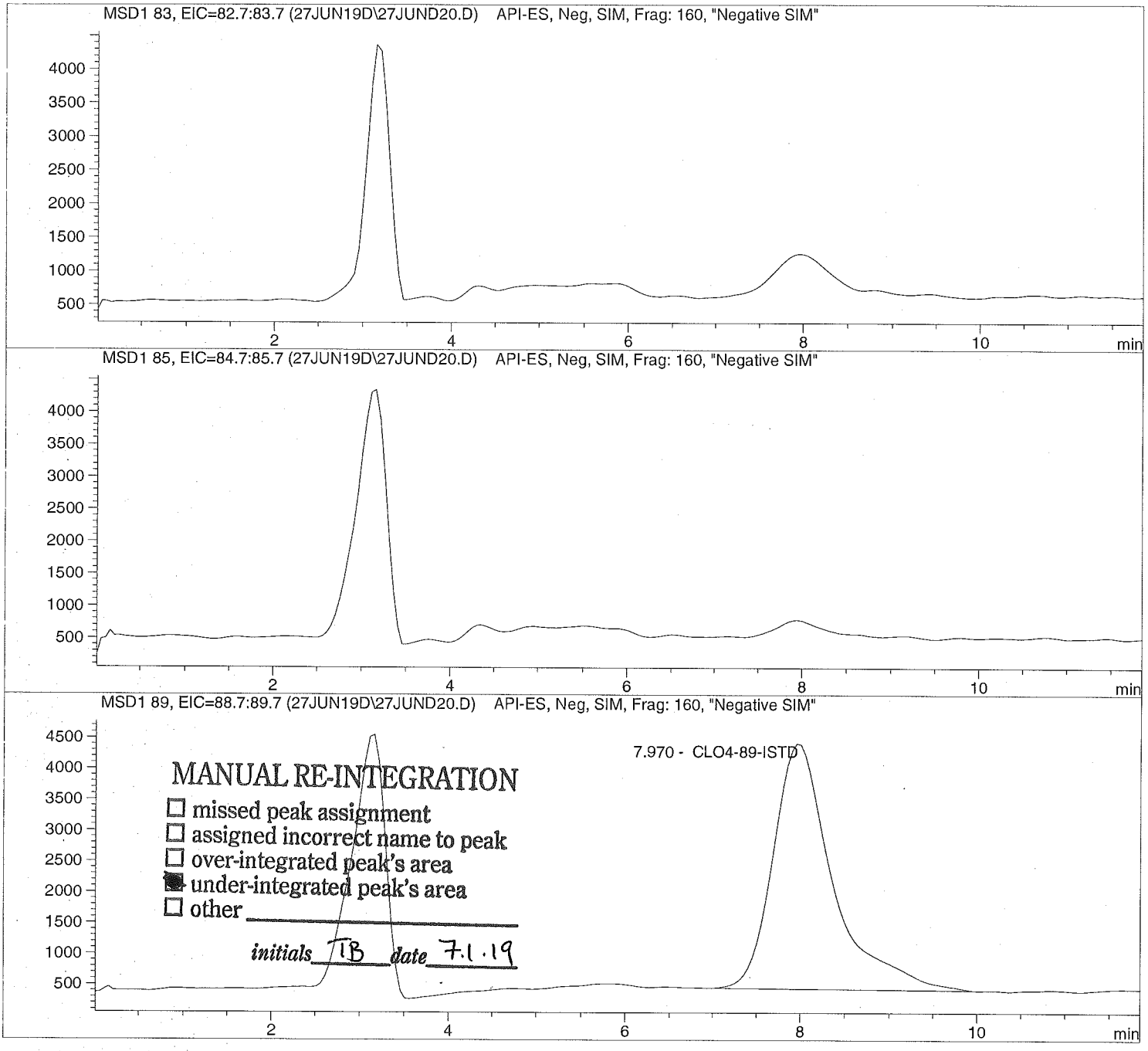
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND20.D Sample Name: 1917672007

Injection Date:	6/27/2019 13:11:15	Seq Line:	20
Sample Name:	1917672007	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



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Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND20.D Sample Name: 1917672007

Injection Date:	6/27/2019 13:11:15	Seq Line:	20
Sample Name:	1917672007	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
7.970	MM	187343.8	5.0000	CLO4-89-ISTD

*** End of Report ***

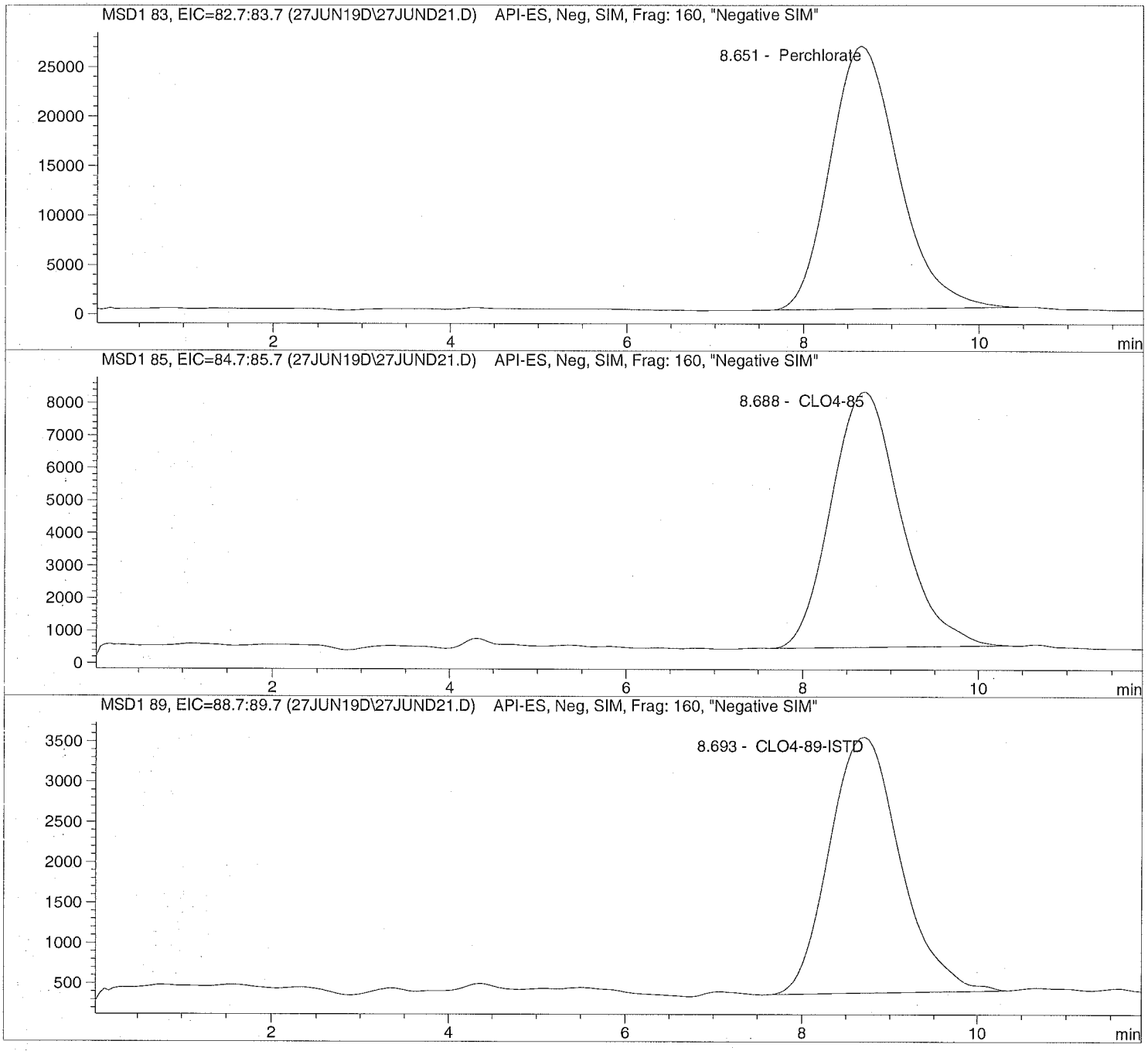
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Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND21.D Sample Name: 660897 CCV@25

Injection Date:	6/27/2019 13:28:58	Seq Line:	21
Sample Name:	660897 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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND21.D Sample Name: 660897 CCV@25

Injection Date:	6/27/2019 13:28:58	Seq Line:	21
Sample Name:	660897 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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.651	PBA	1425160.6	24.4244	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.688	PBA	430117.7	24.8091	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.693	PBA	177769.0	5.0000	CLO4-89-ISTD

*** End of Report ***

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Initial Calibration

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Calibration Table

Perchlorate

Calib. Data Modified : 3/19/2019 2:35:19 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
8.744	1	1	1.00000	7.76074e4	1.28854e-5		1	Perchlorate
		2	2.00000	1.35273e5	1.47849e-5			
		3	5.00000	3.37764e5	1.48033e-5			
		4	10.00000	6.83454e5	1.46316e-5			
		5	25.00000	2.08433e6	1.19943e-5			
		6	50.00000	4.13334e6	1.20968e-5			
		7	75.00000	5.99313e6	1.25143e-5			
8.755	2	1	1.00000	2.36780e4	4.22333e-5		1	CLO4-85
		2	2.00000	4.69486e4	4.25998e-5			
		3	5.00000	1.06124e5	4.71147e-5			
		4	10.00000	2.13523e5	4.68335e-5			
		5	25.00000	6.14295e5	4.06971e-5			
		6	50.00000	1.19814e6	4.17315e-5			
		7	75.00000	1.78355e6	4.20509e-5			
8.766	3	1	5.00000	2.73208e5	1.83011e-5	+I1		CLO4-89-ISTD
		2	5.00000	2.24886e5	2.22335e-5			
		3	5.00000	2.33196e5	2.14412e-5			
		4	5.00000	2.34454e5	2.13262e-5			
		5	5.00000	2.50568e5	1.99547e-5			
		6	5.00000	2.30977e5	2.16472e-5			

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RetTime [min]	Sig	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
		7	5.00000	2.21504e5	2.25729e-5			

More compound-specific settings:

Compound: Perchlorate
- Time Window : From 6.654 min To 12.544 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 0.5
  - Level 3 : 0.2
  - Level 4 : 0.1
  - Level 5 : 0.04
  - Level 6 : 0.02
  - Level 7 : 0.013333

Compound: CLO4-85
- Time Window : From 6.650 min To 12.505 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 0.5
  - Level 3 : 0.2
  - Level 4 : 0.1
  - Level 5 : 0.04
  - Level 6 : 0.02
  - Level 7 : 0.013333

Compound: CLO4-89-ISTD
- Time Window : From 6.659 min To 12.466 min
- Curve Type : Linear
- Origin : Included
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 1
  - Level 3 : 1
  - Level 4 : 1
  - Level 5 : 1
  - Level 6 : 1
  - Level 7 : 1

Peak Sum Table

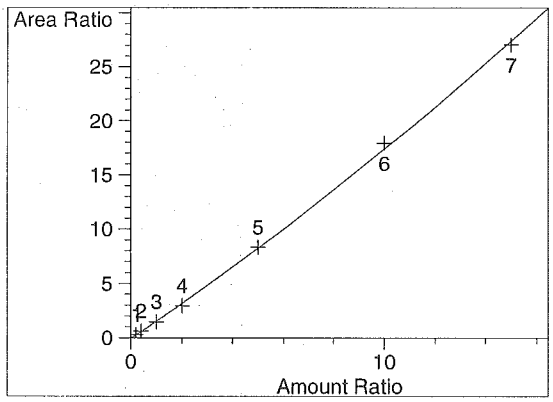
No Entries in table

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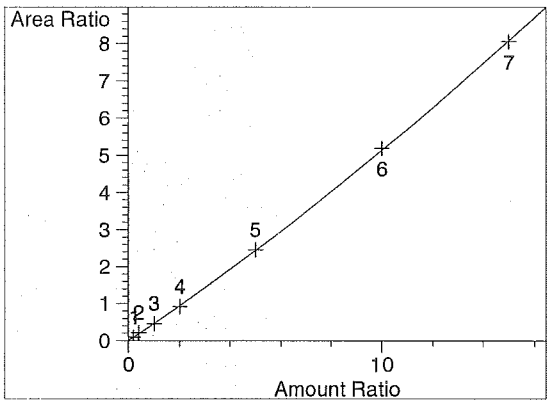
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Calibration Curves

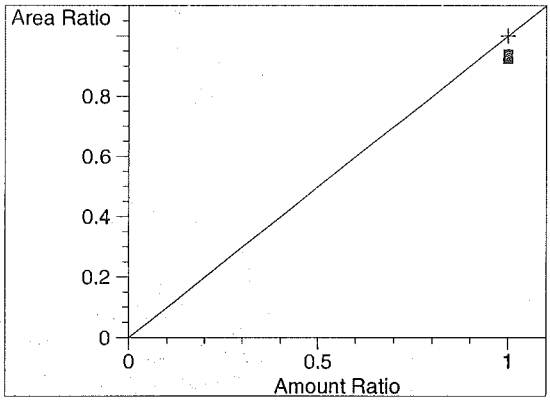
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Perchlorate at exp. RT: 8.744
MSD1 83, EIC=82.7:83.7
Correlation: 0.99957
Residual Std. Dev.: 0.30744
Formula: $y = ax^2 + bx + c$
a: 1.76988e-2
b: 1.56480
c: -4.92430e-2
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.5
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.013333



CLO4-85 at exp. RT: 8.755
MSD1 85, EIC=84.7:85.7
Correlation: 0.99983
Residual Std. Dev.: 0.03473
Formula: $y = ax^2 + bx + c$
a: 5.13396e-3
b: 4.62055e-1
c: 4.97209e-4
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.5
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.013333



CLO4-89-ISTD at exp. RT: 8.766
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 1 : 1
Level 2 : 1
Level 3 : 1
Level 4 : 1
Level 5 : 1
Level 6 : 1
Level 7 : 1

==========

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Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP2.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	7.76074e4	8.744	1.06245
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	1.35273e5	8.992	2.06969
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	3.37764e5	8.586	4.73474
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	6.83454e5	8.698	9.27727
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.08433e6	8.451	25.29036
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	4.13334e6	8.810	51.36844
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	5.99313e6	8.586	74.16754
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	7.34719e5	8.702	9.25940

#	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.36780e4	8.755	9.30535e-1
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	4.69486e4	9.012	2.24255
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	1.06124e5	8.602	4.86656
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.13523e5	8.713	9.64312
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	6.14295e5	8.468	25.12159
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	1.19814e6	8.825	50.46721
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	1.78355e6	8.603	74.72019
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.27495e5	8.721	9.54024

#	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	2.73208e5	8.766	5.00000
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	2.24886e5	9.012	5.00000
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	2.33196e5	8.609	5.00000
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.34454e5	8.716	5.00000
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.50568e5	8.472	5.00000
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	2.30977e5	8.825	5.00000
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	2.21504e5	8.610	5.00000
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.52544e5	8.725	5.00000

*** End of Report ***

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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 80	ICAL Verf@10ug/L	CLO4-AQN	1	Ctrl Samp		

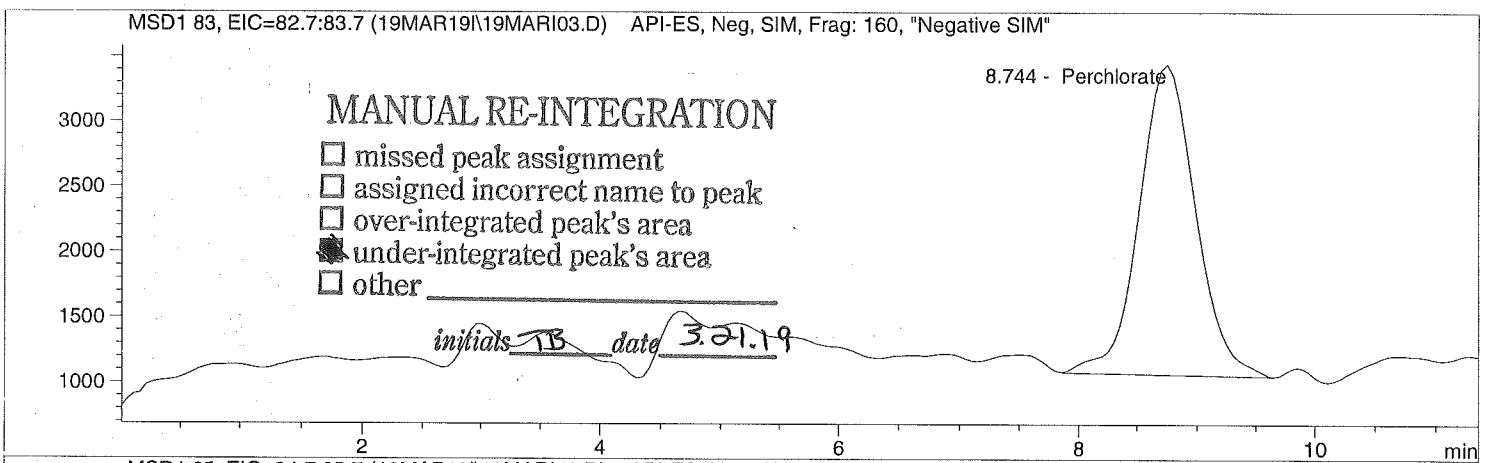
RIGHT SOLUTIONS | RIGHT PARTNER

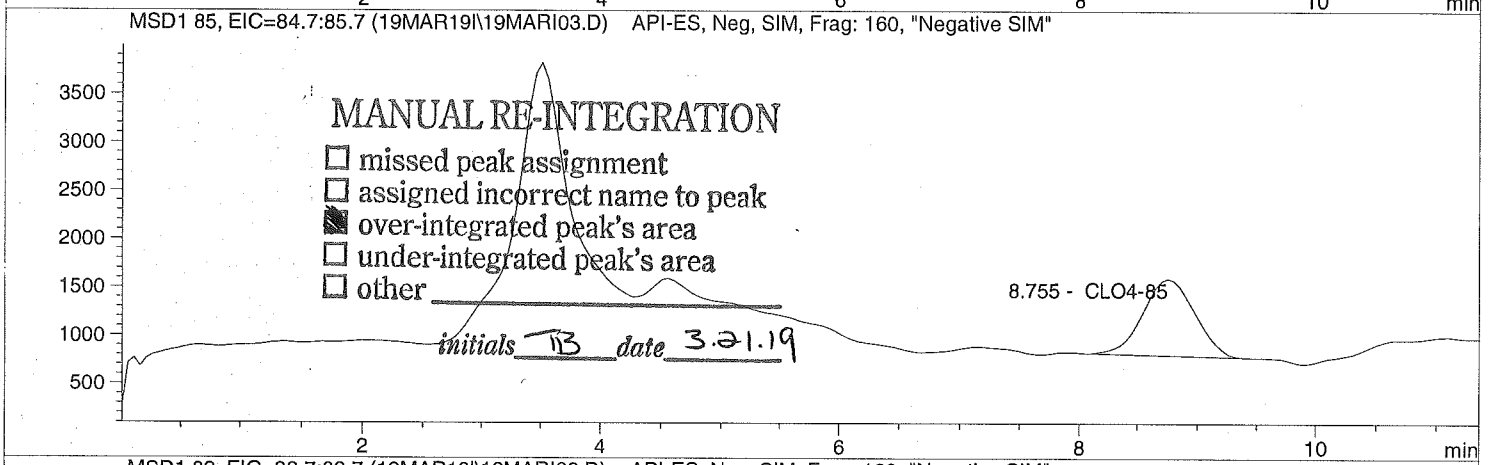
Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

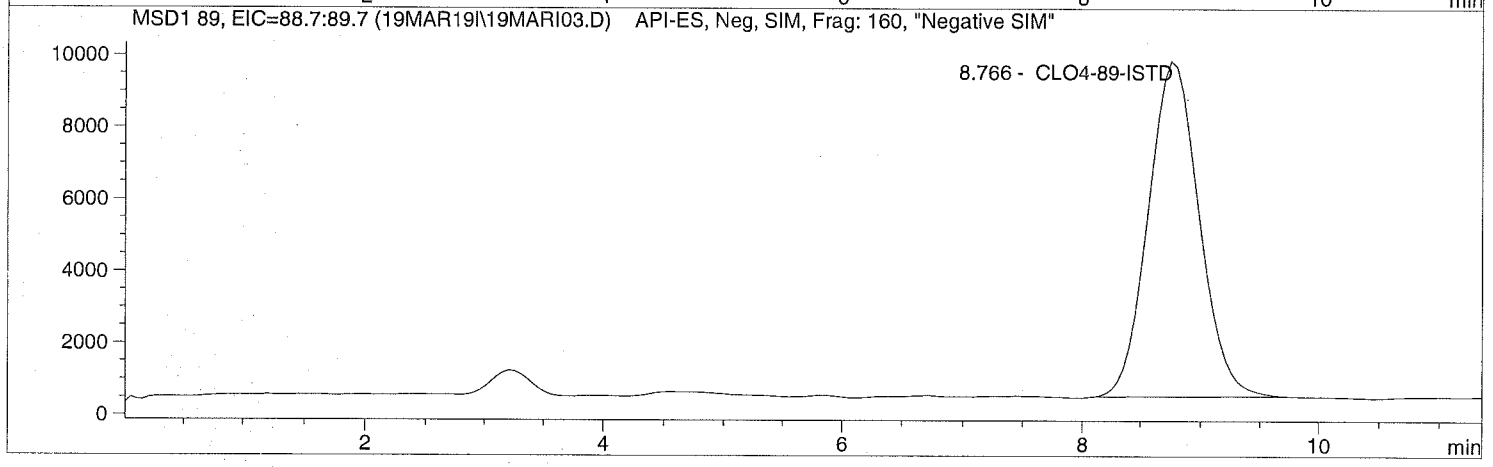
Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	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-DP2.M
Last Changed:	3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 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
8.744	MM	77607.4	1.0625	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	MM	23678.0	0.9305	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

*** End of Report ***

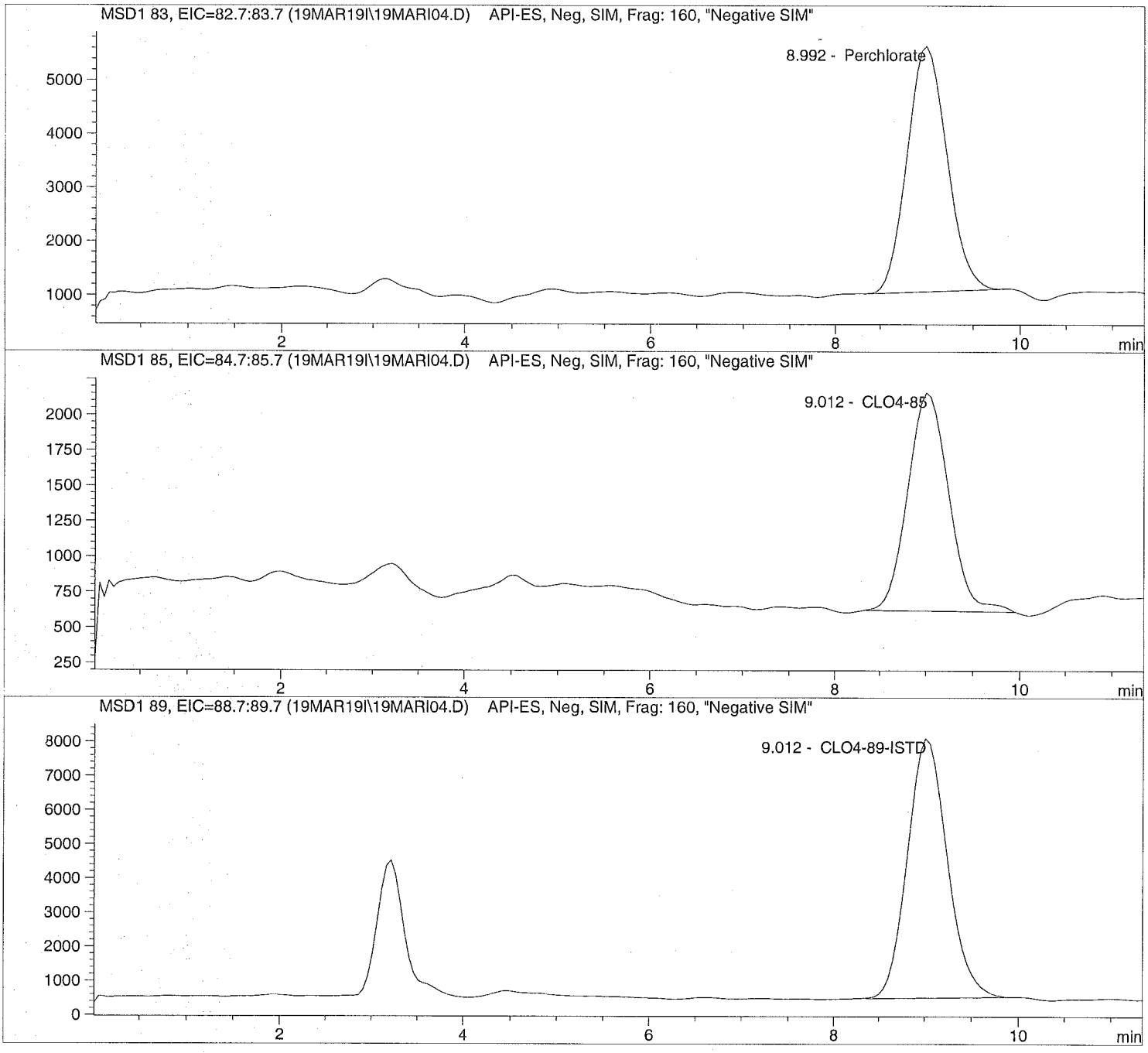
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	3/19/2019 09:53:00	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



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Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	3/19/2019 09:53:00	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 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
8.992	BBA	135272.8	2.0697	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	46948.6	2.2425	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	224885.9	5.0000	CLO4-89-ISTD

*** End of Report ***

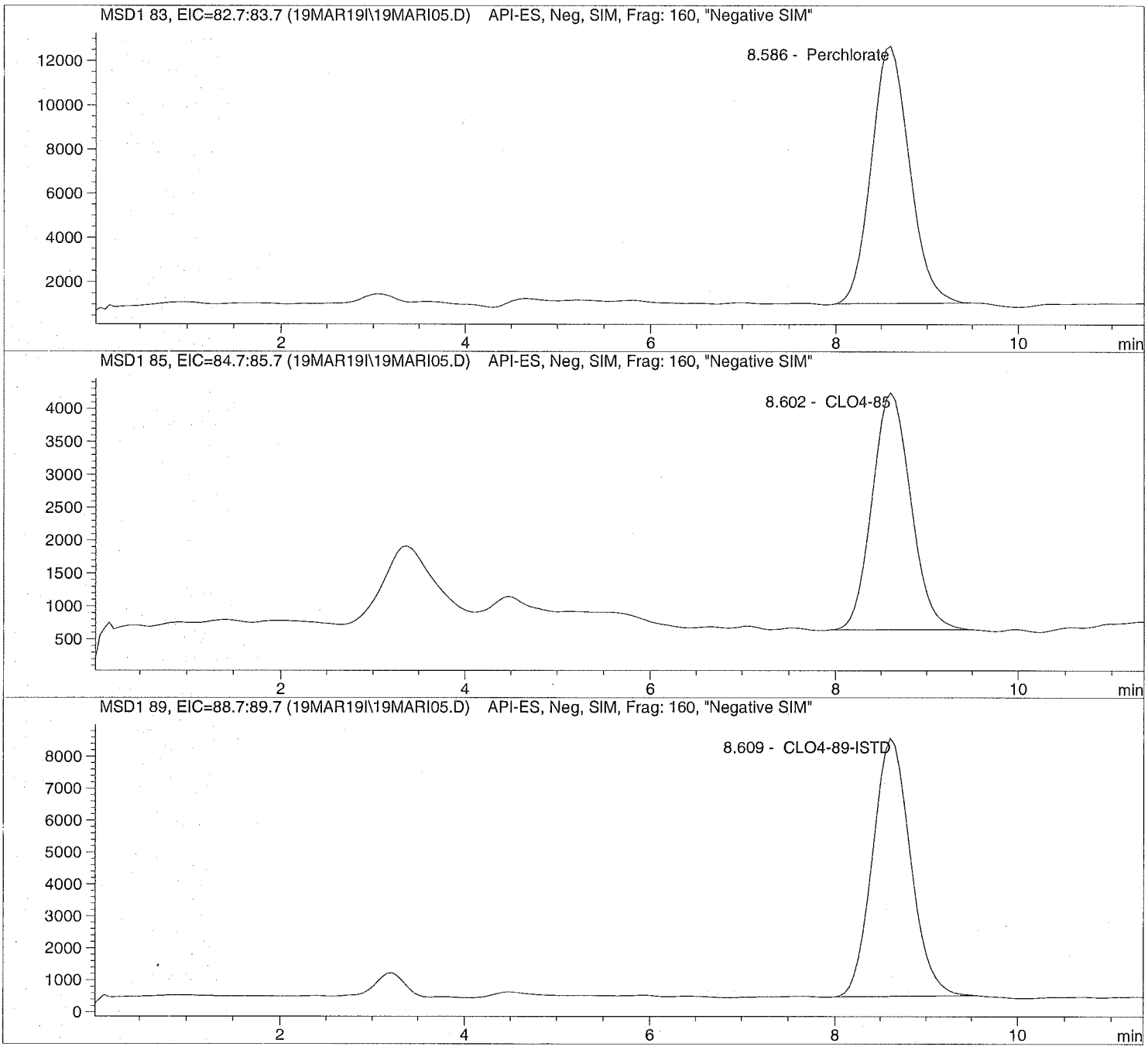
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	3/19/2019 10:06:16	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	3/19/2019 10:06:16	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 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
8.586	PBA	337763.6	4.7347	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.602	PBA	106124.0	4.8666	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.609	PBA	233196.3	5.0000	CLO4-89-ISTD

*** End of Report ***

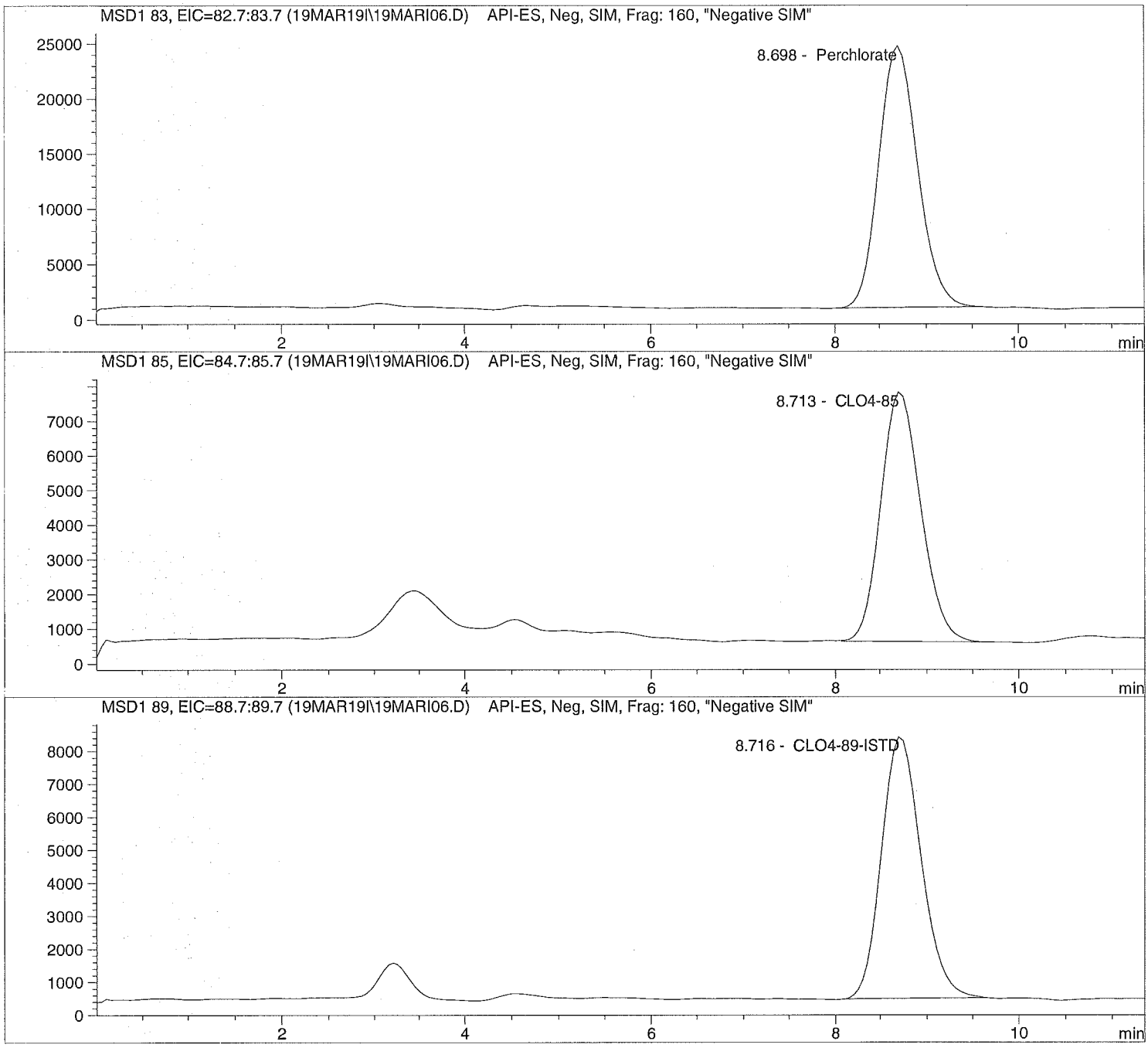
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	3/19/2019 10:19:32	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



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Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	3/19/2019 10:19:32	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 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
8.698	PBA	683454.4	9.2773	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.713	BBA	213522.6	9.6431	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.716	PBA	234453.6	5.0000	CLO4-89-ISTD

*** End of Report ***

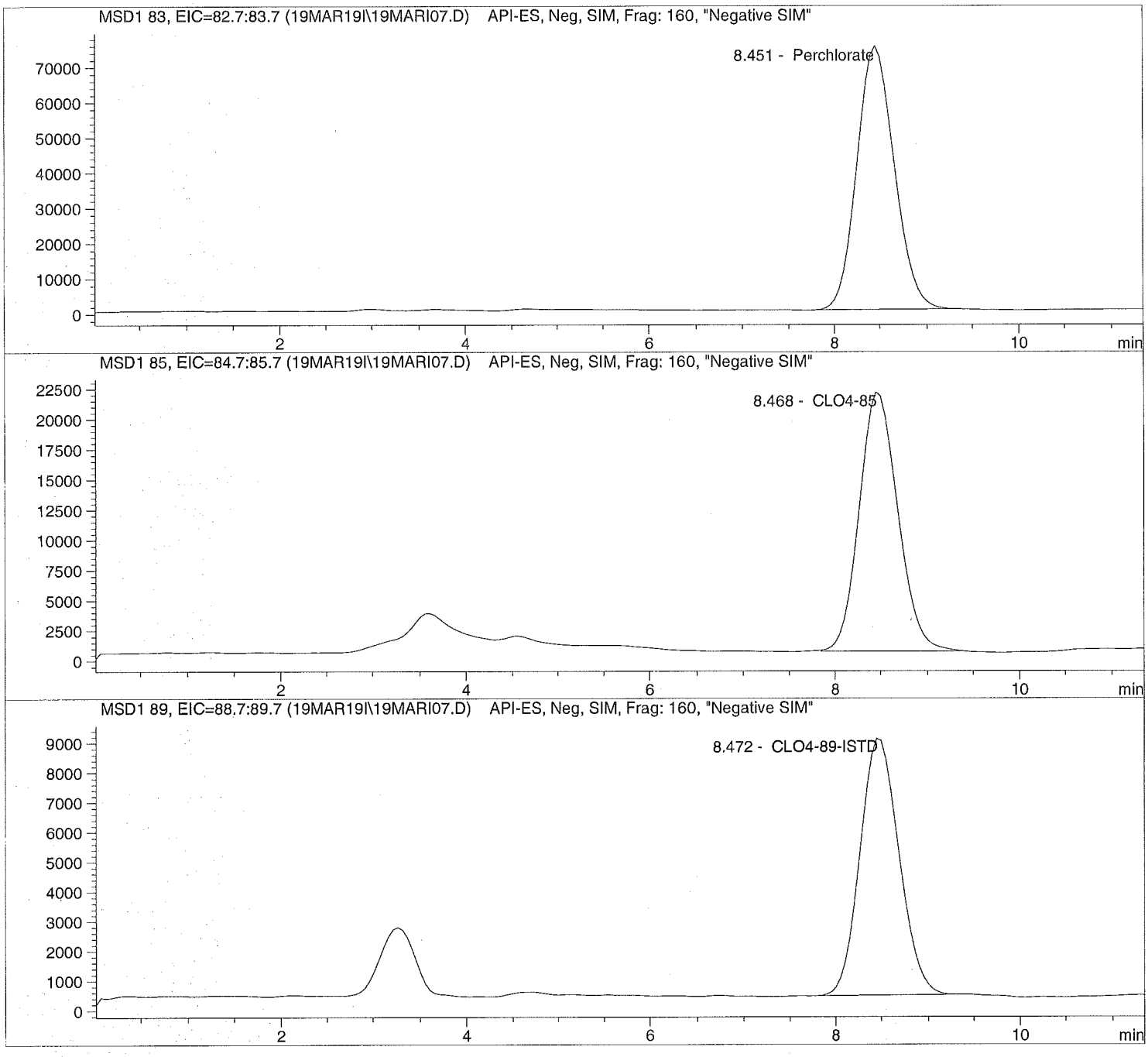
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	3/19/2019 10:32:49	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	3/19/2019 10:32:49	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 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
8.451	PBA	2084327.4	25.2904	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.468	BBA	614294.8	25.1216	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.472	BBA	250568.0	5.0000	CLO4-89-ISTD

*** End of Report ***

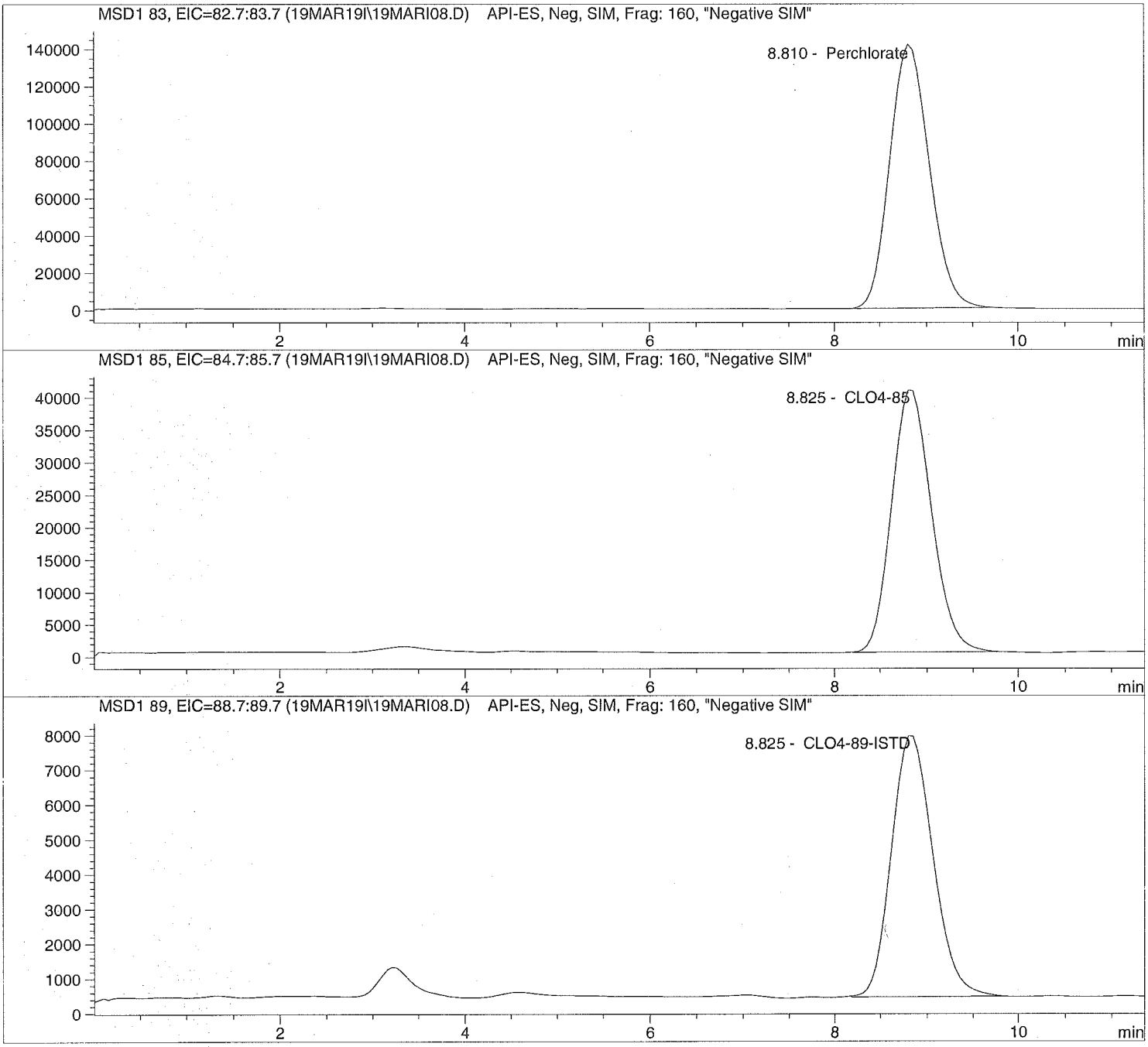
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	3/19/2019 10:46:05	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	3/19/2019 10:46:05	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 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
8.810	PBA	4133340.5	51.3684	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	1198135.6	50.4672	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	230976.7	5.0000	CLO4-89-ISTD

*** End of Report ***

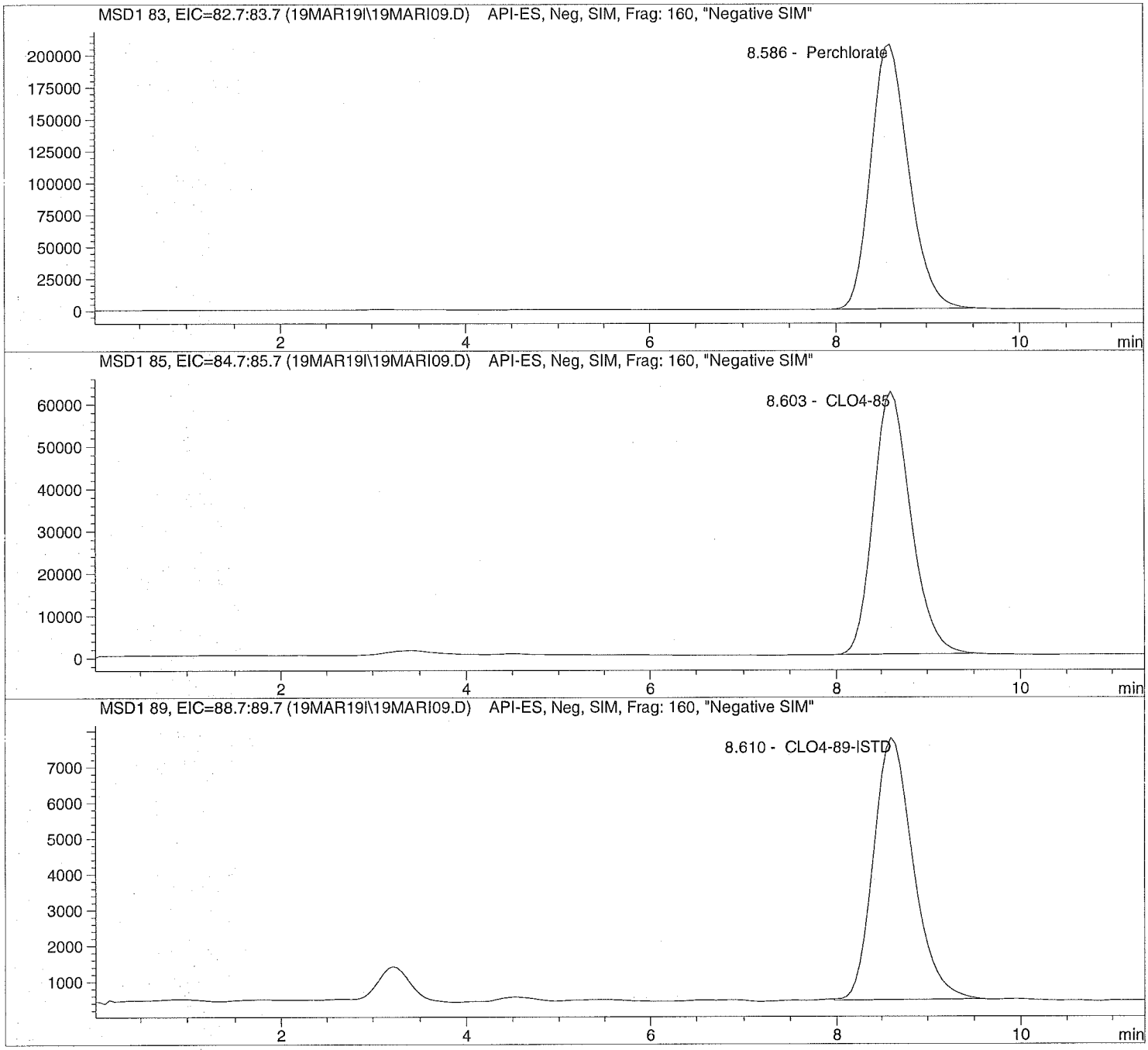
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	3/19/2019 10:59:22	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	3/19/2019 10:59:22	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 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
8.586	PBA	5993128.0	74.1675	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.603	PBA	1783554.4	74.7202	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.610	BBA	221504.5	5.0000	CLO4-89-ISTD

*** End of Report ***

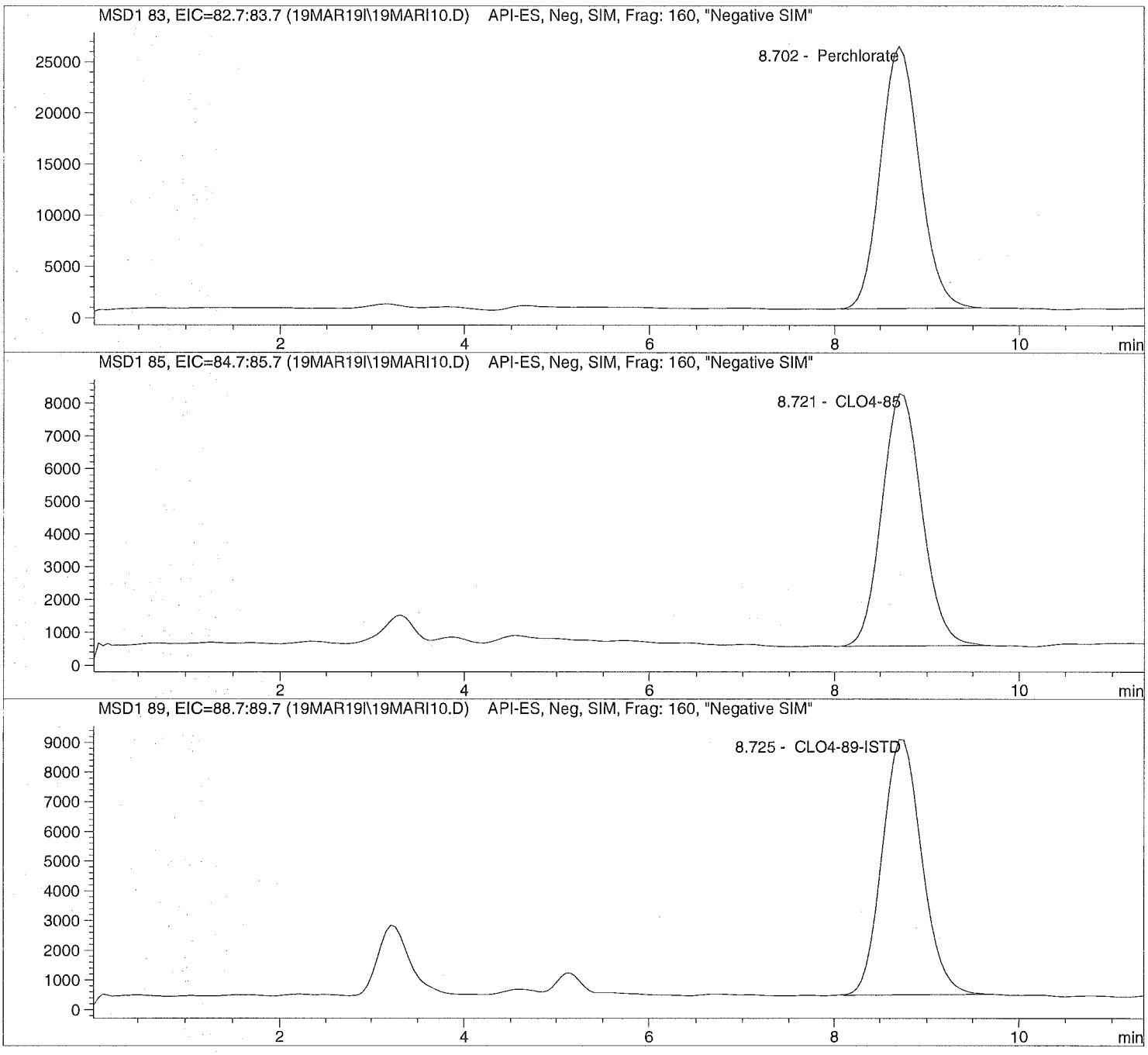
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L

Injection Date:	3/19/2019 11:12:42	Seq Line:	10
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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L

Injection Date:	3/19/2019 11:12:42	Seq Line:	10
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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 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
8.702	PBA	734718.7	9.2594	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.721	PBA	227494.7	9.5402	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.725	BBA	252544.4	5.0000	CLO4-89-ISTD

*** End of Report ***

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Unmodified

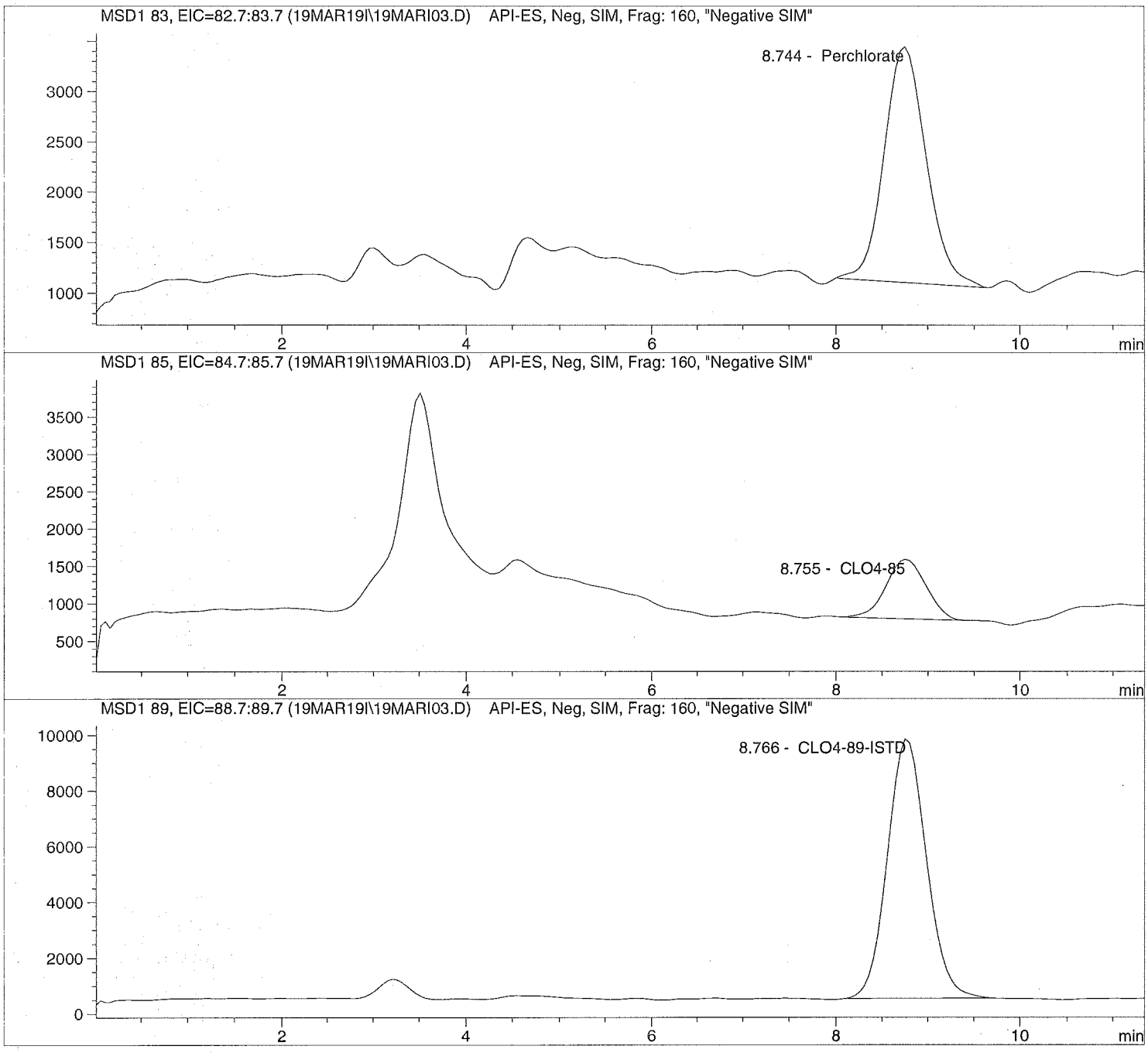
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	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-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	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-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 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
8.744	BBA	74166.3	1.0224	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	BBA	24138.1	0.9487	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

*** End of Report ***

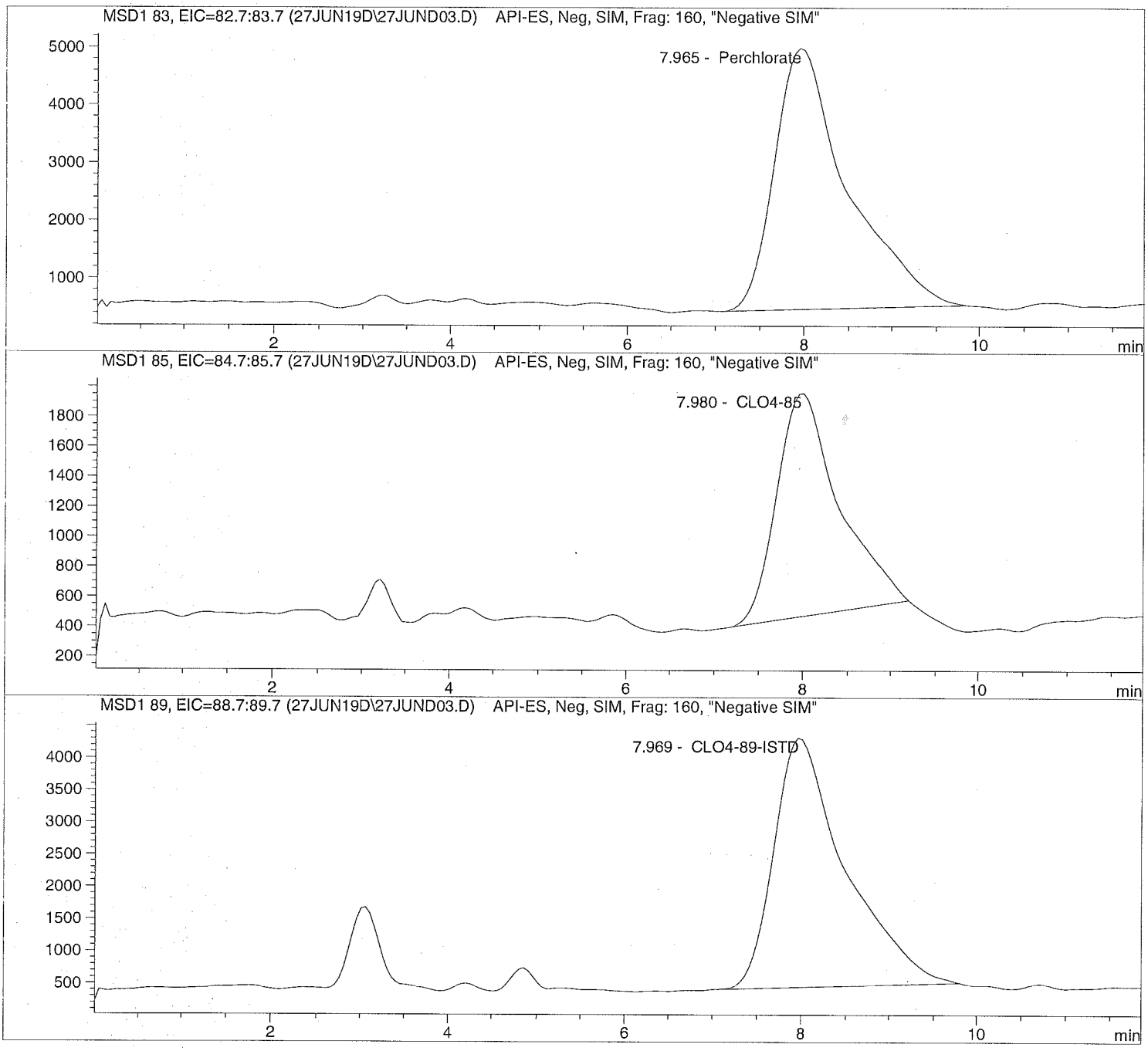
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND03.D Sample Name: 660891 ICS@4.0

Injection Date:	6/27/2019 09:14:16	Seq Line:	3
Sample Name:	660891 ICS@4.0	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND03.D Sample Name: 660891 ICS@4.0

Injection Date:	6/27/2019 09:14:16	Seq Line:	3
Sample Name:	660891 ICS@4.0	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.965	PBA	257330.2	3.9251	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.980	PBA	71973.3	3.5682	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.969	BBA	216232.2	5.0000	CLO4-89-ISTD

*** End of Report ***

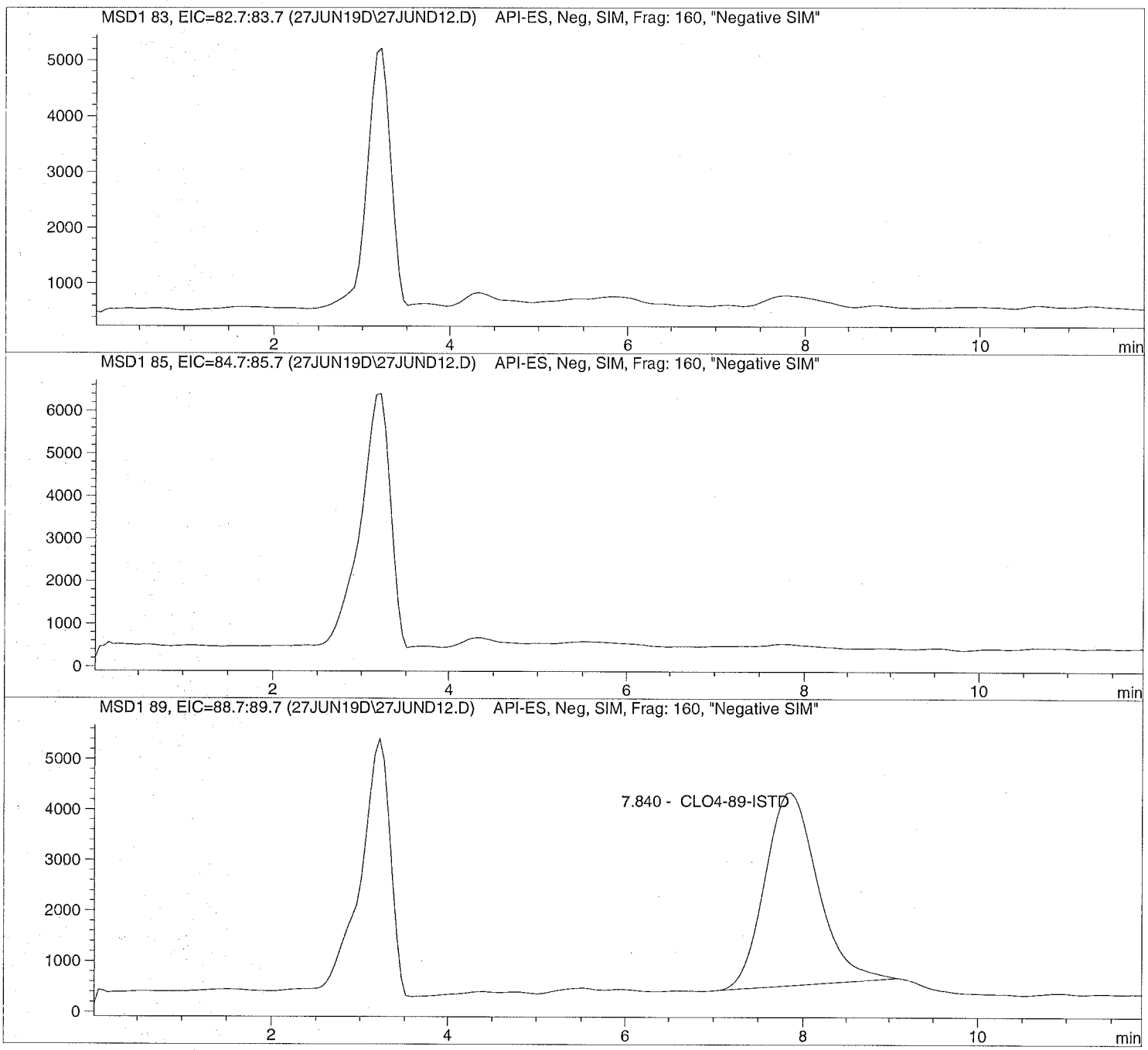
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND12.D Sample Name: 1917489005

Injection Date:	6/27/2019 11:20:03	Seq Line:	12
Sample Name:	1917489005	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND12.D Sample Name: 1917489005

Injection Date:	6/27/2019 11:20:03	Seq Line:	12
Sample Name:	1917489005	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-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
7.840	PBA	156379.6	5.0000	CLO4-89-ISTD

*** End of Report ***

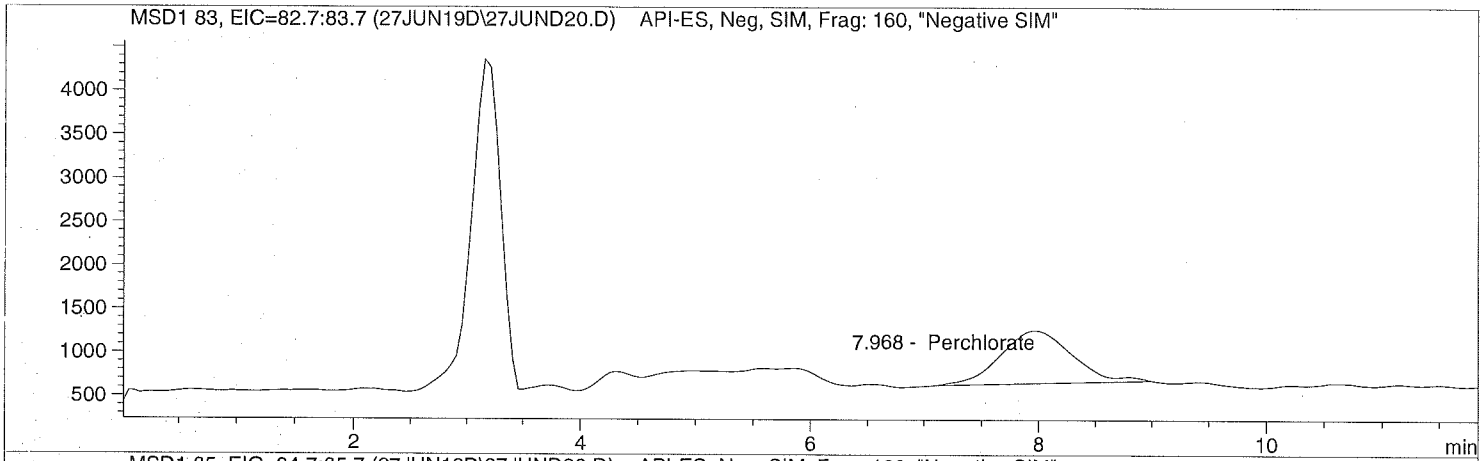
RIGHT SOLUTIONS | RIGHT PARTNER

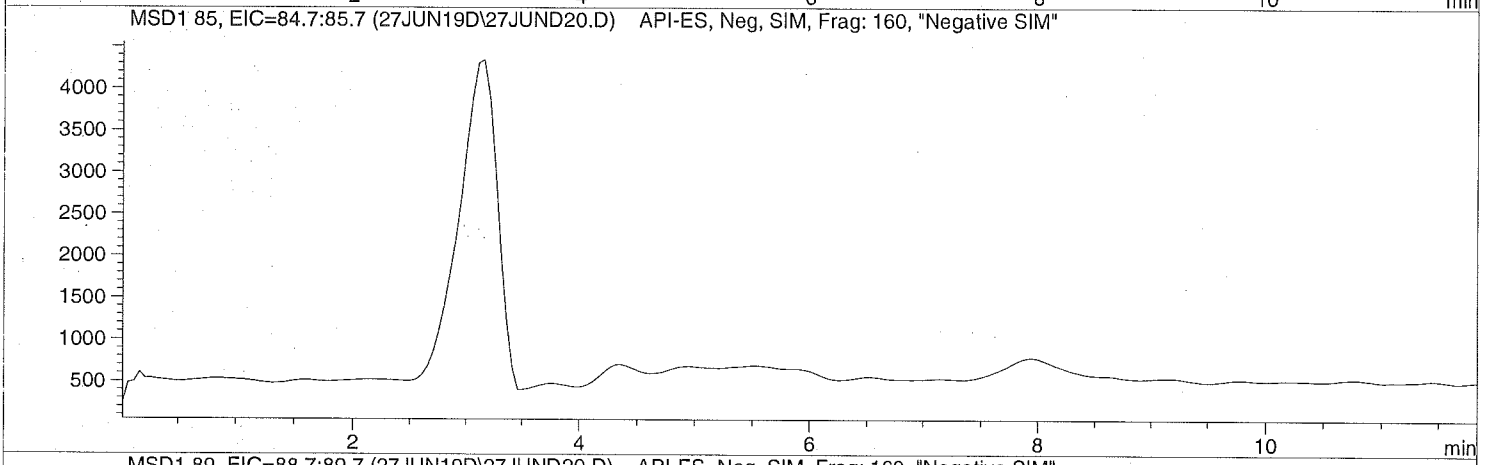
Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND20.D Sample Name: 1917672007

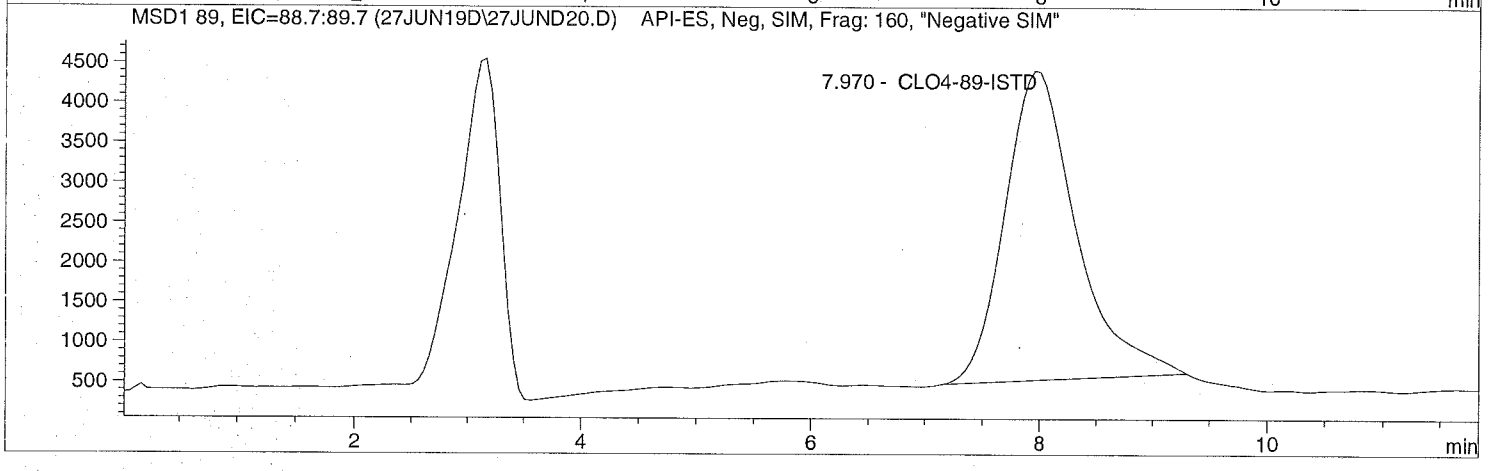
Injection Date:	6/27/2019 13:11:15	Seq Line:	20
Sample Name:	1917672007	Location:	Vial 89
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND20.D Sample Name: 1917672007

Injection Date:	6/27/2019 13:11:15	Seq Line:	20
Sample Name:	1917672007	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
7.968	PBA	26504.7	0.6583	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
7.970	PBA	168729.9	5.0000	CLO4-89-ISTD

*** End of Report ***

RIGHT SOLUTIONS | RIGHT PARTNER

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
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July 10, 2019

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

Work Order: **HS19060986**

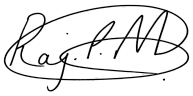
Laboratory Results for: **LHAAP 18 24**

Dear Marcia,

ALS Environmental received 7 sample(s) on Jun 19, 2019 for the analysis presented in the following report.

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

Regards,



Generated By: RJ.MODASHIA
RJ Modashia
Project Manager

ALS Houston, US Date: 10-jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Work Order: HS19060986

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19060986-01	18CpTMW08SW_061819	Groundwater		18-Jun-2019 08:10	19-Jun-2019 08:40	☐
HS19060986-02	MW5_061819	Groundwater		18-Jun-2019 08:55	19-Jun-2019 08:40	☐
HS19060986-03	19CptMW08DW_061819	Groundwater		18-Jun-2019 09:45	19-Jun-2019 08:40	☐
HS19060986-04	MW6_061819	Groundwater		18-Jun-2019 10:40	19-Jun-2019 08:40	☐
HS19060986-05	109_061819	Groundwater		18-Jun-2019 11:40	19-Jun-2019 08:40	☐
HS19060986-06	MW21_061819	Groundwater		18-Jun-2019 12:55	19-Jun-2019 08:40	☐
HS19060986-07	Trip Blank	Water		18-Jun-2019 00:00	19-Jun-2019 08:40	☐

Revision:1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc. **CASE NARRATIVE**
Project: LHAAP 18 24
Work Order: HS19060986

Work Order Comments

- Revised to correct the reporting limit for Mercury

Work Order Comments

- The analyses for Perchlorate was subcontracted to ALS Environmental in Salt Lake City, UT. Final Report attached

GCMS Semivolatiles by Method SW8270SIM

Batch ID: 142169

Sample ID: 18CpTMW08SW_061819 (HS19060986-01)

- Sample was spiked with 2X the normal concentration. Surrogates 4-Terphenyl-d14 and Nitrobenzene-d5 recovered outside the control limits

Sample ID: LCSD-142169

- LCS/LCSD RPD recovered above the RPD limit. The individual recoveries met acceptance criteria (Surrogate 4-Terphenyl-d14)

GCMS Volatiles by Method SW8260

Batch ID: R341453

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

Batch ID: R341546

Sample ID: VLCSW-190628

- 1,2,3_Trichlorobenzene and Naphthalene exceeded QC limits for LCS. CCV is OK. Samples are ND for these compounds.

Metals by Method SW6020

Batch ID: 142427

Sample ID: MW6_061819 (HS19060986-04MS)

- The MS and/or MSD recovery was outside of the control; however, the result in the parent sample is greater than 4x the spike amount. Barium, Calcium, Chromium, Magnesium, Nickel and Sodium.

Sample ID: MW6_061819 (HS19060986-04MSD)

- Manganese failed on MSD but passed for MS and PDS.

Metals by Method SW7470

Batch ID: 142417

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CpTMW08SW_061819
Collection Date: 18-Jun-2019 08:10

ANALYTICAL REPORT
WorkOrder:HS19060986
Lab ID:HS19060986-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 18:22
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 18:22
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 18:22
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 18:22
1,1-Dichloroethane	**2.1**		**0.20**	**0.50**	**1.0**	**UG/L**	1	27-Jun-2019 18:22
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 18:22
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 18:22
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 18:22
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 18:22
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 18:22
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 18:22
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 18:22
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 18:22
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 18:22
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 18:22
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 18:22
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 18:22
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 18:22
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 18:22
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 18:22
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 18:22
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	27-Jun-2019 18:22
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 18:22
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	27-Jun-2019 18:22
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 18:22
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 18:22
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	27-Jun-2019 18:22
Acetone	**2.7**		**0.40**	**1.0**	**2.0**	**UG/L**	1	27-Jun-2019 18:22
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 18:22
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 18:22
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 18:22
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 18:22
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 18:22
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 18:22
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	27-Jun-2019 18:22
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 18:22
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 18:22
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 18:22
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 18:22

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CpTMW08SW_061819
Collection Date: 18-Jun-2019 08:10

ANALYTICAL REPORT
WorkOrder:HS19060986
Lab ID:HS19060986-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 18:22
cis-1,2-Dichloroethene	**11**		**0.20**	**0.50**	**1.0**	**UG/L**	1	27-Jun-2019 18:22
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	27-Jun-2019 18:22
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 18:22
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 18:22
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 18:22
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 18:22
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	27-Jun-2019 18:22
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 18:22
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	27-Jun-2019 18:22
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	27-Jun-2019 18:22
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 18:22
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 18:22
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 18:22
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 18:22
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 18:22
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 18:22
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 18:22
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 18:22
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 18:22
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 18:22
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 18:22
Trichloroethene	**40**		**0.20**	**0.50**	**1.0**	**UG/L**	1	27-Jun-2019 18:22
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 18:22
Vinyl chloride	**5.0**		**0.20**	**0.50**	**1.0**	**UG/L**	1	27-Jun-2019 18:22
Surr: 1,2-Dichloroethane-d4	*101*			**0**	*81-118*	*%REC*	*1*	*27-Jun-2019 18:22*
Surr: 4-Bromofluorobenzene	*93.6*			**0**	*85-114*	*%REC*	*1*	*27-Jun-2019 18:22*
Surr: Dibromofluoromethane	*94.7*			**0**	*80-119*	*%REC*	*1*	*27-Jun-2019 18:22*
Surr: Toluene-d8	*97.1*			**0**	*89-112*	*%REC*	*1*	*27-Jun-2019 18:22*
SEMIVOLATILES SIM		**Method:SW8270SIM**				Prep:SW3510 / 19-Jun-2019		Analyst: LG
1,4-Dioxane	**1.7**		**0.10**	**0.10**	**0.10**	**ug/L**	10	27-Jun-2019 19:06
Surr: 2-Fluorobiphenyl	*101*			**0**	*40-140*	*%REC*	*10*	*27-Jun-2019 19:06*
Surr: 4-Terphenyl-d14	*72.6*			**0**	*40-140*	*%REC*	*10*	*27-Jun-2019 19:06*
Surr: Nitrobenzene-d5	*123*			**0**	*40-140*	*%REC*	*10*	*27-Jun-2019 19:06*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	05-Jul-2019 14:42

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: MW5_061819
Collection Date: 18-Jun-2019 08:55

ANALYTICAL REPORT
WorkOrder:HS19060986
Lab ID:HS19060986-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 18:46
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 18:46
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 18:46
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 18:46
1,1-Dichloroethane	**1.1**		**0.20**	**0.50**	**1.0**	**UG/L**	1	27-Jun-2019 18:46
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 18:46
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 18:46
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 18:46
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 18:46
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 18:46
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 18:46
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 18:46
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 18:46
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 18:46
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 18:46
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 18:46
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 18:46
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 18:46
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 18:46
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 18:46
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 18:46
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	27-Jun-2019 18:46
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 18:46
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	27-Jun-2019 18:46
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 18:46
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 18:46
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	27-Jun-2019 18:46
Acetone	**4.9**		**0.40**	**1.0**	**2.0**	**UG/L**	1	27-Jun-2019 18:46
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 18:46
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 18:46
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 18:46
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 18:46
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 18:46
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 18:46
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	27-Jun-2019 18:46
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 18:46
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 18:46
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 18:46
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 18:46

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: MW5_061819
Collection Date: 18-Jun-2019 08:55

ANALYTICAL REPORT
WorkOrder:HS19060986
Lab ID:HS19060986-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 18:46
cis-1,2-Dichloroethene	**8.5**		**0.20**	**0.50**	**1.0**	**UG/L**	1	27-Jun-2019 18:46
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	27-Jun-2019 18:46
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 18:46
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 18:46
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 18:46
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 18:46
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	27-Jun-2019 18:46
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 18:46
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	27-Jun-2019 18:46
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	27-Jun-2019 18:46
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 18:46
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 18:46
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 18:46
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 18:46
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 18:46
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 18:46
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 18:46
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 18:46
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 18:46
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 18:46
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 18:46
Trichloroethene	**30**		**0.20**	**0.50**	**1.0**	**UG/L**	1	27-Jun-2019 18:46
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 18:46
Vinyl chloride	**1.6**		**0.20**	**0.50**	**1.0**	**UG/L**	1	27-Jun-2019 18:46
Surr: 1,2-Dichloroethane-d4	*108*			**0**	*81-118*	*%REC*	*1*	*27-Jun-2019 18:46*
Surr: 4-Bromofluorobenzene	*97.0*			**0**	*85-114*	*%REC*	*1*	*27-Jun-2019 18:46*
Surr: Dibromofluoromethane	*100*			**0**	*80-119*	*%REC*	*1*	*27-Jun-2019 18:46*
Surr: Toluene-d8	*100*			**0**	*89-112*	*%REC*	*1*	*27-Jun-2019 18:46*
SEMIVOLATILES SIM		**Method:SW8270SIM**				Prep:SW3510 / 19-Jun-2019		Analyst: LG
1,4-Dioxane	0.010	U	0.010	0.010	0.010	ug/L	1	27-Jun-2019 16:41
Surr: 2-Fluorobiphenyl	*99.8*			**0**	*40-140*	*%REC*	*1*	*27-Jun-2019 16:41*
Surr: 4-Terphenyl-d14	*90.6*			**0**	*40-140*	*%REC*	*1*	*27-Jun-2019 16:41*
Surr: Nitrobenzene-d5	*115*			**0**	*40-140*	*%REC*	*1*	*27-Jun-2019 16:41*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	05-Jul-2019 14:42

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 19CptMW08DW_061819
Collection Date: 18-Jun-2019 09:45

ANALYTICAL REPORT
WorkOrder:HS19060986
Lab ID:HS19060986-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
SEMIVOLATILES SIM	**Method:SW8270SIM**					Prep:SW3510 / 19-Jun-2019		Analyst: LG
1,4-Dioxane	**0.38**		**0.010**	**0.010**	**0.010**	**ug/L**	1	27-Jun-2019 17:02
Surr: 2-Fluorobiphenyl	*96.2*			**0**	*40-140*	*%REC*	*1*	*27-Jun-2019 17:02*
Surr: 4-Terphenyl-d14	*110*			**0**	*40-140*	*%REC*	*1*	*27-Jun-2019 17:02*
Surr: Nitrobenzene-d5	*109*			**0**	*40-140*	*%REC*	*1*	*27-Jun-2019 17:02*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)	**Method:NA**							Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	05-Jul-2019 14:42

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: MW6_061819
Collection Date: 18-Jun-2019 10:40

ANALYTICAL REPORT
WorkOrder:HS19060986
Lab ID:HS19060986-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 13:35
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 13:35
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 13:35
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 13:35
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 13:35
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 13:35
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 13:35
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 13:35
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 13:35
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 13:35
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 13:35
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 13:35
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 13:35
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 13:35
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 13:35
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 13:35
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 13:35
1,3-Dichlorobenzene	**0.62**	J	**0.40**	**0.50**	**1.0**	**UG/L**	1	27-Jun-2019 13:35
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 13:35
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 13:35
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 13:35
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	27-Jun-2019 13:35
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 13:35
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	27-Jun-2019 13:35
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 13:35
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 13:35
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	27-Jun-2019 13:35
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	27-Jun-2019 13:35
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 13:35
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 13:35
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 13:35
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 13:35
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 13:35
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 13:35
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	27-Jun-2019 13:35
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 13:35
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 13:35
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 13:35
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 13:35

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: LHAAP 18 24 WorkOrder:HS19060986
Sample ID: MW6_061819 Lab ID:HS19060986-04
Collection Date: 18-Jun-2019 10:40 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 13:35
cis-1,2-Dichloroethene	**4.7**		**0.20**	**0.50**	**1.0**	**UG/L**	1	27-Jun-2019 13:35
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	27-Jun-2019 13:35
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 13:35
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 13:35
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 13:35
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 13:35
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	27-Jun-2019 13:35
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 13:35
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	27-Jun-2019 13:35
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	27-Jun-2019 13:35
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 13:35
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 13:35
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 13:35
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 13:35
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 13:35
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 13:35
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 13:35
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 13:35
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 13:35
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 13:35
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 13:35
Trichloroethene	**14**		**0.20**	**0.50**	**1.0**	**UG/L**	1	27-Jun-2019 13:35
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 13:35
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 13:35
Surr: 1,2-Dichloroethane-d4	*104*			**0**	*81-118*	*%REC*	*1*	*27-Jun-2019 13:35*
Surr: 4-Bromofluorobenzene	*98.4*			**0**	*85-114*	*%REC*	*1*	*27-Jun-2019 13:35*
Surr: Dibromofluoromethane	*97.1*			**0**	*80-119*	*%REC*	*1*	*27-Jun-2019 13:35*
Surr: Toluene-d8	*101*			**0**	*89-112*	*%REC*	*1*	*27-Jun-2019 13:35*

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: MW6_061819
Collection Date: 18-Jun-2019 10:40

ANALYTICAL REPORT
WorkOrder:HS19060986
Lab ID:HS19060986-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 25-Jun-2019		Analyst: JHD
Aluminum	**0.0152**		**0.00180**	**0.00500**	**0.0100**	**mg/L**	1	27-Jun-2019 17:00
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	27-Jun-2019 17:00
Arsenic	**0.00204**	J	**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 17:00
Barium	**0.700**		**0.0190**	**0.0250**	**0.0500**	**mg/L**	10	28-Jun-2019 15:11
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Jun-2019 17:00
Cadmium	**0.000205**	J	**0.000200**	**0.000500**	**0.00200**	**mg/L**	1	27-Jun-2019 17:00
Calcium	**26.9**		**0.340**	**0.500**	**5.00**	**mg/L**	10	28-Jun-2019 15:11
Chromium	**0.228**		**0.00400**	**0.00500**	**0.0500**	**mg/L**	10	28-Jun-2019 15:11
Cobalt	**0.00561**		**0.000100**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 17:00
Copper	**0.00520**		**0.00100**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 17:00
Iron	**2.15**		**0.120**	**0.500**	**2.00**	**mg/L**	10	28-Jun-2019 15:11
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	27-Jun-2019 17:00
Magnesium	**22.9**		**0.100**	**0.500**	**2.00**	**mg/L**	10	28-Jun-2019 15:11
Manganese	**0.137**		**0.00700**	**0.0100**	**0.0500**	**mg/L**	10	28-Jun-2019 15:11
Nickel	**0.168**		**0.00600**	**0.0100**	**0.0500**	**mg/L**	10	28-Jun-2019 15:11
Potassium	**2.16**		**0.180**	**0.500**	**2.00**	**mg/L**	10	28-Jun-2019 15:11
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	27-Jun-2019 17:00
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	27-Jun-2019 17:00
Sodium	**203**		**0.140**	**0.500**	**2.00**	**mg/L**	10	28-Jun-2019 15:11
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Jun-2019 17:00
Vanadium	**0.00378**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 17:00
Zinc	**0.0358**		**0.00200**	**0.00200**	**0.00500**	**mg/L**	1	27-Jun-2019 17:00
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 25-Jun-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	25-Jun-2019 15:04
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	05-Jul-2019 14:42

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 109_061819
Collection Date: 18-Jun-2019 11:40

ANALYTICAL REPORT
WorkOrder:HS19060986
Lab ID:HS19060986-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 19:10
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 19:10
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 19:10
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 19:10
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 19:10
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 19:10
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 19:10
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 19:10
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 19:10
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 19:10
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 19:10
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 19:10
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 19:10
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 19:10
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 19:10
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 19:10
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 19:10
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 19:10
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 19:10
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 19:10
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 19:10
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	27-Jun-2019 19:10
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 19:10
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	27-Jun-2019 19:10
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 19:10
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 19:10
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	27-Jun-2019 19:10
Acetone	**7.8**		**0.40**	**1.0**	**2.0**	**UG/L**	1	27-Jun-2019 19:10
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 19:10
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 19:10
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 19:10
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 19:10
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 19:10
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 19:10
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	27-Jun-2019 19:10
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 19:10
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 19:10
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 19:10
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 19:10

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 109_061819
Collection Date: 18-Jun-2019 11:40

ANALYTICAL REPORT
WorkOrder:HS19060986
Lab ID:HS19060986-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 19:10
cis-1,2-Dichloroethene	**57**		**0.20**	**0.50**	**1.0**	**UG/L**	1	27-Jun-2019 19:10
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	27-Jun-2019 19:10
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 19:10
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 19:10
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 19:10
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 19:10
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	27-Jun-2019 19:10
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 19:10
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	27-Jun-2019 19:10
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	27-Jun-2019 19:10
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 19:10
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 19:10
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 19:10
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 19:10
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 19:10
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 19:10
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 19:10
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 19:10
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 19:10
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 19:10
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 19:10
Trichloroethene	**130**		**0.20**	**0.50**	**1.0**	**UG/L**	1	27-Jun-2019 19:10
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 19:10
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 19:10
Surr: 1,2-Dichloroethane-d4	*105*			**0**	*81-118*	*%REC*	*1*	*27-Jun-2019 19:10*
Surr: 4-Bromofluorobenzene	*98.3*			**0**	*85-114*	*%REC*	*1*	*27-Jun-2019 19:10*
Surr: Dibromofluoromethane	*97.2*			**0**	*80-119*	*%REC*	*1*	*27-Jun-2019 19:10*
Surr: Toluene-d8	*102*			**0**	*89-112*	*%REC*	*1*	*27-Jun-2019 19:10*
SEMIVOLATILES SIM		**Method:SW8270SIM**				Prep:SW3510 / 19-Jun-2019		Analyst: LG
1,4-Dioxane	**0.50**		**0.010**	**0.010**	**0.010**	**ug/L**	1	27-Jun-2019 17:22
Surr: 2-Fluorobiphenyl	*88.5*			**0**	*40-140*	*%REC*	*1*	*27-Jun-2019 17:22*
Surr: 4-Terphenyl-d14	*108*			**0**	*40-140*	*%REC*	*1*	*27-Jun-2019 17:22*
Surr: Nitrobenzene-d5	*114*			**0**	*40-140*	*%REC*	*1*	*27-Jun-2019 17:22*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	05-Jul-2019 14:42

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: MW21_061819
Collection Date: 18-Jun-2019 12:55

ANALYTICAL REPORT
WorkOrder:HS19060986
Lab ID:HS19060986-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	10	U	6.0	10	20	UG/L	20	27-Jun-2019 19:34
1,1,1-Trichloroethane	10	U	4.0	10	20	UG/L	20	27-Jun-2019 19:34
1,1,2,2-Tetrachloroethane	10	U	10	10	20	UG/L	20	27-Jun-2019 19:34
1,1,2-Trichloroethane	10	U	6.0	10	20	UG/L	20	27-Jun-2019 19:34
1,1-Dichloroethane	10	U	4.0	10	20	UG/L	20	27-Jun-2019 19:34
1,1-Dichloroethene	10	U	4.0	10	20	UG/L	20	27-Jun-2019 19:34
1,1-Dichloropropene	10	U	6.0	10	20	UG/L	20	27-Jun-2019 19:34
1,2,3-Trichlorobenzene	10	U	8.0	10	20	UG/L	20	27-Jun-2019 19:34
1,2,3-Trichloropropane	10	U	10	10	20	UG/L	20	27-Jun-2019 19:34
1,2,4-Trichlorobenzene	10	U	10	10	20	UG/L	20	27-Jun-2019 19:34
1,2,4-Trimethylbenzene	10	U	6.0	10	20	UG/L	20	27-Jun-2019 19:34
1,2-Dibromo-3-chloropropane	10	U	4.0	10	20	UG/L	20	27-Jun-2019 19:34
1,2-Dibromoethane	10	U	4.0	10	20	UG/L	20	27-Jun-2019 19:34
1,2-Dichlorobenzene	10	U	10	10	20	UG/L	20	27-Jun-2019 19:34
1,2-Dichloroethane	**38**		**4.0**	**10**	**20**	**UG/L**	20	27-Jun-2019 19:34
1,2-Dichloropropane	10	U	10	10	20	UG/L	20	27-Jun-2019 19:34
1,3,5-Trimethylbenzene	10	U	6.0	10	20	UG/L	20	27-Jun-2019 19:34
1,3-Dichlorobenzene	10	U	8.0	10	20	UG/L	20	27-Jun-2019 19:34
1,3-Dichloropropane	10	U	6.0	10	20	UG/L	20	27-Jun-2019 19:34
1,4-Dichlorobenzene	10	U	8.0	10	20	UG/L	20	27-Jun-2019 19:34
2,2-Dichloropropane	10	U	4.0	10	20	UG/L	20	27-Jun-2019 19:34
2-Butanone	20	U	10	20	40	UG/L	20	27-Jun-2019 19:34
2-Chlorotoluene	10	U	6.0	10	20	UG/L	20	27-Jun-2019 19:34
2-Hexanone	20	U	20	20	40	UG/L	20	27-Jun-2019 19:34
4-Chlorotoluene	10	U	8.0	10	20	UG/L	20	27-Jun-2019 19:34
4-Isopropyltoluene	10	U	6.0	10	20	UG/L	20	27-Jun-2019 19:34
4-Methyl-2-pentanone	20	U	14	20	40	UG/L	20	27-Jun-2019 19:34
Acetone	20	U	8.0	20	40	UG/L	20	27-Jun-2019 19:34
Benzene	10	U	4.0	10	20	UG/L	20	27-Jun-2019 19:34
Bromobenzene	10	U	8.0	10	20	UG/L	20	27-Jun-2019 19:34
Bromochloromethane	10	U	4.0	10	20	UG/L	20	27-Jun-2019 19:34
Bromodichloromethane	10	U	4.0	10	20	UG/L	20	27-Jun-2019 19:34
Bromoform	10	U	8.0	10	20	UG/L	20	27-Jun-2019 19:34
Bromomethane	10	U	8.0	10	20	UG/L	20	27-Jun-2019 19:34
Carbon disulfide	20	U	12	20	40	UG/L	20	27-Jun-2019 19:34
Carbon tetrachloride	10	U	10	10	20	UG/L	20	27-Jun-2019 19:34
Chlorobenzene	10	U	6.0	10	20	UG/L	20	27-Jun-2019 19:34
Chloroethane	10	U	6.0	10	20	UG/L	20	27-Jun-2019 19:34
Chloroform	10	U	4.0	10	20	UG/L	20	27-Jun-2019 19:34

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: MW21_061819
Collection Date: 18-Jun-2019 12:55

ANALYTICAL REPORT
WorkOrder:HS19060986
Lab ID:HS19060986-06
Matrix:Groundwater

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	27-Jun-2019 19:34
cis-1,2-Dichloroethene	**190**		**4.0**	**10**	**20**	**UG/L**	20	27-Jun-2019 19:34
cis-1,3-Dichloropropene	10	U	2.0	10	20	UG/L	20	27-Jun-2019 19:34
Dibromochloromethane	10	U	6.0	10	20	UG/L	20	27-Jun-2019 19:34
Dibromomethane	10	U	4.0	10	20	UG/L	20	27-Jun-2019 19:34
Dichlorodifluoromethane	10	U	6.0	10	20	UG/L	20	27-Jun-2019 19:34
Ethylbenzene	10	U	6.0	10	20	UG/L	20	27-Jun-2019 19:34
Hexachlorobutadiene	20	U	20	20	20	UG/L	20	27-Jun-2019 19:34
Isopropylbenzene	10	U	6.0	10	20	UG/L	20	27-Jun-2019 19:34
m,p-Xylene	20	U	10	20	40	UG/L	20	27-Jun-2019 19:34
Methylene chloride	20	U	8.0	20	40	UG/L	20	27-Jun-2019 19:34
n-Butylbenzene	10	U	8.0	10	20	UG/L	20	27-Jun-2019 19:34
n-Propylbenzene	10	U	6.0	10	20	UG/L	20	27-Jun-2019 19:34
Naphthalene	10	U	6.0	10	20	UG/L	20	27-Jun-2019 19:34
o-Xylene	10	U	6.0	10	20	UG/L	20	27-Jun-2019 19:34
sec-Butylbenzene	10	U	6.0	10	20	UG/L	20	27-Jun-2019 19:34
Styrene	10	U	6.0	10	20	UG/L	20	27-Jun-2019 19:34
tert-Butylbenzene	10	U	6.0	10	20	UG/L	20	27-Jun-2019 19:34
Tetrachloroethene	10	U	6.0	10	20	UG/L	20	27-Jun-2019 19:34
Toluene	10	U	4.0	10	20	UG/L	20	27-Jun-2019 19:34
trans-1,2-Dichloroethene	10	U	4.0	10	20	UG/L	20	27-Jun-2019 19:34
trans-1,3-Dichloropropene	10	U	4.0	10	20	UG/L	20	27-Jun-2019 19:34
Trichloroethene	**6,300**		**40**	**100**	**200**	**UG/L**	200	27-Jun-2019 19:58
Trichlorofluoromethane	10	U	6.0	10	20	UG/L	20	27-Jun-2019 19:34
Vinyl chloride	**18**	J	**4.0**	**10**	**20**	**UG/L**	20	27-Jun-2019 19:34
Surr: 1,2-Dichloroethane-d4	*105*			**0**	*81-118*	*%REC*	*20*	*27-Jun-2019 19:34*
Surr: 1,2-Dichloroethane-d4	*108*			**0**	*81-118*	*%REC*	*200*	*27-Jun-2019 19:58*
Surr: 4-Bromofluorobenzene	*95.3*			**0**	*85-114*	*%REC*	*200*	*27-Jun-2019 19:58*
Surr: 4-Bromofluorobenzene	*96.5*			**0**	*85-114*	*%REC*	*20*	*27-Jun-2019 19:34*
Surr: Dibromofluoromethane	*97.1*			**0**	*80-119*	*%REC*	*20*	*27-Jun-2019 19:34*
Surr: Dibromofluoromethane	*99.8*			**0**	*80-119*	*%REC*	*200*	*27-Jun-2019 19:58*
Surr: Toluene-d8	*100*			**0**	*89-112*	*%REC*	*20*	*27-Jun-2019 19:34*
Surr: Toluene-d8	*100*			**0**	*89-112*	*%REC*	*200*	*27-Jun-2019 19:58*
SEMIVOLATILES SIM		**Method:SW8270SIM**				Prep:SW3510 / 19-Jun-2019		Analyst: LG
1,4-Dioxane	**1.2**		**0.10**	**0.10**	**0.10**	**ug/L**	10	27-Jun-2019 19:27
Surr: 2-Fluorobiphenyl	*111*			**0**	*40-140*	*%REC*	*10*	*27-Jun-2019 19:27*
Surr: 4-Terphenyl-d14	*23700*	*SE*		**0**	*40-140*	*%REC*	*10*	*27-Jun-2019 19:27*
Surr: Nitrobenzene-d5	*1450*	*S*		**0**	*40-140*	*%REC*	*10*	*27-Jun-2019 19:27*

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: MW21_061819
Collection Date: 18-Jun-2019 12:55

ANALYTICAL REPORT
WorkOrder:HS19060986
Lab ID:HS19060986-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 25-Jun-2019		Analyst: JHD
Aluminum	**0.0299**		**0.00180**	**0.00500**	**0.0100**	**mg/L**	1	27-Jun-2019 17:58
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	27-Jun-2019 17:58
Arsenic	**0.00241**	J	**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 17:58
Barium	**9.21**		**0.0380**	**0.0500**	**0.100**	**mg/L**	20	28-Jun-2019 15:45
Beryllium	**0.000301**	J	**0.000200**	**0.000500**	**0.00200**	**mg/L**	1	27-Jun-2019 17:58
Cadmium	**0.000837**	J	**0.000200**	**0.000500**	**0.00200**	**mg/L**	1	27-Jun-2019 17:58
Calcium	**223**		**0.680**	**1.00**	**10.0**	**mg/L**	20	28-Jun-2019 15:45
Chromium	**1.09**		**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 17:58
Cobalt	**0.117**		**0.000100**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 17:58
Copper	**0.219**		**0.00100**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 17:58
Iron	**15.2**		**0.0120**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 17:58
Lead	**0.000663**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 17:58
Magnesium	**178**		**0.200**	**1.00**	**4.00**	**mg/L**	20	28-Jun-2019 15:45
Manganese	**2.59**		**0.0140**	**0.0200**	**0.100**	**mg/L**	20	28-Jun-2019 15:45
Nickel	**1.49**		**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 17:58
Potassium	**3.20**		**0.0180**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 17:58
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	27-Jun-2019 17:58
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	27-Jun-2019 17:58
Sodium	**552**		**0.280**	**1.00**	**4.00**	**mg/L**	20	28-Jun-2019 15:45
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Jun-2019 17:58
Vanadium	**0.00433**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 17:58
Zinc	**0.0462**		**0.00200**	**0.00200**	**0.00500**	**mg/L**	1	27-Jun-2019 17:58
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 25-Jun-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	25-Jun-2019 15:09
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	05-Jul-2019 14:42

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: Trip Blank
Collection Date: 18-Jun-2019 00:00

ANALYTICAL REPORT
WorkOrder:HS19060986
Lab ID:HS19060986-07
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:01
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:01
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 12:01
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:01
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:01
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:01
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:01
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 12:01
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 12:01
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 12:01
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:01
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:01
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:01
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 12:01
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:01
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 12:01
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:01
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 12:01
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:01
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 12:01
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:01
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	28-Jun-2019 12:01
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:01
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	28-Jun-2019 12:01
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 12:01
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:01
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	28-Jun-2019 12:01
Acetone	**5.2**		**0.40**	**1.0**	**2.0**	**UG/L**	1	28-Jun-2019 12:01
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:01
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 12:01
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:01
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:01
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 12:01
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 12:01
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	28-Jun-2019 12:01
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 12:01
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:01
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:01
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:01

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: Trip Blank
Collection Date: 18-Jun-2019 00:00

ANALYTICAL REPORT
WorkOrder:HS19060986
Lab ID:HS19060986-07
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-Jun-2019 12:01
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:01
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	28-Jun-2019 12:01
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:01
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:01
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:01
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:01
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	28-Jun-2019 12:01
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:01
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	28-Jun-2019 12:01
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	28-Jun-2019 12:01
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 12:01
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:01
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:01
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:01
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:01
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:01
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:01
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:01
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:01
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:01
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:01
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:01
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:01
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:01
Surr: 1,2-Dichloroethane-d4	*97.0*			**0**	*81-118*	*%REC*	*1*	*28-Jun-2019 12:01*
Surr: 4-Bromofluorobenzene	*94.9*			**0**	*85-114*	*%REC*	*1*	*28-Jun-2019 12:01*
Surr: Dibromofluoromethane	*92.9*			**0**	*80-119*	*%REC*	*1*	*28-Jun-2019 12:01*
Surr: Toluene-d8	*95.7*			**0**	*89-112*	*%REC*	*1*	*28-Jun-2019 12:01*

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

RIGHT SOLUTIONS | RIGHT PARTNER

WEIGHT LOG

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060986

Batch ID: 142169 **Method:** SEMIVOLATILES SIM **Prep:** 3510_B_SIM

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19060986-01	1	1000	1 (mL)	0.001
HS19060986-02	1	1000	1 (mL)	0.001
HS19060986-03	1	1000	1 (mL)	0.001
HS19060986-05	1	1000	1 (mL)	0.001
HS19060986-06	1	1000	1 (mL)	0.001

Batch ID: 142417 **Method:** MERCURY BY SW7470A **Prep:** HG_WPR

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19060986-04	1	10 (mL)	10 (mL)	1
HS19060986-06	1	10 (mL)	10 (mL)	1

Batch ID: 142427 **Method:** METALS BY ICPMS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19060986-04	1	10	10 (mL)	1
HS19060986-06	1	10	10 (mL)	1

ALS Houston, US Date: 10-jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060986

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID: 142169 (0)	**Test Name :** SEMIVOLATILES SIM				**Matrix:** Groundwater	
HS19060986-01	18CpTMW08SW_061819	18 Jun 2019 08:10		19 Jun 2019 09:21	27 Jun 2019 19:06	10
HS19060986-02	MW5_061819	18 Jun 2019 08:55		19 Jun 2019 09:21	27 Jun 2019 16:41	1
HS19060986-03	19CptMW08DW_061819	18 Jun 2019 09:45		19 Jun 2019 09:21	27 Jun 2019 17:02	1
HS19060986-05	109_061819	18 Jun 2019 11:40		19 Jun 2019 09:21	27 Jun 2019 17:22	1
HS19060986-06	MW21_061819	18 Jun 2019 12:55		19 Jun 2019 09:21	27 Jun 2019 19:27	10
Batch ID: 142417 (0)	**Test Name :** MERCURY BY SW7470A				**Matrix:** Groundwater	
HS19060986-04	MW6_061819	18 Jun 2019 10:40		25 Jun 2019 09:30	25 Jun 2019 15:04	1
HS19060986-06	MW21_061819	18 Jun 2019 12:55		25 Jun 2019 09:30	25 Jun 2019 15:09	1
Batch ID: 142427 (0)	**Test Name :** METALS BY ICPMS BY SW6020A				**Matrix:** Groundwater	
HS19060986-04	MW6_061819	18 Jun 2019 10:40		25 Jun 2019 11:30	28 Jun 2019 15:11	10
HS19060986-04	MW6_061819	18 Jun 2019 10:40		25 Jun 2019 11:30	27 Jun 2019 17:00	1
HS19060986-06	MW21_061819	18 Jun 2019 12:55		25 Jun 2019 11:30	28 Jun 2019 15:45	20
HS19060986-06	MW21_061819	18 Jun 2019 12:55		25 Jun 2019 11:30	27 Jun 2019 17:58	1
Batch ID: R341453 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS19060986-01	18CpTMW08SW_061819	18 Jun 2019 08:10			27 Jun 2019 18:22	1
HS19060986-02	MW5_061819	18 Jun 2019 08:55			27 Jun 2019 18:46	1
HS19060986-04	MW6_061819	18 Jun 2019 10:40			27 Jun 2019 13:35	1
HS19060986-05	109_061819	18 Jun 2019 11:40			27 Jun 2019 19:10	1
HS19060986-06	MW21_061819	18 Jun 2019 12:55			27 Jun 2019 19:58	200
HS19060986-06	MW21_061819	18 Jun 2019 12:55			27 Jun 2019 19:34	20
Batch ID: R341546 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS19060986-07	Trip Blank	18 Jun 2019 00:00			28 Jun 2019 12:01	1
Batch ID: R341906 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** Groundwater	
HS19060986-01	18CpTMW08SW_061819	18 Jun 2019 08:10			05 Jul 2019 14:42	1
HS19060986-02	MW5_061819	18 Jun 2019 08:55			05 Jul 2019 14:42	1
HS19060986-03	19CptMW08DW_061819	18 Jun 2019 09:45			05 Jul 2019 14:42	1
HS19060986-04	MW6_061819	18 Jun 2019 10:40			05 Jul 2019 14:42	1
HS19060986-05	109_061819	18 Jun 2019 11:40			05 Jul 2019 14:42	1
HS19060986-06	MW21_061819	18 Jun 2019 12:55			05 Jul 2019 14:42	1

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060986

QC BATCH REPORT

Batch ID: 142417 (0) **Instrument: HG03** **Method: MERCURY BY SW7470A**

MBLK Sample ID: **MBLK-142417** Units: **mg/L** Analysis Date: **25-Jun-2019 14:58**
Client ID: Run ID: **HG03_341258** SeqNo: **5139847** PrepDate: **25-Jun-2019** 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-142417** Units: **mg/L** Analysis Date: **25-Jun-2019 15:02**
Client ID: Run ID: **HG03_341258** SeqNo: **5139848** PrepDate: **25-Jun-2019** 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	100	80 - 120				

MS Sample ID: **HS19060986-04MS** Units: **mg/L** Analysis Date: **25-Jun-2019 15:06**
Client ID: **MW6_061819** Run ID: **HG03_341258** SeqNo: **5139850** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00000511	0.000000200	5e-006	0.0000000010	102	75 - 125				

MSD Sample ID: **HS19060986-04MSD** Units: **mg/L** Analysis Date: **25-Jun-2019 15:07**
Client ID: **MW6_061819** Run ID: **HG03_341258** SeqNo: **5139851** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00000558	0.000000200	5e-006	0.0000000010	112	75 - 125	0.000005110	8.79	20	

The following samples were analyzed in this batch: HS19060986-04 HS19060986-06

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060986

QC BATCH REPORT

Batch ID: 142427 (0) **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

MBLK Sample ID: **MBLK-142427** Units: **mg/L** Analysis Date: **27-Jun-2019 17:22**
Client ID: Run ID: **ICPMS06_341376** SeqNo: **5145221** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.002457	0.0100								J
Antimony	0.000500	0.00500								U
Arsenic	0.000500	0.00500								U
Barium	0.00250	0.00500								U
Beryllium	0.000500	0.00200								U
Cadmium	0.000500	0.00200								U
Calcium	0.0500	0.500								U
Chromium	0.000500	0.00500								U
Cobalt	0.000500	0.00500								U
Copper	0.001932	0.00500								J
Iron	0.0500	0.200								U
Lead	0.00100	0.00500								U
Magnesium	0.0500	0.200								U
Manganese	0.00100	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	0.02437	0.200								J
Thallium	0.000500	0.00200								U
Vanadium	0.001051	0.00500								J
Zinc	0.00200	0.00500								U

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060986

QC BATCH REPORT

Batch ID: 142427 (0) **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

LCS Sample ID: **LCS-142427** Units: **mg/L** Analysis Date: **27-Jun-2019 16:58**
Client ID: Run ID: **ICPMS06_341376** SeqNo: **5145214** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.1091	0.0100	0.1	0	109	84 - 117				
Antimony	0.0559	0.00500	0.05	0	112	85 - 117				
Arsenic	0.05618	0.00500	0.05	0	112	84 - 116				
Barium	0.05364	0.00500	0.05	0	107	86 - 114				
Beryllium	0.05694	0.00200	0.05	0	114	83 - 121				
Cadmium	0.05632	0.00200	0.05	0	113	87 - 115				
Calcium	5.323	0.500	5	0	106	87 - 118				
Chromium	0.05591	0.00500	0.05	0	112	85 - 116				
Cobalt	0.05561	0.00500	0.05	0	111	86 - 115				
Copper	0.05732	0.00500	0.05	0	115	85 - 118				
Iron	5.504	0.200	5	0	110	87 - 118				
Lead	0.05401	0.00500	0.05	0	108	88 - 115				
Magnesium	5.42	0.200	5	0	108	83 - 118				
Manganese	0.05651	0.00500	0.05	0	113	87 - 115				
Nickel	0.05699	0.00500	0.05	0	114	85 - 117				
Potassium	5.366	0.200	5	0	107	87 - 115				
Selenium	0.05781	0.00500	0.05	0	116	80 - 120				
Silver	0.05393	0.00500	0.05	0	108	85 - 116				
Sodium	5.418	0.200	5	0	108	85 - 117				
Thallium	0.05098	0.00200	0.05	0	102	82 - 116				
Vanadium	0.05441	0.00500	0.05	0	109	86 - 115				
Zinc	0.05821	0.00500	0.05	0	116	83 - 119				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060986

QC BATCH REPORT

Batch ID: 142427 (0) **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

MS Sample ID: **HS19060986-04MS** Units: **mg/L** Analysis Date: **27-Jun-2019 17:03**
Client ID: **MW6_061819** Run ID: **ICPMS06_341376** SeqNo: **5145217** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.116	0.0100	0.1	0.01515	101	84 - 117				
Antimony	0.05308	0.00500	0.05	0.000258	106	85 - 117				
Arsenic	0.05627	0.00500	0.05	0.002036	108	84 - 116				
Barium	0.8428	0.00500	0.05	0.8565	-27.4	86 - 114				SO
Beryllium	0.05294	0.00200	0.05	0.000048	106	83 - 121				
Cadmium	0.05116	0.00200	0.05	0.000205	102	87 - 115				
Calcium	35.9	0.500	5	33.03	57.3	87 - 118				SO
Chromium	0.3735	0.00500	0.05	0.2809	185	85 - 116				SO
Cobalt	0.0563	0.00500	0.05	0.005607	101	86 - 115				
Copper	0.058	0.00500	0.05	0.005199	106	85 - 118				
Iron	7.669	0.200	5	2.556	102	87 - 118				
Lead	0.05089	0.00500	0.05	0.000094	102	88 - 115				
Magnesium	31.26	0.200	5	27.76	69.9	83 - 118				SO
Manganese	0.2154	0.00500	0.05	0.164	103	87 - 115				
Nickel	0.2401	0.00500	0.05	0.2011	78.0	85 - 117				SO
Potassium	7.654	0.200	5	2.639	100	87 - 115				
Selenium	0.05384	0.00500	0.05	0.000343	107	80 - 120				
Silver	0.04654	0.00500	0.05	0.000013	93.1	85 - 116				
Sodium	233.3	0.200	5	245	-233	85 - 117				SEO
Thallium	0.04975	0.00200	0.05	0.000043	99.4	82 - 116				
Vanadium	0.0572	0.00500	0.05	0.003781	107	86 - 115				
Zinc	0.07874	0.00500	0.05	0.03582	85.8	83 - 119				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060986

QC BATCH REPORT

Batch ID: 142427 (0) **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

MSD Sample ID: **HS19060986-04MSD** Units: **mg/L** Analysis Date: **27-Jun-2019 17:05**
Client ID: **MW6_061819** Run ID: **ICPMS06_341376** SeqNo: **5145218** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.1062	0.0100	0.1	0.01515	91.1	84 - 117	0.116	8.82	20	
Antimony	0.04965	0.00500	0.05	0.000258	98.8	85 - 117	0.05308	6.66	20	
Arsenic	0.05281	0.00500	0.05	0.002036	102	84 - 116	0.05627	6.34	20	
Barium	0.8139	0.00500	0.05	0.8565	-85.2	86 - 114	0.8428	3.49	20	SO
Beryllium	0.05024	0.00200	0.05	0.000048	100	83 - 121	0.05294	5.24	20	
Cadmium	0.04833	0.00200	0.05	0.000205	96.2	87 - 115	0.05116	5.7	20	
Calcium	33.36	0.500	5	33.03	6.56	87 - 118	35.9	7.33	20	SO
Cobalt	0.0531	0.00500	0.05	0.005607	95.0	86 - 115	0.0563	5.85	20	
Copper	0.05342	0.00500	0.05	0.005199	96.4	85 - 118	0.058	8.23	20	
Iron	7.023	0.200	5	2.556	89.3	87 - 118	7.669	8.8	20	
Lead	0.04808	0.00500	0.05	0.000094	96.0	88 - 115	0.05089	5.67	20	
Magnesium	28.94	0.200	5	27.76	23.5	83 - 118	31.26	7.71	20	SO
Manganese	0.1904	0.00500	0.05	0.164	52.8	87 - 115	0.2154	12.4	20	S
Nickel	0.2255	0.00500	0.05	0.2011	48.7	85 - 117	0.2401	6.29	20	SO
Potassium	7.309	0.200	5	2.639	93.4	87 - 115	7.654	4.62	20	
Selenium	0.05051	0.00500	0.05	0.000343	100	80 - 120	0.05384	6.37	20	
Silver	0.04575	0.00500	0.05	0.000013	91.5	85 - 116	0.04654	1.71	20	
Sodium	224.6	0.200	5	245	-407	85 - 117	233.3	3.8	20	SEO
Thallium	0.04905	0.00200	0.05	0.000043	98.0	82 - 116	0.04975	1.42	20	
Vanadium	0.05284	0.00500	0.05	0.003781	98.1	86 - 115	0.0572	7.93	20	
Zinc	0.08005	0.00500	0.05	0.03582	88.5	83 - 119	0.07874	1.66	20	

MSD Sample ID: **HS19060986-04MSD** Units: **mg/L** Analysis Date: **28-Jun-2019 15:07**
Client ID: **MW6_061819** Run ID: **ICPMS06_341483** SeqNo: **5145651** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium	0.343	0.00500	0.05	0.2809	124	85 - 116	0.3735	8.51	20	SO

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060986

QC BATCH REPORT

Batch ID: 142427 (0) **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

PDS Sample ID: **HS19060986-04PDS** Units: **mg/L** Analysis Date: **27-Jun-2019 17:07**
Client ID: **MW6_061819** Run ID: **ICPMS06_341376** SeqNo: **5145219** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.1008	0.0100	0.1	0.01515	85.7	80 - 120				
Antimony	0.08752	0.00500	0.1	0.000258	87.3	80 - 120				
Arsenic	0.09313	0.00500	0.1	0.002036	91.1	80 - 120				
Beryllium	0.09784	0.00200	0.1	0.000048	97.8	80 - 120				
Cadmium	0.09096	0.00200	0.1	0.000205	90.8	80 - 120				
Cobalt	0.09093	0.00500	0.1	0.005607	85.3	80 - 120				
Copper	0.09101	0.00500	0.1	0.005199	85.8	80 - 120				
Iron	10.93	0.200	10	2.556	83.8	80 - 120				
Lead	0.09017	0.00500	0.1	0.000094	90.1	80 - 120				
Potassium	11.36	0.200	10	2.639	87.2	80 - 120				
Selenium	0.09025	0.00500	0.1	0.000343	89.9	80 - 120				
Silver	0.08464	0.00500	0.1	0.000013	84.6	80 - 120				
Thallium	0.08892	0.00200	0.1	0.000043	88.9	80 - 120				
Vanadium	0.09309	0.00500	0.1	0.003781	89.3	80 - 120				
Zinc	0.1183	0.00500	0.1	0.03582	82.5	80 - 120				

PDS Sample ID: **HS19060986-04PDS** Units: **mg/L** Analysis Date: **28-Jun-2019 15:14**
Client ID: **MW6_061819** Run ID: **ICPMS06_341483** SeqNo: **5145655** PrepDate: **25-Jun-2019** DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Barium	1.703	0.0500	1	0.7	100	80 - 120				
Calcium	129.7	5.00	100	26.89	103	80 - 120				
Chromium	1.283	0.0500	1	0.2283	105	80 - 120				
Iron	107.4	2.00	100	2.151	105	80 - 120				
Magnesium	125.2	2.00	100	22.92	102	80 - 120				
Manganese	1.175	0.0500	1	0.1367	104	80 - 120				
Nickel	1.217	0.0500	1	0.1678	105	80 - 120				
Potassium	106.9	2.00	100	2.16	105	80 - 120				
Sodium	299.8	2.00	100	202.9	96.9	80 - 120				

Revision: 1

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ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060986

QC BATCH REPORT

Batch ID: 142427 (0) **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

SD Sample ID: **HS19060986-04SD** Units: **mg/L** Analysis Date: **27-Jun-2019 17:02**
Client ID: **MW6_061819** Run ID: **ICPMS06_341376** SeqNo: **5145216** PrepDate: **25-Jun-2019** DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Aluminum	0.01988	0.0500					0.01515	0	10	J
Antimony	0.00250	0.0250					0.000258	0	10	U
Arsenic	0.002183	0.0250					0.002036	0	10	J
Beryllium	0.00250	0.0100					0.000048	0	10	U
Cadmium	0.00250	0.0100					0.000205	0	10	U
Cobalt	0.004619	0.0250					0.005607	0	10	J
Copper	0.00500	0.0250					0.005199	0	10	U
Lead	0.00500	0.0250					0.000094	0	10	U
Selenium	0.0125	0.0250					0.000343	0	10	U
Silver	0.00250	0.0250					0.000013	0	10	U
Thallium	0.00250	0.0100					0.000043	0	10	U
Vanadium	0.01164	0.0250					0.003781	0	10	J
Zinc	0.038	0.0250					0.03582	6.07	10	

SD Sample ID: **HS19060986-04SD** Units: **mg/L** Analysis Date: **28-Jun-2019 15:13**
Client ID: **MW6_061819** Run ID: **ICPMS06_341483** SeqNo: **5145654** PrepDate: **25-Jun-2019** DF: **50**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Barium	0.6998	0.250					0.7	0.0306	10	
Calcium	27.1	25.0					26.89	0.761	10	
Chromium	0.234	0.250					0.2283	0	10	J
Iron	2.19	10.0					2.151	0	10	J
Magnesium	22.74	10.0					22.92	0.776	10	
Manganese	0.1567	0.250					0.1367	0	10	J
Nickel	0.1736	0.250					0.1678	0	10	J
Potassium	2.068	10.0					2.16	0	10	J
Sodium	207.1	10.0					202.9	2.06	10	

The following samples were analyzed in this batch: HS19060986-04 HS19060986-06

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060986

QC BATCH REPORT

Batch ID: 142169 (0) **Instrument: SV-5** **Method: SEMIVOLATILES SIM**

MBLK Sample ID: **MBLK-142169** Units: **ug/L** Analysis Date: **27-Jun-2019 11:30**
Client ID: Run ID: **SV-5_341496** SeqNo: **5145167** PrepDate: **19-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.010	0.010								U
Surr: 2-Fluorobiphenyl	*0.07589*	*0*	*0.08*	*0*	*94.9*	*40 - 140*				
Surr: 4-Terphenyl-d14	*0.09153*	*0*	*0.08*	*0*	*114*	*40 - 140*				
Surr: Nitrobenzene-d5	*0.09043*	*0*	*0.08*	*0*	*113*	*40 - 140*				

LCS Sample ID: **LCS-142169** Units: **ug/L** Analysis Date: **27-Jun-2019 11:51**
Client ID: Run ID: **SV-5_341496** SeqNo: **5145168** PrepDate: **19-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.07581	0.010	0.08	0	94.8	40 - 140				
Surr: 2-Fluorobiphenyl	*0.0738*	*0*	*0.08*	*0*	*92.2*	*40 - 140*				
Surr: 4-Terphenyl-d14	*0.07856*	*0*	*0.08*	*0*	*98.2*	*40 - 140*				
Surr: Nitrobenzene-d5	*0.08245*	*0*	*0.08*	*0*	*103*	*40 - 140*				

LCSD Sample ID: **LCSD-142169** Units: **ug/L** Analysis Date: **27-Jun-2019 12:11**
Client ID: Run ID: **SV-5_341496** SeqNo: **5145169** PrepDate: **19-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.07894	0.010	0.08	0	98.7	40 - 140	0.07581	4.05	20	
Surr: 2-Fluorobiphenyl	*0.07855*	*0*	*0.08*	*0*	*98.2*	*40 - 140*	*0.0738*	*6.23*	*20*	
Surr: 4-Terphenyl-d14	*0.1075*	*0*	*0.08*	*0*	*134*	*40 - 140*	*0.07856*	*31.1*	*20*	R
Surr: Nitrobenzene-d5	*0.08954*	*0*	*0.08*	*0*	*112*	*40 - 140*	*0.08245*	*8.25*	*20*	

The following samples were analyzed in this batch: HS19060986-01 HS19060986-02 HS19060986-03 HS19060986-05 HS19060986-06

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060986

QC BATCH REPORT

Batch ID: R341453 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-190627** Units: **UG/L** Analysis Date: **27-Jun-2019 11:11**
Client ID: Run ID: **VOA6_341453** SeqNo: **5144199** 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

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060986

QC BATCH REPORT

Batch ID: R341453 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-190627** Units: **UG/L** Analysis Date: **27-Jun-2019 11:11**
Client ID: Run ID: **VOA6_341453** SeqNo: **5144199** 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	*49.36*	*1.0*	*50*	*0*	*98.7*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*47.49*	*1.0*	*50*	*0*	*95.0*	*85 - 114*				
Surr: Dibromofluoromethane	*46.28*	*1.0*	*50*	*0*	*92.6*	*80 - 119*				
Surr: Toluene-d8	*49.04*	*1.0*	*50*	*0*	*98.1*	*89 - 112*				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060986

QC BATCH REPORT

Batch ID: R341453 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-190627** Units: **UG/L** Analysis Date: **27-Jun-2019 10:23**
Client ID: Run ID: **VOA6_341453** SeqNo: **5144198** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	18.77	1.0	20	0	93.8	78 - 124				
1,1,1-Trichloroethane	19.61	1.0	20	0	98.1	74 - 131				
1,1,2,2-Tetrachloroethane	20.69	1.0	20	0	103	71 - 121				
1,1,2-Trichloroethane	20.36	1.0	20	0	102	80 - 119				
1,1-Dichloroethane	19.43	1.0	20	0	97.1	77 - 125				
1,1-Dichloroethene	19.6	1.0	20	0	98.0	71 - 131				
1,1-Dichloropropene	19.74	1.0	20	0	98.7	78 - 125				
1,2,3-Trichlorobenzene	23.06	1.0	20	0	115	69 - 129				
1,2,3-Trichloropropane	21.25	1.0	20	0	106	73 - 122				
1,2,4-Trichlorobenzene	20.84	1.0	20	0	104	69 - 130				
1,2,4-Trimethylbenzene	18.56	1.0	20	0	92.8	76 - 124				
1,2-Dibromo-3-chloropropane	21.57	1.0	20	0	108	62 - 128				
1,2-Dibromoethane	19.54	1.0	20	0	97.7	77 - 121				
1,2-Dichlorobenzene	18.49	1.0	20	0	92.4	80 - 119				
1,2-Dichloroethane	18.7	1.0	20	0	93.5	73 - 128				
1,2-Dichloropropane	19.06	1.0	20	0	95.3	78 - 122				
1,3,5-Trimethylbenzene	18.18	1.0	20	0	90.9	75 - 124				
1,3-Dichlorobenzene	18.01	1.0	20	0	90.1	80 - 119				
1,3-Dichloropropane	19.83	1.0	20	0	99.1	80 - 119				
1,4-Dichlorobenzene	19.42	1.0	20	0	97.1	79 - 118				
2,2-Dichloropropane	20.55	1.0	20	0	103	60 - 139				
2-Butanone	45.99	2.0	40	0	115	56 - 143				
2-Chlorotoluene	19.68	1.0	20	0	98.4	79 - 122				
2-Hexanone	39.89	2.0	40	0	99.7	57 - 139				
4-Chlorotoluene	19.71	1.0	20	0	98.5	78 - 122				
4-Isopropyltoluene	18.53	1.0	20	0	92.6	77 - 127				
4-Methyl-2-pentanone	39.77	2.0	40	0	99.4	67 - 130				
Acetone	49.5	2.0	40	0	124	39 - 160				
Benzene	19.65	1.0	20	0	98.2	79 - 120				
Bromobenzene	17.92	1.0	20	0	89.6	80 - 120				
Bromochloromethane	18.73	1.0	20	0	93.7	78 - 123				
Bromodichloromethane	19.3	1.0	20	0	96.5	79 - 125				
Bromoform	19.68	1.0	20	0	98.4	66 - 130				
Bromomethane	21.59	1.0	20	0	108	53 - 141				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060986

QC BATCH REPORT

Batch ID: R341453 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-190627** Units: **UG/L** Analysis Date: **27-Jun-2019 10:23**
Client ID: Run ID: **VOA6_341453** SeqNo: **5144198** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	35.73	2.0	40	0	89.3	64 - 133				
Carbon tetrachloride	19.41	1.0	20	0	97.0	72 - 136				
Chlorobenzene	18.46	1.0	20	0	92.3	82 - 118				
Chloroethane	20.98	1.0	20	0	105	60 - 138				
Chloroform	19.78	1.0	20	0	98.9	79 - 124				
Chloromethane	18.51	1.0	20	0	92.5	50 - 139				
cis-1,2-Dichloroethene	19.31	1.0	20	0	96.6	78 - 123				
cis-1,3-Dichloropropene	19.08	1.0	20	0	95.4	75 - 124				
Dibromochloromethane	18.87	1.0	20	0	94.4	74 - 126				
Dibromomethane	19.13	1.0	20	0	95.6	79 - 123				
Dichlorodifluoromethane	19.8	1.0	20	0	99.0	32 - 152				
Ethylbenzene	18.41	1.0	20	0	92.0	79 - 121				
Hexachlorobutadiene	23.02	1.0	20	0	115	66 - 134				
Isopropylbenzene	18.47	1.0	20	0	92.4	72 - 131				
m,p-Xylene	37.16	2.0	40	0	92.9	80 - 121				
Methylene chloride	18.91	2.0	20	0	94.5	74 - 124				
Naphthalene	21.45	1.0	20	0	107	61 - 128				
n-Butylbenzene	18.85	1.0	20	0	94.2	75 - 128				
n-Propylbenzene	19.66	1.0	20	0	98.3	76 - 126				
o-Xylene	18.48	1.0	20	0	92.4	78 - 122				
sec-Butylbenzene	19.8	1.0	20	0	99.0	77 - 126				
Styrene	19.29	1.0	20	0	96.4	78 - 123				
tert-Butylbenzene	19.57	1.0	20	0	97.8	78 - 124				
Tetrachloroethene	18.01	1.0	20	0	90.1	74 - 129				
Toluene	18.39	1.0	20	0	91.9	80 - 121				
trans-1,2-Dichloroethene	19.44	1.0	20	0	97.2	75 - 124				
trans-1,3-Dichloropropene	19.45	1.0	20	0	97.3	73 - 127				
Trichloroethene	18.29	1.0	20	0	91.4	79 - 123				
Trichlorofluoromethane	20.3	1.0	20	0	102	65 - 141				
Vinyl chloride	19.44	1.0	20	0	97.2	58 - 137				
Surr: 1,2-Dichloroethane-d4	*53.25*	*1.0*	*50*	*0*	*106*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*51.3*	*1.0*	*50*	*0*	*103*	*85 - 114*				
Surr: Dibromofluoromethane	*51.63*	*1.0*	*50*	*0*	*103*	*80 - 119*				
Surr: Toluene-d8	*49.81*	*1.0*	*50*	*0*	*99.6*	*89 - 112*				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060986

QC BATCH REPORT

Batch ID: R341453 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS19060986-04MS** Units: **UG/L** Analysis Date: **27-Jun-2019 14:47**
Client ID: **MW6_061819** Run ID: **VOA6_341453** SeqNo: **5144208** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	17.6	1.0	20	0	88.0	78 - 124				
1,1,1-Trichloroethane	19.37	1.0	20	0	96.9	74 - 131				
1,1,2,2-Tetrachloroethane	19.88	1.0	20	0	99.4	71 - 121				
1,1,2-Trichloroethane	18.84	1.0	20	0	94.2	80 - 119				
1,1-Dichloroethane	20.52	1.0	20	0	103	77 - 125				
1,1-Dichloroethene	20.92	1.0	20	0	105	71 - 131				
1,1-Dichloropropene	19.44	1.0	20	0	97.2	78 - 125				
1,2,3-Trichlorobenzene	21.07	1.0	20	0	105	69 - 129				
1,2,3-Trichloropropane	20.06	1.0	20	0	100	73 - 122				
1,2,4-Trichlorobenzene	20.07	1.0	20	0	100	69 - 130				
1,2,4-Trimethylbenzene	18.7	1.0	20	0	93.5	76 - 124				
1,2-Dibromo-3-chloropropane	20.57	1.0	20	0	103	62 - 128				
1,2-Dibromoethane	17.91	1.0	20	0	89.6	77 - 121				
1,2-Dichlorobenzene	18.15	1.0	20	0	90.7	80 - 119				
1,2-Dichloroethane	17.56	1.0	20	0	87.8	73 - 128				
1,2-Dichloropropane	18.1	1.0	20	0	90.5	78 - 122				
1,3,5-Trimethylbenzene	18.75	1.0	20	0	93.7	75 - 124				
1,3-Dichlorobenzene	18.62	1.0	20	0.619	90.0	80 - 119				
1,3-Dichloropropane	18.78	1.0	20	0	93.9	80 - 119				
1,4-Dichlorobenzene	18.97	1.0	20	0	94.9	79 - 118				
2,2-Dichloropropane	19.07	1.0	20	0	95.3	60 - 139				
2-Butanone	40.06	2.0	40	0	100	56 - 143				
2-Chlorotoluene	19.58	1.0	20	0	97.9	79 - 122				
2-Hexanone	35.98	2.0	40	0	90.0	57 - 139				
4-Chlorotoluene	19.71	1.0	20	0	98.5	78 - 122				
4-Isopropyltoluene	19.52	1.0	20	0	97.6	77 - 127				
4-Methyl-2-pentanone	36.25	2.0	40	0	90.6	67 - 130				
Acetone	42.2	2.0	40	0	105	39 - 160				
Benzene	18.94	1.0	20	0	94.7	79 - 120				
Bromobenzene	17	1.0	20	0	85.0	80 - 120				
Bromochloromethane	16.86	1.0	20	0	84.3	78 - 123				
Bromodichloromethane	18.36	1.0	20	0	91.8	79 - 125				
Bromoform	17.93	1.0	20	0	89.6	66 - 130				
Bromomethane	20.38	1.0	20	0	102	53 - 141				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060986

QC BATCH REPORT

Batch ID: R341453 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS19060986-04MS** Units: **UG/L** Analysis Date: **27-Jun-2019 14:47**
Client ID: **MW6_061819** Run ID: **VOA6_341453** SeqNo: **5144208** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	35.55	2.0	40	0	88.9	64 - 133				
Carbon tetrachloride	19.35	1.0	20	0	96.8	72 - 136				
Chlorobenzene	17.87	1.0	20	0	89.3	82 - 118				
Chloroethane	19.94	1.0	20	0	99.7	60 - 138				
Chloroform	18.71	1.0	20	0	93.6	79 - 124				
Chloromethane	19.86	1.0	20	0	99.3	50 - 139				
cis-1,2-Dichloroethene	24.44	1.0	20	4.696	98.7	78 - 123				
cis-1,3-Dichloropropene	17.14	1.0	20	0	85.7	75 - 124				
Dibromochloromethane	17.35	1.0	20	0	86.8	74 - 126				
Dibromomethane	17.39	1.0	20	0	86.9	79 - 123				
Dichlorodifluoromethane	18.96	1.0	20	0	94.8	32 - 152				
Ethylbenzene	18.23	1.0	20	0	91.2	79 - 121				
Hexachlorobutadiene	22.45	1.0	20	0	112	66 - 134				
Isopropylbenzene	19.04	1.0	20	0	95.2	72 - 131				
m,p-Xylene	37.06	2.0	40	0	92.7	80 - 121				
Methylene chloride	17.62	2.0	20	0	88.1	74 - 124				
Naphthalene	20.33	1.0	20	0	102	61 - 128				
n-Butylbenzene	19.95	1.0	20	0	99.7	75 - 128				
n-Propylbenzene	20.39	1.0	20	0	102	76 - 126				
o-Xylene	17.97	1.0	20	0	89.9	78 - 122				
sec-Butylbenzene	20.69	1.0	20	0	103	77 - 126				
Styrene	18.28	1.0	20	0	91.4	78 - 123				
tert-Butylbenzene	20.4	1.0	20	0	102	78 - 124				
Tetrachloroethene	18.26	1.0	20	0	91.3	74 - 129				
Toluene	18.16	1.0	20	0	90.8	80 - 121				
trans-1,2-Dichloroethene	19.19	1.0	20	0	96.0	75 - 124				
trans-1,3-Dichloropropene	17.78	1.0	20	0	88.9	73 - 127				
Trichloroethene	32.63	1.0	20	13.8	94.2	79 - 123				
Trichlorofluoromethane	20.12	1.0	20	0	101	65 - 141				
Vinyl chloride	20.24	1.0	20	0	101	58 - 137				
Surr: 1,2-Dichloroethane-d4	*50.63*	*1.0*	*50*	*0*	*101*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*49.94*	*1.0*	*50*	*0*	*99.9*	*85 - 114*				
Surr: Dibromofluoromethane	*49.14*	*1.0*	*50*	*0*	*98.3*	*80 - 119*				
Surr: Toluene-d8	*48.68*	*1.0*	*50*	*0*	*97.4*	*89 - 112*				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060986

QC BATCH REPORT

Batch ID: R341453 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS19060986-04MSD** Units: **UG/L** Analysis Date: **27-Jun-2019 15:10**
Client ID: **MW6_061819** Run ID: **VOA6_341453** SeqNo: **5144209** 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	17.76	1.0	20	0	88.8	78 - 124	17.6	0.896	20	
1,1,1-Trichloroethane	19.21	1.0	20	0	96.0	74 - 131	19.37	0.855	20	
1,1,2,2-Tetrachloroethane	20.67	1.0	20	0	103	71 - 121	19.88	3.87	20	
1,1,2-Trichloroethane	19.42	1.0	20	0	97.1	80 - 119	18.84	3.01	20	
1,1-Dichloroethane	20.68	1.0	20	0	103	77 - 125	20.52	0.772	20	
1,1-Dichloroethene	20.95	1.0	20	0	105	71 - 131	20.92	0.151	20	
1,1-Dichloropropene	19.47	1.0	20	0	97.4	78 - 125	19.44	0.197	20	
1,2,3-Trichlorobenzene	22.82	1.0	20	0	114	69 - 129	21.07	7.97	20	
1,2,3-Trichloropropane	20.8	1.0	20	0	104	73 - 122	20.06	3.63	20	
1,2,4-Trichlorobenzene	21.1	1.0	20	0	105	69 - 130	20.07	4.98	20	
1,2,4-Trimethylbenzene	19.03	1.0	20	0	95.2	76 - 124	18.7	1.75	20	
1,2-Dibromo-3-chloropropane	21.34	1.0	20	0	107	62 - 128	20.57	3.7	20	
1,2-Dibromoethane	18.27	1.0	20	0	91.4	77 - 121	17.91	1.99	20	
1,2-Dichlorobenzene	18.58	1.0	20	0	92.9	80 - 119	18.15	2.37	20	
1,2-Dichloroethane	17.68	1.0	20	0	88.4	73 - 128	17.56	0.689	20	
1,2-Dichloropropane	18.34	1.0	20	0	91.7	78 - 122	18.1	1.29	20	
1,3,5-Trimethylbenzene	18.93	1.0	20	0	94.7	75 - 124	18.75	0.991	20	
1,3-Dichlorobenzene	18.6	1.0	20	0.619	89.9	80 - 119	18.62	0.134	20	
1,3-Dichloropropane	18.98	1.0	20	0	94.9	80 - 119	18.78	1.08	20	
1,4-Dichlorobenzene	19.29	1.0	20	0	96.5	79 - 118	18.97	1.68	20	
2,2-Dichloropropane	18.72	1.0	20	0	93.6	60 - 139	19.07	1.86	20	
2-Butanone	41.72	2.0	40	0	104	56 - 143	40.06	4.07	20	
2-Chlorotoluene	19.83	1.0	20	0	99.2	79 - 122	19.58	1.26	20	
2-Hexanone	37.6	2.0	40	0	94.0	57 - 139	35.98	4.41	20	
4-Chlorotoluene	19.88	1.0	20	0	99.4	78 - 122	19.71	0.902	20	
4-Isopropyltoluene	19.73	1.0	20	0	98.7	77 - 127	19.52	1.07	20	
4-Methyl-2-pentanone	37.65	2.0	40	0	94.1	67 - 130	36.25	3.77	20	
Acetone	43.42	2.0	40	0	109	39 - 160	42.2	2.86	20	
Benzene	18.88	1.0	20	0	94.4	79 - 120	18.94	0.299	20	
Bromobenzene	17.22	1.0	20	0	86.1	80 - 120	17	1.29	20	
Bromochloromethane	17.4	1.0	20	0	87.0	78 - 123	16.86	3.17	20	
Bromodichloromethane	18.44	1.0	20	0	92.2	79 - 125	18.36	0.421	20	
Bromoform	18.53	1.0	20	0	92.6	66 - 130	17.93	3.28	20	
Bromomethane	19.72	1.0	20	0	98.6	53 - 141	20.38	3.28	20	

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060986

QC BATCH REPORT

Batch ID: R341453 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS19060986-04MSD** Units: **UG/L** Analysis Date: **27-Jun-2019 15:10**
Client ID: **MW6_061819** Run ID: **VOA6_341453** SeqNo: **5144209** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Carbon disulfide	34.97	2.0	40	0	87.4	64 - 133	35.55	1.65	20	
Carbon tetrachloride	19.12	1.0	20	0	95.6	72 - 136	19.35	1.2	20	
Chlorobenzene	17.91	1.0	20	0	89.5	82 - 118	17.87	0.216	20	
Chloroethane	21.79	1.0	20	0	109	60 - 138	19.94	8.88	20	
Chloroform	18.72	1.0	20	0	93.6	79 - 124	18.71	0.043	20	
Chloromethane	18.15	1.0	20	0	90.8	50 - 139	19.86	8.97	20	
cis-1,2-Dichloroethene	24.78	1.0	20	4.696	100	78 - 123	24.44	1.39	20	
cis-1,3-Dichloropropene	17.28	1.0	20	0	86.4	75 - 124	17.14	0.79	20	
Dibromochloromethane	17.72	1.0	20	0	88.6	74 - 126	17.35	2.1	20	
Dibromomethane	18.15	1.0	20	0	90.8	79 - 123	17.39	4.3	20	
Dichlorodifluoromethane	18.36	1.0	20	0	91.8	32 - 152	18.96	3.24	20	
Ethylbenzene	18.31	1.0	20	0	91.6	79 - 121	18.23	0.456	20	
Hexachlorobutadiene	23.53	1.0	20	0	118	66 - 134	22.45	4.71	20	
Isopropylbenzene	18.92	1.0	20	0	94.6	72 - 131	19.04	0.611	20	
m,p-Xylene	37.08	2.0	40	0	92.7	80 - 121	37.06	0.0437	20	
Methylene chloride	17.83	2.0	20	0	89.2	74 - 124	17.62	1.2	20	
Naphthalene	21.72	1.0	20	0	109	61 - 128	20.33	6.62	20	
n-Butylbenzene	20.3	1.0	20	0	102	75 - 128	19.95	1.76	20	
n-Propylbenzene	20.51	1.0	20	0	103	76 - 126	20.39	0.609	20	
o-Xylene	17.89	1.0	20	0	89.5	78 - 122	17.97	0.445	20	
sec-Butylbenzene	21.03	1.0	20	0	105	77 - 126	20.69	1.6	20	
Styrene	18.48	1.0	20	0	92.4	78 - 123	18.28	1.12	20	
tert-Butylbenzene	20.44	1.0	20	0	102	78 - 124	20.4	0.178	20	
Tetrachloroethene	18.1	1.0	20	0	90.5	74 - 129	18.26	0.894	20	
Toluene	18.1	1.0	20	0	90.5	80 - 121	18.16	0.31	20	
trans-1,2-Dichloroethene	18.55	1.0	20	0	92.8	75 - 124	19.19	3.4	20	
trans-1,3-Dichloropropene	17.86	1.0	20	0	89.3	73 - 127	17.78	0.461	20	
Trichloroethene	32.01	1.0	20	13.8	91.0	79 - 123	32.63	1.94	20	
Trichlorofluoromethane	20.09	1.0	20	0	100	65 - 141	20.12	0.15	20	
Vinyl chloride	19.45	1.0	20	0	97.3	58 - 137	20.24	3.94	20	
Surr: 1,2-Dichloroethane-d4	*51.82*	*1.0*	*50*	*0*	*104*	*81 - 118*	*50.63*	*2.31*	*20*	
Surr: 4-Bromofluorobenzene	*49.79*	*1.0*	*50*	*0*	*99.6*	*85 - 114*	*49.94*	*0.285*	*20*	
Surr: Dibromofluoromethane	*49.79*	*1.0*	*50*	*0*	*99.6*	*80 - 119*	*49.14*	*1.3*	*20*	
Surr: Toluene-d8	*48.19*	*1.0*	*50*	*0*	*96.4*	*89 - 112*	*48.68*	*0.999*	*20*	

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060986

QC BATCH REPORT

Batch ID: R341453 (0)	Instrument: VOA6	Method: VOLATILES ORGANICS BY METHOD 8260C

The following samples were analyzed in this batch:

HS19060986-01	HS19060986-02	HS19060986-04	HS19060986-05
HS19060986-06			

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060986

QC BATCH REPORT

Batch ID: R341546 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-190628** Units: **UG/L** Analysis Date: **28-Jun-2019 11:38**
Client ID: Run ID: **VOA6_341546** SeqNo: **5146430** 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

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060986

QC BATCH REPORT

Batch ID: R341546 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-190628** Units: **UG/L** Analysis Date: **28-Jun-2019 11:38**
Client ID: Run ID: **VOA6_341546** SeqNo: **5146430** 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	*46.64*	*1.0*	*50*	*0*	*93.3*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*45.03*	*1.0*	*50*	*0*	*90.1*	*85 - 114*				
Surr: Dibromofluoromethane	*44.27*	*1.0*	*50*	*0*	*88.5*	*80 - 119*				
Surr: Toluene-d8	*45.03*	*1.0*	*50*	*0*	*90.1*	*89 - 112*				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060986

QC BATCH REPORT

Batch ID: R341546 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-190628** Units: **UG/L** Analysis Date: **28-Jun-2019 10:50**
Client ID: Run ID: **VOA6_341546** SeqNo: **5146429** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	18.71	1.0	20	0	93.5	78 - 124				
1,1,1-Trichloroethane	18.86	1.0	20	0	94.3	74 - 131				
1,1,2,2-Tetrachloroethane	21.83	1.0	20	0	109	71 - 121				
1,1,2-Trichloroethane	20.31	1.0	20	0	102	80 - 119				
1,1-Dichloroethane	19.37	1.0	20	0	96.9	77 - 125				
1,1-Dichloroethene	19.49	1.0	20	0	97.5	71 - 131				
1,1-Dichloropropene	18.57	1.0	20	0	92.9	78 - 125				
1,2,3-Trichlorobenzene	27.19	1.0	20	0	136	69 - 129				S
1,2,3-Trichloropropane	22.5	1.0	20	0	113	73 - 122				
1,2,4-Trichlorobenzene	23.25	1.0	20	0	116	69 - 130				
1,2,4-Trimethylbenzene	18.63	1.0	20	0	93.2	76 - 124				
1,2-Dibromo-3-chloropropane	23.82	1.0	20	0	119	62 - 128				
1,2-Dibromoethane	20.03	1.0	20	0	100	77 - 121				
1,2-Dichlorobenzene	19.12	1.0	20	0	95.6	80 - 119				
1,2-Dichloroethane	18.81	1.0	20	0	94.1	73 - 128				
1,2-Dichloropropane	18.83	1.0	20	0	94.2	78 - 122				
1,3,5-Trimethylbenzene	17.9	1.0	20	0	89.5	75 - 124				
1,3-Dichlorobenzene	18.42	1.0	20	0	92.1	80 - 119				
1,3-Dichloropropane	20.28	1.0	20	0	101	80 - 119				
1,4-Dichlorobenzene	19.67	1.0	20	0	98.3	79 - 118				
2,2-Dichloropropane	19.99	1.0	20	0	99.9	60 - 139				
2-Butanone	49.3	2.0	40	0	123	56 - 143				
2-Chlorotoluene	19.48	1.0	20	0	97.4	79 - 122				
2-Hexanone	43.05	2.0	40	0	108	57 - 139				
4-Chlorotoluene	19.99	1.0	20	0	99.9	78 - 122				
4-Isopropyltoluene	17.77	1.0	20	0	88.9	77 - 127				
4-Methyl-2-pentanone	41.38	2.0	40	0	103	67 - 130				
Acetone	54.41	2.0	40	0	136	39 - 160				
Benzene	19.29	1.0	20	0	96.4	79 - 120				
Bromobenzene	18.42	1.0	20	0	92.1	80 - 120				
Bromochloromethane	18.67	1.0	20	0	93.3	78 - 123				
Bromodichloromethane	19.53	1.0	20	0	97.6	79 - 125				
Bromoform	20.73	1.0	20	0	104	66 - 130				
Bromomethane	22.75	1.0	20	0	114	53 - 141				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060986

QC BATCH REPORT

Batch ID: R341546 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-190628** Units: **UG/L** Analysis Date: **28-Jun-2019 10:50**
Client ID: Run ID: **VOA6_341546** SeqNo: **5146429** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	37.03	2.0	40	0	92.6	64 - 133				
Carbon tetrachloride	18.08	1.0	20	0	90.4	72 - 136				
Chlorobenzene	18.69	1.0	20	0	93.5	82 - 118				
Chloroethane	20.86	1.0	20	0	104	60 - 138				
Chloroform	20.01	1.0	20	0	100	79 - 124				
Chloromethane	18.7	1.0	20	0	93.5	50 - 139				
cis-1,2-Dichloroethene	19.38	1.0	20	0	96.9	78 - 123				
cis-1,3-Dichloropropene	18.8	1.0	20	0	94.0	75 - 124				
Dibromochloromethane	19.26	1.0	20	0	96.3	74 - 126				
Dibromomethane	19.49	1.0	20	0	97.4	79 - 123				
Dichlorodifluoromethane	17.68	1.0	20	0	88.4	32 - 152				
Ethylbenzene	18.26	1.0	20	0	91.3	79 - 121				
Hexachlorobutadiene	21.78	1.0	20	0	109	66 - 134				
Isopropylbenzene	17.76	1.0	20	0	88.8	72 - 131				
m,p-Xylene	36.78	2.0	40	0	92.0	80 - 121				
Methylene chloride	19.74	2.0	20	0	98.7	74 - 124				
Naphthalene	25.7	1.0	20	0	128	61 - 128				S
n-Butylbenzene	17.78	1.0	20	0	88.9	75 - 128				
n-Propylbenzene	19.05	1.0	20	0	95.3	76 - 126				
o-Xylene	18.37	1.0	20	0	91.8	78 - 122				
sec-Butylbenzene	18.27	1.0	20	0	91.4	77 - 126				
Styrene	19.37	1.0	20	0	96.9	78 - 123				
tert-Butylbenzene	18.73	1.0	20	0	93.7	78 - 124				
Tetrachloroethene	17.11	1.0	20	0	85.5	74 - 129				
Toluene	18.5	1.0	20	0	92.5	80 - 121				
trans-1,2-Dichloroethene	19.5	1.0	20	0	97.5	75 - 124				
trans-1,3-Dichloropropene	19.19	1.0	20	0	96.0	73 - 127				
Trichloroethene	18.25	1.0	20	0	91.2	79 - 123				
Trichlorofluoromethane	18.83	1.0	20	0	94.1	65 - 141				
Vinyl chloride	18.93	1.0	20	0	94.6	58 - 137				
Surr: 1,2-Dichloroethane-d4	*52.6*	*1.0*	*50*	*0*	*105*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.75*	*1.0*	*50*	*0*	*102*	*85 - 114*				
Surr: Dibromofluoromethane	*51.89*	*1.0*	*50*	*0*	*104*	*80 - 119*				
Surr: Toluene-d8	*47.75*	*1.0*	*50*	*0*	*95.5*	*89 - 112*				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060986

QC BATCH REPORT

Batch ID: R341546 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MS Sample ID: **HS19061157-02MS** Units: **UG/L** Analysis Date: **28-Jun-2019 14:49**
Client ID: Run ID: **VOA6_341546** SeqNo: **5146438** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	17.73	1.0	20	0	88.6	78 - 124				
1,1,1-Trichloroethane	19.03	1.0	20	0	95.2	74 - 131				
1,1,2,2-Tetrachloroethane	20.66	1.0	20	0	103	71 - 121				
1,1,2-Trichloroethane	18.94	1.0	20	0	94.7	80 - 119				
1,1-Dichloroethane	17.57	1.0	20	0	87.9	77 - 125				
1,1-Dichloroethene	19.66	1.0	20	0	98.3	71 - 131				
1,1-Dichloropropene	19.33	1.0	20	0	96.6	78 - 125				
1,2,3-Trichlorobenzene	24.14	1.0	20	0	121	69 - 129				
1,2,3-Trichloropropane	20.5	1.0	20	0	102	73 - 122				
1,2,4-Trichlorobenzene	21.59	1.0	20	0	108	69 - 130				
1,2,4-Trimethylbenzene	18.47	1.0	20	0	92.3	76 - 124				
1,2-Dibromo-3-chloropropane	21.81	1.0	20	0	109	62 - 128				
1,2-Dibromoethane	17.9	1.0	20	0	89.5	77 - 121				
1,2-Dichlorobenzene	18.33	1.0	20	0	91.7	80 - 119				
1,2-Dichloroethane	17.43	1.0	20	0	87.1	73 - 128				
1,2-Dichloropropane	17.55	1.0	20	0	87.7	78 - 122				
1,3,5-Trimethylbenzene	18.27	1.0	20	0	91.4	75 - 124				
1,3-Dichlorobenzene	17.46	1.0	20	0	87.3	80 - 119				
1,3-Dichloropropane	18.65	1.0	20	0	93.2	80 - 119				
1,4-Dichlorobenzene	18.88	1.0	20	0	94.4	79 - 118				
2,2-Dichloropropane	18.91	1.0	20	0	94.5	60 - 139				
2-Butanone	42.59	2.0	40	0	106	56 - 143				
2-Chlorotoluene	19.4	1.0	20	0	97.0	79 - 122				
2-Hexanone	38.42	2.0	40	0	96.0	57 - 139				
4-Chlorotoluene	19.35	1.0	20	0	96.7	78 - 122				
4-Isopropyltoluene	19.33	1.0	20	0	96.6	77 - 127				
4-Methyl-2-pentanone	38.74	2.0	40	0	96.9	67 - 130				
Acetone	46.92	2.0	40	5.359	104	39 - 160				
Benzene	18.35	1.0	20	0	91.7	79 - 120				
Bromobenzene	16.8	1.0	20	0	84.0	80 - 120				
Bromochloromethane	16.09	1.0	20	0	80.4	78 - 123				
Bromodichloromethane	18.04	1.0	20	0	90.2	79 - 125				
Bromoform	18.53	1.0	20	0	92.6	66 - 130				
Bromomethane	13.53	1.0	20	0	67.6	53 - 141				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060986

QC BATCH REPORT

Batch ID: R341546 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MS Sample ID: **HS19061157-02MS** Units: **UG/L** Analysis Date: **28-Jun-2019 14:49**
Client ID: Run ID: **VOA6_341546** SeqNo: **5146438** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	34.31	2.0	40	0	85.8	64 - 133				
Carbon tetrachloride	19.13	1.0	20	0	95.6	72 - 136				
Chlorobenzene	17.61	1.0	20	0	88.1	82 - 118				
Chloroethane	20.41	1.0	20	0	102	60 - 138				
Chloroform	18.1	1.0	20	0	90.5	79 - 124				
Chloromethane	29.09	1.0	20	0	145	50 - 139				S
cis-1,2-Dichloroethene	19.95	1.0	20	0	99.8	78 - 123				
cis-1,3-Dichloropropene	17.23	1.0	20	0	86.1	75 - 124				
Dibromochloromethane	17.55	1.0	20	0	87.7	74 - 126				
Dibromomethane	17.65	1.0	20	0	88.3	79 - 123				
Dichlorodifluoromethane	18.02	1.0	20	0	90.1	32 - 152				
Ethylbenzene	18.28	1.0	20	0	91.4	79 - 121				
Hexachlorobutadiene	23.73	1.0	20	0	119	66 - 134				
Isopropylbenzene	18.91	1.0	20	0	94.5	72 - 131				
m,p-Xylene	37.07	2.0	40	0	92.7	80 - 121				
Methylene chloride	25.8	2.0	20	0	129	74 - 124				S
Naphthalene	23.22	1.0	20	0	116	61 - 128				
n-Butylbenzene	19.75	1.0	20	0	98.7	75 - 128				
n-Propylbenzene	20.08	1.0	20	0	100	76 - 126				
o-Xylene	17.73	1.0	20	0	88.6	78 - 122				
sec-Butylbenzene	20.67	1.0	20	0	103	77 - 126				
Styrene	18.57	1.0	20	0	92.9	78 - 123				
tert-Butylbenzene	20.06	1.0	20	0	100	78 - 124				
Tetrachloroethene	18.08	1.0	20	0	90.4	74 - 129				
Toluene	17.83	1.0	20	0	89.2	80 - 121				
trans-1,2-Dichloroethene	18.21	1.0	20	0	91.0	75 - 124				
trans-1,3-Dichloropropene	17.88	1.0	20	0	89.4	73 - 127				
Trichloroethene	17.77	1.0	20	0	88.9	79 - 123				
Trichlorofluoromethane	20.23	1.0	20	0	101	65 - 141				
Vinyl chloride	18.22	1.0	20	0	91.1	58 - 137				
Surr: 1,2-Dichloroethane-d4	*50.38*	*1.0*	*50*	*0*	*101*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.99*	*1.0*	*50*	*0*	*102*	*85 - 114*				
Surr: Dibromofluoromethane	*49.29*	*1.0*	*50*	*0*	*98.6*	*80 - 119*				
Surr: Toluene-d8	*48.04*	*1.0*	*50*	*0*	*96.1*	*89 - 112*				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060986

QC BATCH REPORT

Batch ID: R341546 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MSD Sample ID: **HS19061157-02MSD** Units: **UG/L** Analysis Date: **28-Jun-2019 15:13**
Client ID: Run ID: **VOA6_341546** SeqNo: **5146439** 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	17.53	1.0	20	0	87.7	78 - 124	17.73	1.11	20	
1,1,1-Trichloroethane	18.55	1.0	20	0	92.7	74 - 131	19.03	2.57	20	
1,1,2,2-Tetrachloroethane	21.38	1.0	20	0	107	71 - 121	20.66	3.41	20	
1,1,2-Trichloroethane	19.17	1.0	20	0	95.9	80 - 119	18.94	1.26	20	
1,1-Dichloroethane	17.86	1.0	20	0	89.3	77 - 125	17.57	1.63	20	
1,1-Dichloroethene	19.11	1.0	20	0	95.5	71 - 131	19.66	2.85	20	
1,1-Dichloropropene	19.03	1.0	20	0	95.1	78 - 125	19.33	1.56	20	
1,2,3-Trichlorobenzene	25.23	1.0	20	0	126	69 - 129	24.14	4.4	20	
1,2,3-Trichloropropane	20.93	1.0	20	0	105	73 - 122	20.5	2.06	20	
1,2,4-Trichlorobenzene	21.92	1.0	20	0	110	69 - 130	21.59	1.52	20	
1,2,4-Trimethylbenzene	18.33	1.0	20	0	91.7	76 - 124	18.47	0.739	20	
1,2-Dibromo-3-chloropropane	22.89	1.0	20	0	114	62 - 128	21.81	4.81	20	
1,2-Dibromoethane	18.73	1.0	20	0	93.7	77 - 121	17.9	4.54	20	
1,2-Dichlorobenzene	18.43	1.0	20	0	92.1	80 - 119	18.33	0.521	20	
1,2-Dichloroethane	17.55	1.0	20	0	87.8	73 - 128	17.43	0.726	20	
1,2-Dichloropropane	17.93	1.0	20	0	89.7	78 - 122	17.55	2.16	20	
1,3,5-Trimethylbenzene	18.28	1.0	20	0	91.4	75 - 124	18.27	0.0341	20	
1,3-Dichlorobenzene	17.74	1.0	20	0	88.7	80 - 119	17.46	1.57	20	
1,3-Dichloropropane	19.01	1.0	20	0	95.1	80 - 119	18.65	1.93	20	
1,4-Dichlorobenzene	19.13	1.0	20	0	95.6	79 - 118	18.88	1.28	20	
2,2-Dichloropropane	18.53	1.0	20	0	92.6	60 - 139	18.91	2.03	20	
2-Butanone	44.5	2.0	40	0	111	56 - 143	42.59	4.39	20	
2-Chlorotoluene	19.45	1.0	20	0	97.2	79 - 122	19.4	0.245	20	
2-Hexanone	40.16	2.0	40	0	100	57 - 139	38.42	4.43	20	
4-Chlorotoluene	19.29	1.0	20	0	96.5	78 - 122	19.35	0.277	20	
4-Isopropyltoluene	19.26	1.0	20	0	96.3	77 - 127	19.33	0.313	20	
4-Methyl-2-pentanone	39.71	2.0	40	0	99.3	67 - 130	38.74	2.45	20	
Acetone	50.25	2.0	40	5.359	112	39 - 160	46.92	6.85	20	
Benzene	18.36	1.0	20	0	91.8	79 - 120	18.35	0.0865	20	
Bromobenzene	16.88	1.0	20	0	84.4	80 - 120	16.8	0.466	20	
Bromochloromethane	16.49	1.0	20	0	82.4	78 - 123	16.09	2.45	20	
Bromodichloromethane	18.36	1.0	20	0	91.8	79 - 125	18.04	1.78	20	
Bromoform	19.36	1.0	20	0	96.8	66 - 130	18.53	4.42	20	
Bromomethane	16.13	1.0	20	0	80.7	53 - 141	13.53	17.6	20	

Revision: 1

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ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060986

QC BATCH REPORT

Batch ID: R341546 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS19061157-02MSD** Units: **UG/L** Analysis Date: **28-Jun-2019 15:13**
Client ID: Run ID: **VOA6_341546** SeqNo: **5146439** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Carbon disulfide	34.41	2.0	40	0	86.0	64 - 133	34.31	0.298	20	
Carbon tetrachloride	18.94	1.0	20	0	94.7	72 - 136	19.13	0.978	20	
Chlorobenzene	17.62	1.0	20	0	88.1	82 - 118	17.61	0.0136	20	
Chloroethane	18.76	1.0	20	0	93.8	60 - 138	20.41	8.41	20	
Chloroform	18.25	1.0	20	0	91.3	79 - 124	18.1	0.822	20	
Chloromethane	23.96	1.0	20	0	120	50 - 139	29.09	19.4	20	
cis-1,2-Dichloroethene	18.61	1.0	20	0	93.1	78 - 123	19.95	6.93	20	
cis-1,3-Dichloropropene	17.39	1.0	20	0	87.0	75 - 124	17.23	0.946	20	
Dibromochloromethane	18.07	1.0	20	0	90.3	74 - 126	17.55	2.93	20	
Dibromomethane	18.25	1.0	20	0	91.3	79 - 123	17.65	3.33	20	
Dichlorodifluoromethane	17.78	1.0	20	0	88.9	32 - 152	18.02	1.36	20	
Ethylbenzene	18.25	1.0	20	0	91.3	79 - 121	18.28	0.178	20	
Hexachlorobutadiene	23.8	1.0	20	0	119	66 - 134	23.73	0.3	20	
Isopropylbenzene	18.76	1.0	20	0	93.8	72 - 131	18.91	0.782	20	
m,p-Xylene	36.69	2.0	40	0	91.7	80 - 121	37.07	1.03	20	
Methylene chloride	20.47	2.0	20	0	102	74 - 124	25.8	23.1	20	R
Naphthalene	24.28	1.0	20	0	121	61 - 128	23.22	4.46	20	
n-Butylbenzene	20.17	1.0	20	0	101	75 - 128	19.75	2.1	20	
n-Propylbenzene	20.11	1.0	20	0	101	76 - 126	20.08	0.148	20	
o-Xylene	17.67	1.0	20	0	88.4	78 - 122	17.73	0.292	20	
sec-Butylbenzene	20.54	1.0	20	0	103	77 - 126	20.67	0.606	20	
Styrene	18.44	1.0	20	0	92.2	78 - 123	18.57	0.717	20	
tert-Butylbenzene	20.01	1.0	20	0	100	78 - 124	20.06	0.251	20	
Tetrachloroethene	18.05	1.0	20	0	90.2	74 - 129	18.08	0.156	20	
Toluene	17.82	1.0	20	0	89.1	80 - 121	17.83	0.055	20	
trans-1,2-Dichloroethene	18.18	1.0	20	0	90.9	75 - 124	18.21	0.146	20	
trans-1,3-Dichloropropene	18	1.0	20	0	90.0	73 - 127	17.88	0.68	20	
Trichloroethene	17.66	1.0	20	0	88.3	79 - 123	17.77	0.648	20	
Trichlorofluoromethane	19.72	1.0	20	0	98.6	65 - 141	20.23	2.53	20	
Vinyl chloride	17.84	1.0	20	0	89.2	58 - 137	18.22	2.1	20	
Surr: 1,2-Dichloroethane-d4	*51.79*	*1.0*	*50*	*0*	*104*	*81 - 118*	*50.38*	*2.77*	*20*	
Surr: 4-Bromofluorobenzene	*50.7*	*1.0*	*50*	*0*	*101*	*85 - 114*	*50.99*	*0.571*	*20*	
Surr: Dibromofluoromethane	*49.25*	*1.0*	*50*	*0*	*98.5*	*80 - 119*	*49.29*	*0.0914*	*20*	
Surr: Toluene-d8	*47.25*	*1.0*	*50*	*0*	*94.5*	*89 - 112*	*48.04*	*1.66*	*20*	

Revision: 1

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ALS Houston, US Date: 10-Jul-19

Client:	Bhate Environmental Associates, Inc.
Project:	LHAAP 18 24
WorkOrder:	HS19060986

QC BATCH REPORT

Batch ID:	**R341546 (0)**	**Instrument:**	**VOA6**	**Method:**	**VOLATILES ORGANICS BY METHOD 8260C**

The following samples were analyzed in this batch: HS19060986-07

Revision: 1

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ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: **HS19060986**

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	20-Dec-2021
Kansas	E-10352 2018-2019	31-Jul-2019
Kentucky	123043, 2019-2020	30-Apr-2020
Louisiana	03087, 2019-2020	30-Jun-2020
Maryland	343, 2019-2020	30-Jun-2020
North Carolina	624-2019	31-Dec-2019
Oklahoma	2018-156	31-Aug-2019
Texas	TX104704231-19-23	30-Apr-2020

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ALS Houston, US Date: 10-jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Work Order: HS19060986

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19060986-01	18CpTMW08SW_061819	Login	19/06/2019 11:34:13	RPG	Sub
HS19060986-01	18CpTMW08SW_061819	Login	19/06/2019 11:34:13	RPG	EXT177
HS19060986-01	18CpTMW08SW_061819	Login	19/06/2019 11:34:13	RPG	VOA123
HS19060986-06	MW21_061819	Login	19/06/2019 11:34:13	RPG	MET091
HS19060986-06	MW21_061819	Login	19/06/2019 11:34:13	RPG	Sub
HS19060986-06	MW21_061819	Login	19/06/2019 11:34:13	RPG	EXT177
HS19060986-06	MW21_061819	Login	19/06/2019 11:34:13	RPG	VOA123
HS19060986-07	Trip Blank	Login	19/06/2019 11:34:13	RPG	VOA123

Revision:1

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ALS Houston, US Date: 10-Jul-19

Sample Receipt Checklist

Client Name: Bhate Environmental
Work Order: HS19060986
Date/Time Received: **19-Jun-2019 08:40**
Received by: **NDR**

Checklist completed by: *Raegen Giga* eSignature 19-Jun-2019 Date
Reviewed by: *RJ Modashia* eSignature 19-Jun-2019 Date

Matrices: **GW**
Carrier name: **FedEx Priority Overnight**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	0.4c uc/c	11
Cooler(s)/Kit(s):	23949	
Date/Time sample(s) sent to storage:	06/19/2019 11:59	

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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bhate ENVIRONMENTAL CONSTRUCTION ENERGY

1608 13th Avenue South, Suite 300
Birmingham Alabama 35205
Tel: 205-918-4000
Fax: 205-918-4050

Chain of Custody and Analytical Request

Page: _____ of _____

Project/Phase No: NWO1312.0150

COC Number(1): _____

LIMS Number: _____

Facility/Base I.D.: LHAAP

Project/Site Name: LHAAP / Site 18/24

Client Name:

Collected by: Scott Beesinger

Field Sample ID (30 Characters Max)	ERPIMS LOCID (15 Characters Max)	Date Collected (dd-mmm-yyyy)	Time Collected (Military) (hhmm)	Sample Depth (beginning - ending)	SA Code (2)	Sample Number (3)	Sample Matrix (4)	Number of containers	VOC	PERCHLORATE	TOTAL METALS	1, 4 - DIOXANE	Ambient Blank Lot Control Number	Equipment Blank Lot Control Number	Trip Blank Lot Control Number	Cooler ID
								Sample Analysis Requested (5)					Quality Assurance Samples (6)			
18SPTMW03SW_061819		18 JUN 2019	0810	-	N		WG	5	X	X		X				
MW5_061819		18 JUN 2019	0855	-	N		WG	5	X	X		X				
18SPTMW03DW_061819		18 JUN 2019	0945	-	N		WG	2		X		X				
MW6_061819		18 JUN 2019	1040		N		WG	5	X	X	X					
MW6_061819_MS		18 JUN 2019	1040		MS		WG	5	X	X	X					
MW6_061819_MSD		18 JUN 2019	1040	-	SD		WG	5	X	X	X					
109_061819		18 JUN 2019	1140	-	N		WG	5	X	X		X				
MW21_061819		18 JUN 2019	1255	-	N		WG	6	X	X	X	X				
TRIP BLANK		18 JUN 2019		-	TB		W	2	X							
				-												
				-												

HS19060986

Bhate Environmental Associates, Inc.
LHAAP 18 24

COMMENTS: _____

Custody Transfers Prior to Receipt by Laboratory

	Relinquished By (Signed)	Date	Time	Received by (signed)	Date	Time
1.	Scott Beesinger	6/18/19	1430	NR	6/19/19	0840
2.						
3.						

Sample Delivery Details / Laboratory Receipt

Delivered Directly to Lab: _____ Shipped No.:

Method of Shipment: _____

_____ Fed Ex _____ Airbill Number:

Analytical Lab: ALS 10450 Stancliff Rd. Suite 210 Houston, TX 77099 (281) 530-5656

ATTN: SONIA WEST Lab Recipient: Delivery Date/Time:

1.) Chain of Custody Number = date collected + custody number (e.g. 09-02-1999-01)

2.) Sample Type (SA) Codes: N = Normal Sample, TB = Trip Blank (-c) Sample, FD = Field Duplicate (-a) Samples, FR = Field Replicate (-b) Samples, EB = Equipment Blank (-d) Samples, MS = Matrix Spike, SD = Matrix Spike Duplicate, AB = Ambient Blank (-e)

3.) Sample Number: Unique sample number collected from a particular location per day. (e.g. Groundwater sample collected from MW-1 on 10/10/99 = 01, if sampled again on 10/10/99 = 02, etc.)

4.) Matrix Codes: GS = Soil Gas, WG = Groundwater, WS = Surface Water, SO = Soil, SE = Sediment, SL = Sludge, SS = Surface Soil Samples, WQ = Aqueous Blank Samples (trip, equipment, ambient, etc), SQ = Soil Blanks

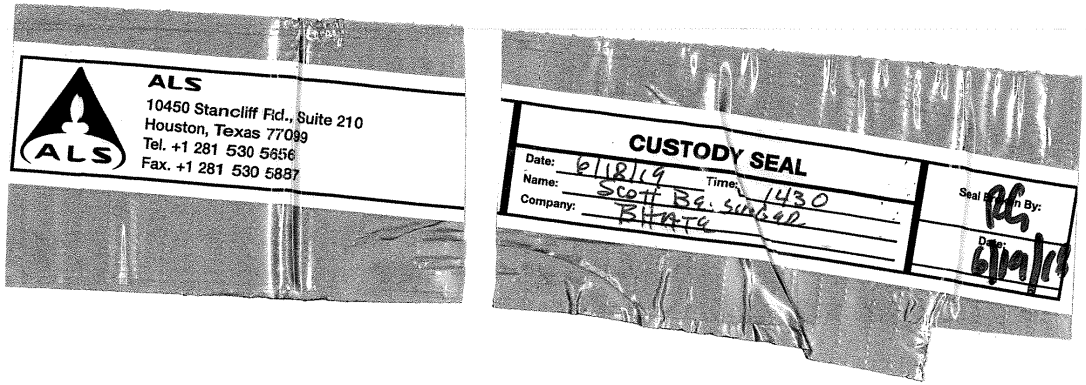
5.) Sample Analysis Requested: Analytical method requested and number of containers provided for each.

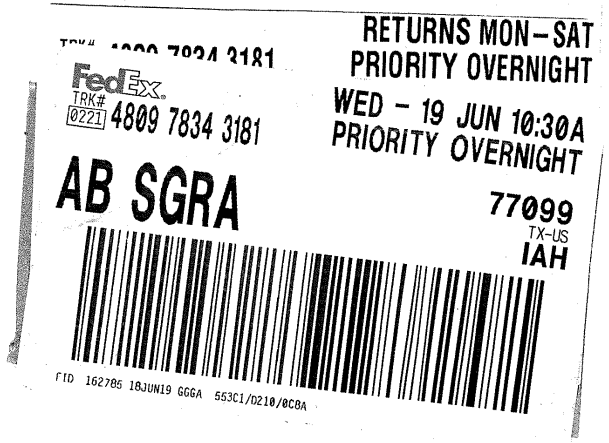
6.) Quality assurance samples are assigned by date (ddmmyy) and the sample number associated with the sample (01, 02, etc) (e.g. Equipment blank collected in association with MW-1 on 10/10/99 will be designated 10109901 in the Equipment Blank Lot Control

Temp 4/C 0.4. 23949

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Case Narrative

Method: 6850
Analysis: Perchlorate
Analysis SOP: LC-MS-CLO4
ALS WO ID(s): 1917698, 1917856, 1918052

Client: ALS Laboratories (Houston, TX)
Matrix: Water
ELMS Batch (HBN): 2266 (242597)

General Set Information: There were seventeen field samples in these Work Orders. The samples were analyzed for perchlorate.

Method Summary: Each sample was prepared as noted below and analyzed using an Agilent 1100 LC/MSD system in select ion monitoring (SIM) mode at m/z 83 and 85, which corresponds to the loss of one oxygen atom from the perchlorate molecule. ChemStation software was used for instrument control and data analysis. The ion ratio of m/z 83 to 85 was used to positively identify the response peak as perchlorate. Quantitation was performed using the m/z 83 peak area. An internal standard (ISTD) of ^{18}O labeled perchlorate was added to each sample to establish the perchlorate peak retention time and used in quantitation.

Sample Preparation: A 10.0mL aliquot of each sample was transferred into a 15-mL centrifuge tube. 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: The following samples were analyzed and reported from various dilutions as specified. 1917698001/02/04-08; 1918052001: 1:1,000. 1917698003; 1917856006/07: 1:100. 1918052002/03: 1:10,000. The reporting limits have been adjusted accordingly.

Method QC data: The method blank (LMB 661480) was less than 1/2 the CRDL. The recovery for the LCS (661481) was within acceptable parameters.

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MS/MSD Analysis: MS/MSD was performed on samples 1917698005/06 (Client ID: MW5_061819). 4.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. The spike target was 4.µg/L. The parent sample and the MS/MSD were analyzed and reported from 1:1,000 dilutions. The effective spike target was 4,000.µg/L. The MS/MSD percent recoveries and relative percent difference 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 – 661478) is reported from the analysis of the Laboratory Control Sample (LCS – 661481) at a level of 4.0µg/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: 19MARI03) along with datafile 01JULD15.

Thomas Bosch July 5, 2019
Analyst Date

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ANALYTICAL REPORT

Report Date: July 05, 2019

RJ Modashia
ALS Environmental (Houston)
10450 Stancliff Road
Suite 210
Houston, TX 77099

Phone: 281 530-5656

E-mail: RJ.Modashia@ALSGlobal.com

Workorder: **34-1917698**
Project ID: HS19060986
Purchase Order: HS19060986
Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
18CPTMW08SW_061819	1917698001	06/18/19	06/20/19	
MW5_061819	1917698002	06/18/19	06/20/19	
19CPTMW08DW_061819	1917698003	06/18/19	06/20/19	
MW6_061819	1917698004	06/18/19	06/20/19	
109_061819	1917698007	06/18/19	06/20/19	
MW21_061819	1917698008	06/18/19	06/20/19	

Client QC ID *	Lab ID	Collect Date	Receive Date	Sampling Site
MW6_061819MS	1917698005	06/18/19	06/20/19	
MW6_061819MSD	1917698006	06/18/19	06/20/19	

***Client QC is reported as part of the Quality Control results report, if requested.**

ANALYTICAL REPORT

Workorder: 34-1917698
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **18CPTMW08SW_061819** | Sampling Site: NA | Collected: 06/18/2019
Lab ID: 1917698001 | Media: 125 mL Nalgene | Received: 06/20/2019
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/2266 (HBN: 242597) | **Percent Solid:** NA
Analyzed: 07/01/2019 09:30 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	**23000**	1000	2000	4000	1000	

Sample ID: **MW5_061819** | Sampling Site: NA | Collected: 06/18/2019
Lab ID: 1917698002 | Media: 125 mL Nalgene | Received: 06/20/2019
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/2266 (HBN: 242597) | **Percent Solid:** NA
Analyzed: 07/01/2019 09:44 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	**26000**	1000	2000	4000	1000	

Sample ID: **19CPTMW08DW_061819** | Sampling Site: NA | Collected: 06/18/2019
Lab ID: 1917698003 | Media: 125 mL Nalgene | Received: 06/20/2019
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/2266 (HBN: 242597) | **Percent Solid:** NA
Analyzed: 07/01/2019 14:11 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	**4300**	100	200	400	100	

Sample ID: **MW6_061819** | Sampling Site: NA | Collected: 06/18/2019
Lab ID: 1917698004 | Media: 125 mL Nalgene | Received: 06/20/2019
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/2266 (HBN: 242597) | **Percent Solid:** NA
Analyzed: 07/01/2019 10:12 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	**4400**	1000	2000	4000	1000	

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ANALYTICAL REPORT

Workorder: 34-1917698
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **109_061819** | Sampling Site: NA | Collected: 06/18/2019
Lab ID: 1917698007 | Media: 125 mL Nalgene | Received: 06/20/2019
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/2266 (HBN: 242597) | **Percent Solid:** NA
Analyzed: 07/01/2019 10:56 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	**10000**	1000	2000	4000	1000	

Sample ID: **MW21_061819** | Sampling Site: NA | Collected: 06/18/2019
Lab ID: 1917698008 | Media: 125 mL Nalgene | Received: 06/20/2019
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/2266 (HBN: 242597) | **Percent Solid:** NA
Analyzed: 07/01/2019 14:25 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	**24000**	1000	2000	4000	1000	

Comments

Quality Control: **EPA 6850, DoD QSM - (HBN: 242597)**

The following samples were analyzed and reported from various dilutions as specified. 1917698001/02/04-08; 1918052001: 1:1,000. 1917698003; 1917856006/07: 1:100. 1918052002/03: 1:10,000. The reporting limits have been adjusted accordingly.

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

Method	Analyst	Peer Review
EPA 6850, DoD QSM	/S/ Thomas Bosch 07/03/2019 09:40	/S/ Stephen Brose 07/05/2019 11:57

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: 34-1917698
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
	Nevada (TNI)	UT00953201-1	https://ndep.nv.gov/water/lab-certification
	Iowa (TNI)	IA# 376	http://www.shl.uiowa.edu/labcert/idnr/
	Kansas	E-10416	http://www.kdheks.gov/envlab/disclaimer.html
	Oklahoma (TNI)	IJ# 9980	http://www.deq.state.ok.us/CSDnew/labcert.htm
	Texas (TNI)	T104704456-18-9	https://www.tceq.texas.gov/assets/public/compliance/compliance_support/qa/txnelap_lab_list.pdf
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: 1917698

Limits:	Client SOW/Contract Specified	**Analysis:**	EPA 6850, DoD QSM
Basis:	DoD QSM	**Batch:**	ELMS/2266 (HBN: 242597)
Preparation:	NA	**Analyzed By:**	Thomas Bosch
Batch:	NA		
Prepared By:	NA		

Blank

LMB: 661480
Analyzed: 07/01/2019 09:16
Units: ug/L

Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 661481
Analyzed: 07/01/2019 08:48
Dilution: 1
Units: ug/L

Analyte	Result	Target	% Rec	QC Limits	
Perchlorate	4.28	4.00	107	78.8	123.8

Matrix Spike - Matrix Spike Duplicate

Sample:	1917698004	**MS:**	1917698005	**MSD:**	1917698006
Analyzed:	07/01/2019 10:12	**Analyzed:**	07/01/2019 10:28	**Analyzed:**	07/01/2019 10:43
Dilution:	1000	**Dilution:**	1000	**Dilution:**	1000
Units:	ug/L	**Units:**	ug/L	**Units:**	ug/L

Analyte	Result	Result	Target	% Rec	QC Limits		Result	% Rec	RPD	QC Limits	
Perchlorate	4400	8910	4000	113	78.8	123.8	8810	110	1.19	0.0	20.0

Comments

The following samples were analyzed and reported from various dilutions as specified. 1917698001/02/04-08; 1918052001: 1:1,000. 1917698003; 1917856006/07: 1:100. 1918052002/03: 1:10,000. The reporting limits have been adjusted accordingly.

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

Analyst	Peer Review
/S/ Thomas Bosch	/S/ Stephen Brose
07/03/2019 12:16	07/05/2019 11:57

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

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10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

18698/#2

Subcontract Chain of Custody

SAMPLING STATE: **Texas**

COC ID: **11625**

1917698

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:	HS19060986
TSR:	Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS19060986-01**	**18CpTMW08SW_061819**	**Groundwater**	**18 Jun 2019 08:10**
	SUB_Perch-6850			03 Jul 2019
2.	**HS19060986-02**	**MW5_061819**	**Groundwater**	**18 Jun 2019 08:55**
	SUB_Perch-6850			03 Jul 2019
3.	**HS19060986-03**	**19CptMW08DW_061819**	**Groundwater**	**18 Jun 2019 09:45**
	SUB_Perch-6850			03 Jul 2019
4.	**HS19060986-04**	**MW6_061819**	**Groundwater**	**18 Jun 2019 10:40**
	SUB_Perch-6850 Designated MS/MSD			03 Jul 2019
5.	**HS19060986-05**	**109_061819**	**Groundwater**	**18 Jun 2019 11:40**
	SUB_Perch-6850			03 Jul 2019
6.	**HS19060986-06**	**MW21_061819**	**Groundwater**	**18 Jun 2019 12:55**
	SUB_Perch-6850			03 Jul 2019

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

QC Level: DOD IV (DoD Data Package)

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Subcontract Chain of Custody

SAMPLING STATE: Texas

COC ID: 11625

Relinquished By: R Grigg

Date/Time: 6/19/19

Received By:

Date/Time: 6/20/19

Cooler ID(s):

Temperature(s):

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ALS Environmental
CHAIN-OF-CUSTODY

Project / Job / Task: HS19060986	Split:	Workorder ID: 1917698	Level: ENV_LVL4
Client: ALS Environmental (Houston)		Account: 8101	Type: 125Poly
Comments:			Preservatives: COOL

Item	Collect Date/Time	Sample ID	Lab ID	QC	Matrix	Containers ID(s)	Count	Requested Analysis: EPA 6850, DoD QSM
1	06/18/2019 08:10	18CPTMW08SW_061819	1917698001		Water	A	1	A
2	06/18/2019 08:55	MW5_061819	1917698002		Water	A	1	A
3	06/18/2019 09:45	19CPTMW08DW_061819	1917698003		Water	A	1	A
4	06/18/2019 10:40	MW6_061819	1917698004		Water	A	1	A
5	06/18/2019 10:40	MW6_061819MS	1917698005	MS	Water	A	1	A
6	06/18/2019 10:40	MW6_061819MSD	1917698006	MSD	Water	A	1	A
7	06/18/2019 11:40	109_061819	1917698007		Water	A	1	A
8	06/18/2019 12:55	MW21_061819	1917698008		Water	A	1	A

ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location
Wrath, Julie	06/20/2019 10:13	ALS Sample Receiving	Sample Login
Julie Wrath 6/20/19 1200		4C	Storage
R.33.1	6/27.19/12:20	T. Bush	6850

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

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00940503

ALS-Salt Lake City-Related Information Report (CRIR)

Cooler or Container Information Checklist (Fill In or Circle)

Client Name: ALS Houston

Project/Task/Site: 191698

Date/Time of Receipt: 6/20/19 10:13

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	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.
1	C199715	2 °C	4	C19	°C	7	C19	°C
2	C19	°C	5	C19	°C	8	C19	°C
3	C19	°C	6	C19	°C	9	C19	°C

Taken By: Jaylynn J. (Signature) Jaylynn Johnson (Printed Name) 6/20/19 (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:

Recieved 3 of HS1906098 6-04*

Client Notified? YES ☐ NO ☐

Response Required Within 24 Hours

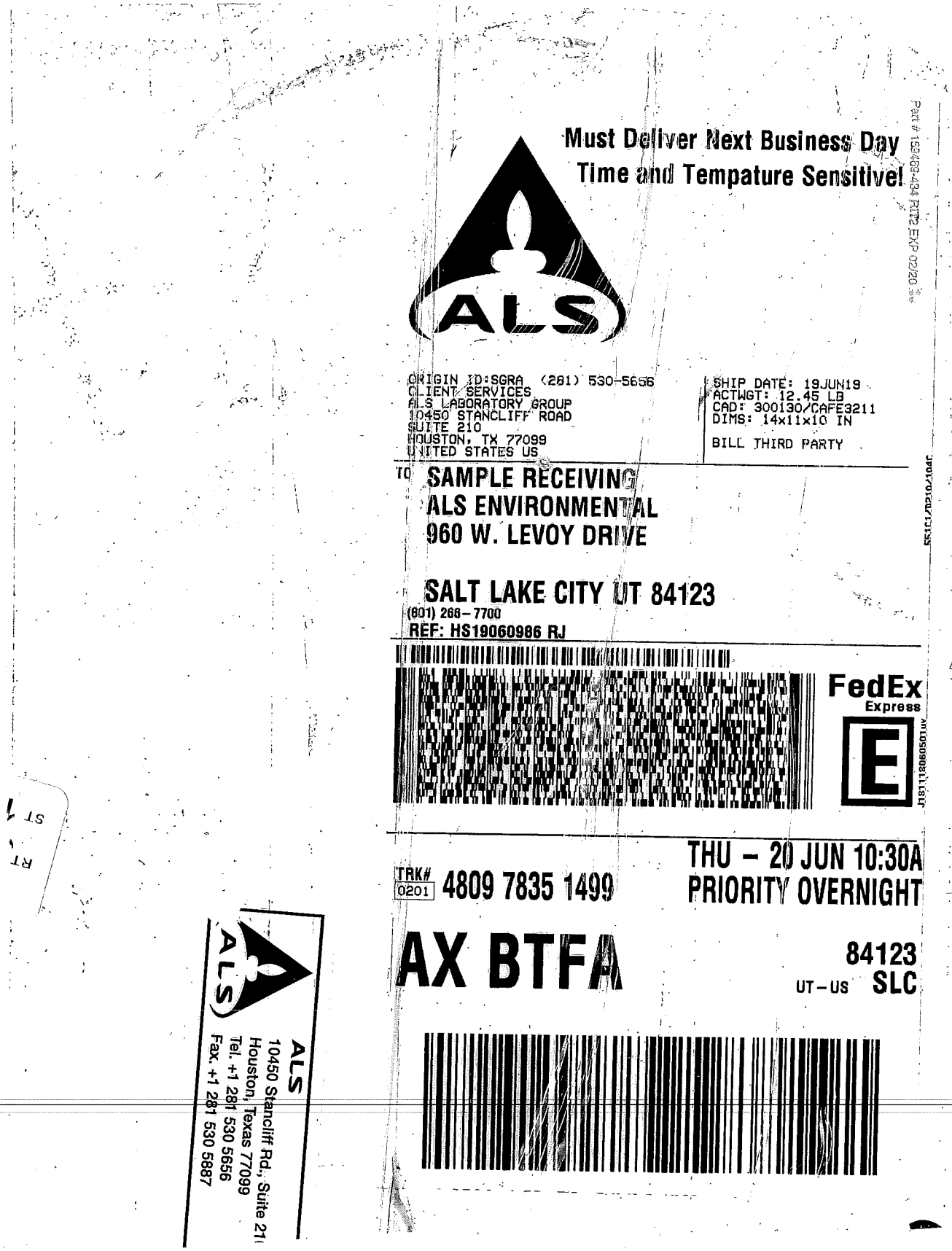
Project Management

Project Manager Comments:

ALS Project Manager: _____ (Printed Name) Returned to Sample Receipt by: _____ (Signature) Date: _____

CRIR.doc Revised 01/01/2018

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Must Deliver Next Business Day
Time and Tempature Sensitive!

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

SHIP DATE: 19JUN19
ACTWGT: 12.45 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: HS19060986 RJ

FedEx Express

TRK# 0201 4809 7835 1499

THU - 20 JUN 10:30A
PRIORITY OVERNIGHT

AX BTFA

84123
UT-US SLC

ALS
10450 Stancliff Rd., Suite 21
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

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Batch Worklist

Batch: ELMS/ 2266 **Created:** 7/1/2019 08:25 **Instrument:** LCMS04 **HBN:** 242597
Rule: EPA 6850, DoD QSM Water **Analyst:** T. Bosch **Status:** WP

Workorder: 1917698 [ENV_LVL4]
Workorder: 1917856 [ENV_LVL4]
Workorder: 1918052 [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	661477	CCV for HBN 242597 [ELMS/2266]				CCV	3		E685041C3Q	5311		7/3/2019	7/1/2019
2	661481	LCS for HBN 242597 [ELMS/2266]				LCS	3		E6850Q413Q	5311		7/3/2019	7/1/2019
3	661479	ICS for HBN 242597 [ELMS/2266]				ICS	3		E6850..D3Q	5311		7/3/2019	7/1/2019
4	661480	LMB for HBN 242597 [ELMS/2266]				LMB	3		E6850Q413Q	5311		7/3/2019	7/1/2019
5	1917698001	18CPTMW08SW_061819				SAMPLE	3	1917698001-A	E6850Q41.3	5480	7/16/2019	7/3/2019	7/1/2019
6	1917698002	MW5_061819				SAMPLE	3	1917698002-A	E6850Q41.3	5480	7/16/2019	7/3/2019	7/1/2019
7	1917698004	MW6_061819				SAMPLE	3	1917698004-A	E6850Q41.3	5480	7/16/2019	7/3/2019	7/1/2019
8	1917698005	MW6_061819MS				MS	3	1917698005-A	E6850Q413Q	5480		7/3/2019	7/1/2019
9	1917698006	MW6_061819MSD				MSD	3	1917698006-A	E6850Q413Q	5480		7/3/2019	7/1/2019
10	1917698007	109_061819				SAMPLE	3	1917698007-A	E6850Q41.3	5480	7/16/2019	7/3/2019	7/1/2019
13	1917856003	18CPTMW01DW_061919				SAMPLE	3	1917856003-A	E6850Q41.3	5480	7/17/2019	7/5/2019	7/1/2019
14	1917856004	18CPTMW015W_061919				SAMPLE	3	1917856004-A	E6850Q41.3	5480	7/17/2019	7/5/2019	7/1/2019
15	661482	CCV for HBN 242597 [ELMS/2266]				CCV	3		E685041C3Q	5311		7/3/2019	7/1/2019
16	1917856005	18CPTMW045W_061919				SAMPLE	3	1917856005-A	E6850Q41.3	5480	7/17/2019	7/5/2019	7/1/2019
17	1917856006	18CPTMW04_061919				SAMPLE	3	1917856006-A	E6850Q41.3	5480	7/17/2019	7/5/2019	7/1/2019
18	1917856007	MW1_061919				SAMPLE	3	1917856007-A	E6850Q41.3	5480	7/17/2019	7/5/2019	7/1/2019
19	1918052001	120_062019				SAMPLE	3	1918052001-A	E6850Q41.3	5480	7/18/2019	7/5/2019	7/1/2019
20	1918052002	MW14_062019				SAMPLE	3	1918052002-A	E6850Q41.3	5480	7/18/2019	7/5/2019	7/1/2019
21	1918052003	MW14_062019_a				SAMPLE	3	1918052003-A	E6850Q41.3	5480	7/18/2019	7/5/2019	7/1/2019
22	1918052004	MW12_062019				SAMPLE	3	1918052004-A	E6850Q41.3	5480	7/18/2019	7/5/2019	7/1/2019
23	1917698003	19CPTMW08DW_061819				SAMPLE	3	1917698003-A	E6850Q41.3	5480	7/16/2019	7/3/2019	7/1/2019
24	1917698008	MW21_061819				SAMPLE	3	1917698008-A	E6850Q41.3	5480	7/16/2019	7/3/2019	7/1/2019
25	1917856001	MW2_061919				SAMPLE	3	1917856001-A	E6850Q41.3	5480	7/17/2019	7/5/2019	7/1/2019
26	661483	CCV for HBN 242597 [ELMS/2266]				CCV	3		E685041C3Q	5311		7/3/2019	7/1/2019
27	1917856002	MW2_061919_a				SAMPLE	3	1917856002-A	E6850Q41.3	5480	7/17/2019	7/5/2019	7/1/2019
28	661478	RLVS for HBN 242597 [ELMS/2266				RLVS	3		E685041C3Q	5311		7/3/2019	7/1/2019
29	661661	CCV for HBN 242597 [ELMS/2266]				CCV	3		E685041C3Q	5311		7/3/2019	7/1/2019

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00940506

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

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ALS Work Order #'s & Sample #( )'s: 1917698 (001-08), 1917856 (001-07), 1918052 (001-04)
ELMS Batch/HBN ID: 2266 (242597)
Prep Date: 06/27/2019 Analysis Date: 07/01/2019 Analyst: T. Bosch
Analyte: **Perchlorate** Matrix: **Water** Method: **6850**
Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2019\JUL\01JUL19D.s
Reported DL: **1.0µg/L** Reported LOD: **2.0µg/L** Reported LOQ: **4.0µg/L**

SAMPLE PREPARATION/ANALYSIS:

Water: Samples were prepared by Thomas 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 AH015-4)/0.1% glacial acetic acid (JT-Baker Lot 04802).
Eluent B1: 95% ACN (B&J Lot AH015-4)/ 5% ASTM Type II water (ALS)/0.1% glacial acetic acid (JT-Baker Lot 04802).

STANDARDS: Internal Standard Spiking Solution Horizon# 43730. Dilutions of Working Standard Solution ID 43702 used for CCV's, LODV's, RLVS and IPC.

CALIBRATION CURVE: Used curve from 03/19/2019, sequence 19MAR19D.s Offline Quantitation Method: CLO4-DP2.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: 7 Injection Volume: 35µL
Column: KP-RPPX C8 separator, 250mm Mobile Phase: 70% Eluent A1; 30% Eluent B1

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: 4.0µL of QC Solution Horizon ID 47516 was used for LCS 661481; Target = 4.0µg/L. ASTM type II water was used for LMB 661480.

MS/MSD: The Matrix Spike and duplicate (MS/MSD) were performed on samples 1917698005/06 (Client ID: MW6_061819). 4.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. Spike target = 4.0µg/L. The parent sample and the MS/MSD were analyzed and reported from 1:1,000 dilutions. The effective spike target was 4,000.µg/L.

COMMENTS:

1) Results reported in µg/L. The following samples were analyzed and reported from various dilutions as specified. 1917698001/02/04-08; 1918052001: 1:1,000. 1917698003; 1917856006/07: 1:100. 1918052002/03: 1:10,000. The reporting limits have been adjusted accordingly.
2) All QC, Blank, CCV, and MS/MSD results were within method parameters.
3) Sample data can be viewed at two directories within the ALS system: \\ALSLTWS013\LCMS\LCMS04\2019\JUL\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
4) Notebook: \\alsltws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2019\242597-DoD-ALS-Hstn LCMS4 or through \\ALSLTWS013\DATAREVIEW\HBN#
5) The Reporting Limit Verification Standard (RLVS – 661478) is reported from the analysis of the Laboratory Control Sample (LCS – 661481) at a level of 4.0µg/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: 19MARI03) along with datafiles 01JULD15.

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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: 2266 HBN: 242597 Sample Set IDs if Applicable: 1917698/1917856/1918052	Analyst Initials	Reviewer Initials
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
Method Blanks 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 flags applied on QC reports; LCSs analyzed and meet acceptance criteria when performed	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 checked	TB	SB
Preparation and analysis calculations checked	TB	SB
NCRs are completed as necessary NC/CAR#	—	—
Report forms are complete and accurate	TB	SB
Manual integrations checked	TB	SB

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STANDARD REPORT

Working Standard - CLO4 WRK

CLO4 WRK — Description - 6850 WKG Std 100.ug/L

Standard: 43702
MFG: ALS/SLC
MFG Lot: TNB: 09/18/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/18/2018 02:09PM

Amount: 10 mL
Expires: 09/18/2019
Usable: Yes
Lab Lot: CLO4 WRK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	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
43701	CLO4 INT	6850 Intermdt AccStd 10.ug/mL	CLO4 INT	0.1 mL	09/18/2019

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: No
Lab Lot: CLO4 STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	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			

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STANDARD REPORT

Constituent

Working Standard - CLO4 INT

CLO4 INT	Description - 6850 Intermdt AccStd 10.ug/mL

Standard: 43701
MFG: ALS/SLC
MFG Lot: TNB: 09/18/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/18/2018 02:09PM

Amount: 10 mL
Expires: 09/18/2019
Usable: Yes
Lab Lot: CLO4 INT

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
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

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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			

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STANDARD REPORT

Constituent

Stock Standard - CLO4 QCSTOCK

CLO4 QCSTOCK — Description - 6850 QC Stock STD 1,000ug/mL

Standard: 36748
MFG: Ultra Scientific
MFG Lot: CP-0860
Part ID: ICC-013

Created By: Thomas Bosch
Create Date: 05/11/2017 01:05PM

Amount: 100 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL

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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

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STANDARD REPORT

Working Standard - CLO4ISTDWRK

CLO4ISTDWRK — Description - Perchlorate ISTD Wrk 1,000ug/L

Standard: 43730
MFG: ALS/SLC
MFG Lot: TNB: 05/09/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/20/2018 09:09AM
Verified By: Thomas Bosch
Verify Date:

Amount: 25 mL
Expires: 09/20/2019
Usable: Yes
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
43729	CLO4ISTDSTK	Perchlorate ISTD Stock	CLO4ISTDSTK	0.25 mL	04/28/2026

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STANDARD REPORT

Constituent

Stock Standard - CLO4ISTDSTK

CLO4ISTDSTK		Description - Perchlorate ISTD Stock
Standard: 43729	Created By: Thomas Bosch	Amount: 1 mL
MFG: Cambridge Isotope	Create Date: 09/20/2018 09:09AM	Expires: 04/28/2026
MFG Lot: SDFF-012A	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

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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

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 ANAB ACCREDITED

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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

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

OR-ORG/NO-001
Rev. 5/18

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Cambridge Isotope Laboratories, Inc.

Certificate of Analysis

Quality Standards:
ISO Guide 34 • ISO/IEC 17025 • ISO 13485 • cGMP

23118

Product Name: (Isotopic Label & Enrichment Specification)	PERCHLORIC ACID, SODIUM SALT (18O4, 90%+) 100 UG/ML IN WATER
Lot Number:	SDDG-013
Catalog Number:	OLM-7310-S

Product Information

Chemical Purity Specification:	≥98%
Labeled CAS Number:	NA
Unlabeled CAS Number:	7601-89-0
MW*:	130.4
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.

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.

* *For isotopically labeled compounds, MW listed is for the fully enriched product.*

Approved by: T. J. Eckersley

Timothy I. Eckersley, Ph.D., Quality Assurance

Quality Control Tests and Results

QC Release Date	2/27/2014
Expiration Date	2/27/2024
Concentration Based on Gravimetry	102 µg/mL
Chemical Purity of Neat Material(s)	98%
LC/MS for Concentration	109.4 ± 2.8 µg/mL (k=2)

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ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

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Batch Report: C:\HPCHEM\1\DATA\01JUL19D\01JUL19S.B

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP2.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
*	661477 CCV@25	Vial 71	1	Control	1	1.94364e6	8.502	26.12624
*	661481 QC@4.0	Vial 72	1	Control	2	3.56116e5	8.215	4.27672
*	661479 ICS@4.0	Vial 73	1	Control	3	2.74101e5	8.013	3.76269
*	661480 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	1917698001 1K	Vial 75	1	Sample	5	1.80575e6	8.547	2.30697e4
*	1917698002 1K	Vial 76	1	Sample	6	2.06010e6	8.593	2.58627e4
*	1917698004 1K	Vial 78	1	Sample	8	3.25841e5	8.618	4410.00331
*	1917698005 MS	Vial 79	1	Sample	9	6.67091e5	8.655	8914.28717
*	1917698006 MSD	Vial 80	1	Sample	10	6.51482e5	8.597	8808.96977
*	1917698007 1K	Vial 81	1	Sample	11	7.47888e5	8.647	1.04112e4
*	1917856001	Vial 83	1	Sample	13	0.00000	0.000	0.00000
*	1917856002	Vial 84	1	Sample	14	0.00000	0.000	0.00000
*	1917856003	Vial 85	1	Sample	15	0.00000	0.000	0.00000
*	1917856004	Vial 86	1	Sample	16	0.00000	0.000	0.00000
*	661482 CCV@25	Vial 71	1	Control	17	1.60409e6	8.558	25.00349
*	1917856005	Vial 87	1	Sample	18	0.00000	0.000	0.00000
*	1917856006 100	Vial 88	1	Sample	19	4.03838e5	8.639	621.06433
*	1917856007 100	Vial 89	1	Sample	20	4.34274e5	8.657	588.15812
*	1918052001 1K	Vial 90	1	Sample	21	9.58579e5	8.665	1.34755e4
*	1918052002 10K	Vial 91	1	Sample	22	1.70174e6	8.689	2.36511e5
*	1918052003 10K	Vial 92	1	Sample	23	1.68203e6	8.679	2.30798e5
*	1918052004	Vial 93	1	Sample	24	0.00000	0.000	0.00000
*	1917698003 100	Vial 94	1	Sample	25	3.02113e6	8.615	4300.62656
*	1917698008 1K	Vial 95	1	Sample	26	1.64048e6	8.691	2.37316e4
*	1917856001 RE	Vial 83	1	Sample	27	0.00000	0.000	0.00000
*	661483 CCV@25	Vial 71	1	Control	28	1.50603e6	8.597	25.41985
*	1917856002 RE	Vial 84	1	Sample	29	0.00000	0.000	0.00000
*	661661 CCV@25	Vial 71	1	Control	30	1.45949e6	8.576	25.10137

#*	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
*	661477 CCV@25	Vial 71	1	Control	1	5.88479e5	8.517	26.62967
*	661481 QC@4.0	Vial 72	1	Control	2	1.16200e5	8.258	4.54646
*	661479 ICS@4.0	Vial 73	1	Control	3	8.51455e4	8.028	3.78922
*	661480 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	1917698001 1K	Vial 75	1	Sample	5	5.48648e5	8.553	2.35743e4
*	1917698002 1K	Vial 76	1	Sample	6	6.20226e5	8.595	2.62187e4
*	1917698004 1K	Vial 78	1	Sample	8	1.08064e5	8.621	4769.85352
*	1917698005 MS	Vial 79	1	Sample	9	2.16450e5	8.652	9609.46002
*	1917698006 MSD	Vial 80	1	Sample	10	2.06556e5	8.628	9281.28672
*	1917698007 1K	Vial 81	1	Sample	11	2.34170e5	8.675	1.08652e4
*	1917856001	Vial 83	1	Sample	13	0.00000	0.000	0.00000
*	1917856002	Vial 84	1	Sample	14	0.00000	0.000	0.00000
*	1917856003	Vial 85	1	Sample	15	0.00000	0.000	0.00000
*	1917856004	Vial 86	1	Sample	16	0.00000	0.000	0.00000
*	661482 CCV@25	Vial 71	1	Control	17	4.85334e5	8.571	25.46167
*	1917856005	Vial 87	1	Sample	18	0.00000	0.000	0.00000
*	1917856006 100	Vial 88	1	Sample	19	1.32726e5	8.663	672.87107
*	1917856007 100	Vial 89	1	Sample	20	1.40119e5	8.663	624.82071
*	1918052001 1K	Vial 90	1	Sample	21	2.95207e5	8.681	1.38848e4
*	1918052002 10K	Vial 91	1	Sample	22	5.16167e5	8.701	2.41334e5
*	1918052003 10K	Vial 92	1	Sample	23	5.17000e5	8.701	2.38460e5
*	1918052004	Vial 93	1	Sample	24	0.00000	0.000	0.00000
*	1917698003 100	Vial 94	1	Sample	25	8.88076e5	8.626	4275.40488
*	1917698008 1K	Vial 95	1	Sample	26	4.99687e5	8.711	2.43133e4
*	1917856001 RE	Vial 83	1	Sample	27	0.00000	0.000	0.00000
*	661483 CCV@25	Vial 71	1	Control	28	4.53099e5	8.615	25.74994
*	1917856002 RE	Vial 84	1	Sample	29	0.00000	0.000	0.00000
*	661661 CCV@25	Vial 71	1	Control	30	4.45116e5	8.600	25.75597

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Batch Report: C:\HPCHEM\1\DATA\01JUL19D\01JUL19S.B

#	*	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
	*	661477 CCV@25	Vial 71	1	Control	1	2.25730e5	8.518	5.00000
	*	661481 QC@4.0	Vial 72	1	Control	2	2.73485e5	8.237	5.00000
	*	661479 ICS@4.0	Vial 73	1	Control	3	2.40789e5	8.048	5.00000
	*	661480 LMB	Vial 74	1	Control	4	2.63576e5	8.496	5.00000
	*	1917698001 1K	Vial 75	1	Sample	5	2.39255e5	8.564	5000.00000
	*	1917698002 1K	Vial 76	1	Sample	6	2.41844e5	8.612	5000.00000
	*	1917698004 1K	Vial 78	1	Sample	8	2.42320e5	8.640	5000.00000
	*	1917698005 MS	Vial 79	1	Sample	9	2.38518e5	8.669	5000.00000
	*	1917698006 MSD	Vial 80	1	Sample	10	2.35827e5	8.629	5000.00000
	*	1917698007 1K	Vial 81	1	Sample	11	2.27615e5	8.679	5000.00000
	*	1917856001	Vial 83	1	Sample	13	9.31342e4	7.613	5.00000
	*	1917856002	Vial 84	1	Sample	14	8.79498e4	7.621	5.00000
	*	1917856003	Vial 85	1	Sample	15	2.30973e5	7.860	5.00000
	*	1917856004	Vial 86	1	Sample	16	2.08544e5	7.904	5.00000
	*	661482 CCV@25	Vial 71	1	Control	17	1.95182e5	8.589	5.00000
	*	1917856005	Vial 87	1	Sample	18	2.92027e5	7.936	5.00000
	*	1917856006 100	Vial 88	1	Sample	19	2.10142e5	8.654	500.00000
	*	1917856007 100	Vial 89	1	Sample	20	2.39145e5	8.684	500.00000
	*	1918052001 1K	Vial 90	1	Sample	21	2.23102e5	8.672	5000.00000
	*	1918052002 10K	Vial 91	1	Sample	22	2.19618e5	8.709	5.00000e4
	*	1918052003 10K	Vial 92	1	Sample	23	2.22758e5	8.695	5.00000e4
	*	1918052004	Vial 93	1	Sample	24	1.88746e5	7.876	5.00000
	*	1917698003 100	Vial 94	1	Sample	25	2.05249e5	8.640	500.00000
	*	1917698008 1K	Vial 95	1	Sample	26	2.10954e5	8.695	5000.00000
	*	1917856001 RE	Vial 83	1	Sample	27	1.44962e5	7.630	5.00000
	*	661483 CCV@25	Vial 71	1	Control	28	1.80070e5	8.618	5.00000
	*	1917856002 RE	Vial 84	1	Sample	29	1.42651e5	7.637	5.00000
	*	661661 CCV@25	Vial 71	1	Control	30	1.76854e5	8.601	5.00000

*** End of Report ***

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Sequence Table:

Method and Injection Info Part:

Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	661477 CCV@25	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	661481 QC@4.0	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	661479 ICS@4.0	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	661480 LMB	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	1917698001 1K	CLO4-AQN	1	Sample		
6	Vial 76	1917698002 1K	CLO4-AQN	1	Sample		
7	Vial 77	1917698003 1K	CLO4-AQN	1	Sample		
8	Vial 78	1917698004 1K	CLO4-AQN	1	Sample		
9	Vial 79	1917698005 MS	CLO4-AQN	1	Sample		
10	Vial 80	1917698006 MSD	CLO4-AQN	1	Sample		
11	Vial 81	1917698007 1K	CLO4-AQN	1	Sample		
12	Vial 82	1917698008 10K	CLO4-AQN	1	Sample		
13	Vial 83	1917856001	CLO4-AQN	1	Sample		
14	Vial 84	1917856002	CLO4-AQN	1	Sample		
15	Vial 85	1917856003	CLO4-AQN	1	Sample		
16	Vial 86	1917856004	CLO4-AQN	1	Sample		
17	Vial 71	661482 CCV@25	CLO4-AQN	1	Ctrl Samp		
18	Vial 87	1917856005	CLO4-AQN	1	Sample		
19	Vial 88	1917856006 100	CLO4-AQN	1	Sample		
20	Vial 89	1917856007 100	CLO4-AQN	1	Sample		
21	Vial 90	1918052001 1K	CLO4-AQN	1	Sample		
22	Vial 91	1918052002 10K	CLO4-AQN	1	Sample		
23	Vial 92	1918052003 10K	CLO4-AQN	1	Sample		
24	Vial 93	1918052004	CLO4-AQN	1	Sample		
25	Vial 94	1917698003 100	CLO4-AQN	1	Sample		
26	Vial 95	1917698008 1K	CLO4-AQN	1	Sample		
27	Vial 83	1917856001 RE	CLO4-AQN	1	Sample		
28	Vial 71	661483 CCV@25	CLO4-AQN	1	Ctrl Samp		
29	Vial 84	1917856002 RE	CLO4-AQN	1	Sample		
30	Vial 71	661661 CCV@25	CLO4-AQN	1	Ctrl Samp		

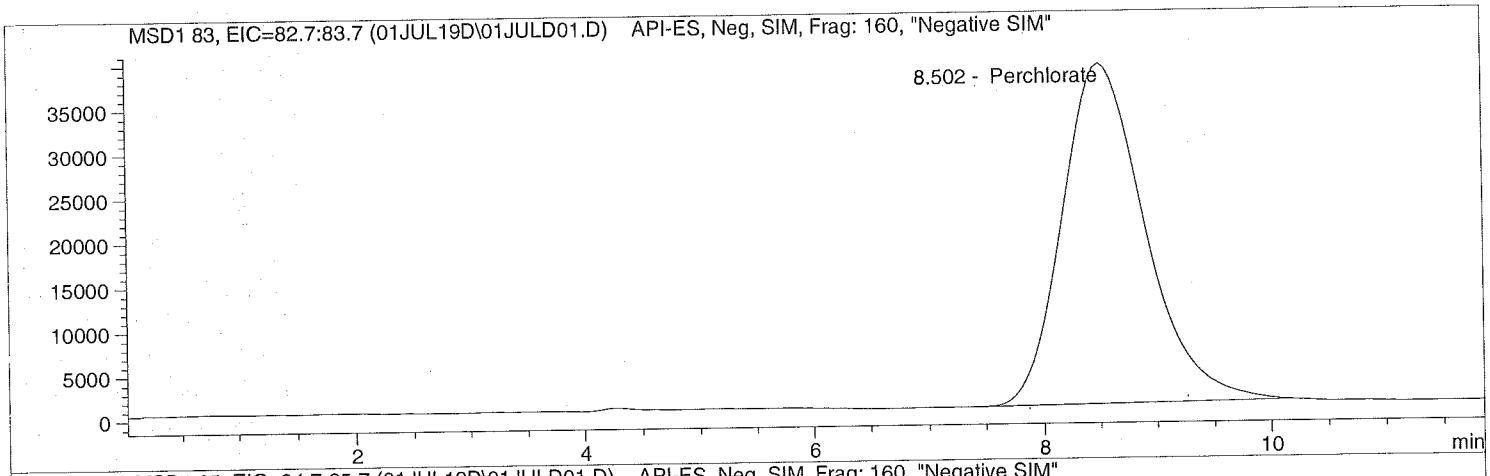
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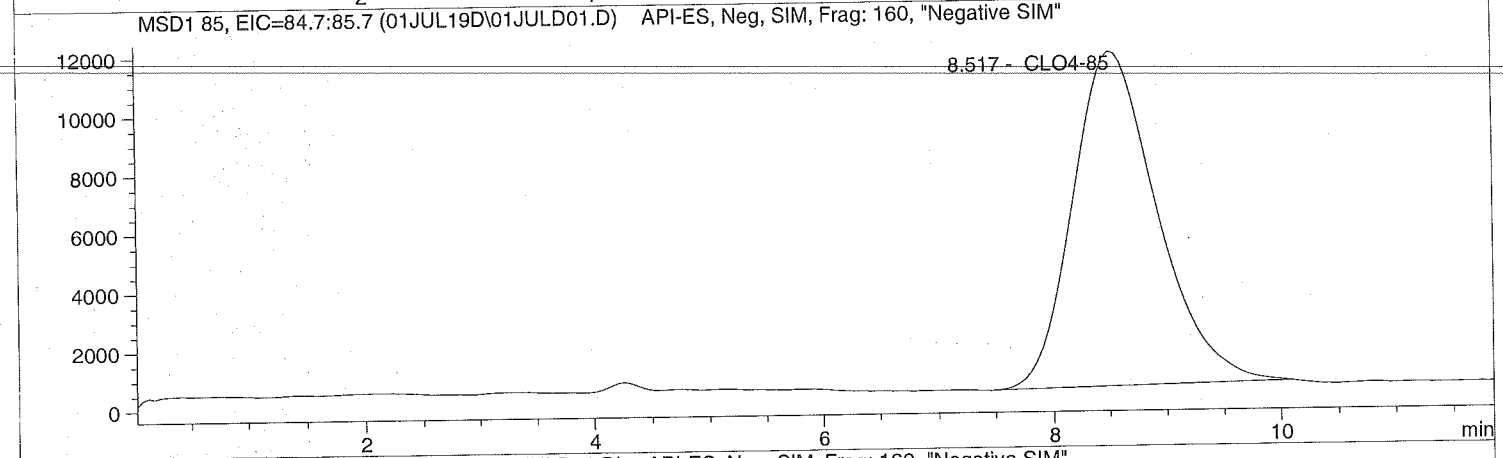
Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD01.D Sample Name: 661477 CCV@25

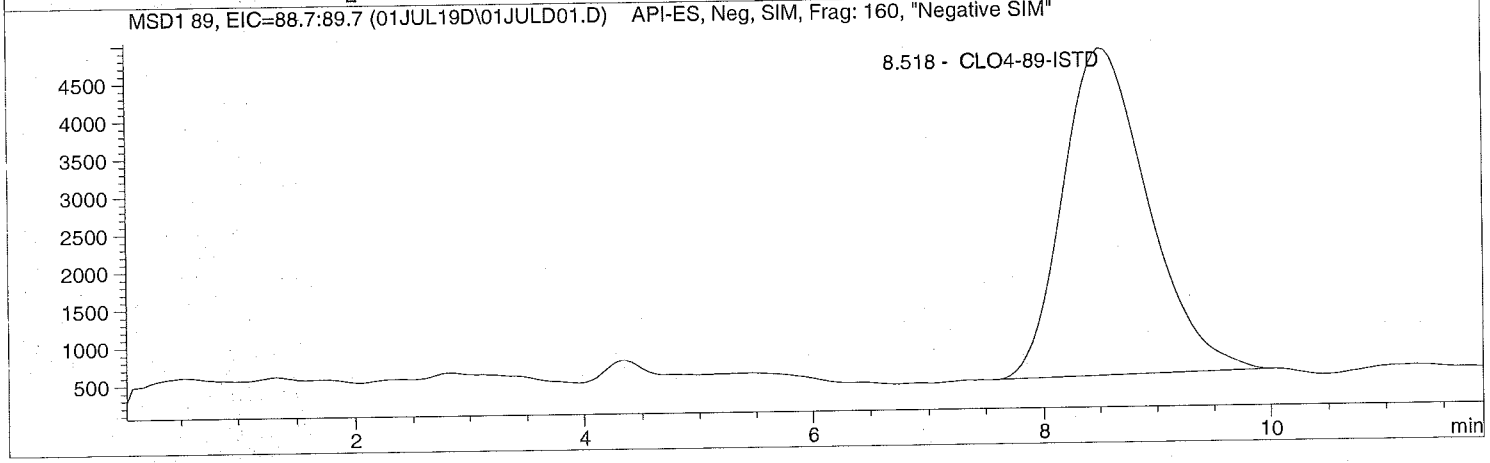
Injection Date:	7/01/2019 08:34:23	Seq Line:	1
Sample Name:	661477 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







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Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD01.D Sample Name: 661477 CCV@25

Injection Date:	7/01/2019 08:34:23	Seq Line:	1
Sample Name:	661477 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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.502	PBA	1943636.6	26.1262	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.517	PBA	588479.1	26.6297	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.518	PBA	225730.5	5.0000	CLO4-89-ISTD

*** End of Report ***

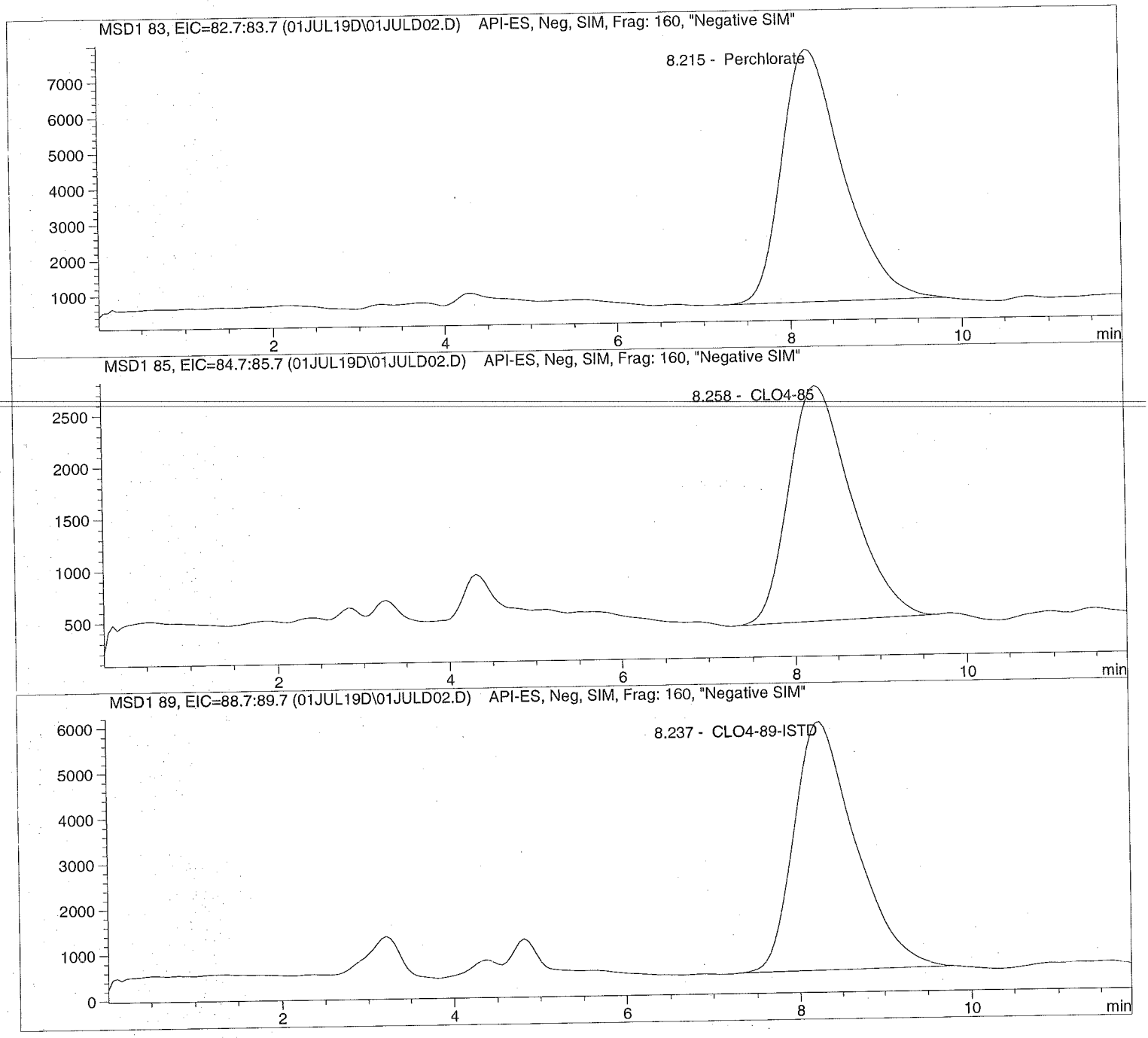
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD02.D Sample Name: 661481 QC@4.0

Injection Date:	7/01/2019 08:48:56	Seq Line:	2
Sample Name:	661481 QC@4.0	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD02.D Sample Name: 661481 QC@4.0

Injection Date:	7/01/2019 08:48:56	Seq Line:	2
Sample Name:	661481 QC@4.0	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.215	PBA	356116.2	4.2767	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.258	PBA	116199.5	4.5465	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.237	PBA	273484.5	5.0000	CLO4-89-ISTD

*** End of Report ***

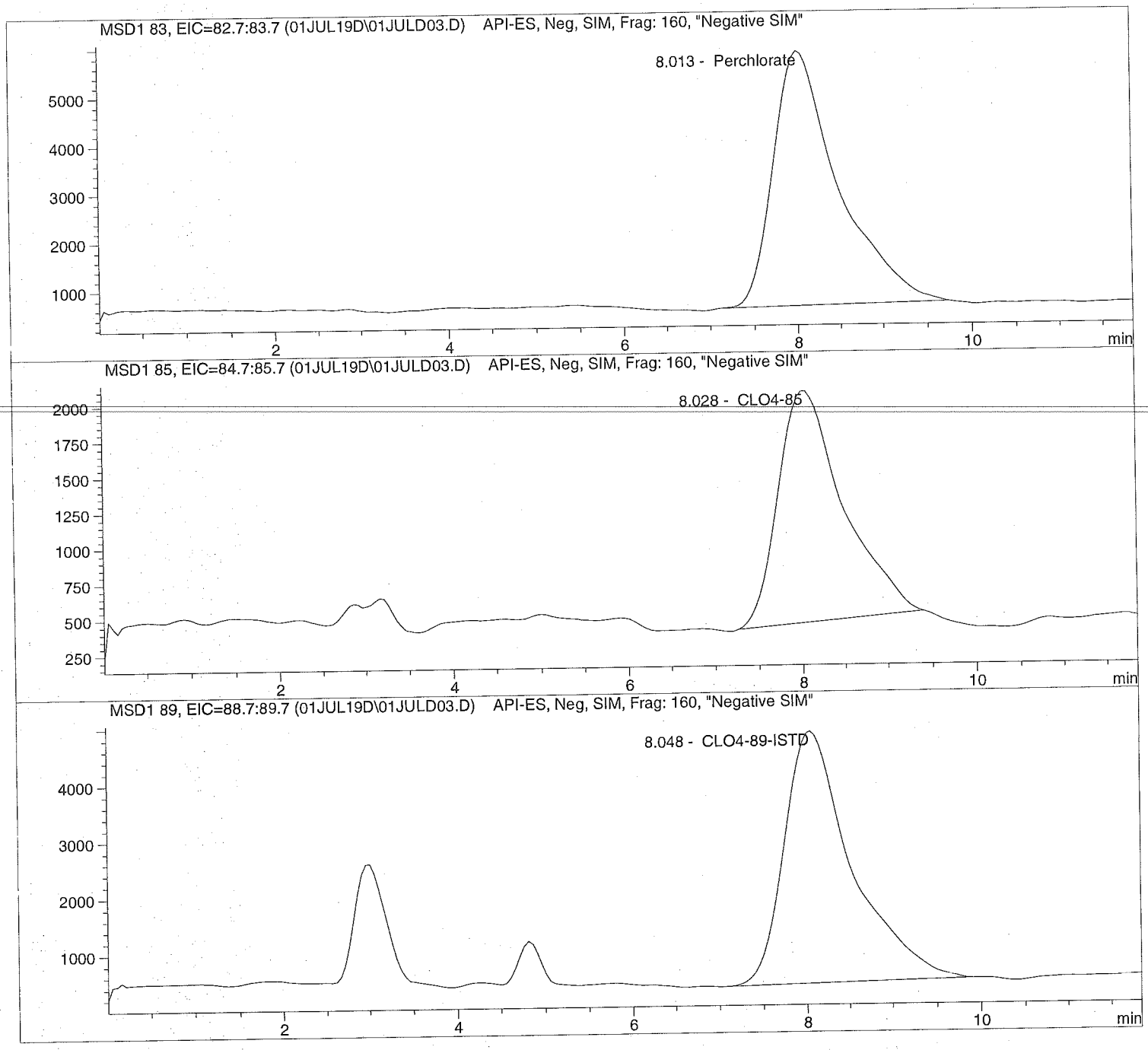
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD03.D Sample Name: 661479 ICS@4.0

Injection Date:	7/01/2019 09:02:47	Seq Line:	3
Sample Name:	661479 ICS@4.0	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD03.D Sample Name: 661479 ICS@4.0

Injection Date:	7/01/2019 09:02:47	Seq Line:	3
Sample Name:	661479 ICS@4.0	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.013	BBA	274101.4	3.7627	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.028	PBA	85145.5	3.7892	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.048	PBA	240788.6	5.0000	CLO4-89-ISTD

*** End of Report ***

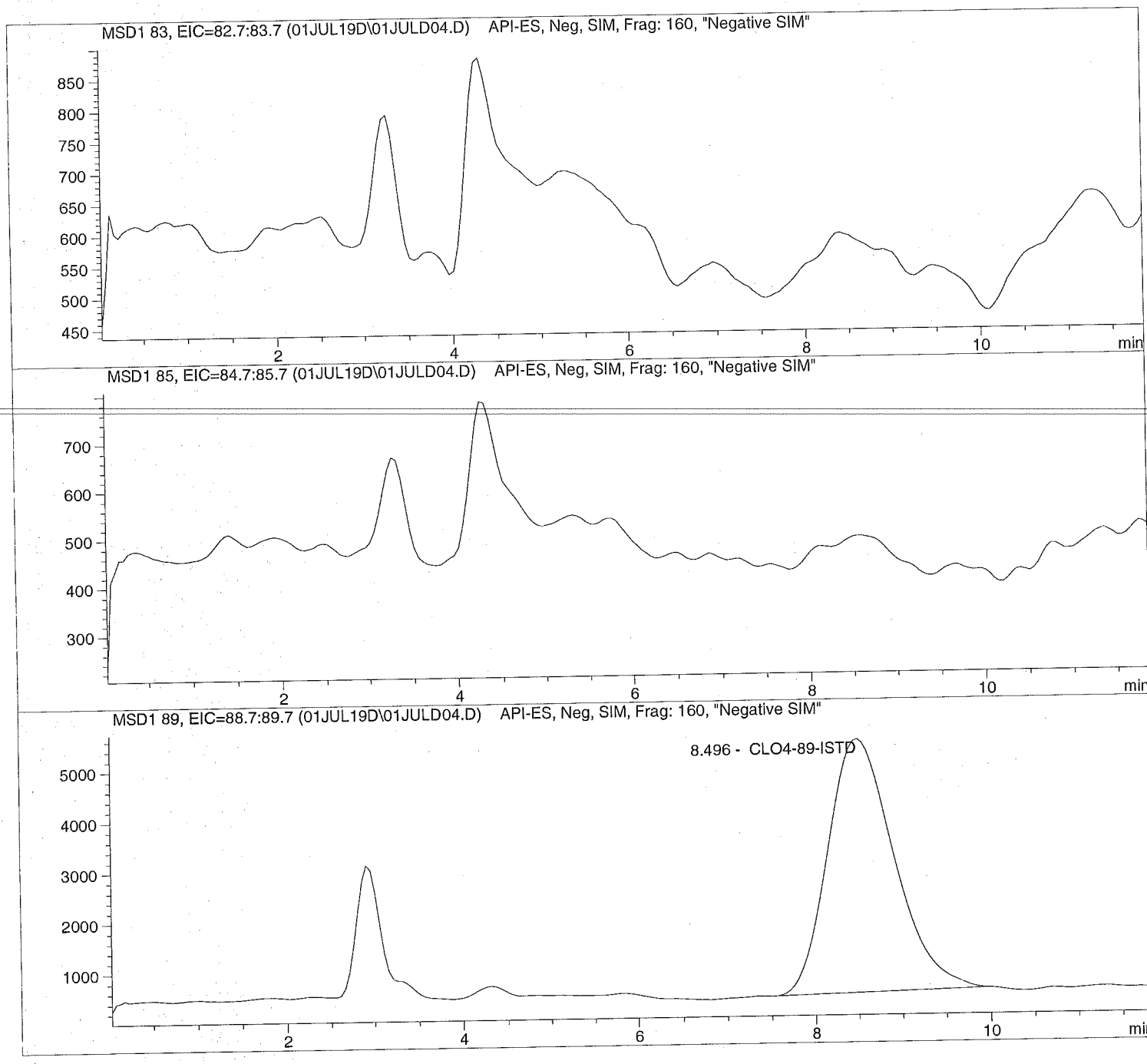
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD04.D Sample Name: 661480 LMB

Injection Date:	7/01/2019 09:16:47	Seq Line:	4
Sample Name:	661480 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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD04.D Sample Name: 661480 LMB

Injection Date:	7/01/2019 09:16:47	Seq Line:	4
Sample Name:	661480 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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.496	PBA	263576.3	5.0000	CLO4-89-ISTD

*** End of Report ***

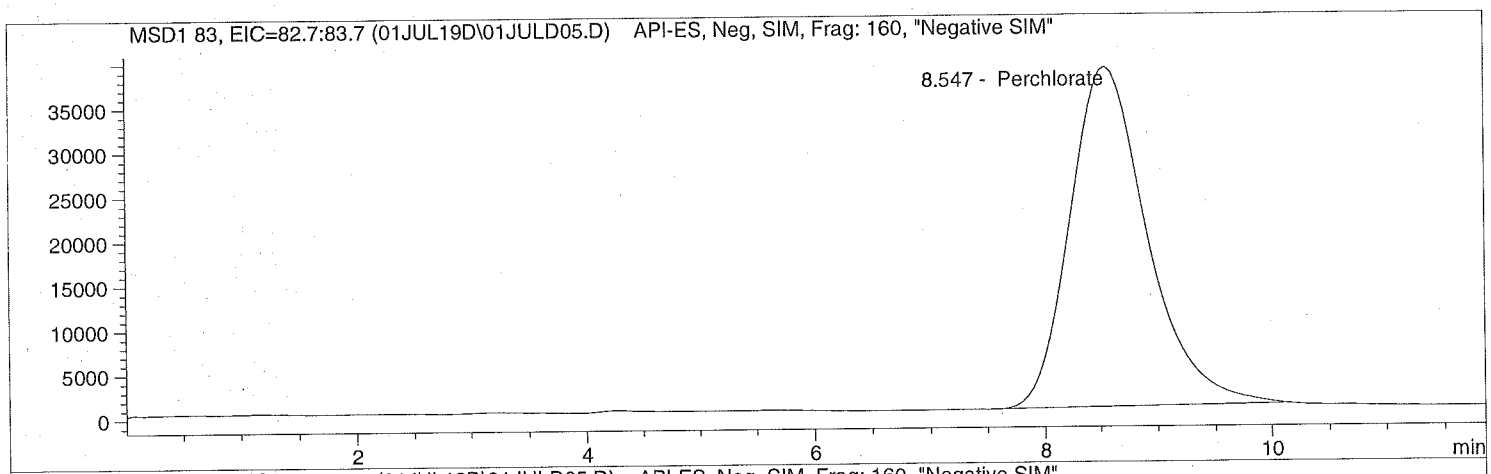
RIGHT SOLUTIONS | RIGHT PARTNER

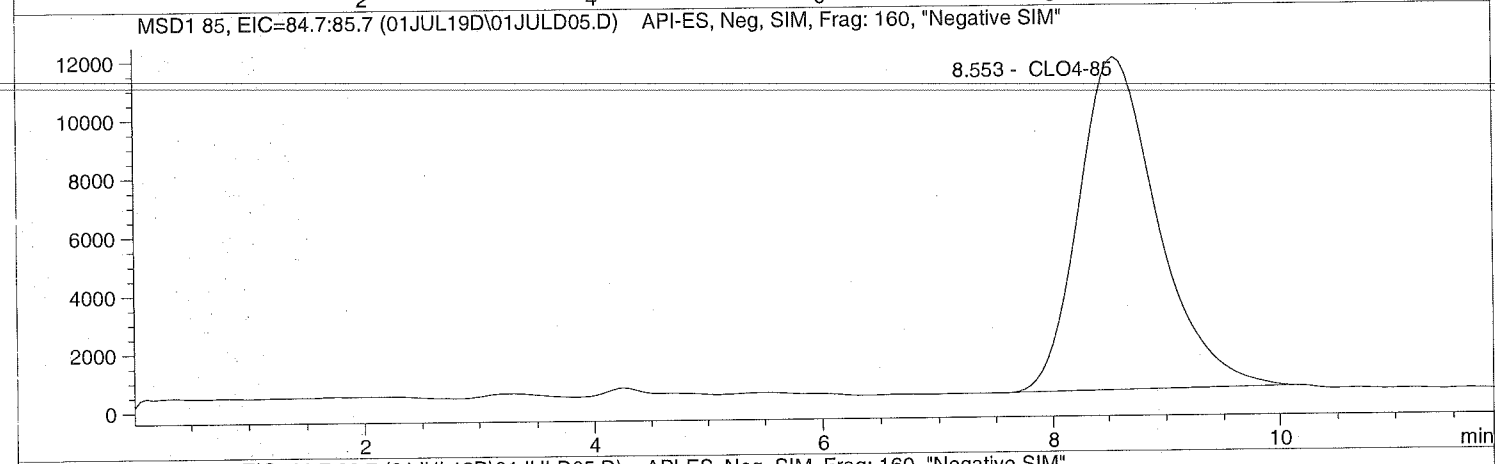
Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD05.D Sample Name: 1917698001 1K

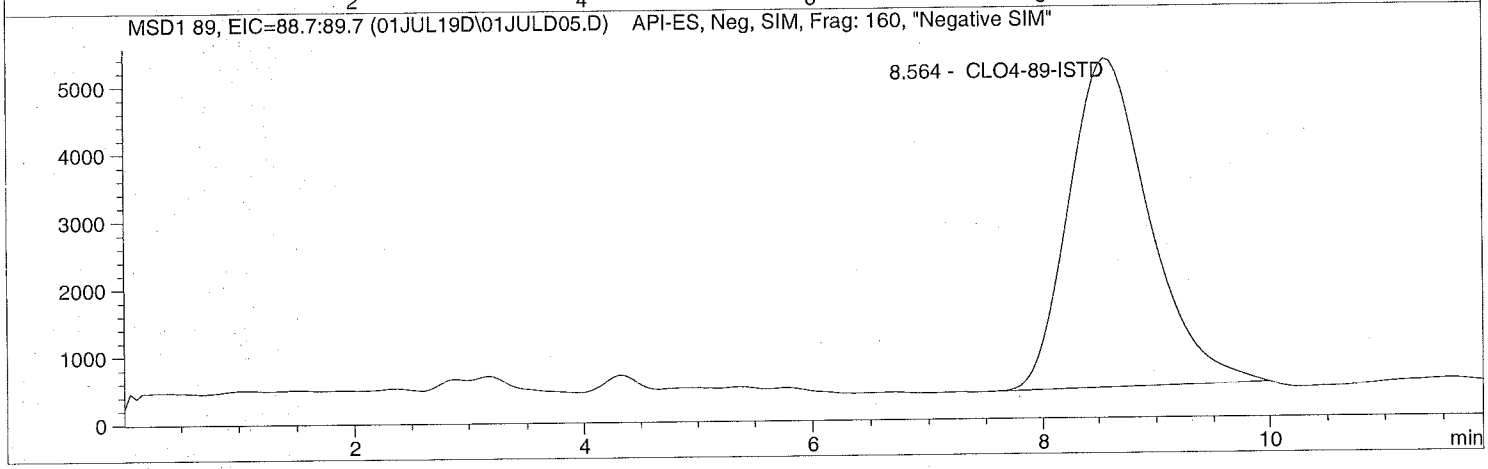
Injection Date:	7/01/2019 09:30:40	Seq Line:	5
Sample Name:	1917698001 1K	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







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Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD05.D Sample Name: 1917698001 1K

Injection Date:	7/01/2019 09:30:40	Seq Line:	5
Sample Name:	1917698001 1K	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.547	PBA	1805754.9	23069.7173	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.553	PBA	548647.9	23574.3344	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.564	PBA	239254.8	5000.0000	CLO4-89-ISTD

*** End of Report ***

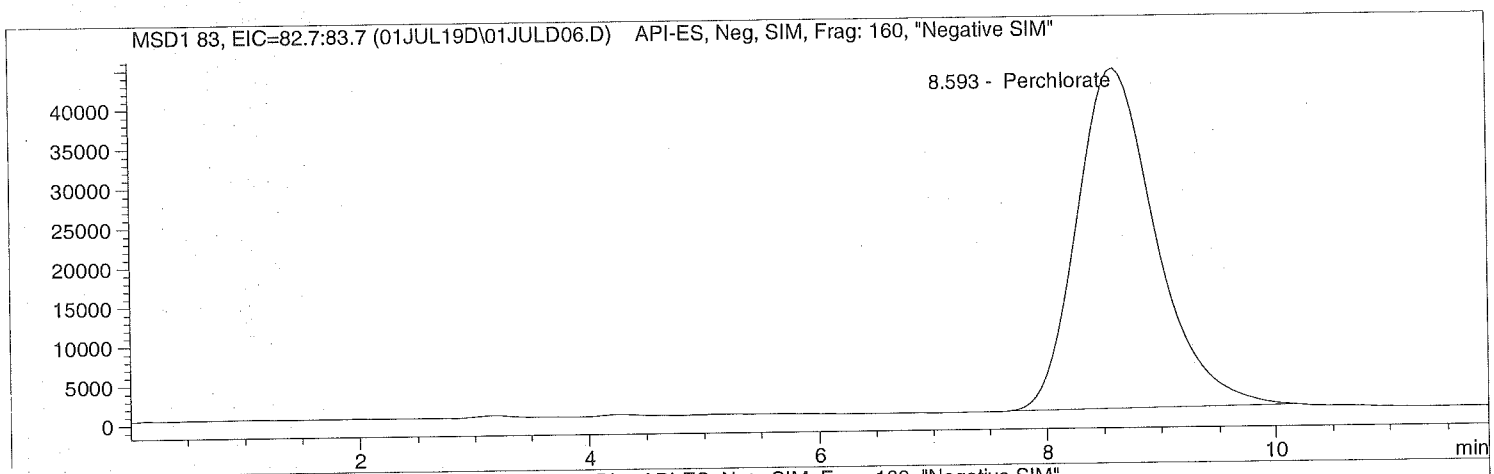
RIGHT SOLUTIONS | RIGHT PARTNER

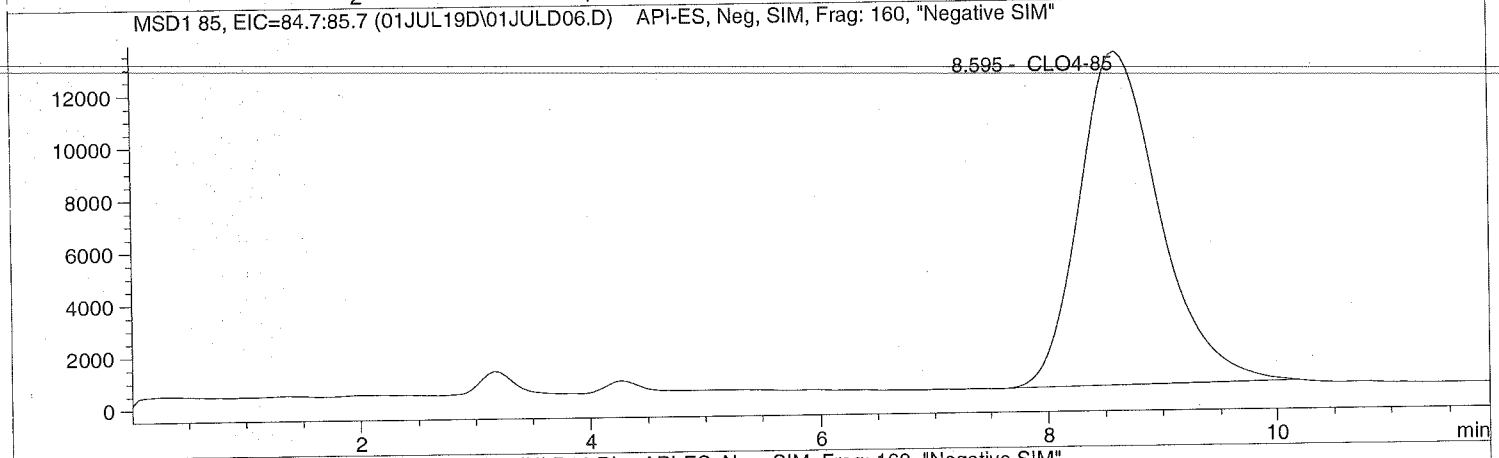
Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD06.D Sample Name: 1917698002 1K

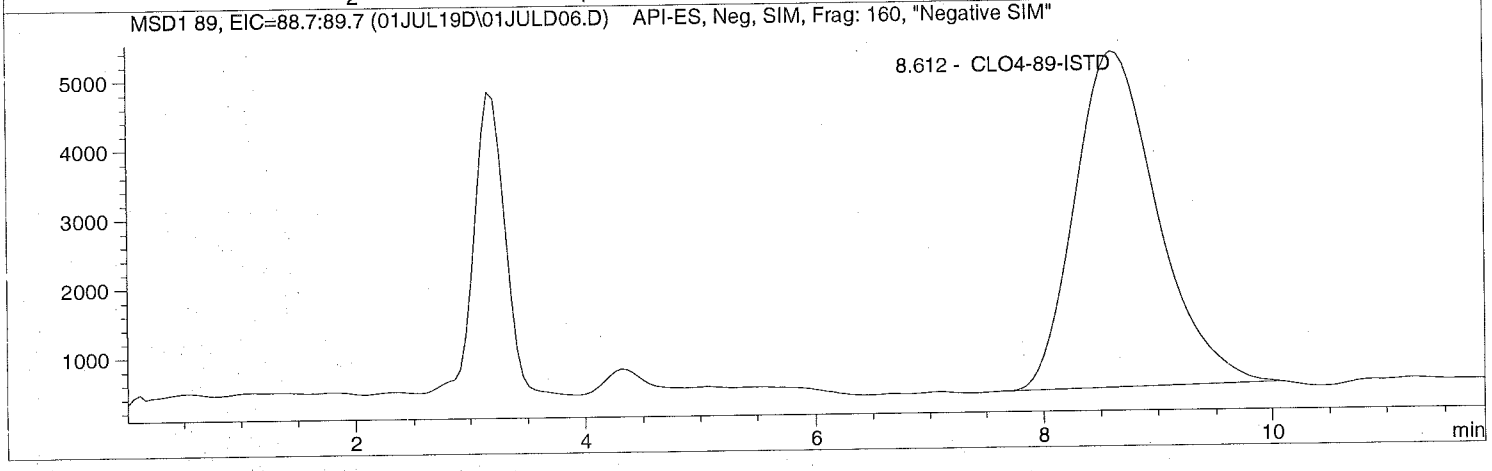
Injection Date:	7/01/2019 09:44:35	Seq Line:	6
Sample Name:	1917698002 1K	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







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Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD06.D Sample Name: 1917698002 1K

Injection Date:	7/01/2019 09:44:35	Seq Line:	6
Sample Name:	1917698002 1K	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.593	PBA	2060095.9	25862.7348	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.595	PBA	620225.7	26218.7320	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.612	PBA	241844.5	5000.0000	CLO4-89-ISTD

*** End of Report ***

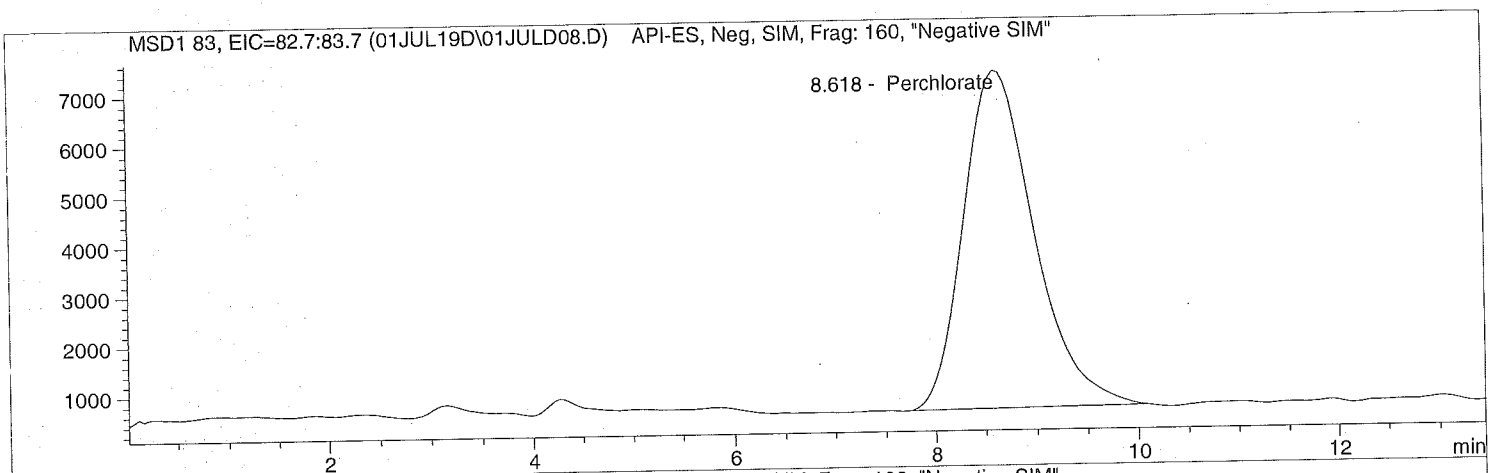
RIGHT SOLUTIONS | RIGHT PARTNER

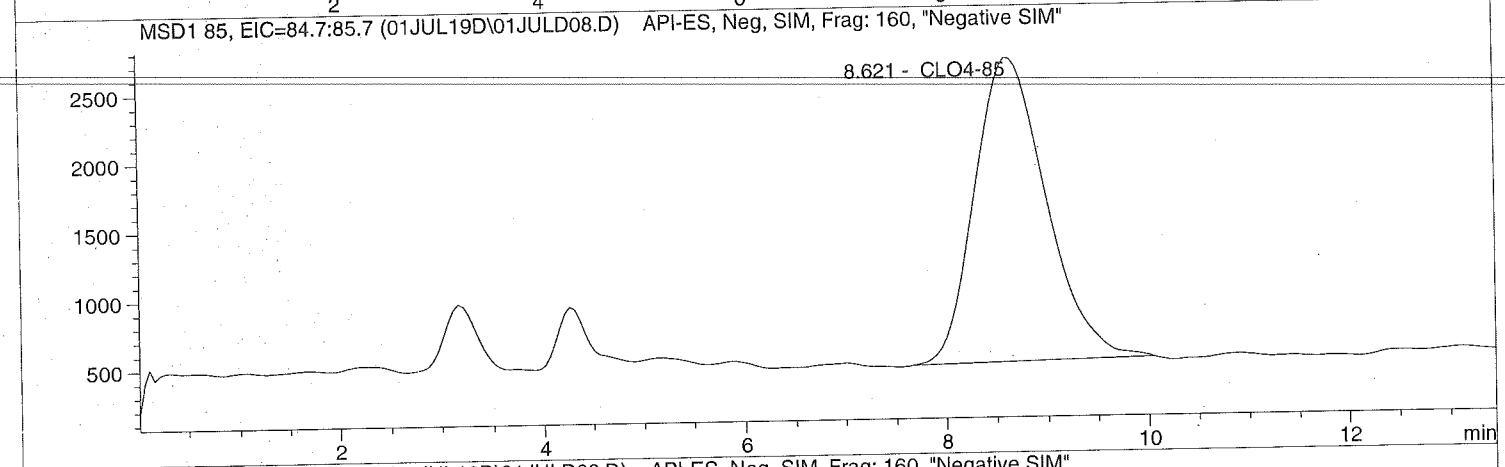
Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD08.D Sample Name: 1917698004 1K

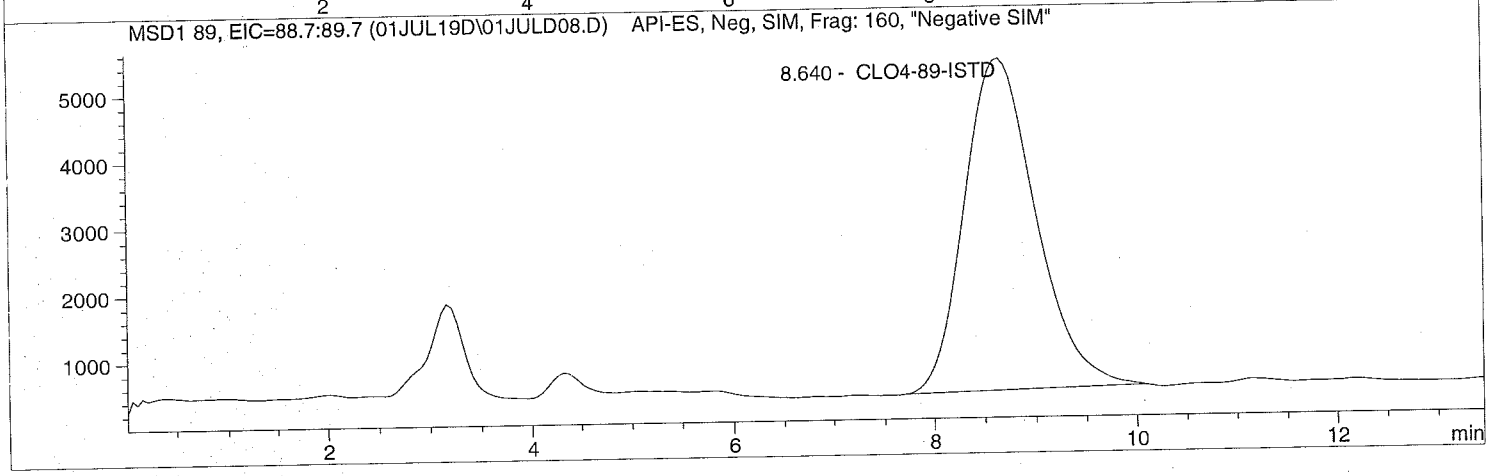
Injection Date:	7/01/2019 10:12:34	Seq Line:	8
Sample Name:	1917698004 1K	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD08.D Sample Name: 1917698004 1K

Injection Date:	7/01/2019 10:12:34	Seq Line:	8
Sample Name:	1917698004 1K	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.618	PBA	325841.4	4410.0033	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.621	PBA	108064.0	4769.8535	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.640	PBA	242319.7	5000.0000	CLO4-89-ISTD

*** End of Report ***

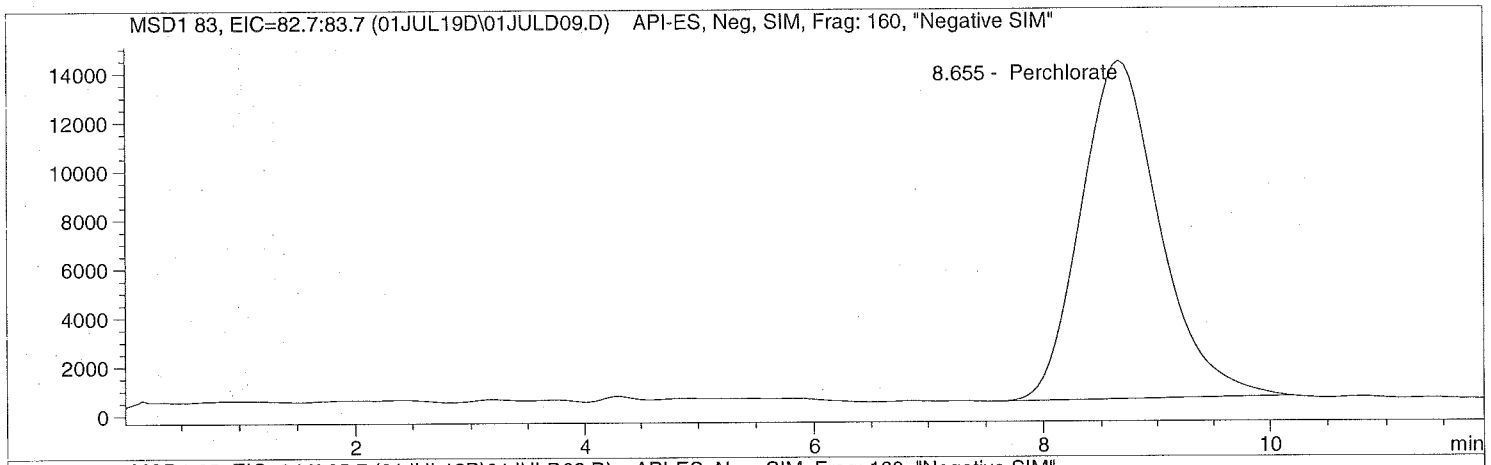
RIGHT SOLUTIONS | RIGHT PARTNER

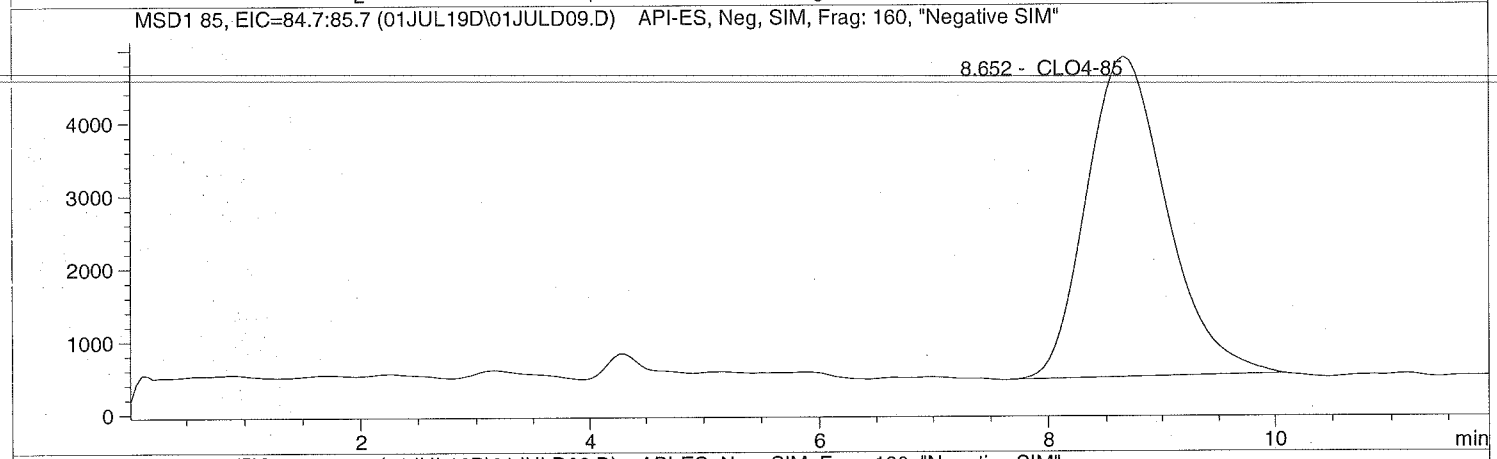
Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD09.D Sample Name: 1917698005 MS

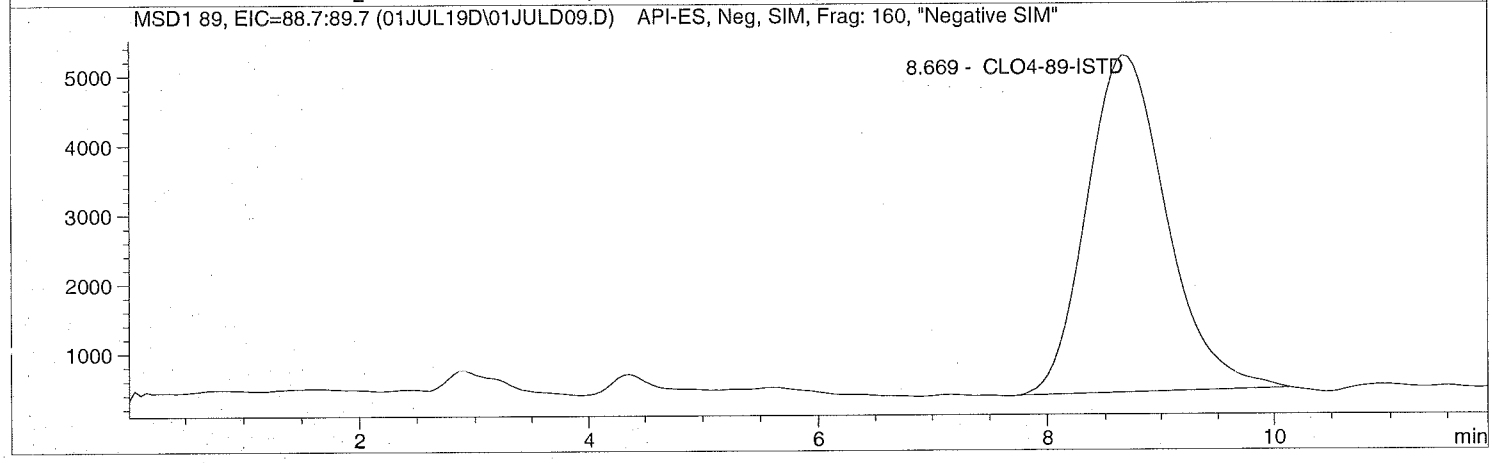
Injection Date:	7/01/2019 10:28:15	Seq Line:	9
Sample Name:	1917698005 MS	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD09.D Sample Name: 1917698005 MS

Injection Date:	7/01/2019 10:28:15	Seq Line:	9
Sample Name:	1917698005 MS	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.655	PBA	667091.1	8914.2872	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.652	PBA	216450.0	9609.4600	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.669	PBA	238517.6	5000.0000	CLO4-89-ISTD

*** End of Report ***

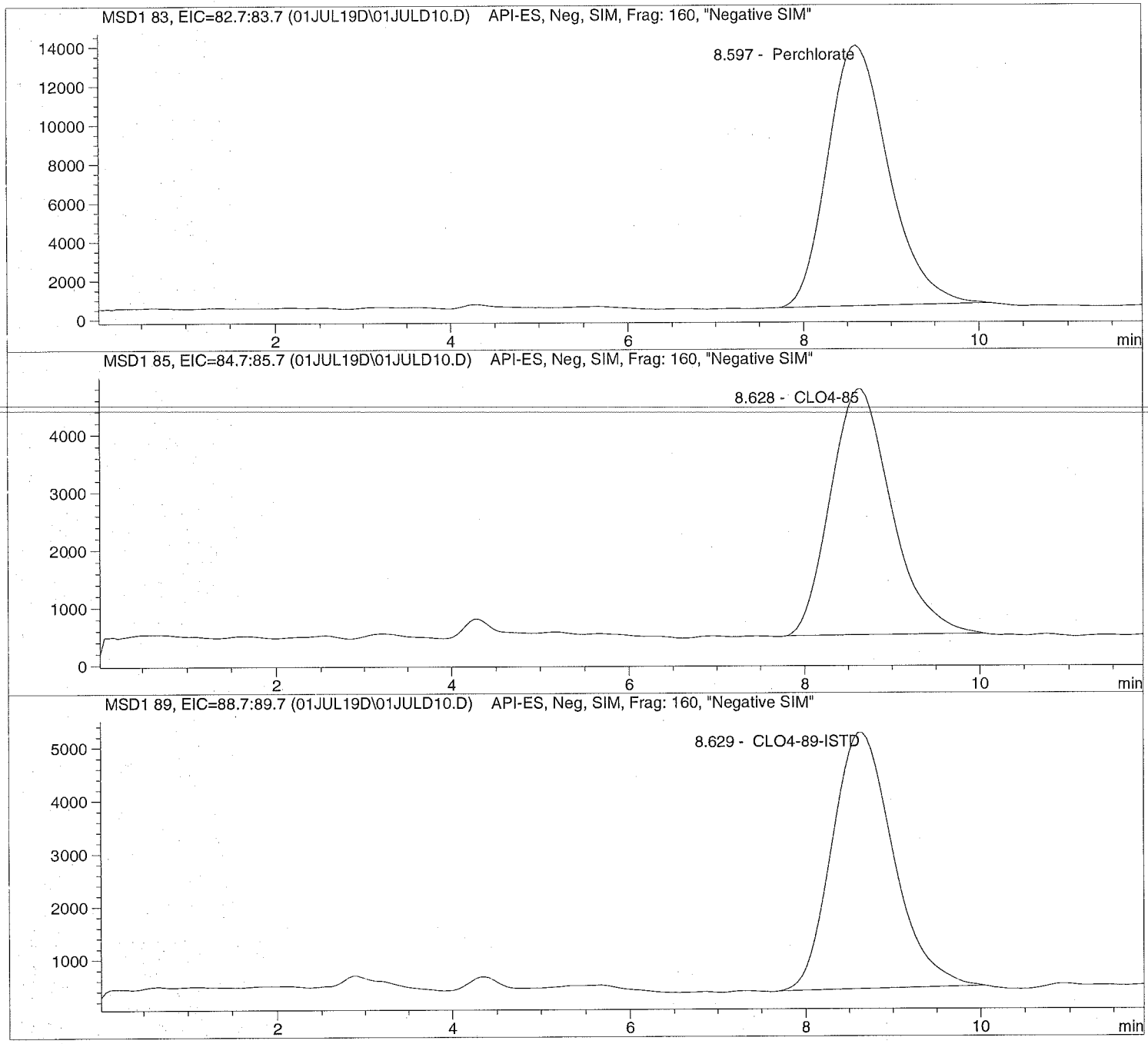
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD10.D Sample Name: 1917698006 MSD

Injection Date:	7/01/2019 10:43:07	Seq Line:	10
Sample Name:	1917698006 MSD	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD10.D Sample Name: 1917698006 MSD

Injection Date:	7/01/2019 10:43:07	Seq Line:	10
Sample Name:	1917698006 MSD	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.597	PBA	651481.5	8808.9698	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.628	BBA	206556.3	9281.2867	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.629	PBA	235827.1	5000.0000	CLO4-89-ISTD

*** End of Report ***

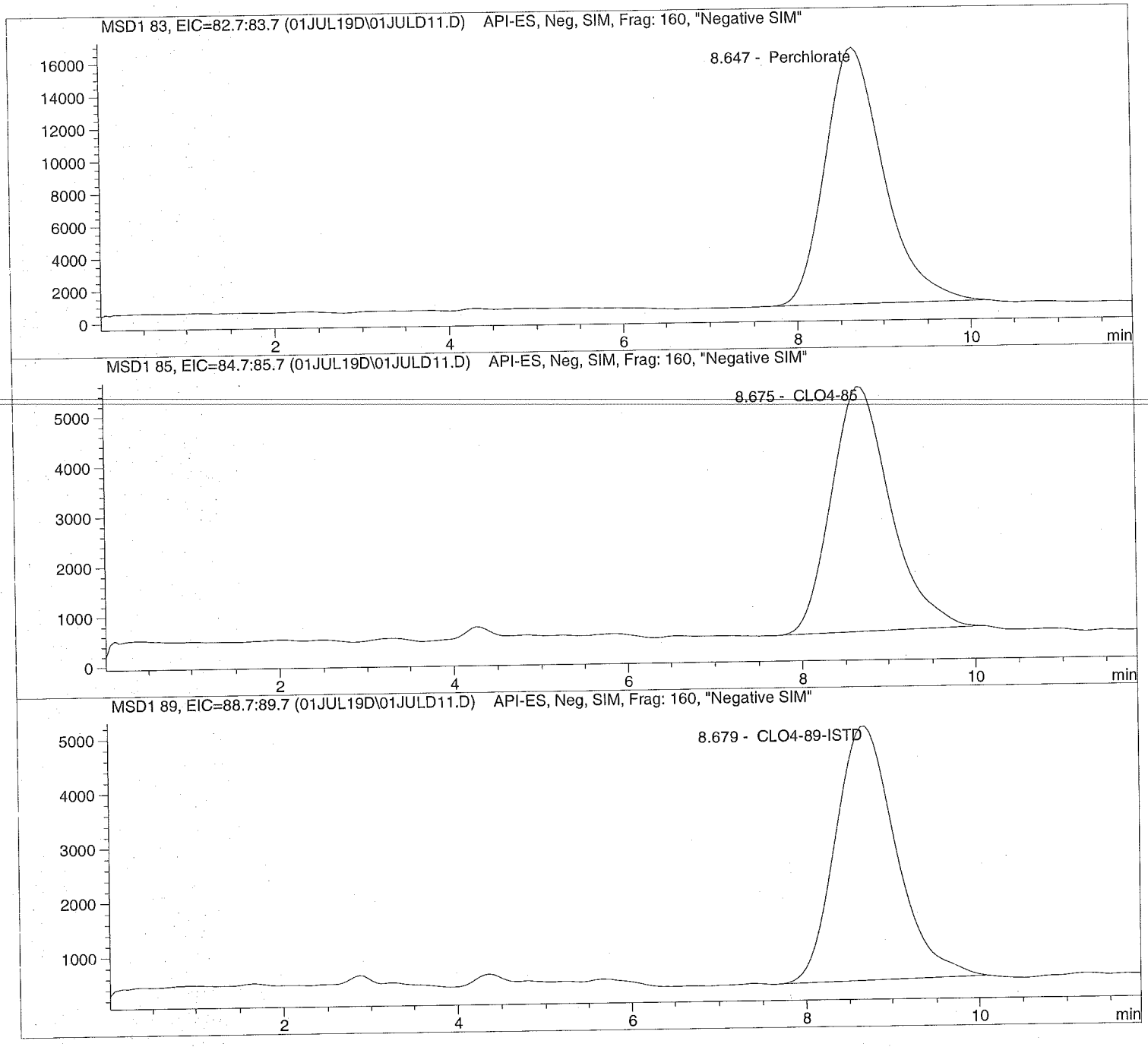
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD11.D Sample Name: 1917698007 1K

Injection Date:	7/01/2019 10:56:59	Seq Line:	11
Sample Name:	1917698007 1K	Location:	Vial 81
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD11.D Sample Name: 1917698007 1K

Injection Date:	7/01/2019 10:56:59	Seq Line:	11
Sample Name:	1917698007 1K	Location:	Vial 81
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.647	PBA	747887.6	10411.1564	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.675	PBA	234170.4	10865.1642	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.679	PBA	227614.9	5000.0000	CLO4-89-ISTD

*** End of Report ***

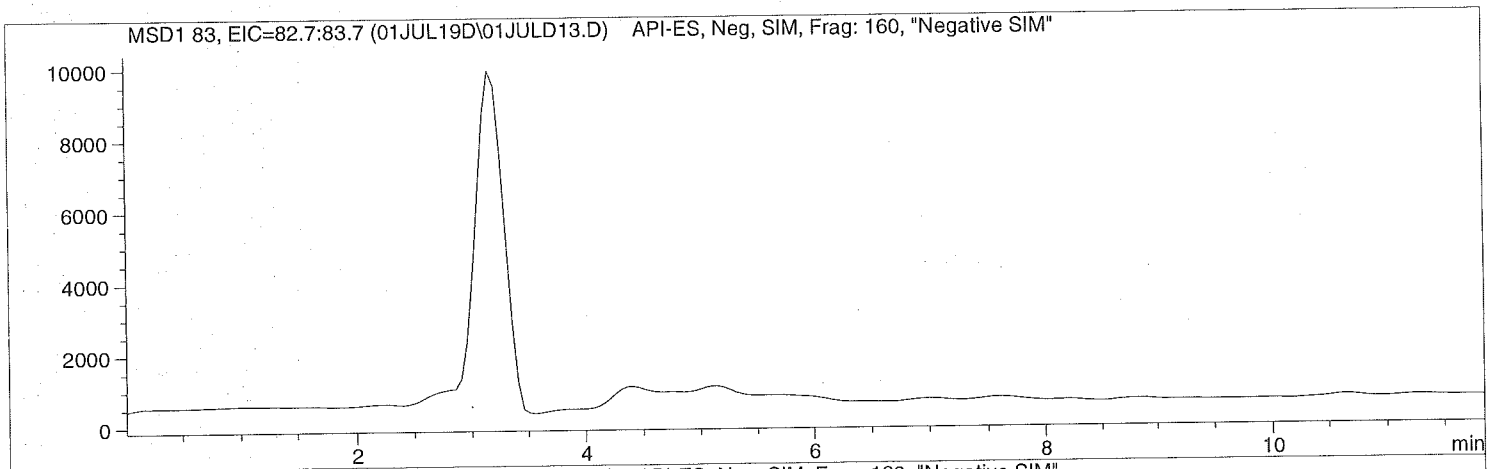
RIGHT SOLUTIONS | RIGHT PARTNER

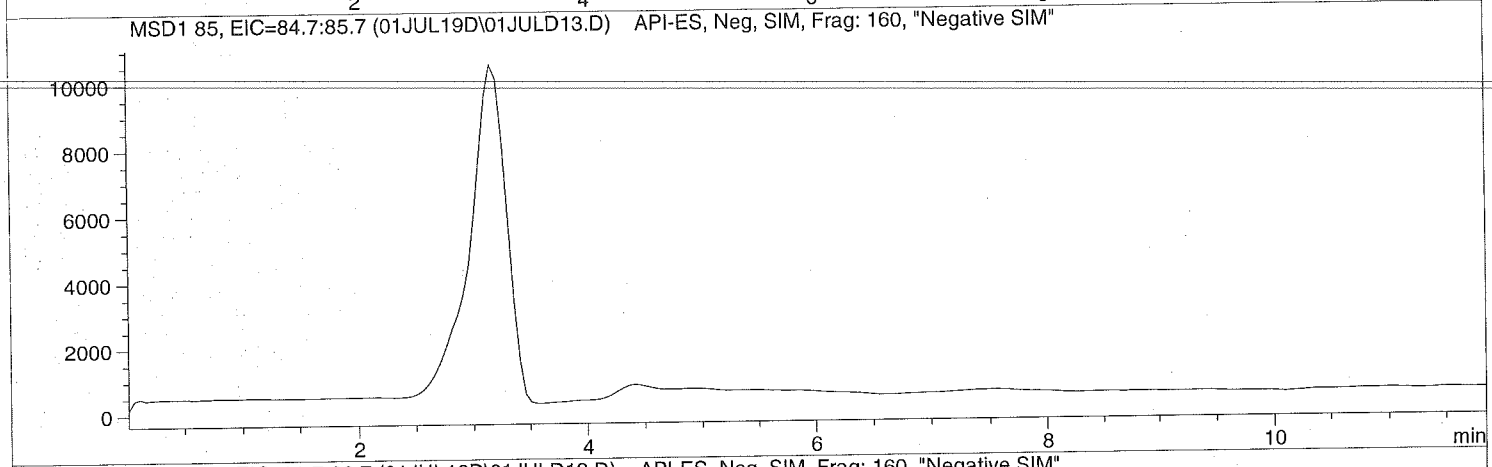
Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD13.D Sample Name: 1917856001

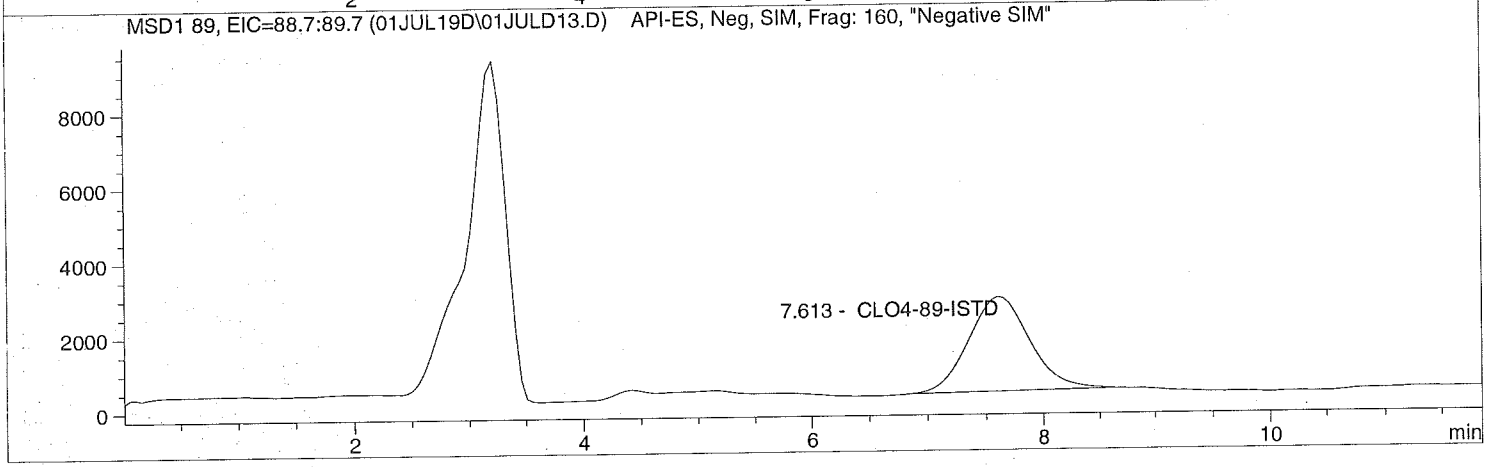
Injection Date:	7/01/2019 11:24:46	Seq Line:	13
Sample Name:	1917856001	Location:	Vial 83
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







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Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD13.D Sample Name: 1917856001

Injection Date:	7/01/2019 11:24:46	Seq Line:	13
Sample Name:	1917856001	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
7.613	PBA	93134.2	5.0000	CLO4-89-ISTD

*** End of Report ***

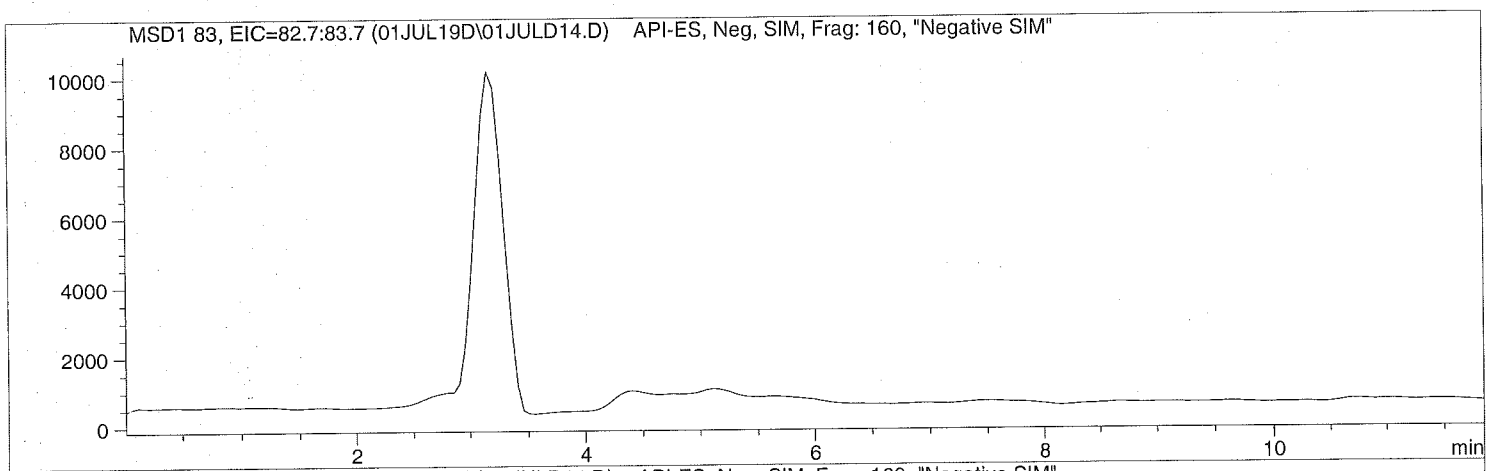
RIGHT SOLUTIONS | RIGHT PARTNER

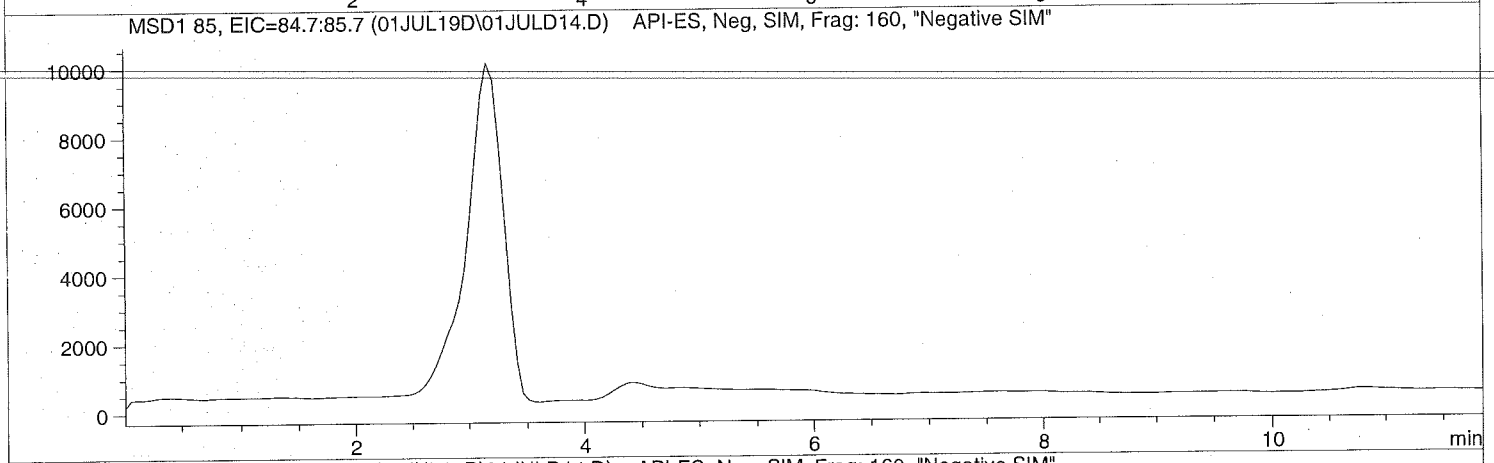
Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD14.D Sample Name: 1917856002

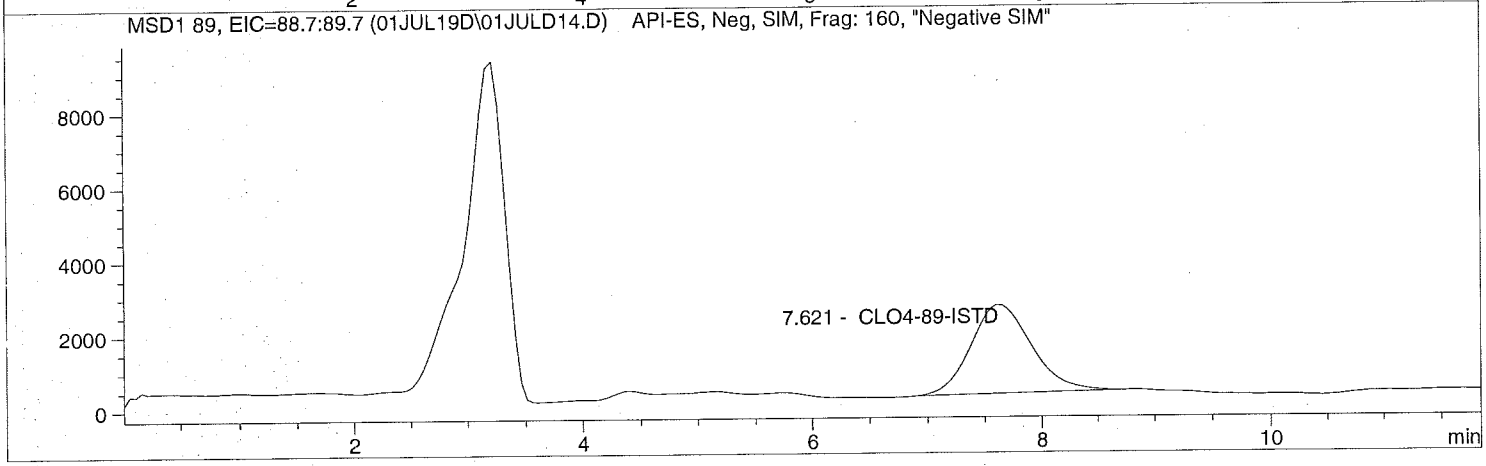
Injection Date:	7/01/2019 11:38:38	Seq Line:	14
Sample Name:	1917856002	Location:	Vial 84
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







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Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD14.D Sample Name: 1917856002

Injection Date:	7/01/2019 11:38:38	Seq Line:	14
Sample Name:	1917856002	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-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
7.621	PBA	87949.8	5.0000	CLO4-89-ISTD

*** End of Report ***

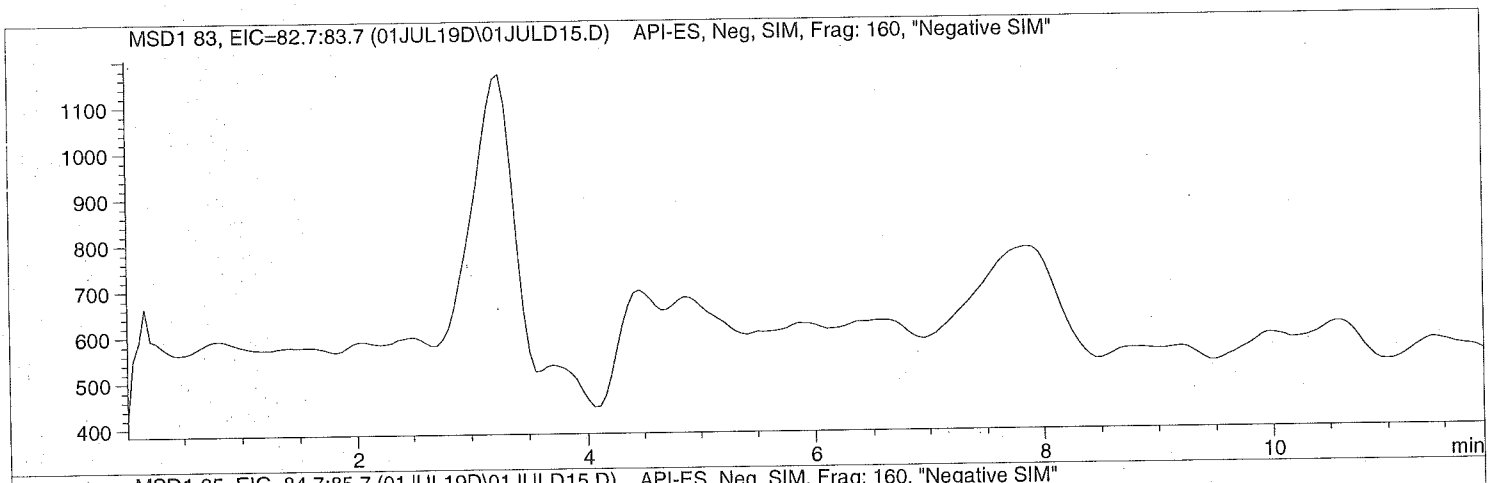
RIGHT SOLUTIONS | RIGHT PARTNER

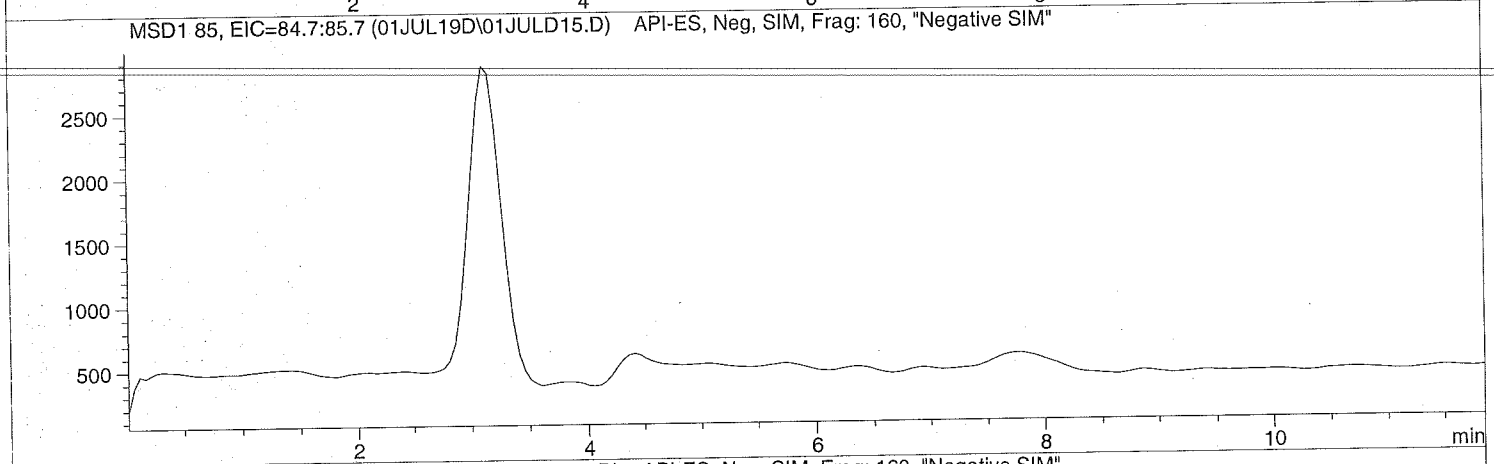
Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD15.D Sample Name: 1917856003

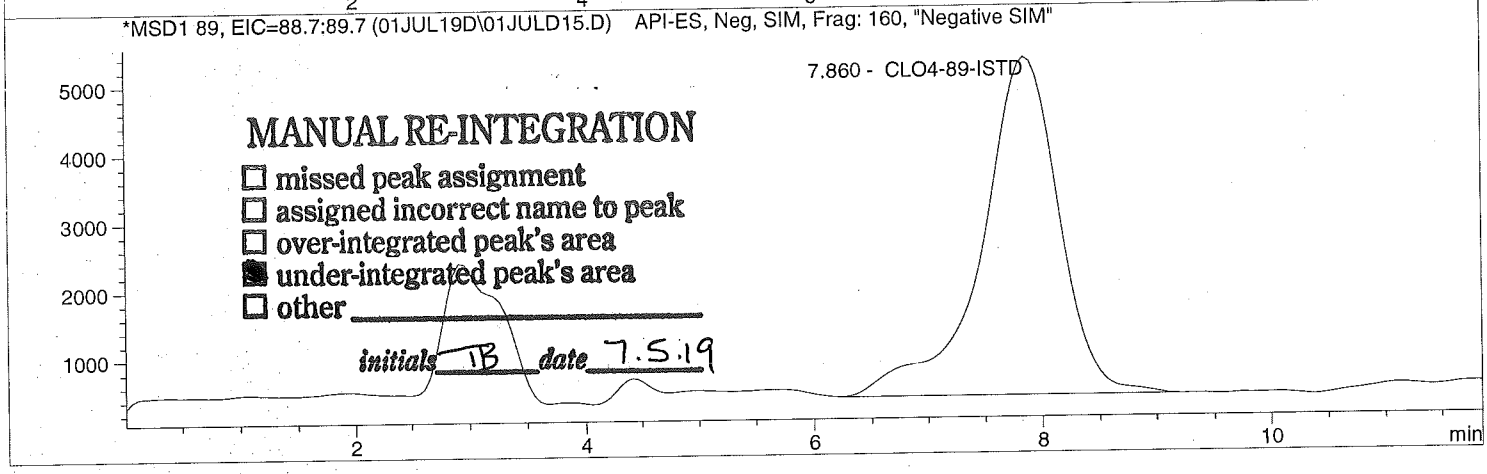
Injection Date:	7/01/2019 11:52:34	Seq Line:	15
Sample Name:	1917856003	Location:	Vial 85
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







MANUAL RE-INTEGRATION
- ☐ missed peak assignment
- ☐ assigned incorrect name to peak
- ☐ over-integrated peak's area
- ■ under-integrated peak's area
- ☐ other _____

initials TB date 7.5.19

RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD15.D Sample Name: 1917856003

Injection Date:	7/01/2019 11:52:34	Seq Line:	15
Sample Name:	1917856003	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
7.860	MM	230973.5	5.0000	CLO4-89-ISTD

*** End of Report ***

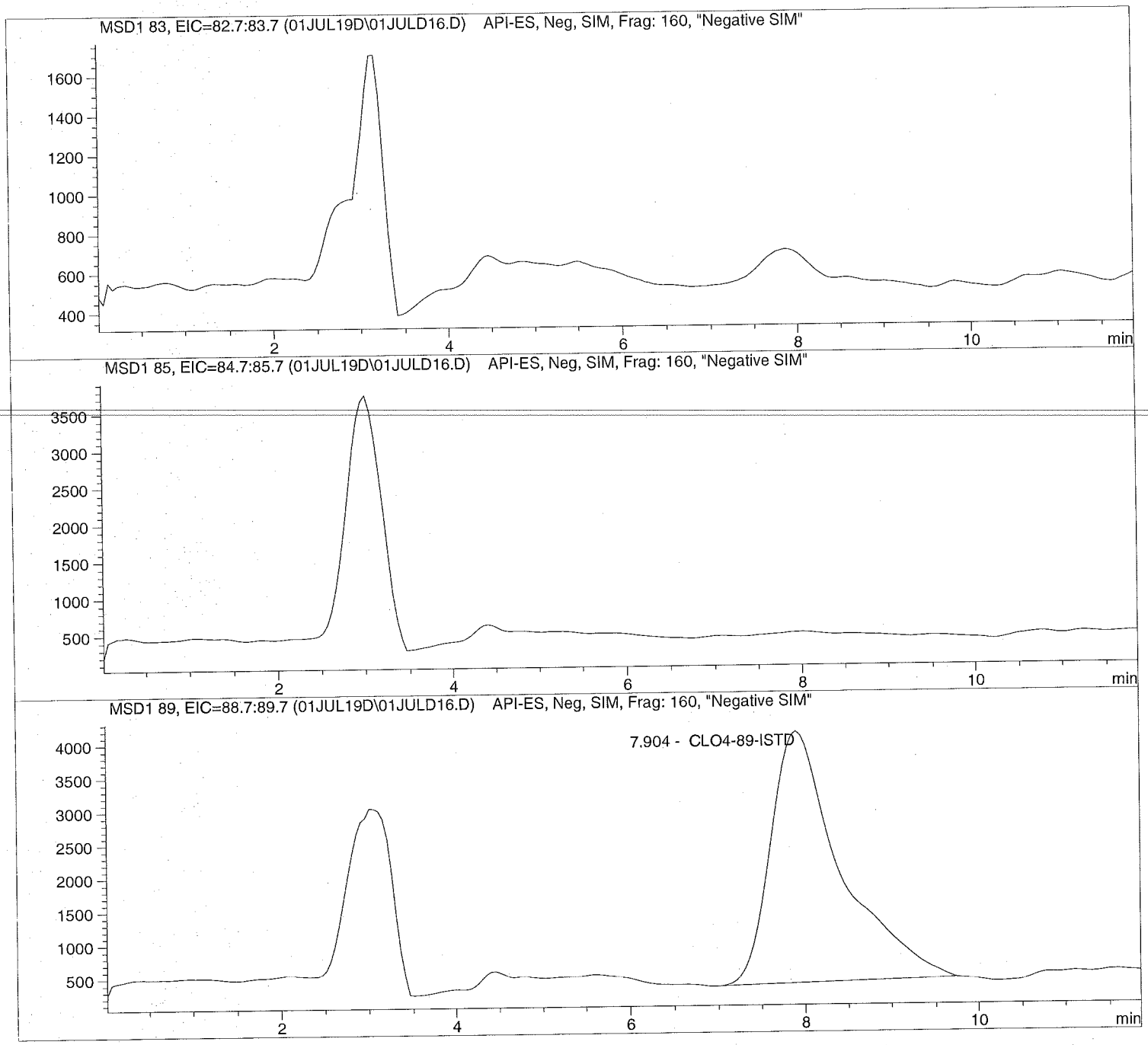
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD16.D Sample Name: 1917856004

Injection Date:	7/01/2019 12:06:28	Seq Line:	16
Sample Name:	1917856004	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-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD16.D Sample Name: 1917856004

Injection Date:	7/01/2019 12:06:28	Seq Line:	16
Sample Name:	1917856004	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-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
7.904	PBA	208544.4	5.0000	CLO4-89-ISTD

*** End of Report ***

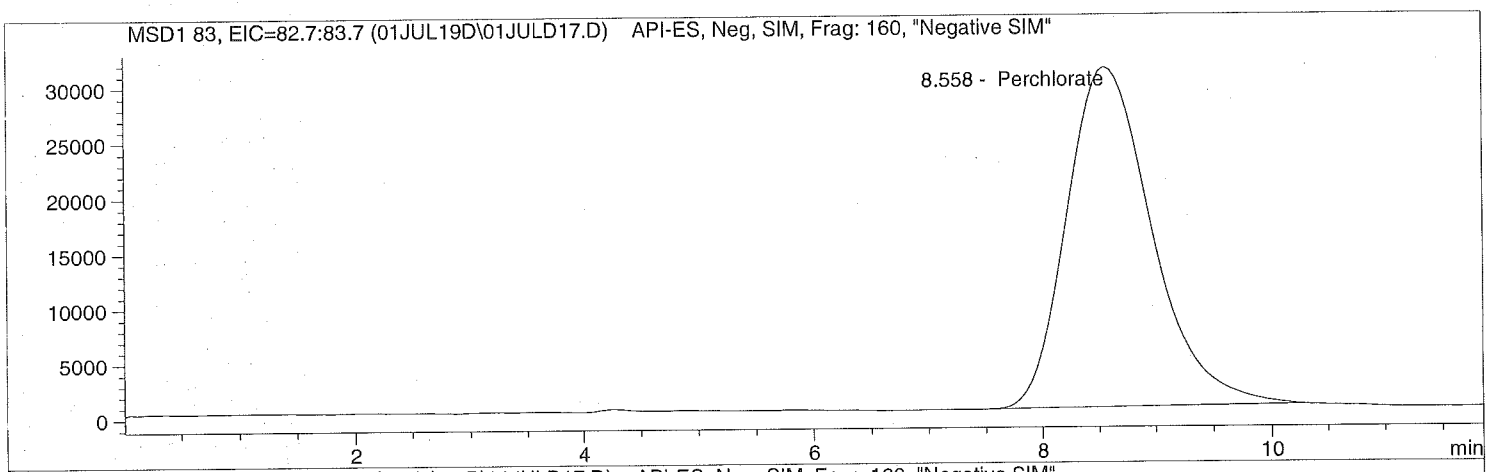
RIGHT SOLUTIONS | RIGHT PARTNER

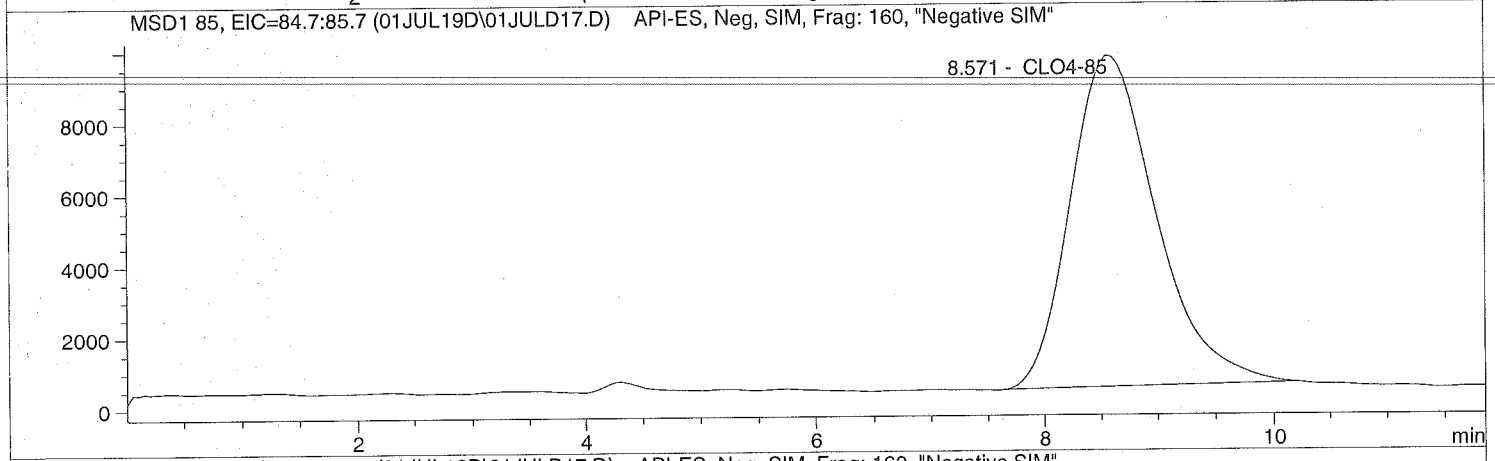
Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD17.D Sample Name: 661482 CCV@25

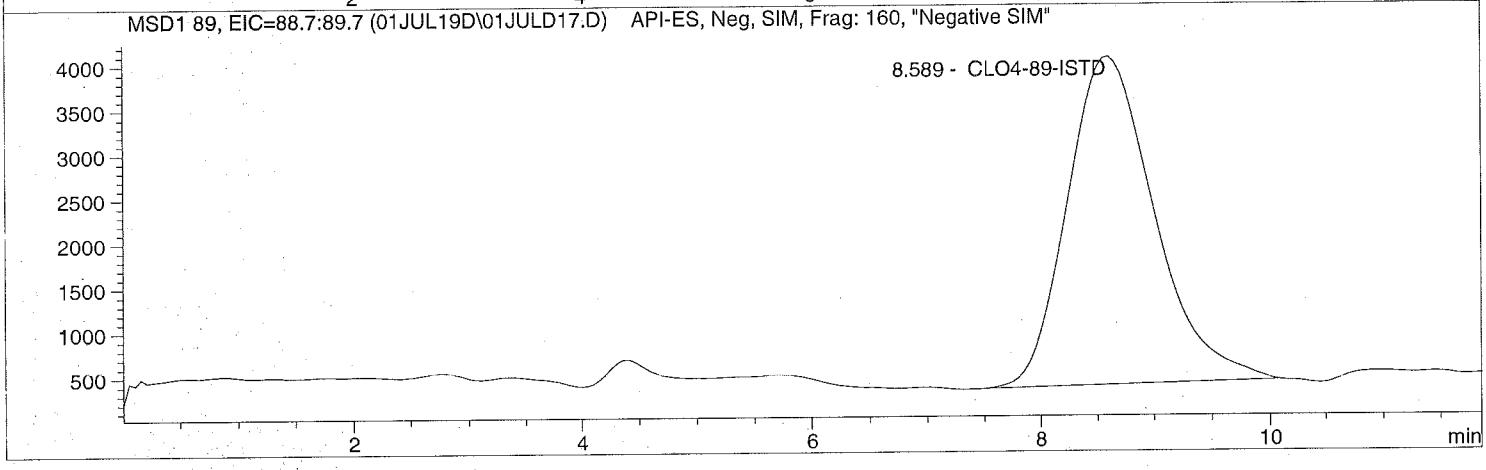
Injection Date:	7/01/2019 12:20:29	Seq Line:	17
Sample Name:	661482 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD17.D Sample Name: 661482 CCV@25

Injection Date:	7/01/2019 12:20:29	Seq Line:	17
Sample Name:	661482 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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.558	PBA	1604090.1	25.0035	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.571	PBA	485334.3	25.4617	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.589	PBA	195182.3	5.0000	CLO4-89-ISTD

*** End of Report ***

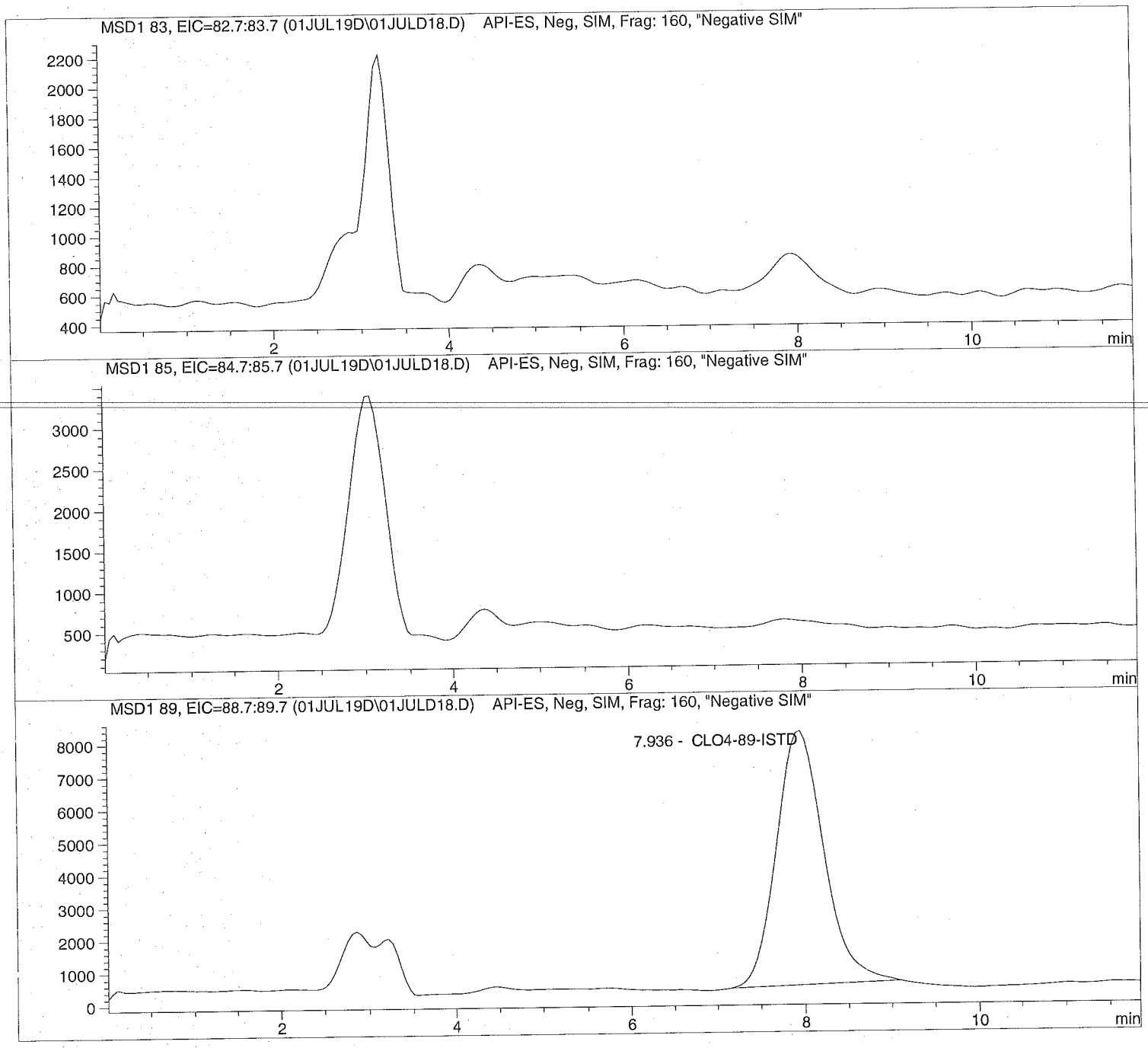
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD18.D Sample Name: 1917856005

Injection Date:	7/01/2019 12:34:22	Seq Line:	18
Sample Name:	1917856005	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD18.D Sample Name: 1917856005

Injection Date:	7/01/2019 12:34:22	Seq Line:	18
Sample Name:	1917856005	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
7.936	PBA	292027.4	5.0000	CLO4-89-ISTD

*** End of Report ***

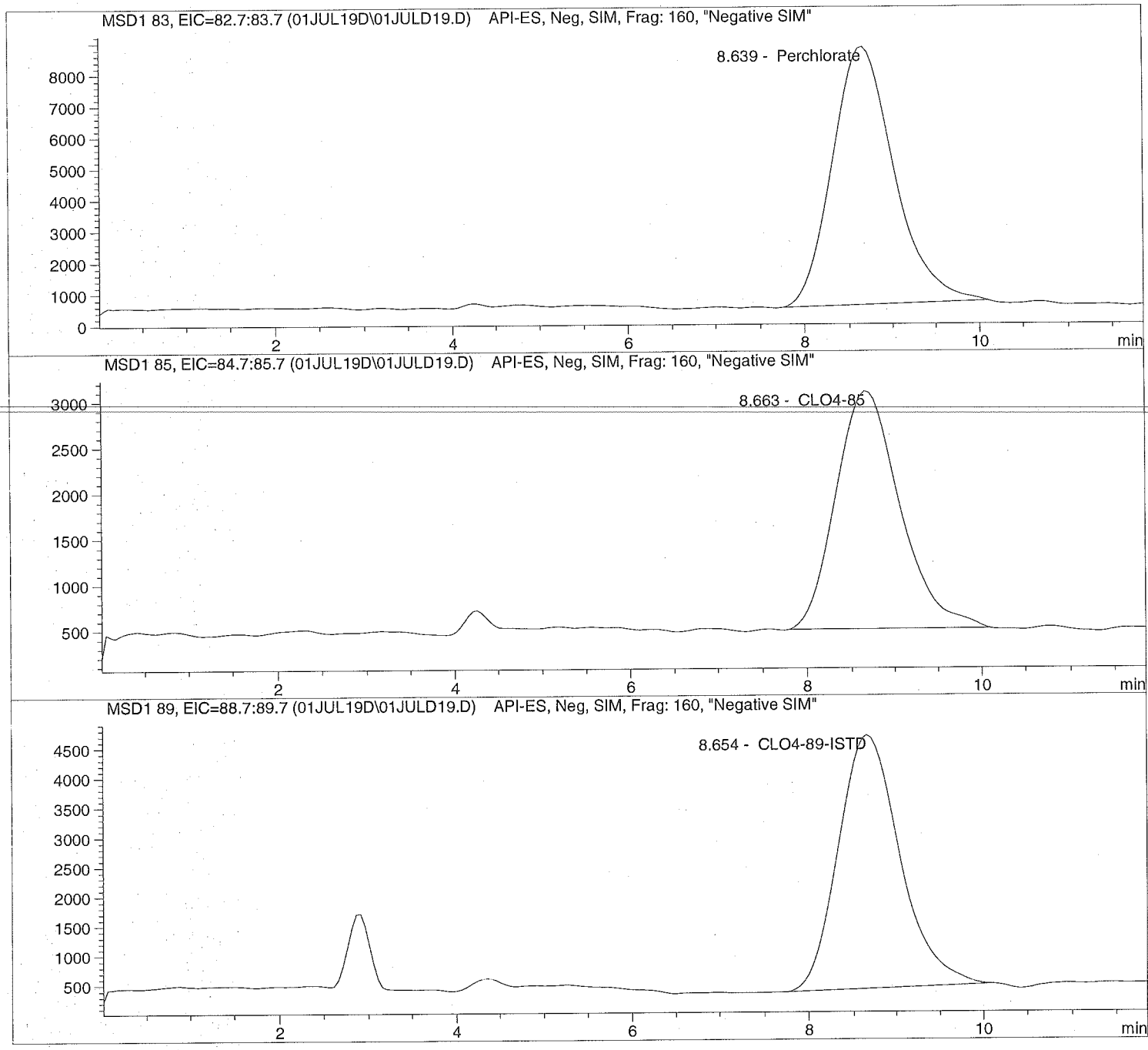
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD19.D Sample Name: 1917856006 100

Injection Date:	7/01/2019 12:48:15	Seq Line:	19
Sample Name:	1917856006 100	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD19.D Sample Name: 1917856006 100

Injection Date:	7/01/2019 12:48:15	Seq Line:	19
Sample Name:	1917856006 100	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.639	PBA	403838.0	621.0643	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.663	BBA	132725.9	672.8711	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.654	PBA	210141.8	500.0000	CLO4-89-ISTD

*** End of Report ***

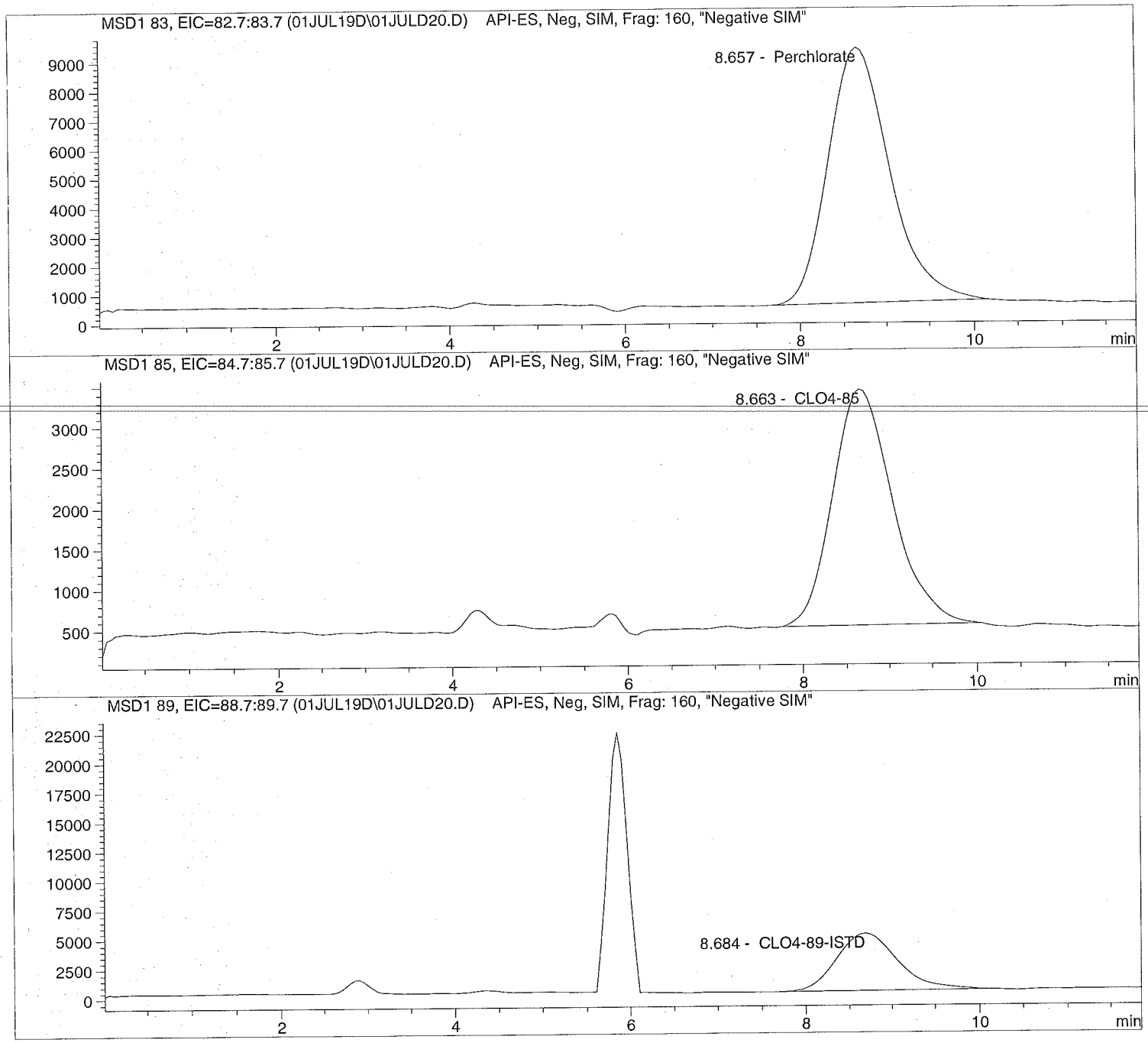
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD20.D Sample Name: 1917856007 100

Injection Date:	7/01/2019 13:02:10	Seq Line:	20
Sample Name:	1917856007 100	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD20.D Sample Name: 1917856007 100

Injection Date:	7/01/2019 13:02:10	Seq Line:	20
Sample Name:	1917856007 100	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.657	PBA	434273.7	588.1581	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.663	BBA	140119.4	624.8207	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.684	PBA	239145.3	500.0000	CLO4-89-ISTD

*** End of Report ***

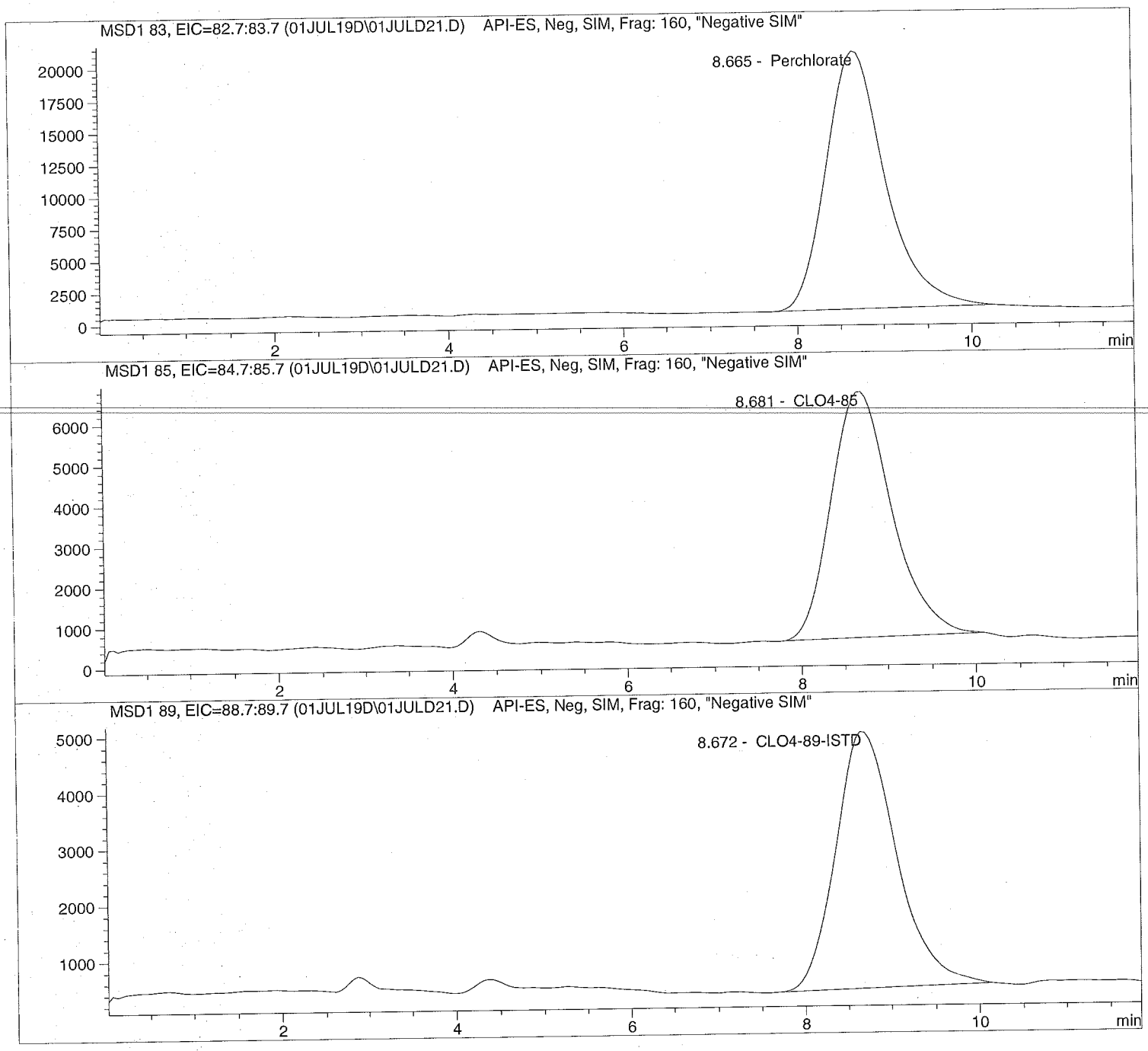
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD21.D Sample Name: 1918052001 1K

Injection Date:	7/01/2019 13:16:12	Seq Line:	21
Sample Name:	1918052001 1K	Location:	Vial 90
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD21.D Sample Name: 1918052001 1K

Injection Date:	7/01/2019 13:16:12	Seq Line:	21
Sample Name:	1918052001 1K	Location:	Vial 90
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.665	PBA	958578.9	13475.4930	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.681	PBA	295207.3	13884.7680	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.672	PBA	223102.2	5000.0000	CLO4-89-ISTD

*** End of Report ***

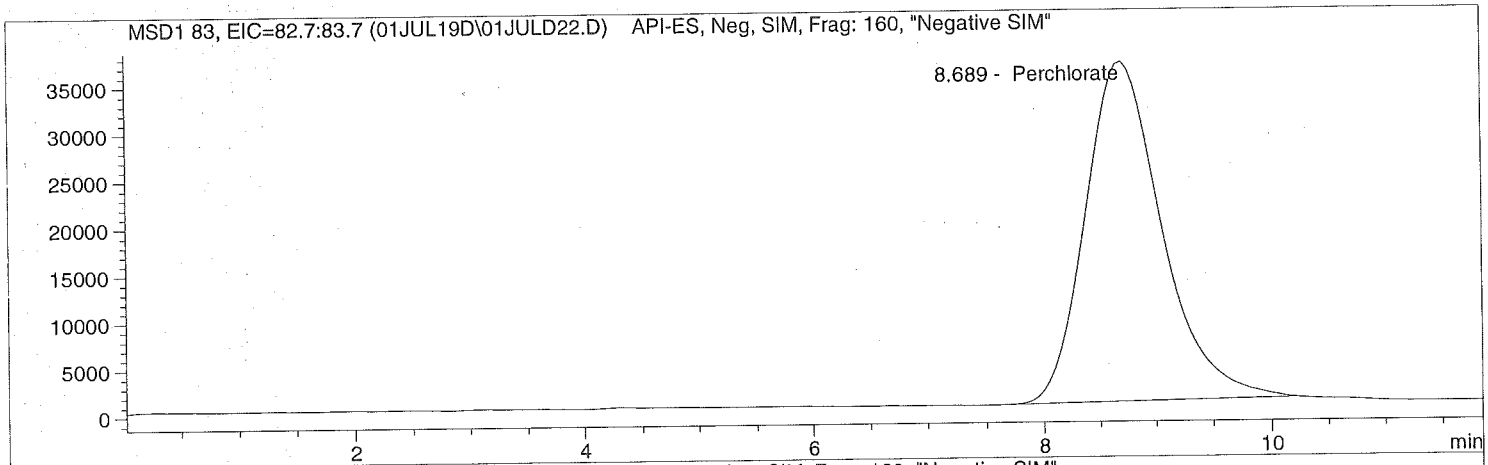
RIGHT SOLUTIONS | RIGHT PARTNER

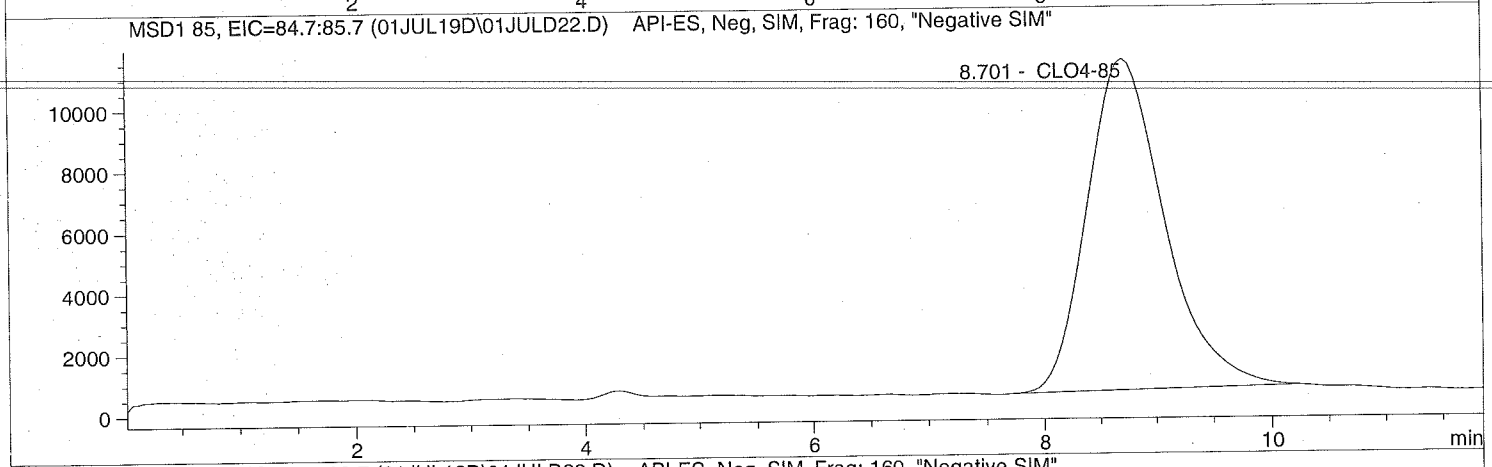
Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD22.D Sample Name: 1918052002 10K

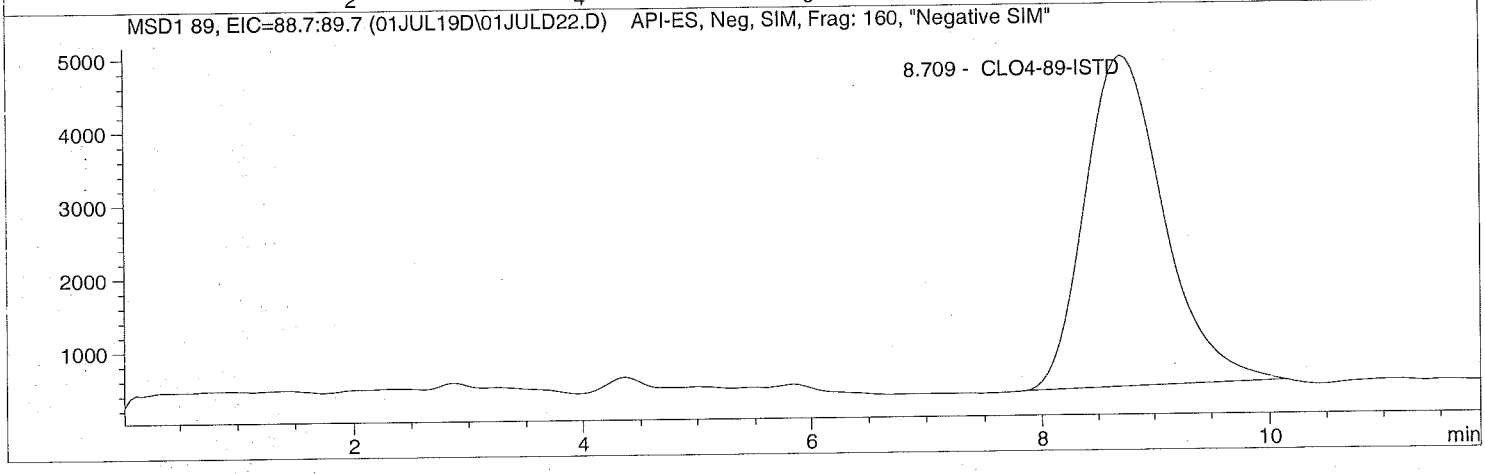
Injection Date:	7/01/2019 13:30:09	Seq Line:	22
Sample Name:	1918052002 10K	Location:	Vial 91
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







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Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD22.D Sample Name: 1918052002 10K

Injection Date:	7/01/2019 13:30:09	Seq Line:	22
Sample Name:	1918052002 10K	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	10000.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.689	PBA	1701736.0	236511.4245	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.701	PBA	516167.1	241333.7557	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.709	PBA	219618.3	50000.0000	CLO4-89-ISTD

*** End of Report ***

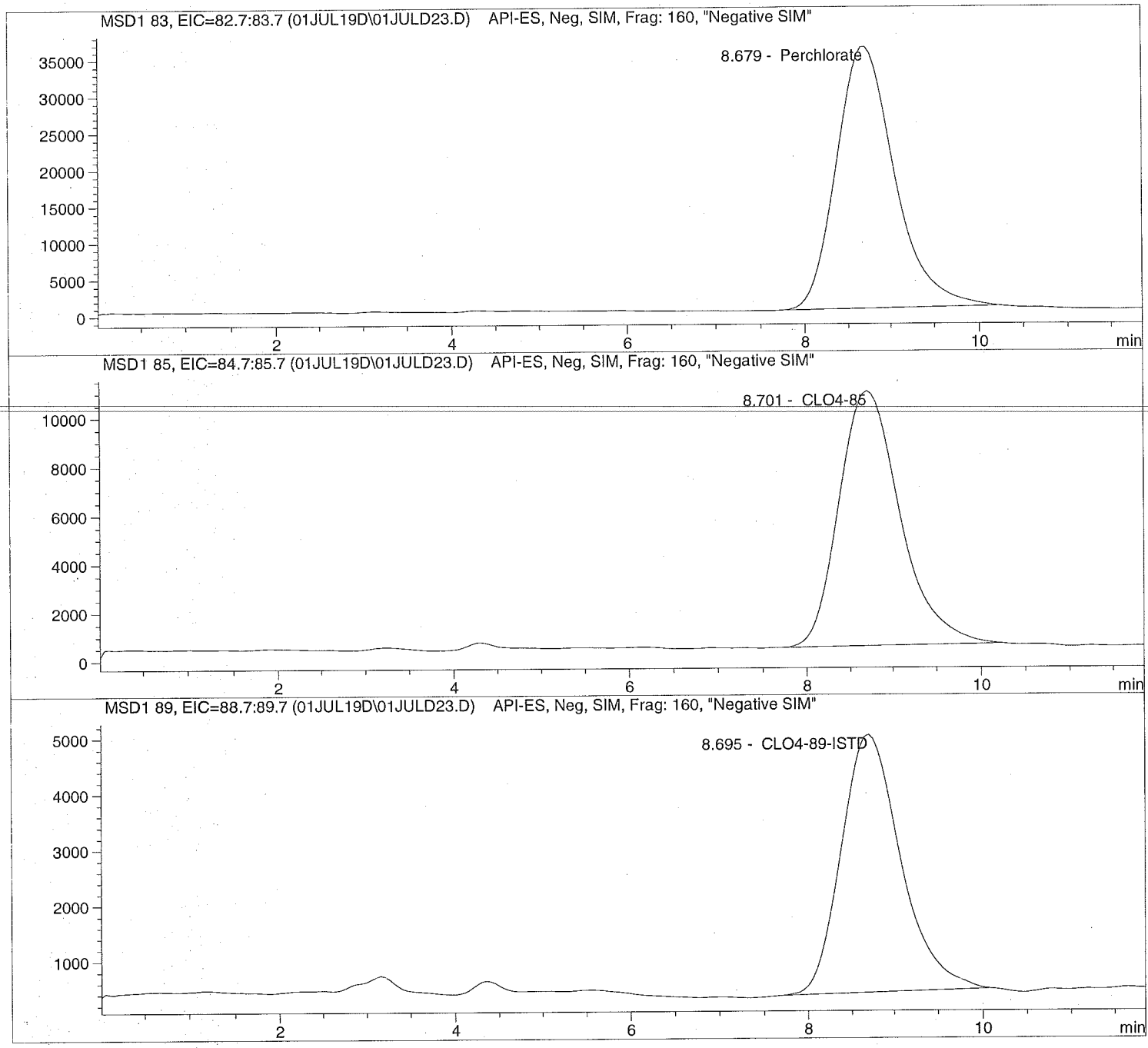
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD23.D Sample Name: 1918052003 10K

Injection Date:	7/01/2019 13:44:04	Seq Line:	23
Sample Name:	1918052003 10K	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



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Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD23.D Sample Name: 1918052003 10K

Injection Date:	7/01/2019 13:44:04	Seq Line:	23
Sample Name:	1918052003 10K	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	10000.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.679	PBA	1682027.8	230798.4297	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.701	PBA	516999.9	238459.8445	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.695	PBA	222758.2	50000.0000	CLO4-89-ISTD

*** End of Report ***

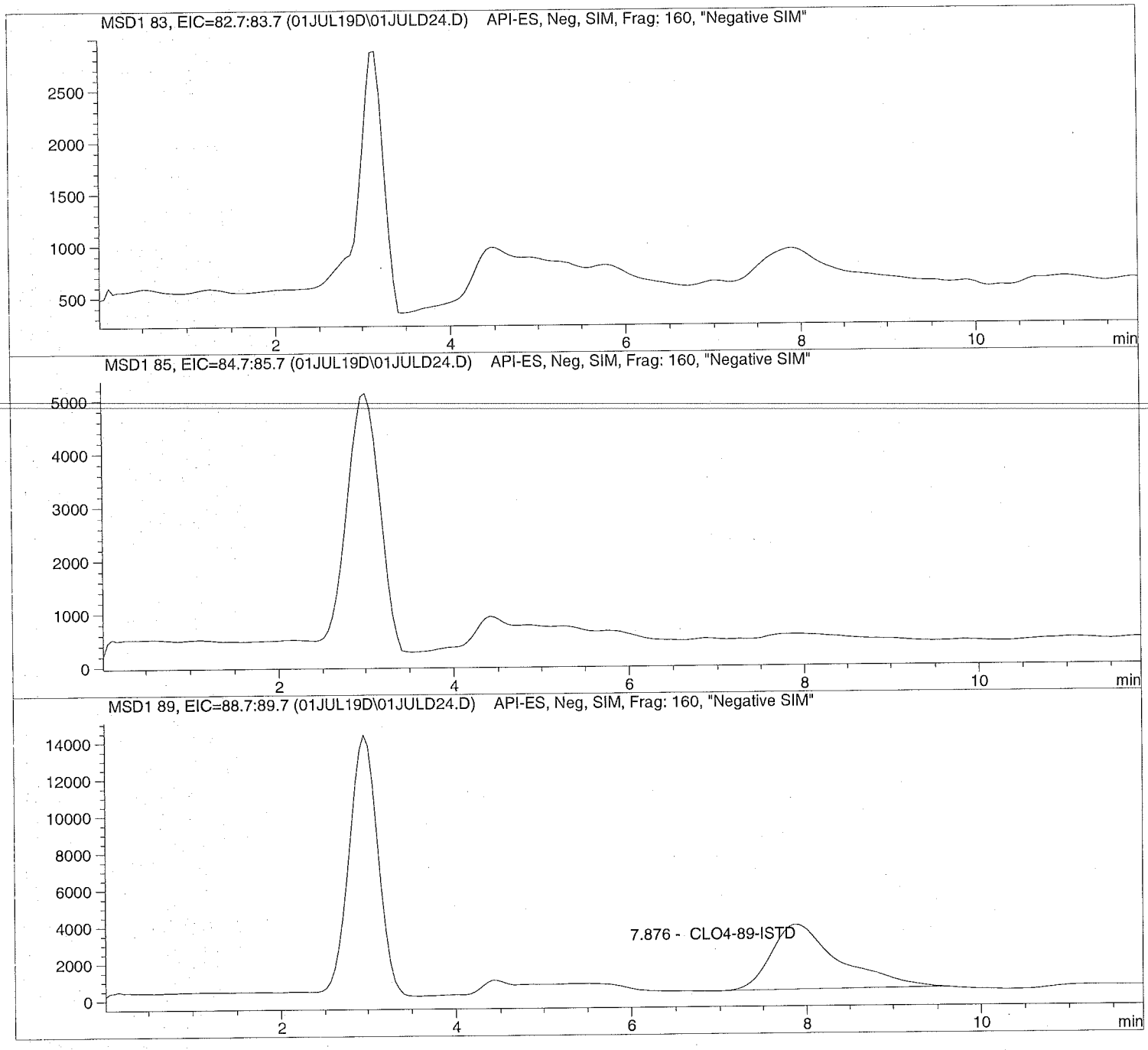
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD24.D Sample Name: 1918052004

Injection Date:	7/01/2019 13:57:58	Seq Line:	24
Sample Name:	1918052004	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



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Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD24.D Sample Name: 1918052004

Injection Date:	7/01/2019 13:57:58	Seq Line:	24
Sample Name:	1918052004	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
7.876	PBA	188746.5	5.0000	CLO4-89-ISTD

*** End of Report ***

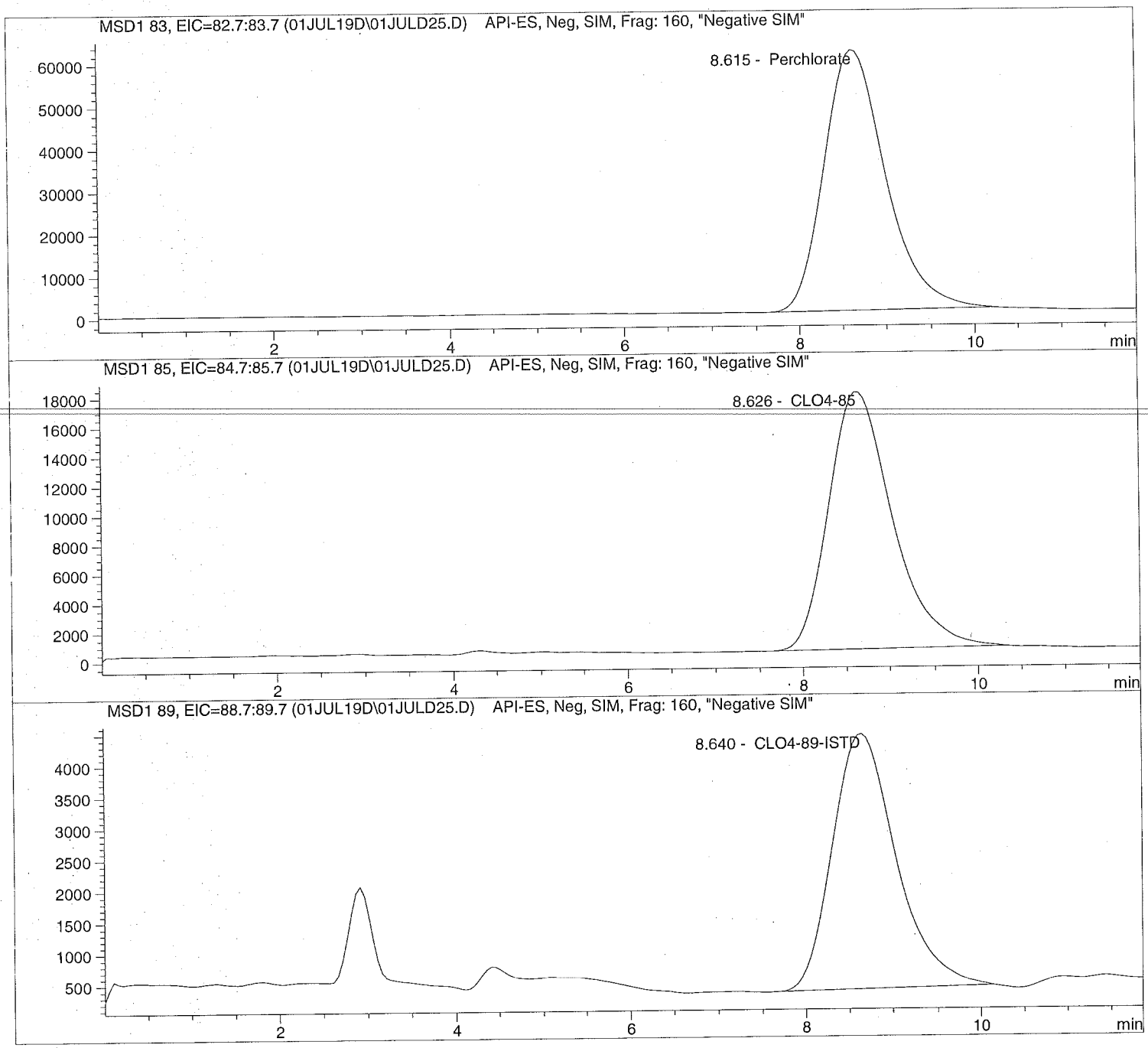
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD25.D Sample Name: 1917698003 100

Injection Date:	7/01/2019 14:11:59	Seq Line:	25
Sample Name:	1917698003 100	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



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Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD25.D Sample Name: 1917698003 100

Injection Date:	7/01/2019 14:11:59	Seq Line:	25
Sample Name:	1917698003 100	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.615	PBA	3021130.8	4300.6266	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.626	PBA	888075.5	4275.4049	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.640	PBA	205249.1	500.0000	CLO4-89-ISTD

*** End of Report ***

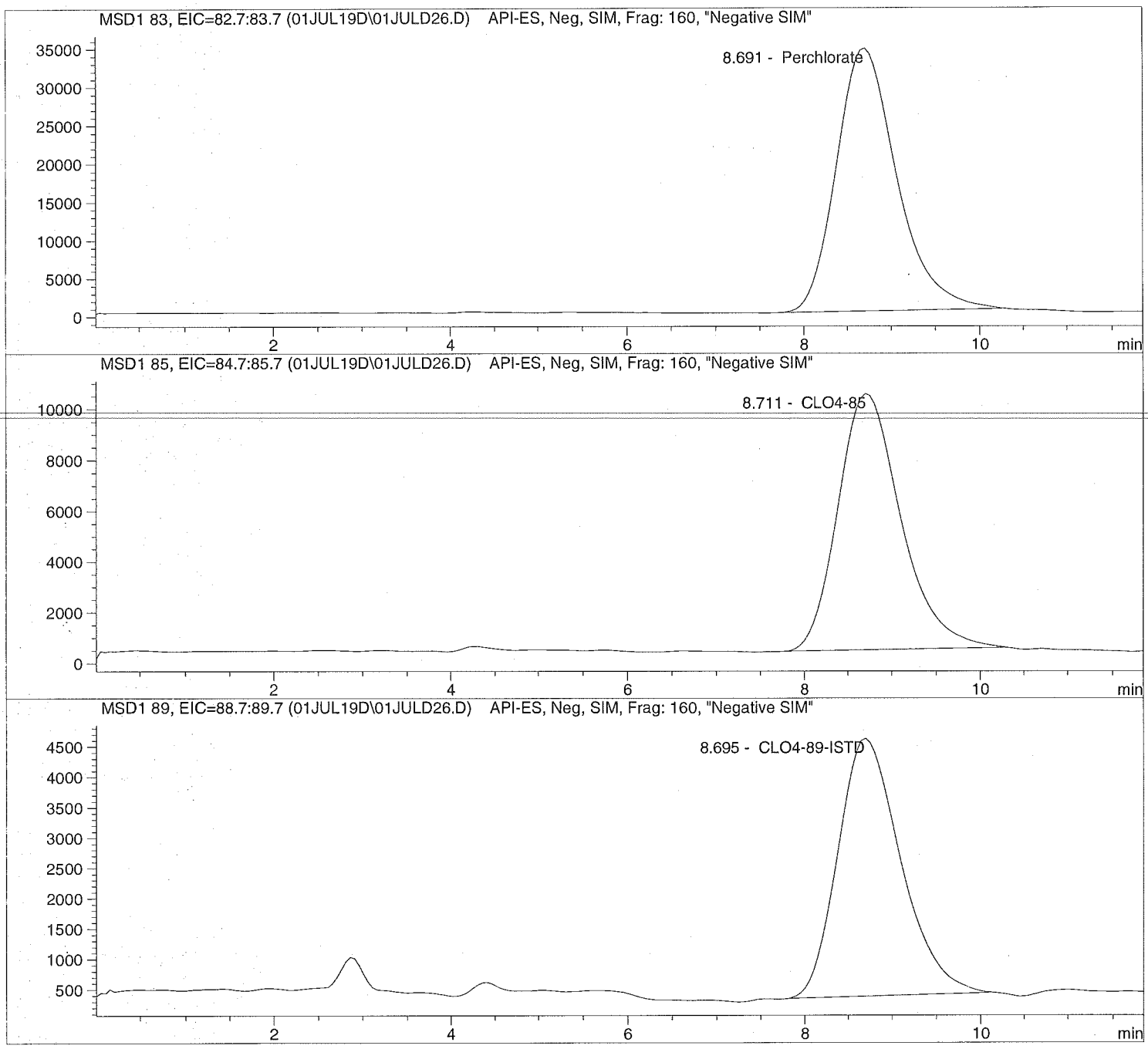
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD26.D Sample Name: 1917698008 1K

Injection Date:	7/01/2019 14:25:54	Seq Line:	26
Sample Name:	1917698008 1K	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD26.D Sample Name: 1917698008 1K

Injection Date:	7/01/2019 14:25:54	Seq Line:	26
Sample Name:	1917698008 1K	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.691	PBA	1640477.0	23731.5795	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.711	PBA	499687.1	24313.2650	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.695	PBA	210953.7	5000.0000	CLO4-89-ISTD

*** End of Report ***

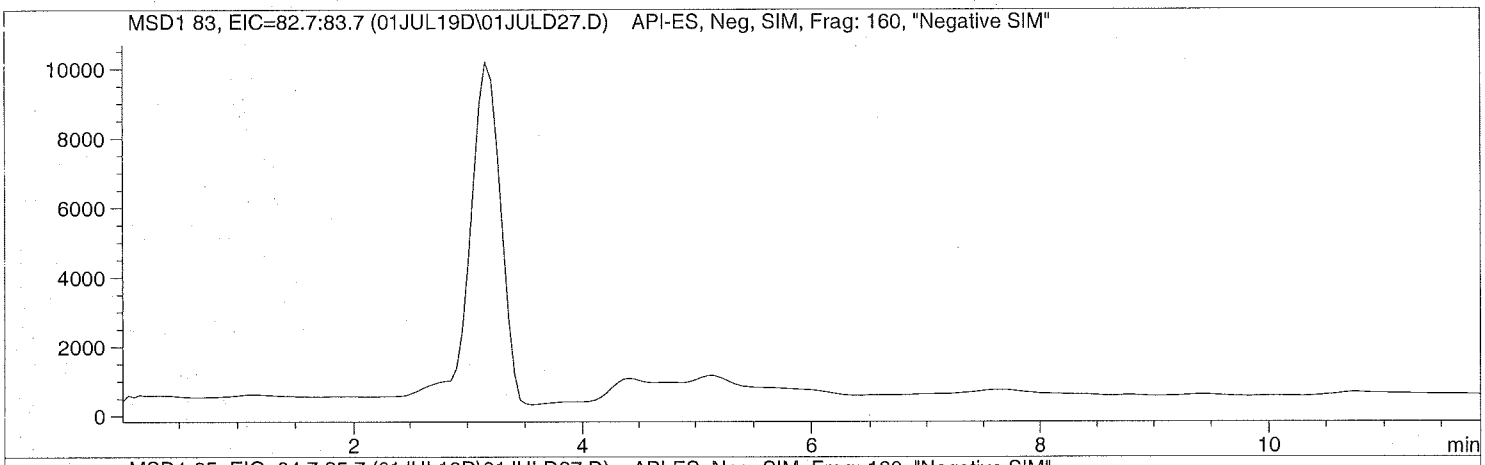
RIGHT SOLUTIONS | RIGHT PARTNER

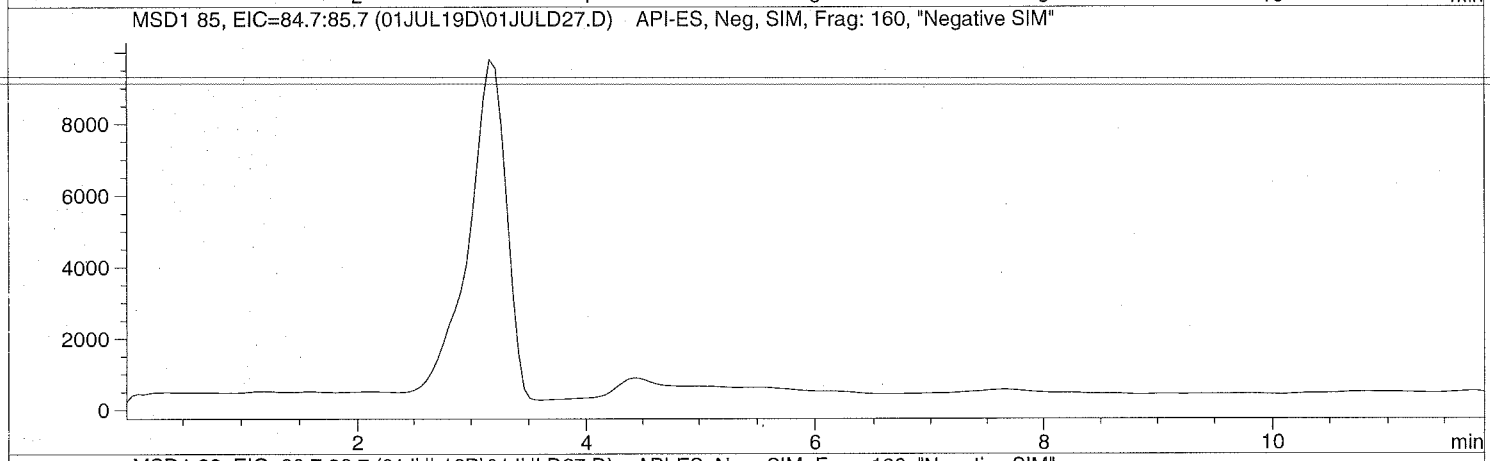
Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD27.D Sample Name: 1917856001 RE

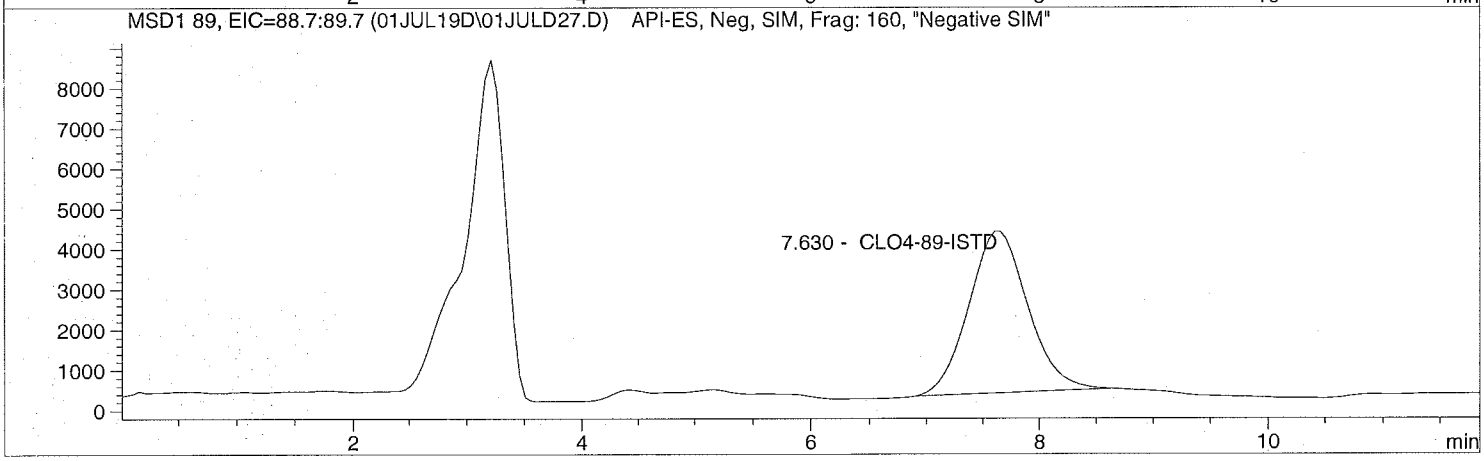
Injection Date:	7/01/2019 14:39:49	Seq Line:	27
Sample Name:	1917856001 RE	Location:	Vial 83
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD27.D Sample Name: 1917856001 RE

Injection Date:	7/01/2019 14:39:49	Seq Line:	27
Sample Name:	1917856001 RE	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-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
7.630	PBA	144962.0	5.0000	CLO4-89-ISTD

*** End of Report ***

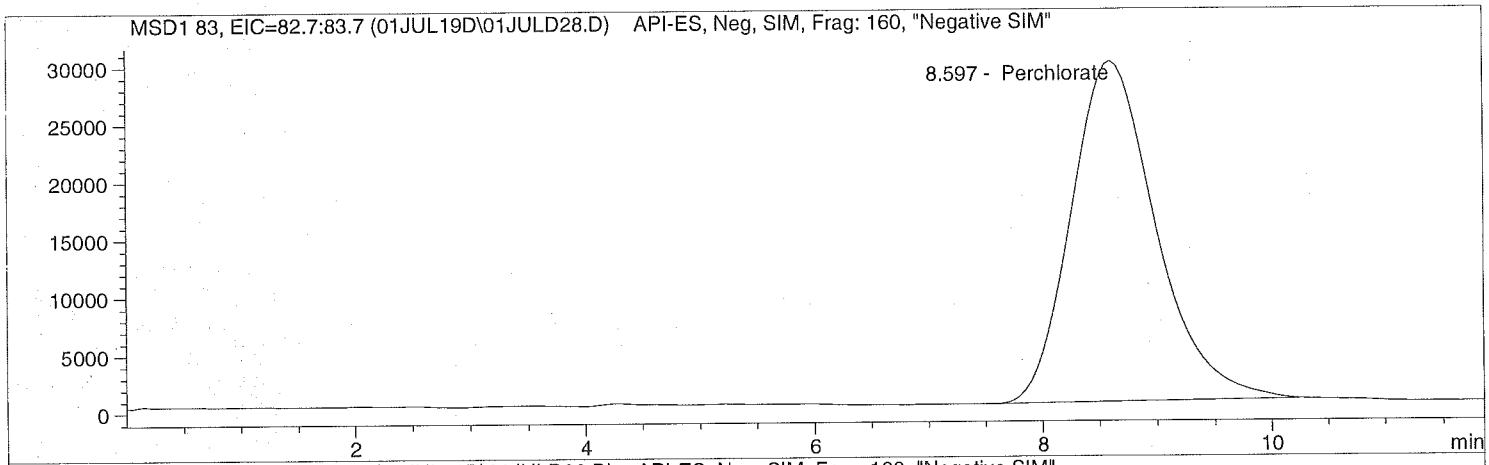
RIGHT SOLUTIONS | RIGHT PARTNER

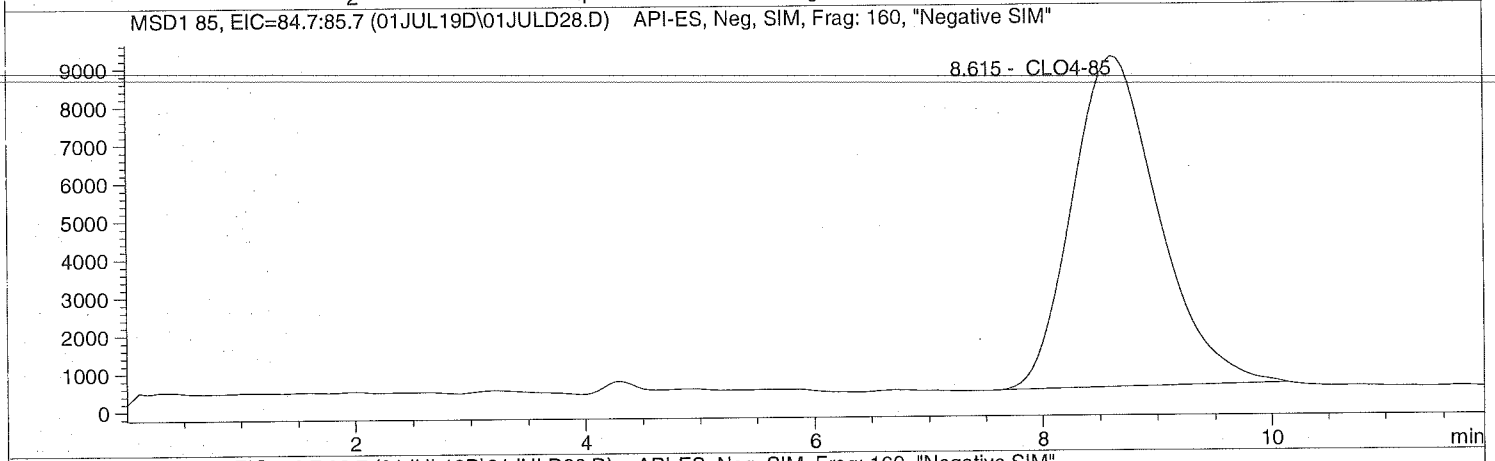
Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD28.D Sample Name: 661483 CCV@25

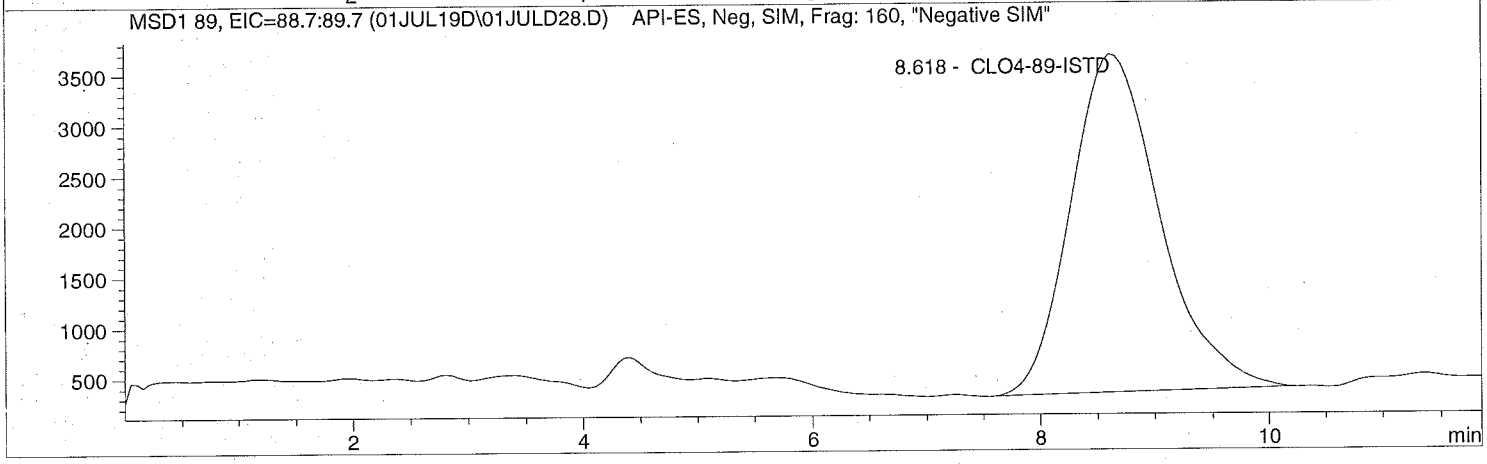
Injection Date:	7/01/2019 14:53:42	Seq Line:	28
Sample Name:	661483 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD28.D Sample Name: 661483 CCV@25

Injection Date:	7/01/2019 14:53:42	Seq Line:	28
Sample Name:	661483 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-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.597	PBA	1506029.6	25.4198	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.615	PBA	453099.1	25.7499	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.618	PBA	180069.9	5.0000	CLO4-89-ISTD

*** End of Report ***

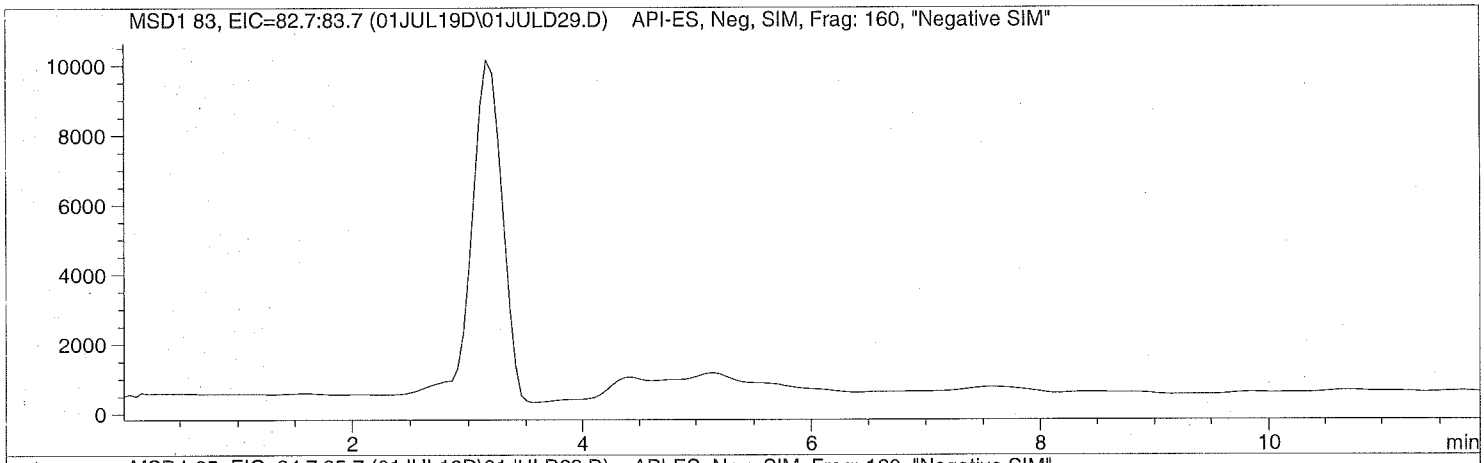
RIGHT SOLUTIONS | RIGHT PARTNER

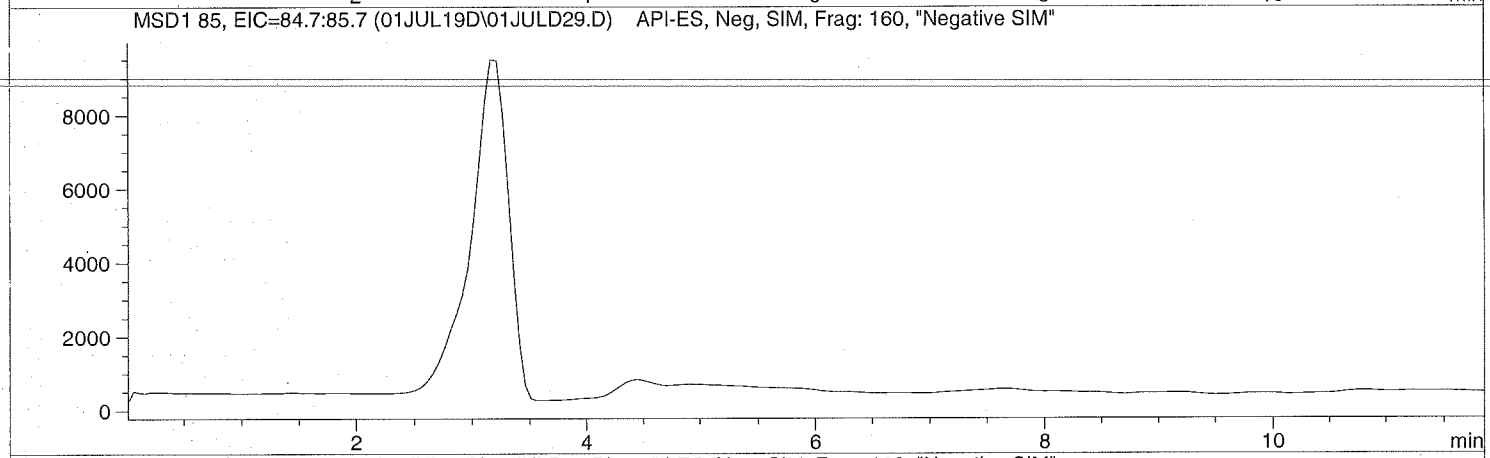
Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD29.D Sample Name: 1917856002 RE

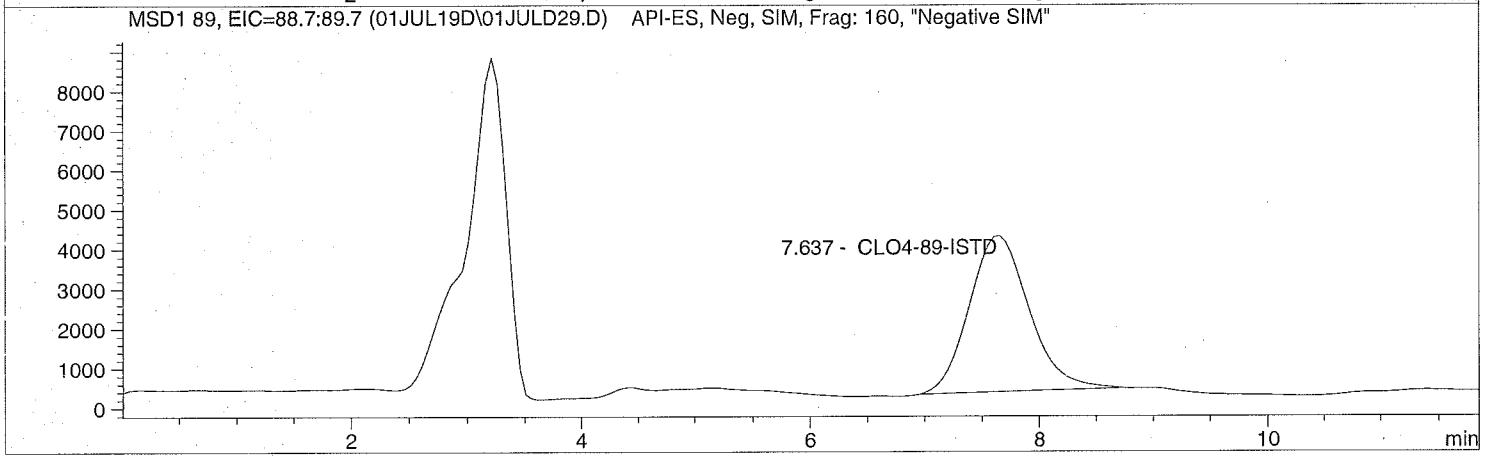
Injection Date:	7/01/2019 15:07:32	Seq Line:	29
Sample Name:	1917856002 RE	Location:	Vial 84
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







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Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD29.D Sample Name: 1917856002 RE

Injection Date:	7/01/2019 15:07:32	Seq Line:	29
Sample Name:	1917856002 RE	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
7.637	PBA	142651.0	5.0000	CLO4-89-ISTD

*** End of Report ***

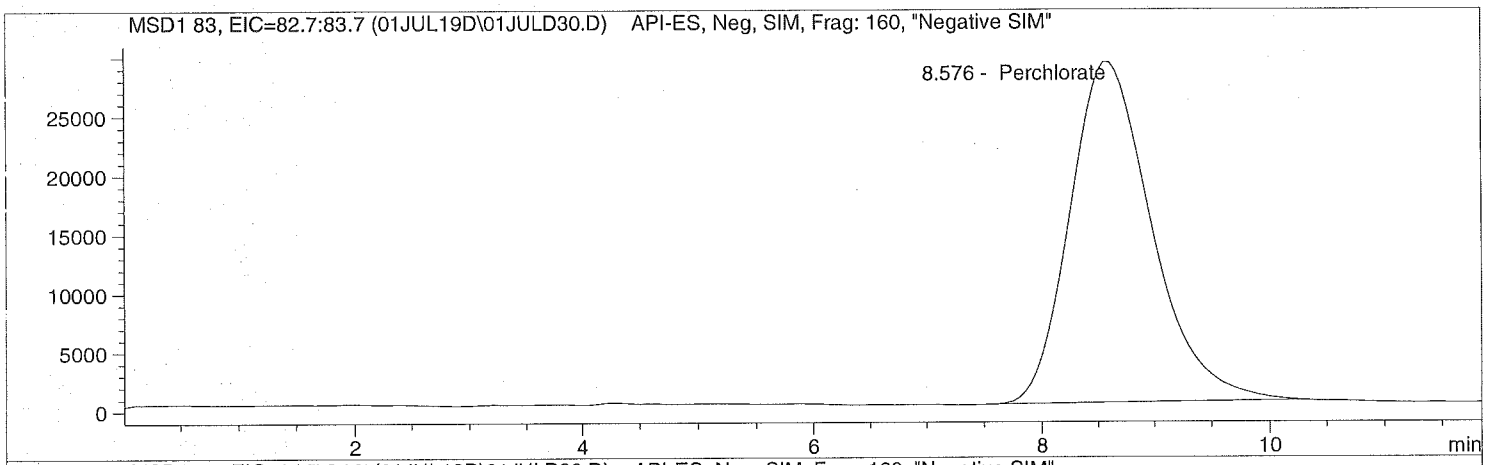
RIGHT SOLUTIONS | RIGHT PARTNER

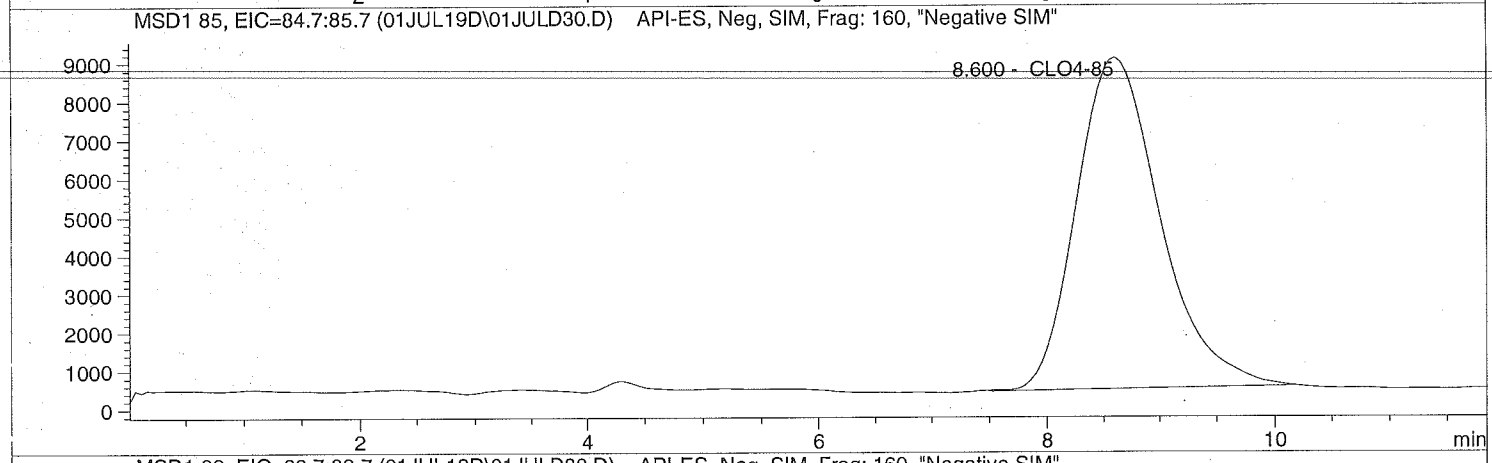
Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD30.D Sample Name: 661661 CCV@25

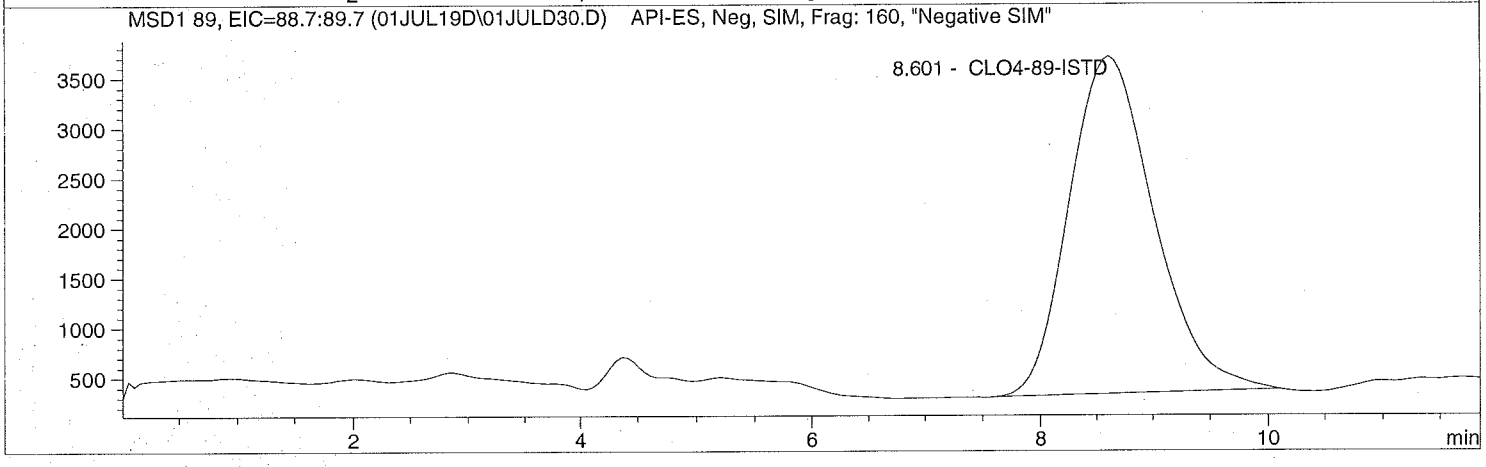
Injection Date:	7/01/2019 15:21:25	Seq Line:	30
Sample Name:	661661 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







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Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD30.D Sample Name: 661661 CCV@25

Injection Date:	7/01/2019 15:21:25	Seq Line:	30
Sample Name:	661661 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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.576	PBA	1459488.9	25.1014	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.600	BBA	445116.2	25.7560	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.601	PBA	176853.7	5.0000	CLO4-89-ISTD

*** End of Report ***

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ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Initial Calibration

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Calibration Table

Perchlorate

Calib. Data Modified : 3/19/2019 2:35:19 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
8.744	1	1	1.00000	7.76074e4	1.28854e-5	1		Perchlorate
		2	2.00000	1.35273e5	1.47849e-5			
		3	5.00000	3.37764e5	1.48033e-5			
		4	10.00000	6.83454e5	1.46316e-5			
		5	25.00000	2.08433e6	1.19943e-5			
		6	50.00000	4.13334e6	1.20968e-5			
		7	75.00000	5.99313e6	1.25143e-5			
8.755	2	1	1.00000	2.36780e4	4.22333e-5	1		CLO4-85
		2	2.00000	4.69486e4	4.25998e-5			
		3	5.00000	1.06124e5	4.71147e-5			
		4	10.00000	2.13523e5	4.68335e-5			
		5	25.00000	6.14295e5	4.06971e-5			
		6	50.00000	1.19814e6	4.17315e-5			
		7	75.00000	1.78355e6	4.20509e-5			
8.766	3	1	5.00000	2.73208e5	1.83011e-5	+I1		CLO4-89-ISTD
		2	5.00000	2.24886e5	2.22335e-5			
		3	5.00000	2.33196e5	2.14412e-5			
		4	5.00000	2.34454e5	2.13262e-5			
		5	5.00000	2.50568e5	1.99547e-5			
		6	5.00000	2.30977e5	2.16472e-5			

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RetTime [min]	Sig	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
		7	5.00000	2.21504e5	2.25729e-5			

More compound-specific settings:

Compound: Perchlorate
- Time Window : From 6.654 min To 12.544 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 0.5
  - Level 3 : 0.2
  - Level 4 : 0.1
  - Level 5 : 0.04
  - Level 6 : 0.02
  - Level 7 : 0.013333

Compound: CLO4-85
- Time Window : From 6.650 min To 12.505 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 0.5
  - Level 3 : 0.2
  - Level 4 : 0.1
  - Level 5 : 0.04
  - Level 6 : 0.02
  - Level 7 : 0.013333

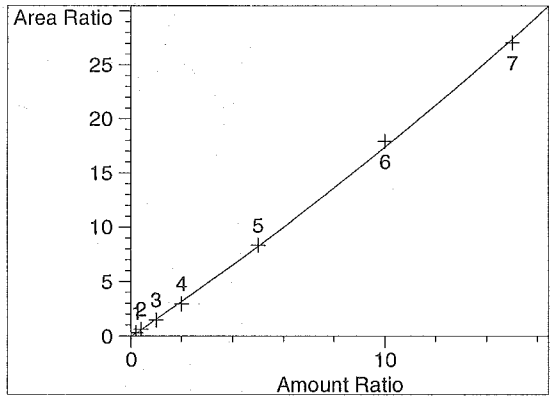
Compound: CLO4-89-ISTD
- Time Window : From 6.659 min To 12.466 min
- Curve Type : Linear
- Origin : Included
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 1
  - Level 3 : 1
  - Level 4 : 1
  - Level 5 : 1
  - Level 6 : 1
  - Level 7 : 1

Peak Sum Table

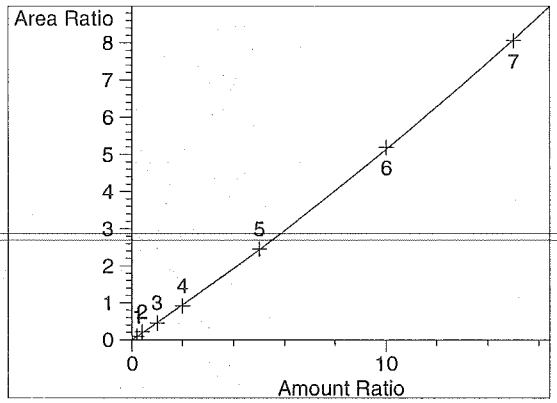
No Entries in table

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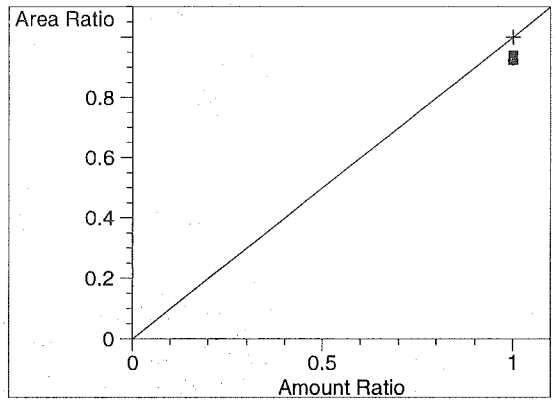
Calibration Curves



Perchlorate at exp. RT: 8.744
MSD1 83, EIC=82.7:83.7
Correlation: 0.99957
Residual Std. Dev.: 0.30744
Formula: y = ax² + bx + c
a: 1.76988e-2
b: 1.56480
c: -4.92430e-2
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.5
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.013333



CLO4-85 at exp. RT: 8.755
MSD1 85, EIC=84.7:85.7
Correlation: 0.99983
Residual Std. Dev.: 0.03473
Formula: y = ax² + bx + c
a: 5.13396e-3
b: 4.62055e-1
c: 4.97209e-4
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.5
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.013333



CLO4-89-ISTD at exp. RT: 8.766
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 1 : 1
Level 2 : 1
Level 3 : 1
Level 4 : 1
Level 5 : 1
Level 6 : 1
Level 7 : 1

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Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP2.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	7.76074e4	8.744	1.06245
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	1.35273e5	8.992	2.06969
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	3.37764e5	8.586	4.73474
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	6.83454e5	8.698	9.27727
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.08433e6	8.451	25.29036
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	4.13334e6	8.810	51.36844
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	5.99313e6	8.586	74.16754
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	7.34719e5	8.702	9.25940

#	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.36780e4	8.755	9.30535e-1
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	4.69486e4	9.012	2.24255
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	1.06124e5	8.602	4.86656
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.13523e5	8.713	9.64312
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	6.14295e5	8.468	25.12159
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	1.19814e6	8.825	50.46721
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	1.78355e6	8.603	74.72019
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.27495e5	8.721	9.54024

#	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	2.73208e5	8.766	5.00000
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	2.24886e5	9.012	5.00000
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	2.33196e5	8.609	5.00000
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.34454e5	8.716	5.00000
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.50568e5	8.472	5.00000
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	2.30977e5	8.825	5.00000
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	2.21504e5	8.610	5.00000
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.52544e5	8.725	5.00000

*** End of Report ***

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Sequence: C:\HPCHEM\1\SEQUENCE\CLO4\2019\MAR\19MAR19I.S

Sequence Table:

Method and Injection Info Part:

Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	CLO4@ 0.2ug/L	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	CLO4@ 0.5ug/L	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	CLO4@ 1.0ug/L	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	CLO4@ 2.0ug/L	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	CLO4@ 5.0ug/L	CLO4-AQN	1	Ctrl Samp		
6	Vial 76	CLO4@ 10.ug/L	CLO4-AQN	1	Ctrl Samp		
7	Vial 77	CLO4@ 25.ug/L	CLO4-AQN	1	Ctrl Samp		
8	Vial 78	CLO4@ 50.ug/L	CLO4-AQN	1	Ctrl Samp		
9	Vial 79	CLO4@ 75.ug/L	CLO4-AQN	1	Ctrl Samp		
10	Vial 80	ICAL Verf@10ug/L	CLO4-AQN	1	Ctrl Samp		

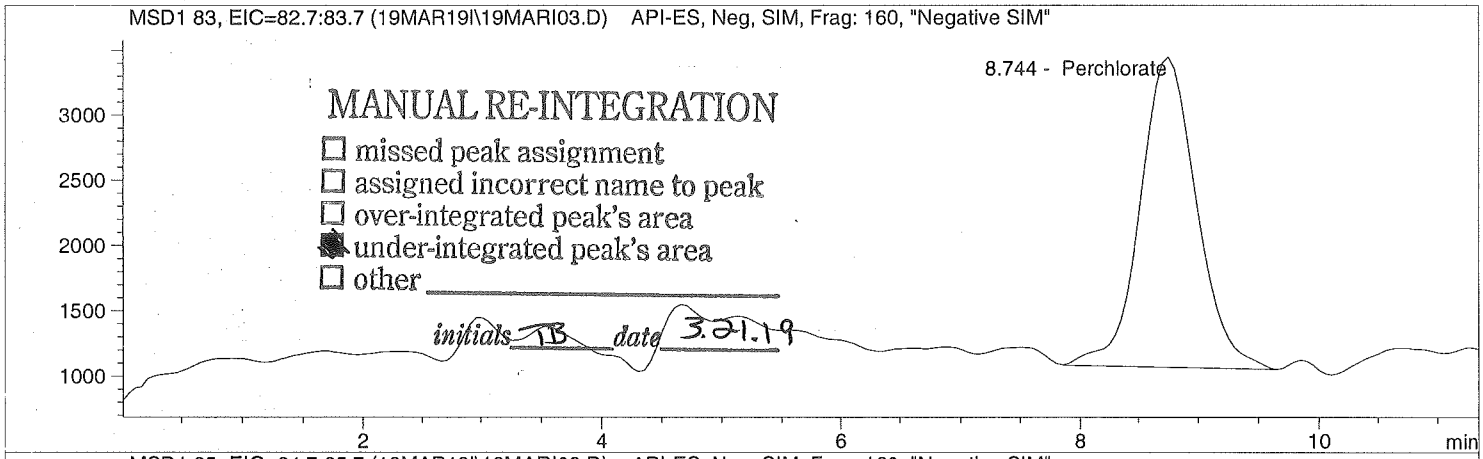
RIGHT SOLUTIONS | RIGHT PARTNER

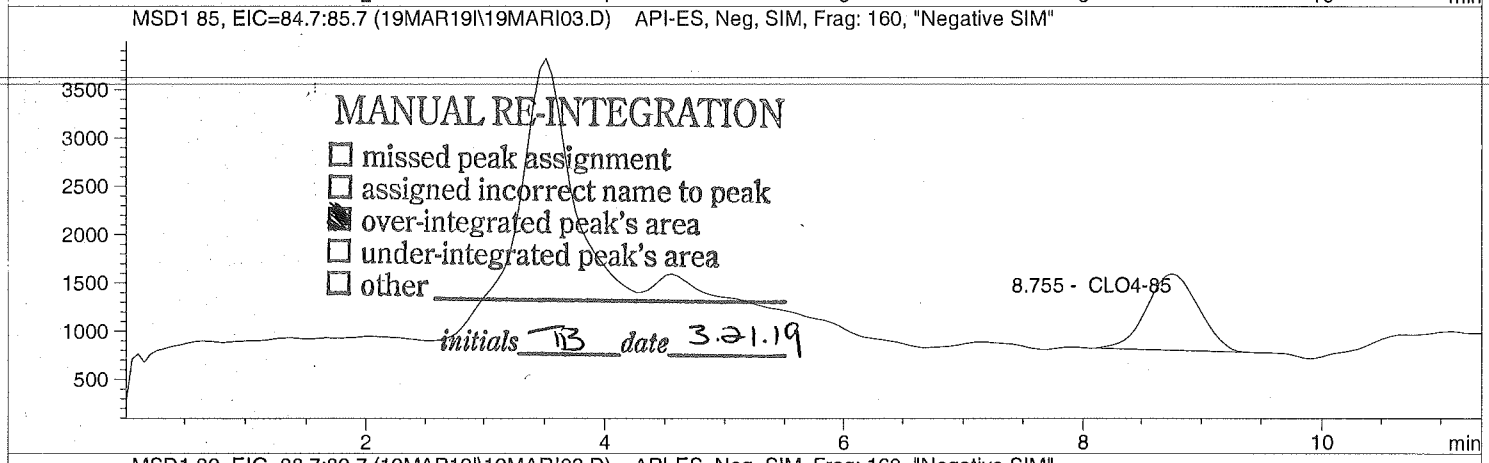
Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

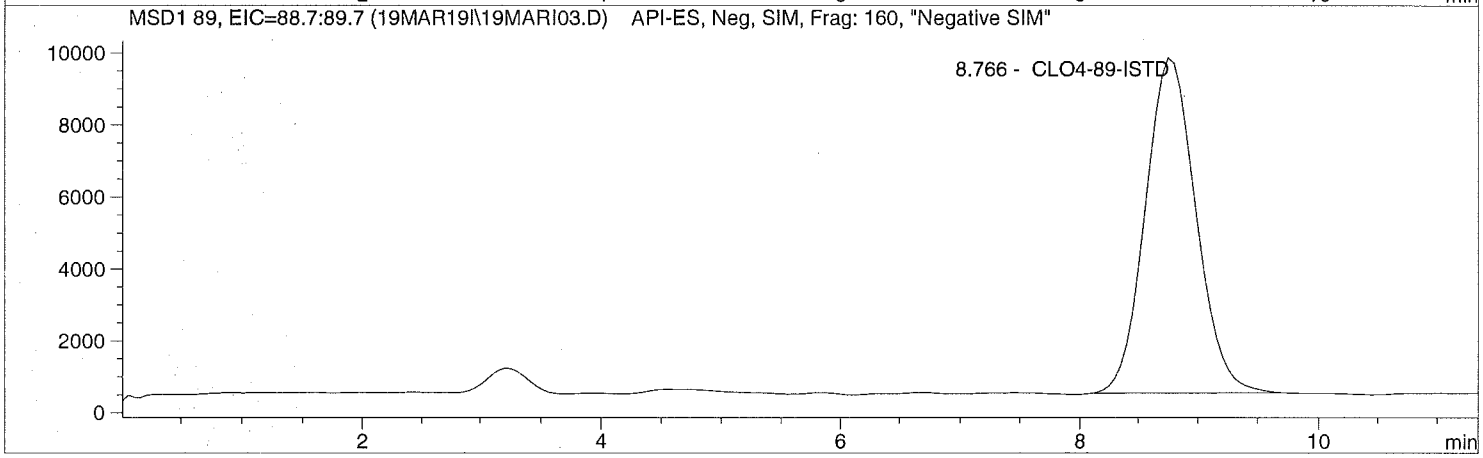
Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis







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Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 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
8.744	MM	77607.4	1.0625	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	MM	23678.0	0.9305	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

*** End of Report ***

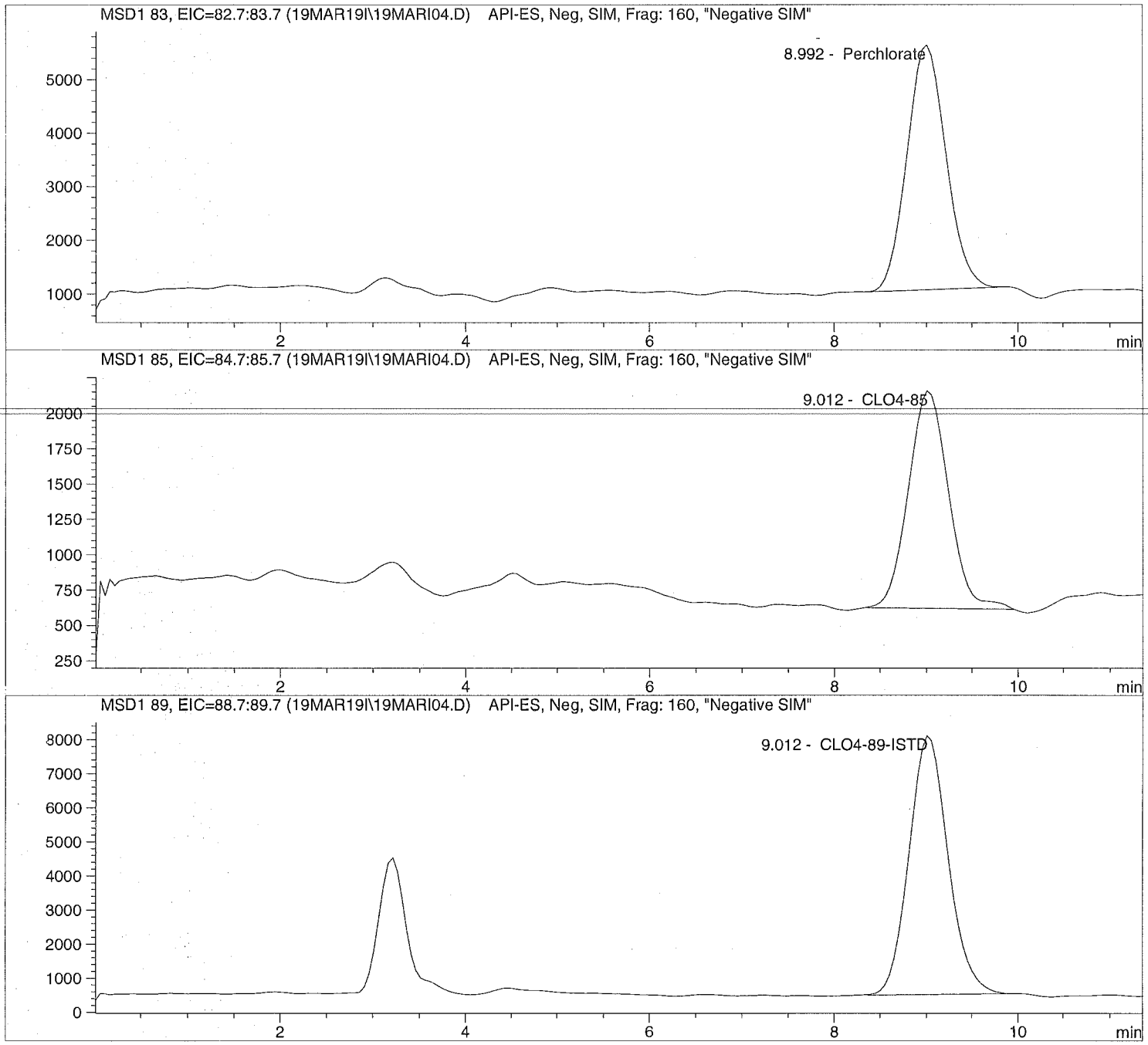
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Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	3/19/2019 09:53:00	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



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Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	3/19/2019 09:53:00	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 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
8.992	BBA	135272.8	2.0697	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	46948.6	2.2425	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	224885.9	5.0000	CLO4-89-ISTD

*** End of Report ***

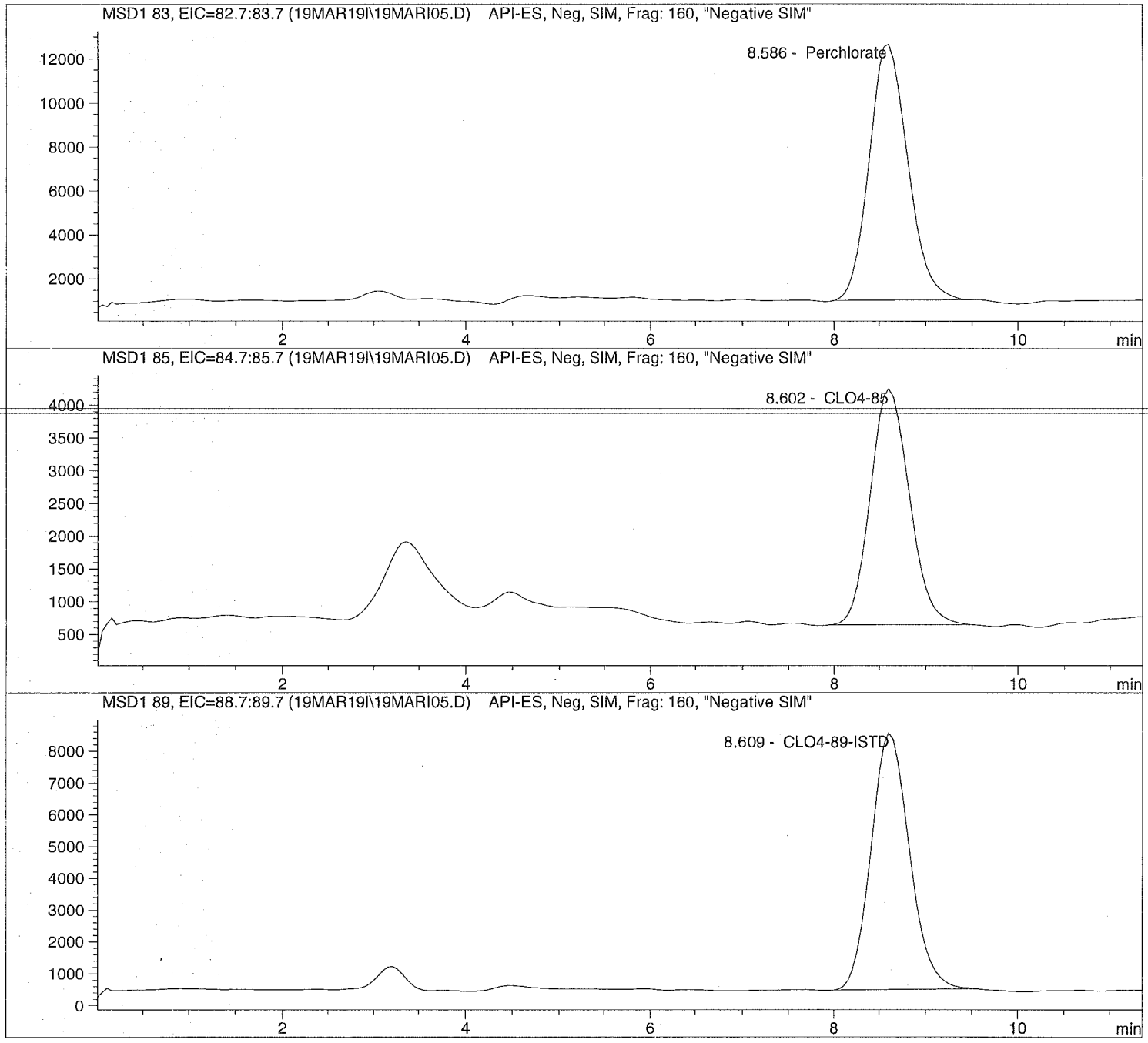
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Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	3/19/2019 10:06:16	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



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Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	3/19/2019 10:06:16	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 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
8.586	PBA	337763.6	4.7347	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.602	PBA	106124.0	4.8666	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.609	PBA	233196.3	5.0000	CLO4-89-ISTD

*** End of Report ***

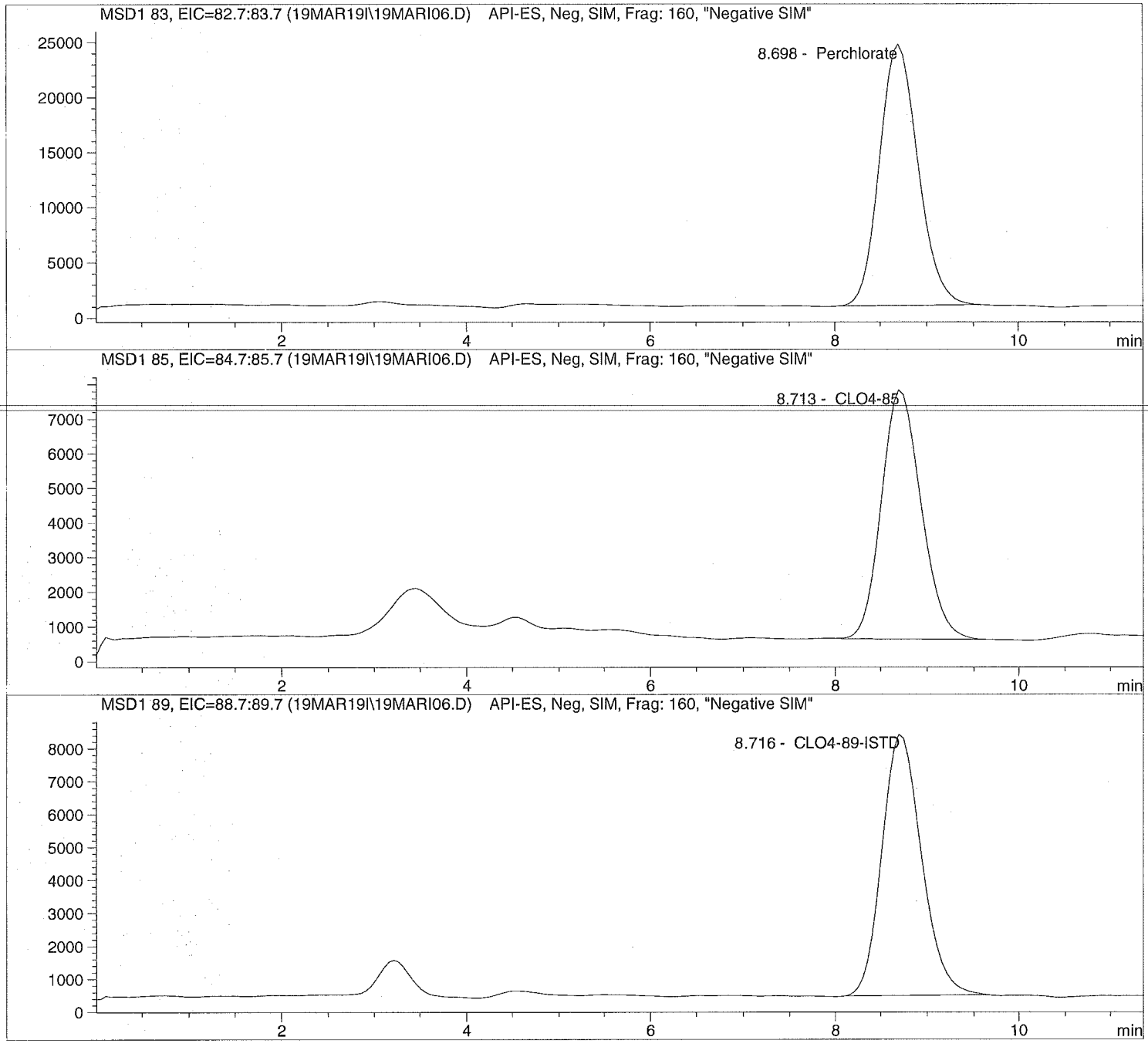
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	3/19/2019 10:19:32	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



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Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	3/19/2019 10:19:32	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 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
8.698	PBA	683454.4	9.2773	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.713	BBA	213522.6	9.6431	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.716	PBA	234453.6	5.0000	CLO4-89-ISTD

*** End of Report ***

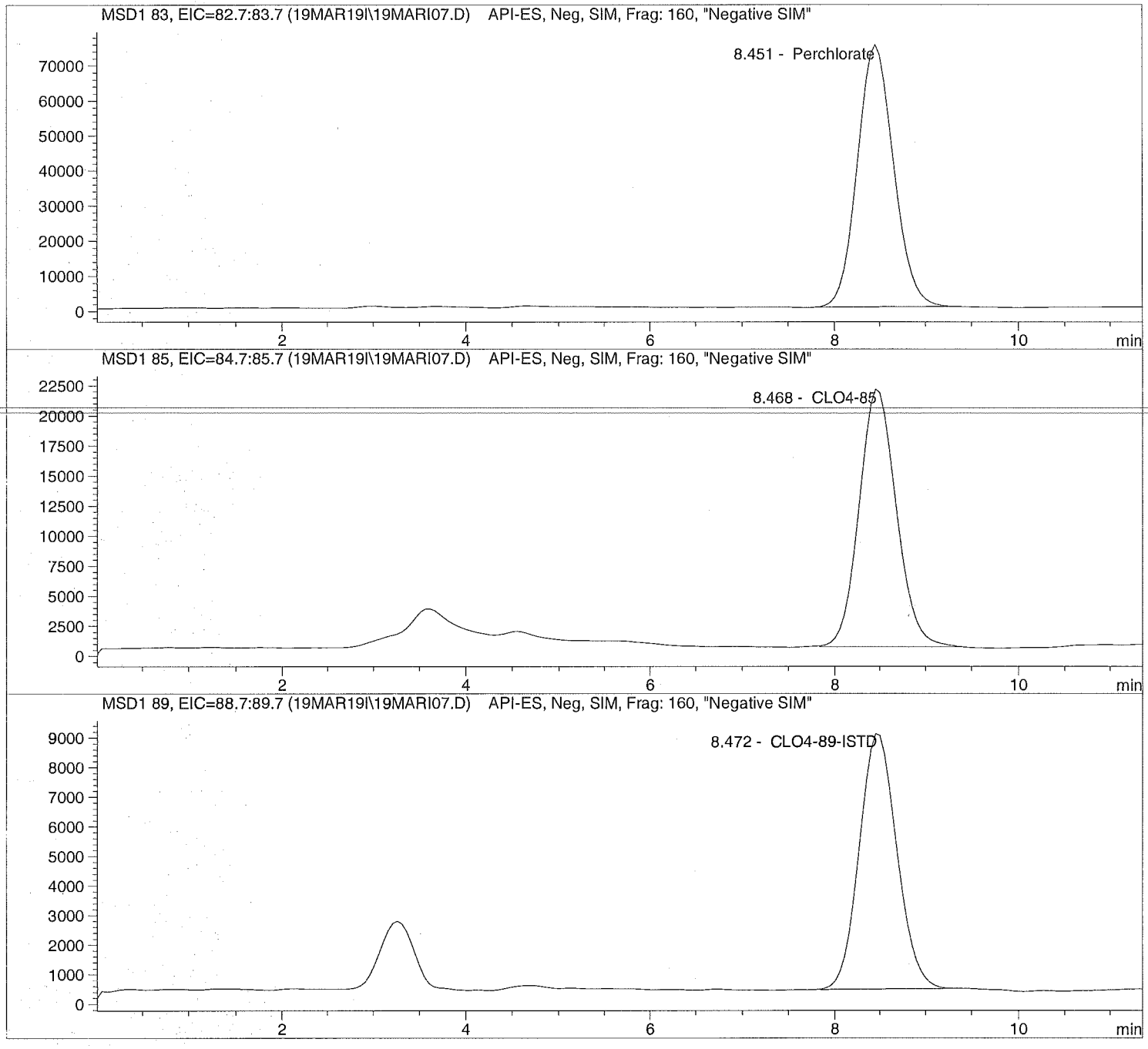
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	3/19/2019 10:32:49	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	3/19/2019 10:32:49	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-DP2.M
Last Changed:	3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 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
8.451	PBA	2084327.4	25.2904	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.468	BBA	614294.8	25.1216	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.472	BBA	250568.0	5.0000	CLO4-89-ISTD

*** End of Report ***

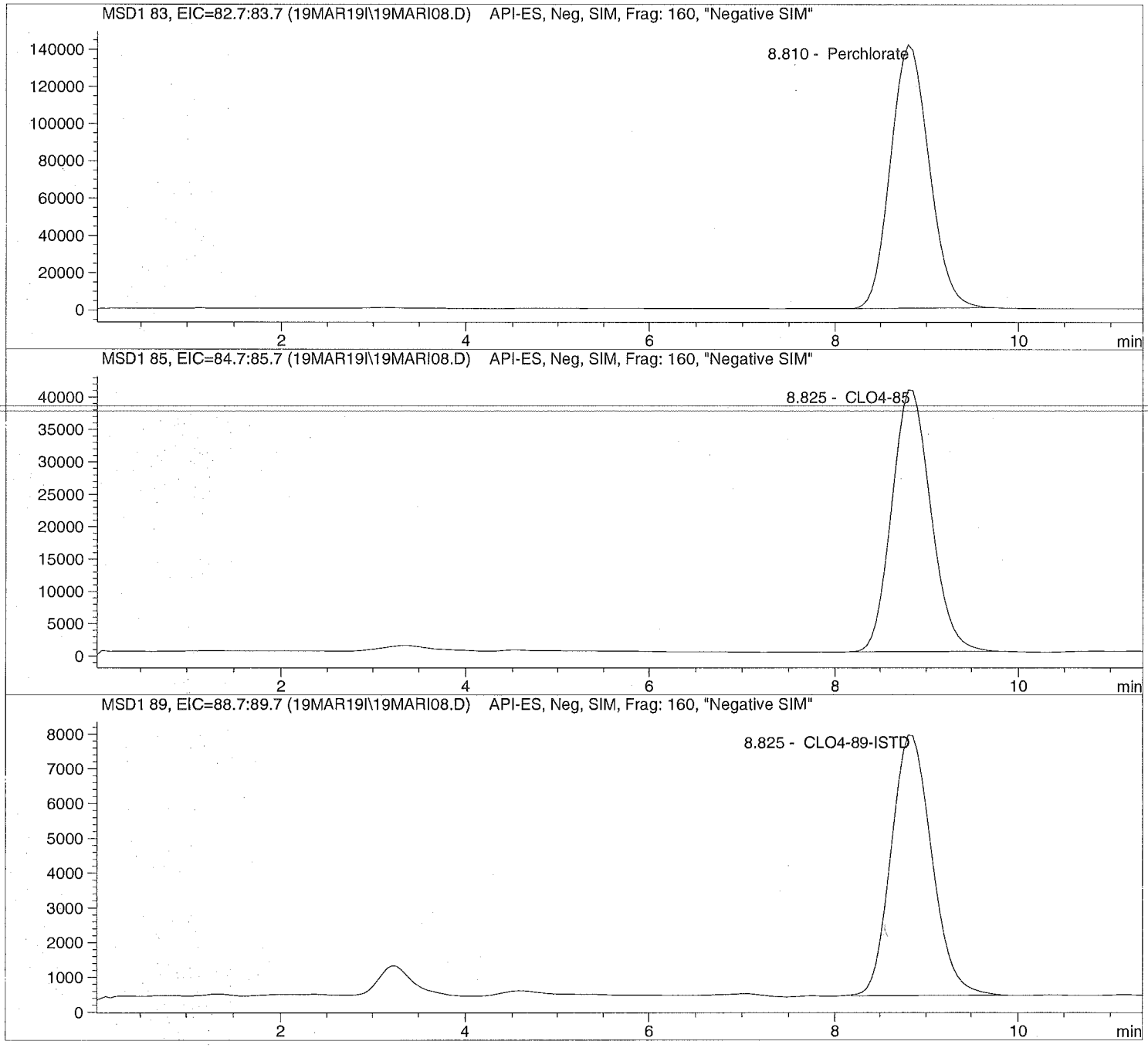
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	3/19/2019 10:46:05	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	3/19/2019 10:46:05	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 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
8.810	PBA	4133340.5	51.3684	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	1198135.6	50.4672	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	230976.7	5.0000	CLO4-89-ISTD

*** End of Report ***

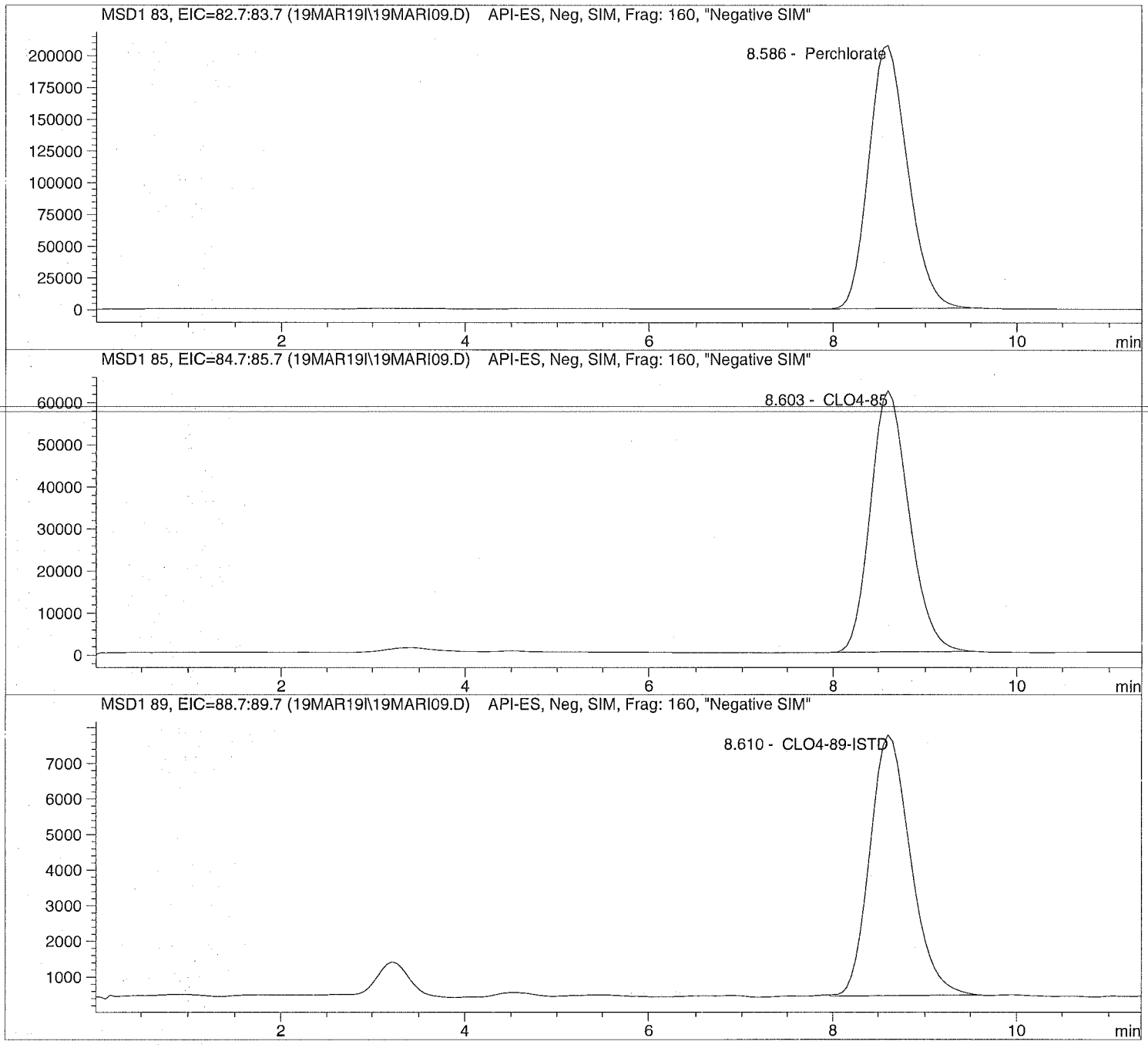
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	3/19/2019 10:59:22	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	3/19/2019 10:59:22	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 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
8.586	PBA	5993128.0	74.1675	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.603	PBA	1783554.4	74.7202	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.610	BBA	221504.5	5.0000	CLO4-89-ISTD

*** End of Report ***

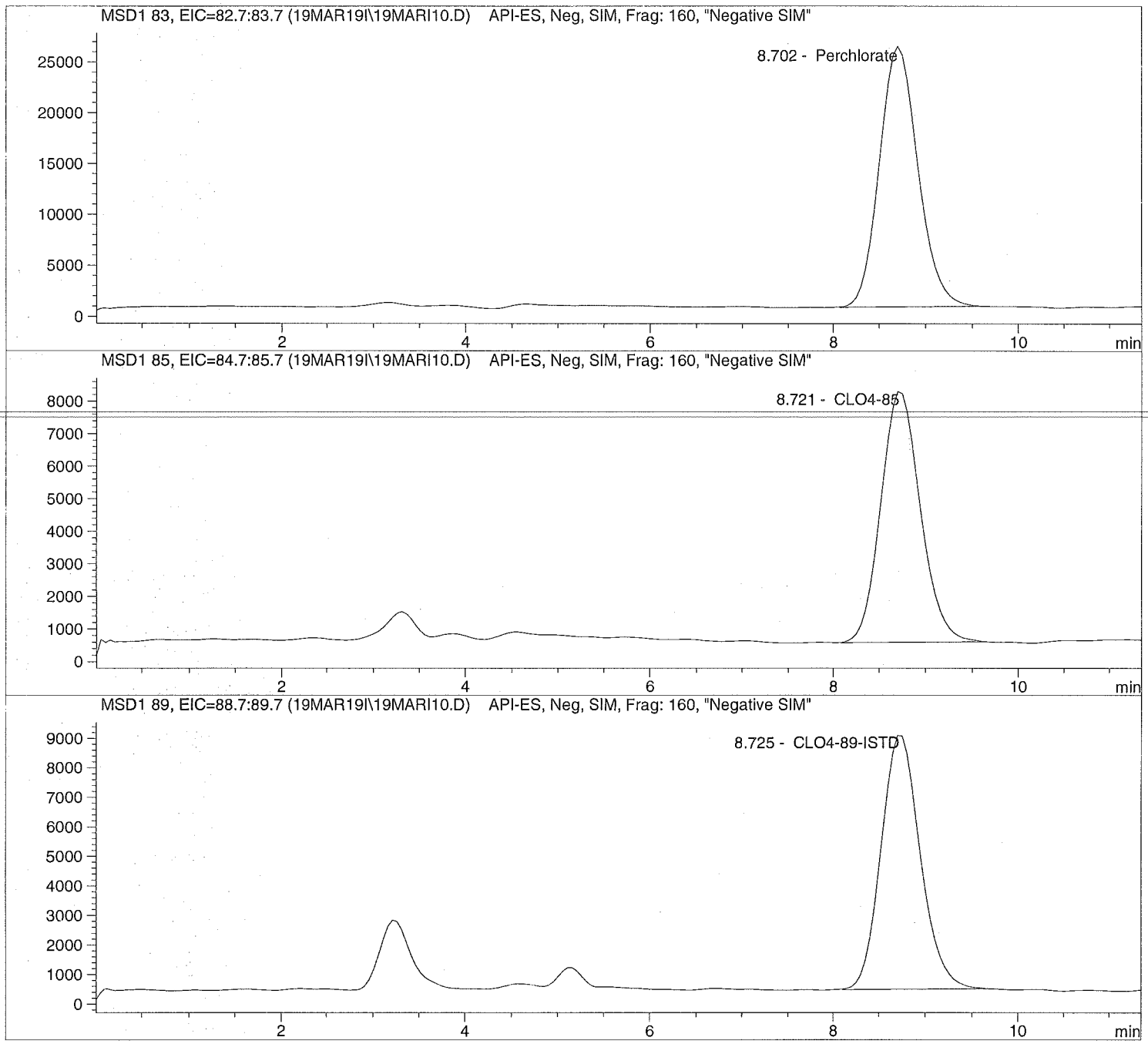
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L

Injection Date:	3/19/2019 11:12:42	Seq Line:	10
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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L

Injection Date:	3/19/2019 11:12:42	Seq Line:	10
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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 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
8.702	PBA	734718.7	9.2594	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.721	PBA	227494.7	9.5402	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.725	BBA	252544.4	5.0000	CLO4-89-ISTD

*** End of Report ***

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Unmodified

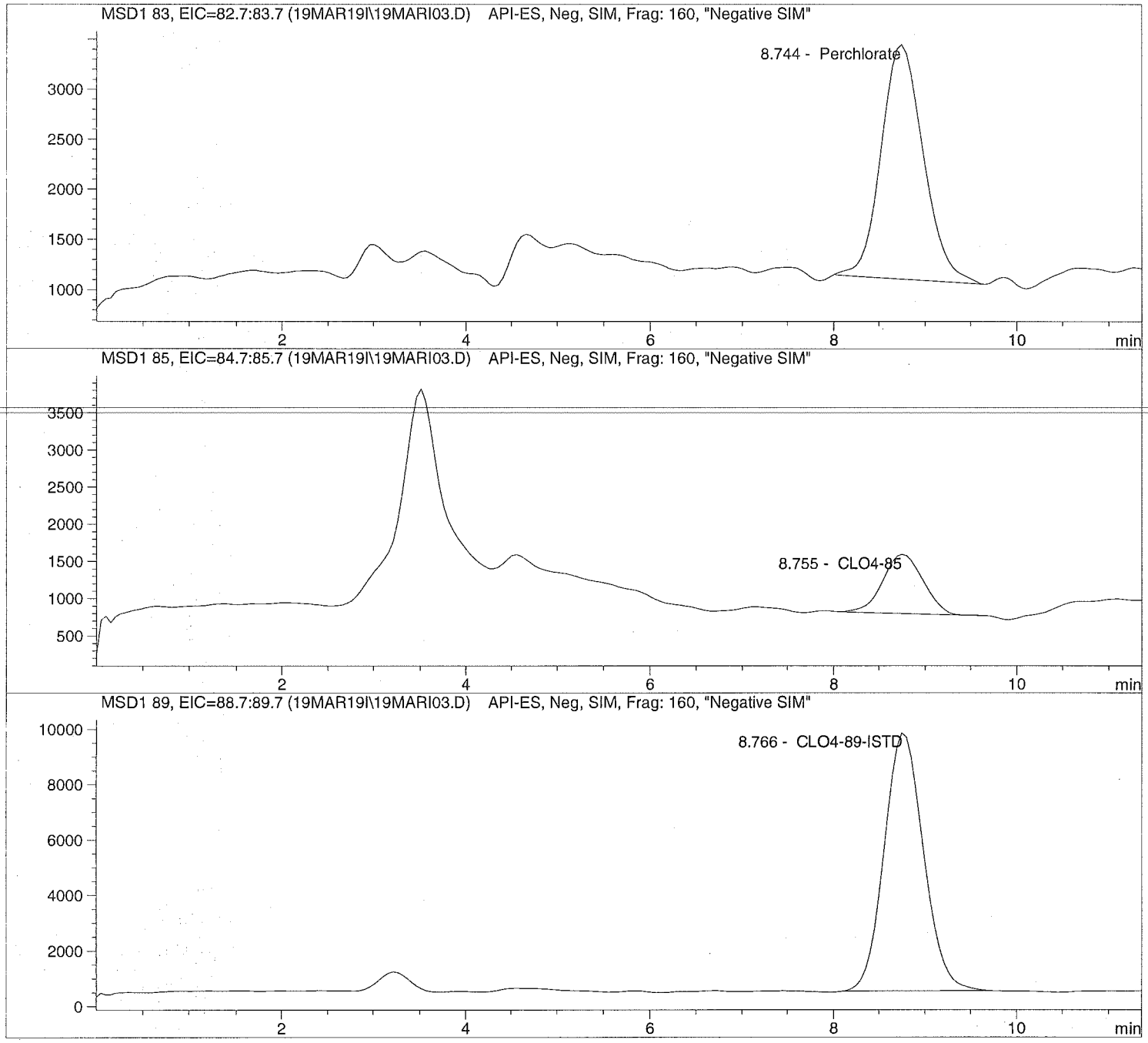
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	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-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	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-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 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
8.744	BBA	74166.3	1.0224	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	BBA	24138.1	0.9487	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

*** End of Report ***

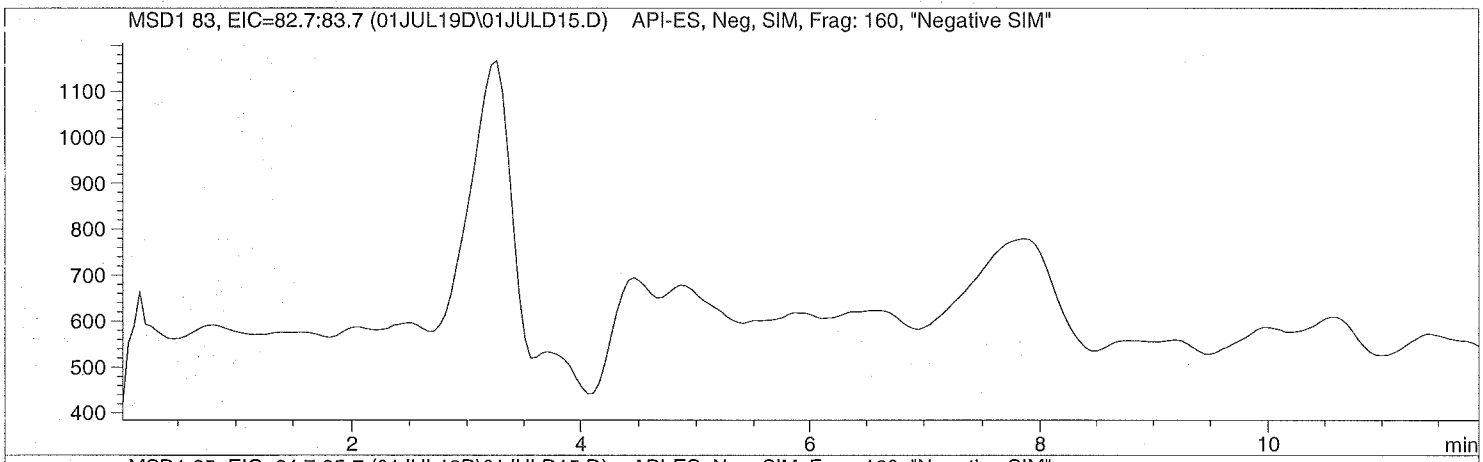
RIGHT SOLUTIONS | RIGHT PARTNER

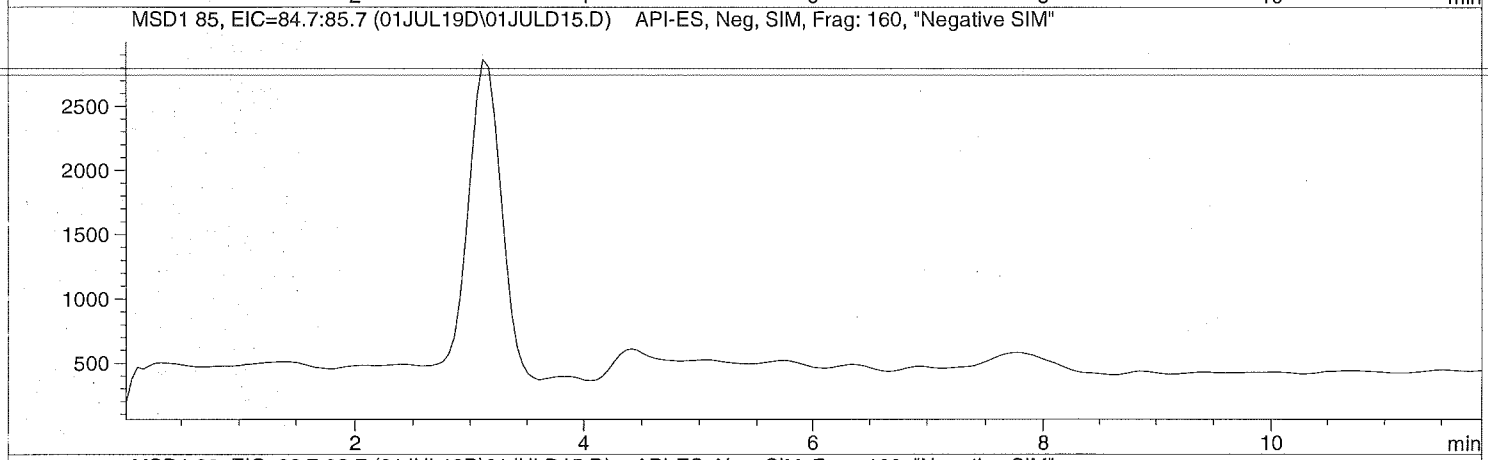
Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD15.D Sample Name: 1917856003

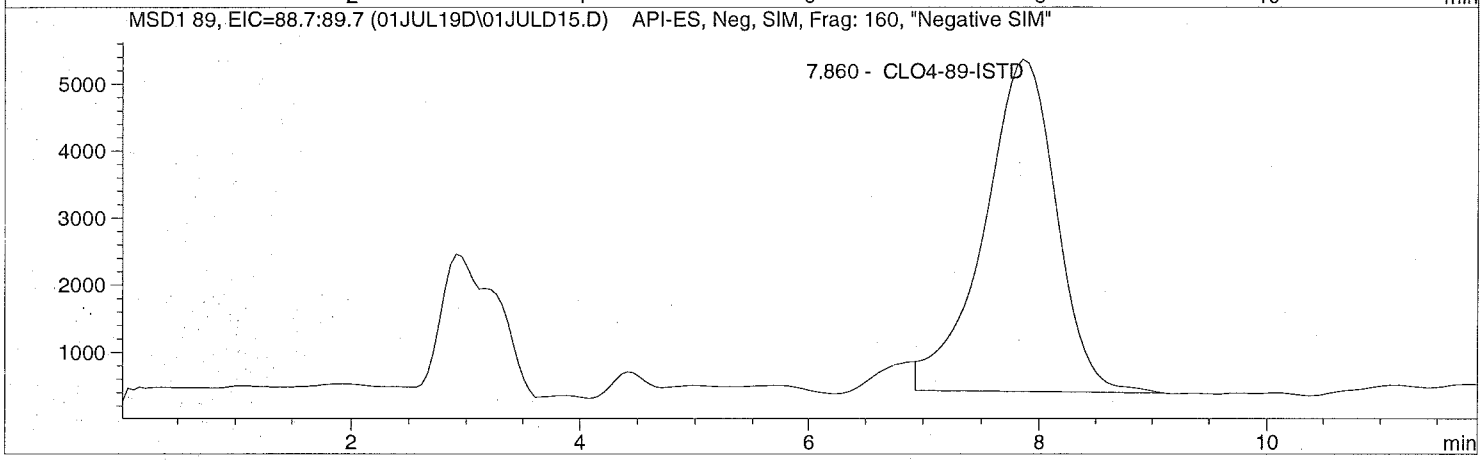
Injection Date:	7/01/2019 11:52:34	Seq Line:	15
Sample Name:	1917856003	Location:	Vial 85
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







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Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD15.D Sample Name: 1917856003

Injection Date:	7/01/2019 11:52:34	Seq Line:	15
Sample Name:	1917856003	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
7.860	BBA	216713.3	5.0000	CLO4-89-ISTD

*** End of Report ***

RIGHT SOLUTIONS | RIGHT PARTNER

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

July 11, 2019

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

Work Order: **HS19061083**

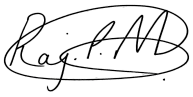
Laboratory Results for: **LHAAP 18 24**

Dear Marcia,

ALS Environmental received 8 sample(s) on Jun 20, 2019 for the analysis presented in the following report.

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

Regards,



Generated By: RJ.MODASHIA
RJ Modashia
Project Manager

ALS Houston, US Date: 11-jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Work Order: HS19061083

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19061083-01	MW2_061919	Groundwater		19-Jun-2019 08:55	20-Jun-2019 08:30	☐
HS19061083-02	MW2_061919_a	Groundwater		19-Jun-2019 08:55	20-Jun-2019 08:30	☐
HS19061083-03	18CPTMW01DW_061919	Groundwater		19-Jun-2019 09:50	20-Jun-2019 08:30	☐
HS19061083-04	18CPTMW01SW_061919	Groundwater		19-Jun-2019 10:40	20-Jun-2019 08:30	☐
HS19061083-05	18CPTMW04SW_061919	Groundwater		19-Jun-2019 11:35	20-Jun-2019 08:30	☐
HS19061083-06	18CPTMW04_061919	Groundwater		19-Jun-2019 12:25	20-Jun-2019 08:30	☐
HS19061083-07	MW1_061919	Groundwater		19-Jun-2019 13:15	20-Jun-2019 08:30	☐
HS19061083-08	Trip Blank	Water	C&G-050119-183	19-Jun-2019 00:00	20-Jun-2019 08:30	☐

Revision:2

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 11-Jul-19

Client: Bhate Environmental Associates, Inc. **CASE NARRATIVE**
Project: LHAAP 18 24
Work Order: HS19061083

Work Order Comments

- Revised to correct the reporting limit for Mercury
- Revised to updated the sample IDs for 18CPTMW01SW_061919 and 18CPTMW04SW_061919.

Work Order Comments

- The analyses for Perchlorate was subcontracted to ALS Environmental in Salt Lake City, UT. Final Report attached

GCMS Semivolatiles by Method SW8270SIM

Batch ID: 142429

Sample ID: LCSD-142429

- LCS/LCSD RPD recovered above the RPD limit. The individual recoveries met acceptance criteria (Surrogate 4-Terphenyl-d14)

GCMS Volatiles by Method SW8260

Batch ID: R341546

Sample ID: 18CPTMW015W_061919 (HS19061083-04)

- Lowest practical dilution for sample HS19061083-04 due to high concentration of non-target compound.

Sample ID: VLCSW-190628

- 1,2,3_Trichlorobenzene and Naphthalene exceeded QC limits for LCS. CCV is OK. Samples are ND for these compounds.

Sample ID: HS19061157-02MS

- MS and MSD are for an unrelated sample

Batch ID: R341659

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

Metals by Method SW6020

Batch ID: 142427

Sample ID: HS19060986-04MS

- MS and MSD are for an unrelated sample

Metals by Method SW7470

Batch ID: 142417

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 11-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: MW2_061919
Collection Date: 19-Jun-2019 08:55

ANALYTICAL REPORT
WorkOrder:HS19061083
Lab ID:HS19061083-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	25	U	15	25	50	UG/L	50	28-Jun-2019 14:01
1,1,1-Trichloroethane	25	U	10	25	50	UG/L	50	28-Jun-2019 14:01
1,1,2,2-Tetrachloroethane	25	U	25	25	50	UG/L	50	28-Jun-2019 14:01
1,1,2-Trichloroethane	25	U	15	25	50	UG/L	50	28-Jun-2019 14:01
1,1-Dichloroethane	25	U	10	25	50	UG/L	50	28-Jun-2019 14:01
1,1-Dichloroethene	25	U	10	25	50	UG/L	50	28-Jun-2019 14:01
1,1-Dichloropropene	25	U	15	25	50	UG/L	50	28-Jun-2019 14:01
1,2,3-Trichlorobenzene	25	U	20	25	50	UG/L	50	28-Jun-2019 14:01
1,2,3-Trichloropropane	25	U	25	25	50	UG/L	50	28-Jun-2019 14:01
1,2,4-Trichlorobenzene	25	U	25	25	50	UG/L	50	28-Jun-2019 14:01
1,2,4-Trimethylbenzene	25	U	15	25	50	UG/L	50	28-Jun-2019 14:01
1,2-Dibromo-3-chloropropane	25	U	10	25	50	UG/L	50	28-Jun-2019 14:01
1,2-Dibromoethane	25	U	10	25	50	UG/L	50	28-Jun-2019 14:01
1,2-Dichlorobenzene	25	U	25	25	50	UG/L	50	28-Jun-2019 14:01
1,2-Dichloroethane	25	U	10	25	50	UG/L	50	28-Jun-2019 14:01
1,2-Dichloropropane	25	U	25	25	50	UG/L	50	28-Jun-2019 14:01
1,3,5-Trimethylbenzene	25	U	15	25	50	UG/L	50	28-Jun-2019 14:01
1,3-Dichlorobenzene	25	U	20	25	50	UG/L	50	28-Jun-2019 14:01
1,3-Dichloropropane	25	U	15	25	50	UG/L	50	28-Jun-2019 14:01
1,4-Dichlorobenzene	25	U	20	25	50	UG/L	50	28-Jun-2019 14:01
2,2-Dichloropropane	25	U	10	25	50	UG/L	50	28-Jun-2019 14:01
2-Butanone	50	U	25	50	100	UG/L	50	28-Jun-2019 14:01
2-Chlorotoluene	25	U	15	25	50	UG/L	50	28-Jun-2019 14:01
2-Hexanone	50	U	50	50	100	UG/L	50	28-Jun-2019 14:01
4-Chlorotoluene	25	U	20	25	50	UG/L	50	28-Jun-2019 14:01
4-Isopropyltoluene	25	U	15	25	50	UG/L	50	28-Jun-2019 14:01
4-Methyl-2-pentanone	50	U	35	50	100	UG/L	50	28-Jun-2019 14:01
Acetone	50	U	20	50	100	UG/L	50	28-Jun-2019 14:01
Benzene	25	U	10	25	50	UG/L	50	28-Jun-2019 14:01
Bromobenzene	25	U	20	25	50	UG/L	50	28-Jun-2019 14:01
Bromochloromethane	**660**		**10**	**25**	**50**	**UG/L**	50	28-Jun-2019 14:01
Bromodichloromethane	25	U	10	25	50	UG/L	50	28-Jun-2019 14:01
Bromoform	25	U	20	25	50	UG/L	50	28-Jun-2019 14:01
Bromomethane	25	U	20	25	50	UG/L	50	28-Jun-2019 14:01
Carbon disulfide	50	U	30	50	100	UG/L	50	28-Jun-2019 14:01
Carbon tetrachloride	25	U	25	25	50	UG/L	50	28-Jun-2019 14:01
Chlorobenzene	25	U	15	25	50	UG/L	50	28-Jun-2019 14:01
Chloroethane	25	U	15	25	50	UG/L	50	28-Jun-2019 14:01
Chloroform	**75**		**10**	**25**	**50**	**UG/L**	50	28-Jun-2019 14:01

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 2

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 11-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: MW2_061919
Collection Date: 19-Jun-2019 08:55

ANALYTICAL REPORT
WorkOrder:HS19061083
Lab ID:HS19061083-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	25	U	10	25	50	UG/L	50	28-Jun-2019 14:01
cis-1,2-Dichloroethene	**58,000**		**1000**	**2500**	**5000**	**UG/L**	5000	28-Jun-2019 15:37
cis-1,3-Dichloropropene	25	U	5.0	25	50	UG/L	50	28-Jun-2019 14:01
Dibromochloromethane	25	U	15	25	50	UG/L	50	28-Jun-2019 14:01
Dibromomethane	25	U	10	25	50	UG/L	50	28-Jun-2019 14:01
Dichlorodifluoromethane	25	U	15	25	50	UG/L	50	28-Jun-2019 14:01
Ethylbenzene	**32**	J	**15**	**25**	**50**	**UG/L**	50	28-Jun-2019 14:01
Hexachlorobutadiene	50	U	50	50	50	UG/L	50	28-Jun-2019 14:01
Isopropylbenzene	25	U	15	25	50	UG/L	50	28-Jun-2019 14:01
m,p-Xylene	50	U	25	50	100	UG/L	50	28-Jun-2019 14:01
Methylene chloride	**510,000**		**2000**	**5000**	**10000**	**UG/L**	5000	28-Jun-2019 15:37
n-Butylbenzene	25	U	20	25	50	UG/L	50	28-Jun-2019 14:01
n-Propylbenzene	25	U	15	25	50	UG/L	50	28-Jun-2019 14:01
Naphthalene	25	U	15	25	50	UG/L	50	28-Jun-2019 14:01
o-Xylene	25	U	15	25	50	UG/L	50	28-Jun-2019 14:01
sec-Butylbenzene	25	U	15	25	50	UG/L	50	28-Jun-2019 14:01
Styrene	25	U	15	25	50	UG/L	50	28-Jun-2019 14:01
tert-Butylbenzene	25	U	15	25	50	UG/L	50	28-Jun-2019 14:01
Tetrachloroethene	**43**	J	**15**	**25**	**50**	**UG/L**	50	28-Jun-2019 14:01
Toluene	**30**	J	**10**	**25**	**50**	**UG/L**	50	28-Jun-2019 14:01
trans-1,2-Dichloroethene	**150**		**10**	**25**	**50**	**UG/L**	50	28-Jun-2019 14:01
trans-1,3-Dichloropropene	25	U	10	25	50	UG/L	50	28-Jun-2019 14:01
Trichloroethene	**1,400**		**10**	**25**	**50**	**UG/L**	50	28-Jun-2019 14:01
Trichlorofluoromethane	25	U	15	25	50	UG/L	50	28-Jun-2019 14:01
Vinyl chloride	25	U	10	25	50	UG/L	50	28-Jun-2019 14:01
Surr: 1,2-Dichloroethane-d4	*95.1*			**0**	*81-118*	*%REC*	*50*	*28-Jun-2019 14:01*
Surr: 1,2-Dichloroethane-d4	*101*			**0**	*81-118*	*%REC*	*5000*	*28-Jun-2019 15:37*
Surr: 4-Bromofluorobenzene	*95.2*			**0**	*85-114*	*%REC*	*5000*	*28-Jun-2019 15:37*
Surr: 4-Bromofluorobenzene	*93.6*			**0**	*85-114*	*%REC*	*50*	*28-Jun-2019 14:01*
Surr: Dibromofluoromethane	*92.7*			**0**	*80-119*	*%REC*	*50*	*28-Jun-2019 14:01*
Surr: Dibromofluoromethane	*95.6*			**0**	*80-119*	*%REC*	*5000*	*28-Jun-2019 15:37*
Surr: Toluene-d8	*93.0*			**0**	*89-112*	*%REC*	*50*	*28-Jun-2019 14:01*
Surr: Toluene-d8	*95.6*			**0**	*89-112*	*%REC*	*5000*	*28-Jun-2019 15:37*
SEMIVOLATILES SIM	**Method:SW8270SIM**					Prep:SW3510 / 25-Jun-2019		Analyst: LG
1,4-Dioxane	**3.5**		**0.20**	**0.20**	**0.20**	**ug/L**	20	28-Jun-2019 16:20
Surr: 2-Fluorobiphenyl	*112*			**0**	*40-140*	*%REC*	*20*	*28-Jun-2019 16:20*
Surr: 4-Terphenyl-d14	*138*			**0**	*40-140*	*%REC*	*20*	*28-Jun-2019 16:20*
Surr: Nitrobenzene-d5	*78.3*			**0**	*40-140*	*%REC*	*20*	*28-Jun-2019 16:20*

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 2

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 11-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: MW2_061919
Collection Date: 19-Jun-2019 08:55

ANALYTICAL REPORT
WorkOrder:HS19061083
Lab ID:HS19061083-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	05-Jul-2019 14:42

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 2

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 11-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: MW2_061919_a
Collection Date: 19-Jun-2019 08:55

ANALYTICAL REPORT
WorkOrder:HS19061083
Lab ID:HS19061083-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	25	U	15	25	50	UG/L	50	28-Jun-2019 14:25
1,1,1-Trichloroethane	25	U	10	25	50	UG/L	50	28-Jun-2019 14:25
1,1,2,2-Tetrachloroethane	25	U	25	25	50	UG/L	50	28-Jun-2019 14:25
1,1,2-Trichloroethane	25	U	15	25	50	UG/L	50	28-Jun-2019 14:25
1,1-Dichloroethane	25	U	10	25	50	UG/L	50	28-Jun-2019 14:25
1,1-Dichloroethene	25	U	10	25	50	UG/L	50	28-Jun-2019 14:25
1,1-Dichloropropene	25	U	15	25	50	UG/L	50	28-Jun-2019 14:25
1,2,3-Trichlorobenzene	25	U	20	25	50	UG/L	50	28-Jun-2019 14:25
1,2,3-Trichloropropane	25	U	25	25	50	UG/L	50	28-Jun-2019 14:25
1,2,4-Trichlorobenzene	25	U	25	25	50	UG/L	50	28-Jun-2019 14:25
1,2,4-Trimethylbenzene	25	U	15	25	50	UG/L	50	28-Jun-2019 14:25
1,2-Dibromo-3-chloropropane	25	U	10	25	50	UG/L	50	28-Jun-2019 14:25
1,2-Dibromoethane	25	U	10	25	50	UG/L	50	28-Jun-2019 14:25
1,2-Dichlorobenzene	25	U	25	25	50	UG/L	50	28-Jun-2019 14:25
1,2-Dichloroethane	25	U	10	25	50	UG/L	50	28-Jun-2019 14:25
1,2-Dichloropropane	25	U	25	25	50	UG/L	50	28-Jun-2019 14:25
1,3,5-Trimethylbenzene	25	U	15	25	50	UG/L	50	28-Jun-2019 14:25
1,3-Dichlorobenzene	25	U	20	25	50	UG/L	50	28-Jun-2019 14:25
1,3-Dichloropropane	25	U	15	25	50	UG/L	50	28-Jun-2019 14:25
1,4-Dichlorobenzene	25	U	20	25	50	UG/L	50	28-Jun-2019 14:25
2,2-Dichloropropane	25	U	10	25	50	UG/L	50	28-Jun-2019 14:25
2-Butanone	50	U	25	50	100	UG/L	50	28-Jun-2019 14:25
2-Chlorotoluene	25	U	15	25	50	UG/L	50	28-Jun-2019 14:25
2-Hexanone	50	U	50	50	100	UG/L	50	28-Jun-2019 14:25
4-Chlorotoluene	25	U	20	25	50	UG/L	50	28-Jun-2019 14:25
4-Isopropyltoluene	25	U	15	25	50	UG/L	50	28-Jun-2019 14:25
4-Methyl-2-pentanone	50	U	35	50	100	UG/L	50	28-Jun-2019 14:25
Acetone	50	U	20	50	100	UG/L	50	28-Jun-2019 14:25
Benzene	25	U	10	25	50	UG/L	50	28-Jun-2019 14:25
Bromobenzene	25	U	20	25	50	UG/L	50	28-Jun-2019 14:25
Bromochloromethane	**460**		**10**	**25**	**50**	**UG/L**	50	28-Jun-2019 14:25
Bromodichloromethane	25	U	10	25	50	UG/L	50	28-Jun-2019 14:25
Bromoform	25	U	20	25	50	UG/L	50	28-Jun-2019 14:25
Bromomethane	25	U	20	25	50	UG/L	50	28-Jun-2019 14:25
Carbon disulfide	50	U	30	50	100	UG/L	50	28-Jun-2019 14:25
Carbon tetrachloride	25	U	25	25	50	UG/L	50	28-Jun-2019 14:25
Chlorobenzene	25	U	15	25	50	UG/L	50	28-Jun-2019 14:25
Chloroethane	25	U	15	25	50	UG/L	50	28-Jun-2019 14:25
Chloroform	**74**		**10**	**25**	**50**	**UG/L**	50	28-Jun-2019 14:25

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 2

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 11-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: MW2_061919_a
Collection Date: 19-Jun-2019 08:55

ANALYTICAL REPORT
WorkOrder:HS19061083
Lab ID:HS19061083-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	25	U	10	25	50	UG/L	50	28-Jun-2019 14:25
cis-1,2-Dichloroethene	**59,000**		**1000**	**2500**	**5000**	**UG/L**	5000	28-Jun-2019 16:01
cis-1,3-Dichloropropene	25	U	5.0	25	50	UG/L	50	28-Jun-2019 14:25
Dibromochloromethane	25	U	15	25	50	UG/L	50	28-Jun-2019 14:25
Dibromomethane	25	U	10	25	50	UG/L	50	28-Jun-2019 14:25
Dichlorodifluoromethane	25	U	15	25	50	UG/L	50	28-Jun-2019 14:25
Ethylbenzene	**33**	J	**15**	**25**	**50**	**UG/L**	50	28-Jun-2019 14:25
Hexachlorobutadiene	50	U	50	50	50	UG/L	50	28-Jun-2019 14:25
Isopropylbenzene	25	U	15	25	50	UG/L	50	28-Jun-2019 14:25
m,p-Xylene	50	U	25	50	100	UG/L	50	28-Jun-2019 14:25
Methylene chloride	**500,000**		**2000**	**5000**	**10000**	**UG/L**	5000	28-Jun-2019 16:01
n-Butylbenzene	25	U	20	25	50	UG/L	50	28-Jun-2019 14:25
n-Propylbenzene	25	U	15	25	50	UG/L	50	28-Jun-2019 14:25
Naphthalene	25	U	15	25	50	UG/L	50	28-Jun-2019 14:25
o-Xylene	25	U	15	25	50	UG/L	50	28-Jun-2019 14:25
sec-Butylbenzene	25	U	15	25	50	UG/L	50	28-Jun-2019 14:25
Styrene	25	U	15	25	50	UG/L	50	28-Jun-2019 14:25
tert-Butylbenzene	25	U	15	25	50	UG/L	50	28-Jun-2019 14:25
Tetrachloroethene	**44**	J	**15**	**25**	**50**	**UG/L**	50	28-Jun-2019 14:25
Toluene	**31**	J	**10**	**25**	**50**	**UG/L**	50	28-Jun-2019 14:25
trans-1,2-Dichloroethene	**150**		**10**	**25**	**50**	**UG/L**	50	28-Jun-2019 14:25
trans-1,3-Dichloropropene	25	U	10	25	50	UG/L	50	28-Jun-2019 14:25
Trichloroethene	**1,400**		**10**	**25**	**50**	**UG/L**	50	28-Jun-2019 14:25
Trichlorofluoromethane	25	U	15	25	50	UG/L	50	28-Jun-2019 14:25
Vinyl chloride	25	U	10	25	50	UG/L	50	28-Jun-2019 14:25
Surr: 1,2-Dichloroethane-d4	*101*			**0**	*81-118*	*%REC*	*5000*	*28-Jun-2019 16:01*
Surr: 1,2-Dichloroethane-d4	*95.4*			**0**	*81-118*	*%REC*	*50*	*28-Jun-2019 14:25*
Surr: 4-Bromofluorobenzene	*90.8*			**0**	*85-114*	*%REC*	*50*	*28-Jun-2019 14:25*
Surr: 4-Bromofluorobenzene	*96.9*			**0**	*85-114*	*%REC*	*5000*	*28-Jun-2019 16:01*
Surr: Dibromofluoromethane	*92.4*			**0**	*80-119*	*%REC*	*50*	*28-Jun-2019 14:25*
Surr: Dibromofluoromethane	*95.3*			**0**	*80-119*	*%REC*	*5000*	*28-Jun-2019 16:01*
Surr: Toluene-d8	*91.9*			**0**	*89-112*	*%REC*	*50*	*28-Jun-2019 14:25*
Surr: Toluene-d8	*96.9*			**0**	*89-112*	*%REC*	*5000*	*28-Jun-2019 16:01*
SEMIVOLATILES SIM		**Method:SW8270SIM**				Prep:SW3510 / 25-Jun-2019		Analyst: LG
1,4-Dioxane	**6.2**		**0.20**	**0.20**	**0.20**	**ug/L**	20	28-Jun-2019 16:41
Surr: 2-Fluorobiphenyl	*111*			**0**	*40-140*	*%REC*	*20*	*28-Jun-2019 16:41*
Surr: 4-Terphenyl-d14	*120*			**0**	*40-140*	*%REC*	*20*	*28-Jun-2019 16:41*
Surr: Nitrobenzene-d5	*106*			**0**	*40-140*	*%REC*	*20*	*28-Jun-2019 16:41*

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 2

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 11-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: MW2_061919_a
Collection Date: 19-Jun-2019 08:55

ANALYTICAL REPORT
WorkOrder:HS19061083
Lab ID:HS19061083-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	05-Jul-2019 14:42

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 2

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 11-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW01DW_061919
Collection Date: 19-Jun-2019 09:50

ANALYTICAL REPORT
WorkOrder:HS19061083
Lab ID:HS19061083-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:48
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:48
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 18:48
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:48
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:48
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:48
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:48
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 18:48
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 18:48
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 18:48
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:48
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:48
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:48
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 18:48
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:48
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 18:48
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:48
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 18:48
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:48
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 18:48
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:48
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	28-Jun-2019 18:48
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:48
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	28-Jun-2019 18:48
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 18:48
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:48
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	28-Jun-2019 18:48
Acetone	**5.1**		**0.40**	**1.0**	**2.0**	**UG/L**	1	28-Jun-2019 18:48
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:48
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 18:48
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:48
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:48
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 18:48
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 18:48
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	28-Jun-2019 18:48
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 18:48
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:48
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:48
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:48

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 2

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 11-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW01DW_061919
Collection Date: 19-Jun-2019 09:50

ANALYTICAL REPORT
WorkOrder:HS19061083
Lab ID:HS19061083-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:48
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:48
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	28-Jun-2019 18:48
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:48
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:48
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:48
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:48
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	28-Jun-2019 18:48
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:48
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	28-Jun-2019 18:48
Methylene chloride	**1.1**	J	**0.40**	**1.0**	**2.0**	**UG/L**	1	28-Jun-2019 18:48
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 18:48
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:48
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:48
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:48
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:48
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:48
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:48
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:48
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:48
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:48
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:48
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:48
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:48
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:48
Surr: 1,2-Dichloroethane-d4	*101*			**0**	*81-118*	*%REC*	*1*	*28-Jun-2019 18:48*
Surr: 4-Bromofluorobenzene	*94.2*			**0**	*85-114*	*%REC*	*1*	*28-Jun-2019 18:48*
Surr: Dibromofluoromethane	*95.1*			**0**	*80-119*	*%REC*	*1*	*28-Jun-2019 18:48*
Surr: Toluene-d8	*94.4*			**0**	*89-112*	*%REC*	*1*	*28-Jun-2019 18:48*
SEMIVOLATILES SIM		**Method:SW8270SIM**				Prep:SW3510 / 25-Jun-2019		Analyst: LG
1,4-Dioxane	**0.27**		**0.010**	**0.010**	**0.010**	**ug/L**	1	28-Jun-2019 00:21
Surr: 2-Fluorobiphenyl	*87.1*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 00:21*
Surr: 4-Terphenyl-d14	*113*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 00:21*
Surr: Nitrobenzene-d5	*110*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 00:21*

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 2

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 11-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW01DW_061919
Collection Date: 19-Jun-2019 09:50

ANALYTICAL REPORT
WorkOrder:HS19061083
Lab ID:HS19061083-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 25-Jun-2019		Analyst: JHD
Aluminum	**0.110**		**0.00180**	**0.00500**	**0.0100**	**mg/L**	1	27-Jun-2019 18:00
Antimony	**0.000408**	J	**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 18:00
Arsenic	**0.00152**	J	**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 18:00
Barium	**0.412**		**0.00190**	**0.00250**	**0.00500**	**mg/L**	1	27-Jun-2019 18:00
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	28-Jun-2019 15:53
Cadmium	**0.000345**	J	**0.000200**	**0.000500**	**0.00200**	**mg/L**	1	27-Jun-2019 18:00
Calcium	**40.3**		**0.0340**	**0.0500**	**0.500**	**mg/L**	1	27-Jun-2019 18:00
Chromium	**0.0949**		**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 18:00
Cobalt	**0.00121**	J	**0.000100**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 18:00
Copper	**0.00332**	J	**0.00100**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 18:00
Iron	**1.65**		**0.0120**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 18:00
Lead	**0.00104**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 18:00
Magnesium	**11.7**		**0.0100**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 18:00
Manganese	**0.115**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 18:00
Nickel	**0.00669**		**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 18:00
Potassium	**147**		**0.0180**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 18:00
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	27-Jun-2019 18:00
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	27-Jun-2019 18:00
Sodium	**370**		**0.140**	**0.500**	**2.00**	**mg/L**	10	28-Jun-2019 15:54
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Jun-2019 18:00
Vanadium	**0.00102**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 18:00
Zinc	**0.0266**		**0.00200**	**0.00200**	**0.00500**	**mg/L**	1	27-Jun-2019 18:00
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 25-Jun-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	25-Jun-2019 15:17
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	05-Jul-2019 14:42

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 2

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 11-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW01SW_061919
Collection Date: 19-Jun-2019 10:40

ANALYTICAL REPORT
WorkOrder:HS19061083
Lab ID:HS19061083-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	12	U	7.5	12	25	UG/L	25	28-Jun-2019 20:00
1,1,1-Trichloroethane	12	U	5.0	12	25	UG/L	25	28-Jun-2019 20:00
1,1,2,2-Tetrachloroethane	12	U	12	12	25	UG/L	25	28-Jun-2019 20:00
1,1,2-Trichloroethane	12	U	7.5	12	25	UG/L	25	28-Jun-2019 20:00
1,1-Dichloroethane	12	U	5.0	12	25	UG/L	25	28-Jun-2019 20:00
1,1-Dichloroethene	12	U	5.0	12	25	UG/L	25	28-Jun-2019 20:00
1,1-Dichloropropene	12	U	7.5	12	25	UG/L	25	28-Jun-2019 20:00
1,2,3-Trichlorobenzene	12	U	10	12	25	UG/L	25	28-Jun-2019 20:00
1,2,3-Trichloropropane	12	U	12	12	25	UG/L	25	28-Jun-2019 20:00
1,2,4-Trichlorobenzene	12	U	12	12	25	UG/L	25	28-Jun-2019 20:00
1,2,4-Trimethylbenzene	12	U	7.5	12	25	UG/L	25	28-Jun-2019 20:00
1,2-Dibromo-3-chloropropane	12	U	5.0	12	25	UG/L	25	28-Jun-2019 20:00
1,2-Dibromoethane	12	U	5.0	12	25	UG/L	25	28-Jun-2019 20:00
1,2-Dichlorobenzene	12	U	12	12	25	UG/L	25	28-Jun-2019 20:00
1,2-Dichloroethane	12	U	5.0	12	25	UG/L	25	28-Jun-2019 20:00
1,2-Dichloropropane	12	U	12	12	25	UG/L	25	28-Jun-2019 20:00
1,3,5-Trimethylbenzene	12	U	7.5	12	25	UG/L	25	28-Jun-2019 20:00
1,3-Dichlorobenzene	12	U	10	12	25	UG/L	25	28-Jun-2019 20:00
1,3-Dichloropropane	12	U	7.5	12	25	UG/L	25	28-Jun-2019 20:00
1,4-Dichlorobenzene	12	U	10	12	25	UG/L	25	28-Jun-2019 20:00
2,2-Dichloropropane	12	U	5.0	12	25	UG/L	25	28-Jun-2019 20:00
2-Butanone	25	U	12	25	50	UG/L	25	28-Jun-2019 20:00
2-Chlorotoluene	12	U	7.5	12	25	UG/L	25	28-Jun-2019 20:00
2-Hexanone	25	U	25	25	50	UG/L	25	28-Jun-2019 20:00
4-Chlorotoluene	12	U	10	12	25	UG/L	25	28-Jun-2019 20:00
4-Isopropyltoluene	12	U	7.5	12	25	UG/L	25	28-Jun-2019 20:00
4-Methyl-2-pentanone	25	U	18	25	50	UG/L	25	28-Jun-2019 20:00
Acetone	25	U	10	25	50	UG/L	25	28-Jun-2019 20:00
Benzene	12	U	5.0	12	25	UG/L	25	28-Jun-2019 20:00
Bromobenzene	12	U	10	12	25	UG/L	25	28-Jun-2019 20:00
Bromochloromethane	12	U	5.0	12	25	UG/L	25	28-Jun-2019 20:00
Bromodichloromethane	12	U	5.0	12	25	UG/L	25	28-Jun-2019 20:00
Bromoform	12	U	10	12	25	UG/L	25	28-Jun-2019 20:00
Bromomethane	12	U	10	12	25	UG/L	25	28-Jun-2019 20:00
Carbon disulfide	25	U	15	25	50	UG/L	25	28-Jun-2019 20:00
Carbon tetrachloride	12	U	12	12	25	UG/L	25	28-Jun-2019 20:00
Chlorobenzene	12	U	7.5	12	25	UG/L	25	28-Jun-2019 20:00
Chloroethane	12	U	7.5	12	25	UG/L	25	28-Jun-2019 20:00
Chloroform	12	U	5.0	12	25	UG/L	25	28-Jun-2019 20:00

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 2

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 11-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW01SW_061919
Collection Date: 19-Jun-2019 10:40

ANALYTICAL REPORT
WorkOrder:HS19061083
Lab ID:HS19061083-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	12	U	5.0	12	25	UG/L	25	28-Jun-2019 20:00
cis-1,2-Dichloroethene	12	U	5.0	12	25	UG/L	25	28-Jun-2019 20:00
cis-1,3-Dichloropropene	12	U	2.5	12	25	UG/L	25	28-Jun-2019 20:00
Dibromochloromethane	12	U	7.5	12	25	UG/L	25	28-Jun-2019 20:00
Dibromomethane	12	U	5.0	12	25	UG/L	25	28-Jun-2019 20:00
Dichlorodifluoromethane	12	U	7.5	12	25	UG/L	25	28-Jun-2019 20:00
Ethylbenzene	12	U	7.5	12	25	UG/L	25	28-Jun-2019 20:00
Hexachlorobutadiene	25	U	25	25	25	UG/L	25	28-Jun-2019 20:00
Isopropylbenzene	12	U	7.5	12	25	UG/L	25	28-Jun-2019 20:00
m,p-Xylene	25	U	12	25	50	UG/L	25	28-Jun-2019 20:00
Methylene chloride	**100**		**10**	**25**	**50**	**UG/L**	25	28-Jun-2019 20:00
n-Butylbenzene	12	U	10	12	25	UG/L	25	28-Jun-2019 20:00
n-Propylbenzene	12	U	7.5	12	25	UG/L	25	28-Jun-2019 20:00
Naphthalene	12	U	7.5	12	25	UG/L	25	28-Jun-2019 20:00
o-Xylene	12	U	7.5	12	25	UG/L	25	28-Jun-2019 20:00
sec-Butylbenzene	12	U	7.5	12	25	UG/L	25	28-Jun-2019 20:00
Styrene	12	U	7.5	12	25	UG/L	25	28-Jun-2019 20:00
tert-Butylbenzene	12	U	7.5	12	25	UG/L	25	28-Jun-2019 20:00
Tetrachloroethene	12	U	7.5	12	25	UG/L	25	28-Jun-2019 20:00
Toluene	12	U	5.0	12	25	UG/L	25	28-Jun-2019 20:00
trans-1,2-Dichloroethene	12	U	5.0	12	25	UG/L	25	28-Jun-2019 20:00
trans-1,3-Dichloropropene	12	U	5.0	12	25	UG/L	25	28-Jun-2019 20:00
Trichloroethene	**32**		**5.0**	**12**	**25**	**UG/L**	25	28-Jun-2019 20:00
Trichlorofluoromethane	12	U	7.5	12	25	UG/L	25	28-Jun-2019 20:00
Vinyl chloride	12	U	5.0	12	25	UG/L	25	28-Jun-2019 20:00
Surr: 1,2-Dichloroethane-d4	*104*			**0**	*81-118*	*%REC*	*25*	*28-Jun-2019 20:00*
Surr: 4-Bromofluorobenzene	*98.4*			**0**	*85-114*	*%REC*	*25*	*28-Jun-2019 20:00*
Surr: Dibromofluoromethane	*97.3*			**0**	*80-119*	*%REC*	*25*	*28-Jun-2019 20:00*
Surr: Toluene-d8	*99.0*			**0**	*89-112*	*%REC*	*25*	*28-Jun-2019 20:00*
SEMIVOLATILES SIM		**Method:SW8270SIM**				Prep:SW3510 / 25-Jun-2019		Analyst: LG
1,4-Dioxane	0.010	U	0.010	0.010	0.010	ug/L	1	28-Jun-2019 00:42
Surr: 2-Fluorobiphenyl	*84.6*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 00:42*
Surr: 4-Terphenyl-d14	*111*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 00:42*
Surr: Nitrobenzene-d5	*113*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 00:42*

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 2

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 11-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW01SW_061919
Collection Date: 19-Jun-2019 10:40

ANALYTICAL REPORT
WorkOrder:HS19061083
Lab ID:HS19061083-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 25-Jun-2019		Analyst: JHD
Aluminum	**0.0504**		**0.00180**	**0.00500**	**0.0100**	**mg/L**	1	27-Jun-2019 18:02
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	27-Jun-2019 18:02
Arsenic	**0.00871**		**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 18:02
Barium	**1.07**		**0.00190**	**0.00250**	**0.00500**	**mg/L**	1	27-Jun-2019 18:02
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Jun-2019 18:02
Cadmium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Jun-2019 18:02
Calcium	**32.9**		**0.0340**	**0.0500**	**0.500**	**mg/L**	1	27-Jun-2019 18:02
Chromium	**0.00638**		**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 18:02
Cobalt	**0.000511**	J	**0.000100**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 18:02
Copper	0.00100	U	0.00100	0.00100	0.00500	mg/L	1	27-Jun-2019 18:02
Iron	**51.3**		**0.0120**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 18:02
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	27-Jun-2019 18:02
Magnesium	**22.6**		**0.0100**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 18:02
Manganese	**0.635**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 18:02
Nickel	**0.00112**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 18:02
Potassium	**18.4**		**0.0180**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 18:02
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	27-Jun-2019 18:02
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	27-Jun-2019 18:02
Sodium	**115**		**0.0140**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 18:02
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Jun-2019 18:02
Vanadium	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	27-Jun-2019 18:02
Zinc	**0.0209**		**0.00200**	**0.00200**	**0.00500**	**mg/L**	1	27-Jun-2019 18:02
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 25-Jun-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	25-Jun-2019 15:19
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	05-Jul-2019 14:42

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 2

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 11-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW04SW_061919
Collection Date: 19-Jun-2019 11:35

ANALYTICAL REPORT
WorkOrder:HS19061083
Lab ID:HS19061083-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 19:12
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 19:12
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 19:12
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 19:12
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 19:12
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 19:12
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 19:12
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 19:12
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 19:12
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 19:12
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 19:12
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 19:12
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 19:12
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 19:12
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 19:12
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 19:12
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 19:12
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 19:12
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 19:12
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 19:12
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 19:12
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	28-Jun-2019 19:12
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 19:12
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	28-Jun-2019 19:12
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 19:12
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 19:12
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	28-Jun-2019 19:12
Acetone	**5.0**		**0.40**	**1.0**	**2.0**	**UG/L**	1	28-Jun-2019 19:12
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 19:12
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 19:12
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 19:12
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 19:12
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 19:12
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 19:12
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	28-Jun-2019 19:12
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 19:12
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 19:12
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 19:12
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 19:12

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 2

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 11-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW04SW_061919
Collection Date: 19-Jun-2019 11:35

ANALYTICAL REPORT
WorkOrder:HS19061083
Lab ID:HS19061083-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 19:12
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 19:12
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	28-Jun-2019 19:12
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 19:12
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 19:12
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 19:12
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 19:12
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	28-Jun-2019 19:12
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 19:12
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	28-Jun-2019 19:12
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	28-Jun-2019 19:12
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 19:12
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 19:12
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 19:12
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 19:12
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 19:12
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 19:12
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 19:12
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 19:12
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 19:12
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 19:12
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 19:12
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 19:12
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 19:12
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 19:12
Surr: 1,2-Dichloroethane-d4	*101*			**0**	*81-118*	*%REC*	*1*	*28-Jun-2019 19:12*
Surr: 4-Bromofluorobenzene	*95.6*			**0**	*85-114*	*%REC*	*1*	*28-Jun-2019 19:12*
Surr: Dibromofluoromethane	*94.4*			**0**	*80-119*	*%REC*	*1*	*28-Jun-2019 19:12*
Surr: Toluene-d8	*95.9*			**0**	*89-112*	*%REC*	*1*	*28-Jun-2019 19:12*
SEMIVOLATILES SIM		**Method:SW8270SIM**				Prep:SW3510 / 25-Jun-2019		Analyst: LG
1,4-Dioxane	0.010	U	0.010	0.010	0.010	ug/L	1	28-Jun-2019 01:03
Surr: 2-Fluorobiphenyl	*100*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 01:03*
Surr: 4-Terphenyl-d14	*112*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 01:03*
Surr: Nitrobenzene-d5	*124*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 01:03*

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 2

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 11-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW04SW_061919
Collection Date: 19-Jun-2019 11:35

ANALYTICAL REPORT
WorkOrder:HS19061083
Lab ID:HS19061083-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 25-Jun-2019		Analyst: JHD
Aluminum	**0.0645**		**0.00180**	**0.00500**	**0.0100**	**mg/L**	1	27-Jun-2019 18:05
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	27-Jun-2019 18:05
Arsenic	**0.00326**	J	**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 18:05
Barium	**0.911**		**0.00190**	**0.00250**	**0.00500**	**mg/L**	1	27-Jun-2019 18:05
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	28-Jun-2019 15:05
Cadmium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Jun-2019 18:05
Calcium	**30.3**		**0.0340**	**0.0500**	**0.500**	**mg/L**	1	27-Jun-2019 18:05
Chromium	**0.0219**		**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 18:05
Cobalt	**0.00473**	J	**0.000100**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 18:05
Copper	0.00100	U	0.00100	0.00100	0.00500	mg/L	1	27-Jun-2019 18:05
Iron	**10.4**		**0.0120**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 18:05
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	27-Jun-2019 18:05
Magnesium	**18.3**		**0.0100**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 18:05
Manganese	**0.455**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 18:05
Nickel	**0.00641**		**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 18:05
Potassium	**108**		**0.0180**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 18:05
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	27-Jun-2019 18:05
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	27-Jun-2019 18:05
Sodium	**130**		**0.0140**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 18:05
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Jun-2019 18:05
Vanadium	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	27-Jun-2019 18:05
Zinc	**0.0400**		**0.00200**	**0.00200**	**0.00500**	**mg/L**	1	27-Jun-2019 18:05
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 25-Jun-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	25-Jun-2019 15:20
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	05-Jul-2019 14:42

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 2

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 11-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW04_061919
Collection Date: 19-Jun-2019 12:25

ANALYTICAL REPORT
WorkOrder:HS19061083
Lab ID:HS19061083-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 19:36
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 19:36
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 19:36
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 19:36
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 19:36
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 19:36
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 19:36
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 19:36
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 19:36
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 19:36
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 19:36
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 19:36
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 19:36
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 19:36
1,2-Dichloroethane	**0.75**	J	**0.20**	**0.50**	**1.0**	**UG/L**	1	28-Jun-2019 19:36
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 19:36
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 19:36
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 19:36
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 19:36
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 19:36
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 19:36
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	28-Jun-2019 19:36
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 19:36
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	28-Jun-2019 19:36
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 19:36
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 19:36
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	28-Jun-2019 19:36
Acetone	**4.6**		**0.40**	**1.0**	**2.0**	**UG/L**	1	28-Jun-2019 19:36
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 19:36
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 19:36
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 19:36
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 19:36
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 19:36
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 19:36
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	28-Jun-2019 19:36
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 19:36
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 19:36
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 19:36
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 19:36

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 2

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 11-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW04_061919
Collection Date: 19-Jun-2019 12:25

ANALYTICAL REPORT
WorkOrder:HS19061083
Lab ID:HS19061083-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 19:36
cis-1,2-Dichloroethene	**16**		**0.20**	**0.50**	**1.0**	**UG/L**	1	28-Jun-2019 19:36
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	28-Jun-2019 19:36
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 19:36
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 19:36
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 19:36
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 19:36
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	28-Jun-2019 19:36
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 19:36
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	28-Jun-2019 19:36
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	28-Jun-2019 19:36
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 19:36
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 19:36
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 19:36
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 19:36
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 19:36
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 19:36
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 19:36
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 19:36
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 19:36
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 19:36
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 19:36
Trichloroethene	**510**		**2.0**	**5.0**	**10**	**UG/L**	10	01-Jul-2019 16:01
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 19:36
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 19:36
Surr: 1,2-Dichloroethane-d4	*99.0*			**0**	*81-118*	*%REC*	*1*	*28-Jun-2019 19:36*
Surr: 1,2-Dichloroethane-d4	*103*			**0**	*81-118*	*%REC*	*10*	*01-Jul-2019 16:01*
Surr: 4-Bromofluorobenzene	*94.8*			**0**	*85-114*	*%REC*	*1*	*28-Jun-2019 19:36*
Surr: 4-Bromofluorobenzene	*95.4*			**0**	*85-114*	*%REC*	*10*	*01-Jul-2019 16:01*
Surr: Dibromofluoromethane	*93.2*			**0**	*80-119*	*%REC*	*1*	*28-Jun-2019 19:36*
Surr: Dibromofluoromethane	*95.5*			**0**	*80-119*	*%REC*	*10*	*01-Jul-2019 16:01*
Surr: Toluene-d8	*95.7*			**0**	*89-112*	*%REC*	*1*	*28-Jun-2019 19:36*
Surr: Toluene-d8	*102*			**0**	*89-112*	*%REC*	*10*	*01-Jul-2019 16:01*
SEMIVOLATILES SIM		**Method:SW8270SIM**				Prep:SW3510 / 25-Jun-2019		Analyst: LG
1,4-Dioxane	**1.3**		**0.050**	**0.050**	**0.050**	**ug/L**	5	28-Jun-2019 17:01
Surr: 2-Fluorobiphenyl	*90.6*			**0**	*40-140*	*%REC*	*5*	*28-Jun-2019 17:01*
Surr: 4-Terphenyl-d14	*133*			**0**	*40-140*	*%REC*	*5*	*28-Jun-2019 17:01*
Surr: Nitrobenzene-d5	*89.2*			**0**	*40-140*	*%REC*	*5*	*28-Jun-2019 17:01*

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 2

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 11-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW04_061919
Collection Date: 19-Jun-2019 12:25

ANALYTICAL REPORT
WorkOrder:HS19061083
Lab ID:HS19061083-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	05-Jul-2019 14:42

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 2

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 11-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: MW1_061919
Collection Date: 19-Jun-2019 13:15

ANALYTICAL REPORT
WorkOrder:HS19061083
Lab ID:HS19061083-07
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	10	U	6.0	10	20	UG/L	20	28-Jun-2019 20:24
1,1,1-Trichloroethane	10	U	4.0	10	20	UG/L	20	28-Jun-2019 20:24
1,1,2,2-Tetrachloroethane	10	U	10	10	20	UG/L	20	28-Jun-2019 20:24
1,1,2-Trichloroethane	10	U	6.0	10	20	UG/L	20	28-Jun-2019 20:24
1,1-Dichloroethane	10	U	4.0	10	20	UG/L	20	28-Jun-2019 20:24
1,1-Dichloroethene	10	U	4.0	10	20	UG/L	20	28-Jun-2019 20:24
1,1-Dichloropropene	10	U	6.0	10	20	UG/L	20	28-Jun-2019 20:24
1,2,3-Trichlorobenzene	10	U	8.0	10	20	UG/L	20	28-Jun-2019 20:24
1,2,3-Trichloropropane	10	U	10	10	20	UG/L	20	28-Jun-2019 20:24
1,2,4-Trichlorobenzene	10	U	10	10	20	UG/L	20	28-Jun-2019 20:24
1,2,4-Trimethylbenzene	10	U	6.0	10	20	UG/L	20	28-Jun-2019 20:24
1,2-Dibromo-3-chloropropane	10	U	4.0	10	20	UG/L	20	28-Jun-2019 20:24
1,2-Dibromoethane	10	U	4.0	10	20	UG/L	20	28-Jun-2019 20:24
1,2-Dichlorobenzene	10	U	10	10	20	UG/L	20	28-Jun-2019 20:24
1,2-Dichloroethane	**300**		**4.0**	**10**	**20**	**UG/L**	20	28-Jun-2019 20:24
1,2-Dichloropropane	10	U	10	10	20	UG/L	20	28-Jun-2019 20:24
1,3,5-Trimethylbenzene	10	U	6.0	10	20	UG/L	20	28-Jun-2019 20:24
1,3-Dichlorobenzene	10	U	8.0	10	20	UG/L	20	28-Jun-2019 20:24
1,3-Dichloropropane	10	U	6.0	10	20	UG/L	20	28-Jun-2019 20:24
1,4-Dichlorobenzene	10	U	8.0	10	20	UG/L	20	28-Jun-2019 20:24
2,2-Dichloropropane	10	U	4.0	10	20	UG/L	20	28-Jun-2019 20:24
2-Butanone	20	U	10	20	40	UG/L	20	28-Jun-2019 20:24
2-Chlorotoluene	10	U	6.0	10	20	UG/L	20	28-Jun-2019 20:24
2-Hexanone	20	U	20	20	40	UG/L	20	28-Jun-2019 20:24
4-Chlorotoluene	10	U	8.0	10	20	UG/L	20	28-Jun-2019 20:24
4-Isopropyltoluene	10	U	6.0	10	20	UG/L	20	28-Jun-2019 20:24
4-Methyl-2-pentanone	20	U	14	20	40	UG/L	20	28-Jun-2019 20:24
Acetone	20	U	8.0	20	40	UG/L	20	28-Jun-2019 20:24
Benzene	10	U	4.0	10	20	UG/L	20	28-Jun-2019 20:24
Bromobenzene	10	U	8.0	10	20	UG/L	20	28-Jun-2019 20:24
Bromochloromethane	10	U	4.0	10	20	UG/L	20	28-Jun-2019 20:24
Bromodichloromethane	10	U	4.0	10	20	UG/L	20	28-Jun-2019 20:24
Bromoform	10	U	8.0	10	20	UG/L	20	28-Jun-2019 20:24
Bromomethane	10	U	8.0	10	20	UG/L	20	28-Jun-2019 20:24
Carbon disulfide	20	U	12	20	40	UG/L	20	28-Jun-2019 20:24
Carbon tetrachloride	10	U	10	10	20	UG/L	20	28-Jun-2019 20:24
Chlorobenzene	10	U	6.0	10	20	UG/L	20	28-Jun-2019 20:24
Chloroethane	10	U	6.0	10	20	UG/L	20	28-Jun-2019 20:24
Chloroform	10	U	4.0	10	20	UG/L	20	28-Jun-2019 20:24

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 2

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 11-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: MW1_061919
Collection Date: 19-Jun-2019 13:15

ANALYTICAL REPORT
WorkOrder:HS19061083
Lab ID:HS19061083-07
Matrix:Groundwater

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	28-Jun-2019 20:24
cis-1,2-Dichloroethene	**4,000**		**4.0**	**10**	**20**	**UG/L**	20	28-Jun-2019 20:24
cis-1,3-Dichloropropene	10	U	2.0	10	20	UG/L	20	28-Jun-2019 20:24
Dibromochloromethane	10	U	6.0	10	20	UG/L	20	28-Jun-2019 20:24
Dibromomethane	10	U	4.0	10	20	UG/L	20	28-Jun-2019 20:24
Dichlorodifluoromethane	10	U	6.0	10	20	UG/L	20	28-Jun-2019 20:24
Ethylbenzene	10	U	6.0	10	20	UG/L	20	28-Jun-2019 20:24
Hexachlorobutadiene	20	U	20	20	20	UG/L	20	28-Jun-2019 20:24
Isopropylbenzene	10	U	6.0	10	20	UG/L	20	28-Jun-2019 20:24
m,p-Xylene	20	U	10	20	40	UG/L	20	28-Jun-2019 20:24
Methylene chloride	20	U	8.0	20	40	UG/L	20	28-Jun-2019 20:24
n-Butylbenzene	10	U	8.0	10	20	UG/L	20	28-Jun-2019 20:24
n-Propylbenzene	10	U	6.0	10	20	UG/L	20	28-Jun-2019 20:24
Naphthalene	10	U	6.0	10	20	UG/L	20	28-Jun-2019 20:24
o-Xylene	10	U	6.0	10	20	UG/L	20	28-Jun-2019 20:24
sec-Butylbenzene	10	U	6.0	10	20	UG/L	20	28-Jun-2019 20:24
Styrene	10	U	6.0	10	20	UG/L	20	28-Jun-2019 20:24
tert-Butylbenzene	10	U	6.0	10	20	UG/L	20	28-Jun-2019 20:24
Tetrachloroethene	10	U	6.0	10	20	UG/L	20	28-Jun-2019 20:24
Toluene	10	U	4.0	10	20	UG/L	20	28-Jun-2019 20:24
trans-1,2-Dichloroethene	10	U	4.0	10	20	UG/L	20	28-Jun-2019 20:24
trans-1,3-Dichloropropene	10	U	4.0	10	20	UG/L	20	28-Jun-2019 20:24
Trichloroethene	**15,000**		**50**	**120**	**250**	**UG/L**	250	01-Jul-2019 16:25
Trichlorofluoromethane	10	U	6.0	10	20	UG/L	20	28-Jun-2019 20:24
Vinyl chloride	10	U	4.0	10	20	UG/L	20	28-Jun-2019 20:24
Surr: 1,2-Dichloroethane-d4	*101*			**0**	*81-118*	*%REC*	*20*	*28-Jun-2019 20:24*
Surr: 1,2-Dichloroethane-d4	*103*			**0**	*81-118*	*%REC*	*250*	*01-Jul-2019 16:25*
Surr: 4-Bromofluorobenzene	*94.6*			**0**	*85-114*	*%REC*	*20*	*28-Jun-2019 20:24*
Surr: 4-Bromofluorobenzene	*95.6*			**0**	*85-114*	*%REC*	*250*	*01-Jul-2019 16:25*
Surr: Dibromofluoromethane	*94.7*			**0**	*80-119*	*%REC*	*20*	*28-Jun-2019 20:24*
Surr: Dibromofluoromethane	*95.2*			**0**	*80-119*	*%REC*	*250*	*01-Jul-2019 16:25*
Surr: Toluene-d8	*96.0*			**0**	*89-112*	*%REC*	*20*	*28-Jun-2019 20:24*
Surr: Toluene-d8	*102*			**0**	*89-112*	*%REC*	*250*	*01-Jul-2019 16:25*

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 2

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 11-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: MW1_061919
Collection Date: 19-Jun-2019 13:15

ANALYTICAL REPORT
WorkOrder:HS19061083
Lab ID:HS19061083-07
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 25-Jun-2019		Analyst: JHD
Aluminum	**0.0775**		**0.00180**	**0.00500**	**0.0100**	**mg/L**	1	27-Jun-2019 18:07
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	27-Jun-2019 18:07
Arsenic	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	27-Jun-2019 18:07
Barium	**0.406**		**0.00190**	**0.00250**	**0.00500**	**mg/L**	1	27-Jun-2019 18:07
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Jun-2019 18:07
Cadmium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Jun-2019 18:07
Calcium	**17.9**		**0.0340**	**0.0500**	**0.500**	**mg/L**	1	27-Jun-2019 18:07
Chromium	**0.358**		**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 18:07
Cobalt	**0.0170**		**0.000100**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 18:07
Copper	**0.00256**	J	**0.00100**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 18:07
Iron	**5.03**		**0.0120**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 18:07
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	27-Jun-2019 18:07
Magnesium	**14.4**		**0.0100**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 18:07
Manganese	**0.703**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 18:07
Nickel	**1.07**		**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 18:07
Potassium	**2.47**		**0.0180**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 18:07
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	27-Jun-2019 18:07
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	27-Jun-2019 18:07
Sodium	**170**		**0.0140**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 18:07
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Jun-2019 18:07
Vanadium	**0.00117**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 18:07
Zinc	**0.00816**		**0.00200**	**0.00200**	**0.00500**	**mg/L**	1	27-Jun-2019 18:07
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 25-Jun-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	25-Jun-2019 15:22
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	05-Jul-2019 14:42

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 2

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 11-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: Trip Blank
Collection Date: 19-Jun-2019 00:00

ANALYTICAL REPORT
WorkOrder:HS19061083
Lab ID:HS19061083-08
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:25
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:25
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 12:25
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:25
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:25
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:25
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:25
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 12:25
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 12:25
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 12:25
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:25
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:25
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:25
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 12:25
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:25
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 12:25
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:25
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 12:25
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:25
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 12:25
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:25
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	28-Jun-2019 12:25
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:25
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	28-Jun-2019 12:25
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 12:25
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:25
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	28-Jun-2019 12:25
Acetone	**29**		**0.40**	**1.0**	**2.0**	**UG/L**	1	28-Jun-2019 12:25
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:25
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 12:25
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:25
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:25
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 12:25
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 12:25
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	28-Jun-2019 12:25
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 12:25
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:25
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:25
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:25

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 2

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 11-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: Trip Blank
Collection Date: 19-Jun-2019 00:00

ANALYTICAL REPORT
WorkOrder:HS19061083
Lab ID:HS19061083-08
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:25
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:25
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	28-Jun-2019 12:25
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:25
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:25
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:25
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:25
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	28-Jun-2019 12:25
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:25
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	28-Jun-2019 12:25
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	28-Jun-2019 12:25
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 12:25
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:25
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:25
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:25
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:25
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:25
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:25
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:25
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:25
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:25
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:25
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:25
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:25
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:25
Surr: 1,2-Dichloroethane-d4	*95.9*			**0**	*81-118*	*%REC*	*1*	*28-Jun-2019 12:25*
Surr: 4-Bromofluorobenzene	*93.2*			**0**	*85-114*	*%REC*	*1*	*28-Jun-2019 12:25*
Surr: Dibromofluoromethane	*91.3*			**0**	*80-119*	*%REC*	*1*	*28-Jun-2019 12:25*
Surr: Toluene-d8	*93.3*			**0**	*89-112*	*%REC*	*1*	*28-Jun-2019 12:25*

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 2

RIGHT SOLUTIONS | RIGHT PARTNER

WEIGHT LOG

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061083

Batch ID: 142417 **Method:** MERCURY BY SW7470A **Prep:** HG_WPR

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19061083-03	1	10 (mL)	10 (mL)	1
HS19061083-04	1	10 (mL)	10 (mL)	1
HS19061083-05	1	10 (mL)	10 (mL)	1
HS19061083-07	1	10 (mL)	10 (mL)	1

Batch ID: 142427 **Method:** METALS BY ICPMS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19061083-03	1	10	10 (mL)	1
HS19061083-04	1	10	10 (mL)	1
HS19061083-05	1	10	10 (mL)	1
HS19061083-07	1	10	10 (mL)	1

Batch ID: 142429 **Method:** SEMIVOLATILES SIM **Prep:** 3510_B_SIM

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19061083-01	1	1000	1 (mL)	0.001
HS19061083-02	1	1000	1 (mL)	0.001
HS19061083-03	1	1000	1 (mL)	0.001
HS19061083-04	1	1000	1 (mL)	0.001
HS19061083-05	1	1000	1 (mL)	0.001
HS19061083-06	1	1000	1 (mL)	0.001

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061083

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID: 142417 (0)	**Test Name :** MERCURY BY SW7470A				**Matrix:** Groundwater	
HS19061083-03	18CPTMW01DW_061919	19 Jun 2019 09:50		25 Jun 2019 09:30	25 Jun 2019 15:17	1
HS19061083-04	18CPTMW01SW_061919	19 Jun 2019 10:40		25 Jun 2019 09:30	25 Jun 2019 15:19	1
HS19061083-05	18CPTMW04SW_061919	19 Jun 2019 11:35		25 Jun 2019 09:30	25 Jun 2019 15:20	1
HS19061083-07	MW1_061919	19 Jun 2019 13:15		25 Jun 2019 09:30	25 Jun 2019 15:22	1
Batch ID: 142427 (0)	**Test Name :** METALS BY ICPMS BY SW6020A				**Matrix:** Groundwater	
HS19061083-03	18CPTMW01DW_061919	19 Jun 2019 09:50		25 Jun 2019 11:30	28 Jun 2019 15:54	10
HS19061083-03	18CPTMW01DW_061919	19 Jun 2019 09:50		25 Jun 2019 11:30	28 Jun 2019 15:53	1
HS19061083-03	18CPTMW01DW_061919	19 Jun 2019 09:50		25 Jun 2019 11:30	27 Jun 2019 18:00	1
HS19061083-04	18CPTMW01SW_061919	19 Jun 2019 10:40		25 Jun 2019 11:30	27 Jun 2019 18:02	1
HS19061083-05	18CPTMW04SW_061919	19 Jun 2019 11:35		25 Jun 2019 11:30	28 Jun 2019 15:05	1
HS19061083-05	18CPTMW04SW_061919	19 Jun 2019 11:35		25 Jun 2019 11:30	27 Jun 2019 18:05	1
HS19061083-07	MW1_061919	19 Jun 2019 13:15		25 Jun 2019 11:30	27 Jun 2019 18:07	1
Batch ID: 142429 (0)	**Test Name :** SEMIVOLATILES SIM				**Matrix:** Groundwater	
HS19061083-01	MW2_061919	19 Jun 2019 08:55		25 Jun 2019 16:16	28 Jun 2019 16:20	20
HS19061083-02	MW2_061919_a	19 Jun 2019 08:55		25 Jun 2019 16:16	28 Jun 2019 16:41	20
HS19061083-03	18CPTMW01DW_061919	19 Jun 2019 09:50		25 Jun 2019 16:16	28 Jun 2019 00:21	1
HS19061083-04	18CPTMW01SW_061919	19 Jun 2019 10:40		25 Jun 2019 16:16	28 Jun 2019 00:42	1
HS19061083-05	18CPTMW04SW_061919	19 Jun 2019 11:35		25 Jun 2019 16:16	28 Jun 2019 01:03	1
HS19061083-06	18CPTMW04_061919	19 Jun 2019 12:25		25 Jun 2019 16:16	28 Jun 2019 17:01	5
Batch ID: R341546 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS19061083-08	Trip Blank	19 Jun 2019 00:00			28 Jun 2019 12:25	1
Batch ID: R341546 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS19061083-01	MW2_061919	19 Jun 2019 08:55			28 Jun 2019 15:37	5000
HS19061083-01	MW2_061919	19 Jun 2019 08:55			28 Jun 2019 14:01	50
HS19061083-02	MW2_061919_a	19 Jun 2019 08:55			28 Jun 2019 16:01	5000
HS19061083-02	MW2_061919_a	19 Jun 2019 08:55			28 Jun 2019 14:25	50
HS19061083-03	18CPTMW01DW_061919	19 Jun 2019 09:50			28 Jun 2019 18:48	1
HS19061083-04	18CPTMW01SW_061919	19 Jun 2019 10:40			28 Jun 2019 20:00	25
HS19061083-05	18CPTMW04SW_061919	19 Jun 2019 11:35			28 Jun 2019 19:12	1
HS19061083-06	18CPTMW04_061919	19 Jun 2019 12:25			28 Jun 2019 19:36	1
HS19061083-07	MW1_061919	19 Jun 2019 13:15			28 Jun 2019 20:24	20
Batch ID: R341659 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS19061083-06	18CPTMW04_061919	19 Jun 2019 12:25			01 Jul 2019 16:01	10
HS19061083-07	MW1_061919	19 Jun 2019 13:15			01 Jul 2019 16:25	250

Revision: 2

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 11-jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061083

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID: R341906 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** Groundwater	
HS19061083-01	MW2_061919	19 Jun 2019 08:55			05 Jul 2019 14:42	1
HS19061083-02	MW2_061919_a	19 Jun 2019 08:55			05 Jul 2019 14:42	1
HS19061083-03	18CPTMW01DW_061919	19 Jun 2019 09:50			05 Jul 2019 14:42	1
HS19061083-04	18CPTMW01SW_061919	19 Jun 2019 10:40			05 Jul 2019 14:42	1
HS19061083-05	18CPTMW04SW_061919	19 Jun 2019 11:35			05 Jul 2019 14:42	1
HS19061083-06	18CPTMW04_061919	19 Jun 2019 12:25			05 Jul 2019 14:42	1
HS19061083-07	MW1_061919	19 Jun 2019 13:15			05 Jul 2019 14:42	1

Revision: 2

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 11-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061083

QC BATCH REPORT

Batch ID: 142417 (0) **Instrument: HG03** **Method: MERCURY BY SW7470A**

MBLK Sample ID: **MBLK-142417** Units: **mg/L** Analysis Date: **25-Jun-2019 14:58**
Client ID: Run ID: **HG03_341258** SeqNo: **5139847** PrepDate: **25-Jun-2019** 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-142417** Units: **mg/L** Analysis Date: **25-Jun-2019 15:02**
Client ID: Run ID: **HG03_341258** SeqNo: **5139848** PrepDate: **25-Jun-2019** 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	100	80 - 120				

MS Sample ID: **HS19060986-04MS** Units: **mg/L** Analysis Date: **25-Jun-2019 15:06**
Client ID: Run ID: **HG03_341258** SeqNo: **5139850** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00000511	0.000000200	5e-006	0.0000000010	102	75 - 125				

MSD Sample ID: **HS19060986-04MSD** Units: **mg/L** Analysis Date: **25-Jun-2019 15:07**
Client ID: Run ID: **HG03_341258** SeqNo: **5139851** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00000558	0.000000200	5e-006	0.0000000010	112	75 - 125	0.000005110	8.79	20	

The following samples were analyzed in this batch: HS19061083-03 HS19061083-04 HS19061083-05 HS19061083-07

Revision: 2

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 11-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061083

QC BATCH REPORT

Batch ID: 142427 (0) **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

MBLK Sample ID: **MBLK-142427** Units: **mg/L** Analysis Date: **27-Jun-2019 17:22**
Client ID: Run ID: **ICPMS06_341376** SeqNo: **5145221** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.002457	0.0100								J
Antimony	0.000500	0.00500								U
Arsenic	0.000500	0.00500								U
Barium	0.00250	0.00500								U
Beryllium	0.000500	0.00200								U
Cadmium	0.000500	0.00200								U
Calcium	0.0500	0.500								U
Chromium	0.000500	0.00500								U
Cobalt	0.000500	0.00500								U
Copper	0.001932	0.00500								J
Iron	0.0500	0.200								U
Lead	0.00100	0.00500								U
Magnesium	0.0500	0.200								U
Manganese	0.00100	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	0.02437	0.200								J
Thallium	0.000500	0.00200								U
Vanadium	0.001051	0.00500								J
Zinc	0.00200	0.00500								U

ALS Houston, US Date: 11-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061083

QC BATCH REPORT

Batch ID: 142427 (0) **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

LCS Sample ID: **LCS-142427** Units: **mg/L** Analysis Date: **27-Jun-2019 16:58**
Client ID: Run ID: **ICPMS06_341376** SeqNo: **5145214** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.1091	0.0100	0.1	0	109	84 - 117				
Antimony	0.0559	0.00500	0.05	0	112	85 - 117				
Arsenic	0.05618	0.00500	0.05	0	112	84 - 116				
Barium	0.05364	0.00500	0.05	0	107	86 - 114				
Beryllium	0.05694	0.00200	0.05	0	114	83 - 121				
Cadmium	0.05632	0.00200	0.05	0	113	87 - 115				
Calcium	5.323	0.500	5	0	106	87 - 118				
Chromium	0.05591	0.00500	0.05	0	112	85 - 116				
Cobalt	0.05561	0.00500	0.05	0	111	86 - 115				
Copper	0.05732	0.00500	0.05	0	115	85 - 118				
Iron	5.504	0.200	5	0	110	87 - 118				
Lead	0.05401	0.00500	0.05	0	108	88 - 115				
Magnesium	5.42	0.200	5	0	108	83 - 118				
Manganese	0.05651	0.00500	0.05	0	113	87 - 115				
Nickel	0.05699	0.00500	0.05	0	114	85 - 117				
Potassium	5.366	0.200	5	0	107	87 - 115				
Selenium	0.05781	0.00500	0.05	0	116	80 - 120				
Silver	0.05393	0.00500	0.05	0	108	85 - 116				
Sodium	5.418	0.200	5	0	108	85 - 117				
Thallium	0.05098	0.00200	0.05	0	102	82 - 116				
Vanadium	0.05441	0.00500	0.05	0	109	86 - 115				
Zinc	0.05821	0.00500	0.05	0	116	83 - 119				

Revision: 2

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 11-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061083

QC BATCH REPORT

Batch ID: 142427 (0) **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

MS Sample ID: **HS19060986-04MS** Units: **mg/L** Analysis Date: **27-Jun-2019 17:03**
Client ID: Run ID: **ICPMS06_341376** SeqNo: **5145217** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.116	0.0100	0.1	0.01515	101	84 - 117				
Antimony	0.05308	0.00500	0.05	0.000258	106	85 - 117				
Arsenic	0.05627	0.00500	0.05	0.002036	108	84 - 116				
Barium	0.8428	0.00500	0.05	0.8565	-27.4	86 - 114				SO
Beryllium	0.05294	0.00200	0.05	0.000048	106	83 - 121				
Cadmium	0.05116	0.00200	0.05	0.000205	102	87 - 115				
Calcium	35.9	0.500	5	33.03	57.3	87 - 118				SO
Chromium	0.3735	0.00500	0.05	0.2809	185	85 - 116				SO
Cobalt	0.0563	0.00500	0.05	0.005607	101	86 - 115				
Copper	0.058	0.00500	0.05	0.005199	106	85 - 118				
Iron	7.669	0.200	5	2.556	102	87 - 118				
Lead	0.05089	0.00500	0.05	0.000094	102	88 - 115				
Magnesium	31.26	0.200	5	27.76	69.9	83 - 118				SO
Manganese	0.2154	0.00500	0.05	0.164	103	87 - 115				
Nickel	0.2401	0.00500	0.05	0.2011	78.0	85 - 117				SO
Potassium	7.654	0.200	5	2.639	100	87 - 115				
Selenium	0.05384	0.00500	0.05	0.000343	107	80 - 120				
Silver	0.04654	0.00500	0.05	0.000013	93.1	85 - 116				
Sodium	233.3	0.200	5	245	-233	85 - 117				SEO
Thallium	0.04975	0.00200	0.05	0.000043	99.4	82 - 116				
Vanadium	0.0572	0.00500	0.05	0.003781	107	86 - 115				
Zinc	0.07874	0.00500	0.05	0.03582	85.8	83 - 119				

Revision: 2

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 11-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061083

QC BATCH REPORT

Batch ID: 142427 (0) **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

MSD Sample ID: **HS19060986-04MSD** Units: **mg/L** Analysis Date: **27-Jun-2019 17:05**
Client ID: Run ID: **ICPMS06_341376** SeqNo: **5145218** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.1062	0.0100	0.1	0.01515	91.1	84 - 117	0.116	8.82	20	
Antimony	0.04965	0.00500	0.05	0.000258	98.8	85 - 117	0.05308	6.66	20	
Arsenic	0.05281	0.00500	0.05	0.002036	102	84 - 116	0.05627	6.34	20	
Barium	0.8139	0.00500	0.05	0.8565	-85.2	86 - 114	0.8428	3.49	20	SO
Beryllium	0.05024	0.00200	0.05	0.000048	100	83 - 121	0.05294	5.24	20	
Cadmium	0.04833	0.00200	0.05	0.000205	96.2	87 - 115	0.05116	5.7	20	
Calcium	33.36	0.500	5	33.03	6.56	87 - 118	35.9	7.33	20	SO
Cobalt	0.0531	0.00500	0.05	0.005607	95.0	86 - 115	0.0563	5.85	20	
Copper	0.05342	0.00500	0.05	0.005199	96.4	85 - 118	0.058	8.23	20	
Iron	7.023	0.200	5	2.556	89.3	87 - 118	7.669	8.8	20	
Lead	0.04808	0.00500	0.05	0.000094	96.0	88 - 115	0.05089	5.67	20	
Magnesium	28.94	0.200	5	27.76	23.5	83 - 118	31.26	7.71	20	SO
Manganese	0.1904	0.00500	0.05	0.164	52.8	87 - 115	0.2154	12.4	20	S
Nickel	0.2255	0.00500	0.05	0.2011	48.7	85 - 117	0.2401	6.29	20	SO
Potassium	7.309	0.200	5	2.639	93.4	87 - 115	7.654	4.62	20	
Selenium	0.05051	0.00500	0.05	0.000343	100	80 - 120	0.05384	6.37	20	
Silver	0.04575	0.00500	0.05	0.000013	91.5	85 - 116	0.04654	1.71	20	
Sodium	224.6	0.200	5	245	-407	85 - 117	233.3	3.8	20	SEO
Thallium	0.04905	0.00200	0.05	0.000043	98.0	82 - 116	0.04975	1.42	20	
Vanadium	0.05284	0.00500	0.05	0.003781	98.1	86 - 115	0.0572	7.93	20	
Zinc	0.08005	0.00500	0.05	0.03582	88.5	83 - 119	0.07874	1.66	20	

MSD Sample ID: **HS19060986-04MSD** Units: **mg/L** Analysis Date: **28-Jun-2019 15:07**
Client ID: Run ID: **ICPMS06_341483** SeqNo: **5145651** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium	0.343	0.00500	0.05	0.2809	124	85 - 116	0.3735	8.51	20	SO

Revision: 2

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 11-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061083

QC BATCH REPORT

Batch ID: 142427 (0) **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

PDS Sample ID: **HS19060986-04PDS** Units: **mg/L** Analysis Date: **27-Jun-2019 17:07**
Client ID: Run ID: **ICPMS06_341376** SeqNo: **5145219** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.1008	0.0100	0.1	0.01515	85.7	80 - 120				
Antimony	0.08752	0.00500	0.1	0.000258	87.3	80 - 120				
Arsenic	0.09313	0.00500	0.1	0.002036	91.1	80 - 120				
Beryllium	0.09784	0.00200	0.1	0.000048	97.8	80 - 120				
Cadmium	0.09096	0.00200	0.1	0.000205	90.8	80 - 120				
Cobalt	0.09093	0.00500	0.1	0.005607	85.3	80 - 120				
Copper	0.09101	0.00500	0.1	0.005199	85.8	80 - 120				
Iron	10.93	0.200	10	2.556	83.8	80 - 120				
Lead	0.09017	0.00500	0.1	0.000094	90.1	80 - 120				
Potassium	11.36	0.200	10	2.639	87.2	80 - 120				
Selenium	0.09025	0.00500	0.1	0.000343	89.9	80 - 120				
Silver	0.08464	0.00500	0.1	0.000013	84.6	80 - 120				
Thallium	0.08892	0.00200	0.1	0.000043	88.9	80 - 120				
Vanadium	0.09309	0.00500	0.1	0.003781	89.3	80 - 120				
Zinc	0.1183	0.00500	0.1	0.03582	82.5	80 - 120				

PDS Sample ID: **HS19060986-04PDS** Units: **mg/L** Analysis Date: **28-Jun-2019 15:14**
Client ID: Run ID: **ICPMS06_341483** SeqNo: **5145655** PrepDate: **25-Jun-2019** DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Barium	1.703	0.0500	1	0.7	100	80 - 120				
Calcium	129.7	5.00	100	26.89	103	80 - 120				
Chromium	1.283	0.0500	1	0.2283	105	80 - 120				
Iron	107.4	2.00	100	2.151	105	80 - 120				
Magnesium	125.2	2.00	100	22.92	102	80 - 120				
Manganese	1.175	0.0500	1	0.1367	104	80 - 120				
Nickel	1.217	0.0500	1	0.1678	105	80 - 120				
Potassium	106.9	2.00	100	2.16	105	80 - 120				
Sodium	299.8	2.00	100	202.9	96.9	80 - 120				

Revision: 2

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 11-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061083

QC BATCH REPORT

Batch ID: 142427 (0) **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

SD Sample ID: **HS19060986-04SD** Units: **mg/L** Analysis Date: **27-Jun-2019 17:02**
Client ID: Run ID: **ICPMS06_341376** SeqNo: **5145216** PrepDate: **25-Jun-2019** DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Aluminum	0.01988	0.0500					0.01515	0	10	J
Antimony	0.00250	0.0250					0.000258	0	10	U
Arsenic	0.002183	0.0250					0.002036	0	10	J
Beryllium	0.00250	0.0100					0.000048	0	10	U
Cadmium	0.00250	0.0100					0.000205	0	10	U
Cobalt	0.004619	0.0250					0.005607	0	10	J
Copper	0.00500	0.0250					0.005199	0	10	U
Lead	0.00500	0.0250					0.000094	0	10	U
Selenium	0.0125	0.0250					0.000343	0	10	U
Silver	0.00250	0.0250					0.000013	0	10	U
Thallium	0.00250	0.0100					0.000043	0	10	U
Vanadium	0.01164	0.0250					0.003781	0	10	J
Zinc	0.038	0.0250					0.03582	6.07	10	

SD Sample ID: **HS19060986-04SD** Units: **mg/L** Analysis Date: **28-Jun-2019 15:13**
Client ID: Run ID: **ICPMS06_341483** SeqNo: **5145654** PrepDate: **25-Jun-2019** DF: **50**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Barium	0.6998	0.250					0.7	0.0306	10	
Calcium	27.1	25.0					26.89	0.761	10	
Chromium	0.234	0.250					0.2283	0	10	J
Iron	2.19	10.0					2.151	0	10	J
Magnesium	22.74	10.0					22.92	0.776	10	
Manganese	0.1567	0.250					0.1367	0	10	J
Nickel	0.1736	0.250					0.1678	0	10	J
Potassium	2.068	10.0					2.16	0	10	J
Sodium	207.1	10.0					202.9	2.06	10	

The following samples were analyzed in this batch: HS19061083-03 HS19061083-04 HS19061083-05 HS19061083-07

Revision: 2

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 11-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061083

QC BATCH REPORT

Batch ID: 142429 (0) **Instrument: SV-5** **Method: SEMIVOLATILES SIM**

MBLK Sample ID: **MBLK-142429** Units: **ug/L** Analysis Date: **27-Jun-2019 21:35**
Client ID: Run ID: **SV-5_341545** SeqNo: **5146405** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.010	0.010								U
Surr: 2-Fluorobiphenyl	*0.0702*	*0*	*0.08*	*0*	*87.7*	*40 - 140*				
Surr: 4-Terphenyl-d14	*0.0811*	*0*	*0.08*	*0*	*101*	*40 - 140*				
Surr: Nitrobenzene-d5	*0.07172*	*0*	*0.08*	*0*	*89.6*	*40 - 140*				

LCS Sample ID: **LCS-142429** Units: **ug/L** Analysis Date: **27-Jun-2019 21:56**
Client ID: Run ID: **SV-5_341545** SeqNo: **5146406** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.0905	0.010	0.08	0	113	40 - 140				
Surr: 2-Fluorobiphenyl	*0.07767*	*0*	*0.08*	*0*	*97.1*	*40 - 140*				
Surr: 4-Terphenyl-d14	*0.08433*	*0*	*0.08*	*0*	*105*	*40 - 140*				
Surr: Nitrobenzene-d5	*0.08991*	*0*	*0.08*	*0*	*112*	*40 - 140*				

LCSD Sample ID: **LCSD-142429** Units: **ug/L** Analysis Date: **27-Jun-2019 22:17**
Client ID: Run ID: **SV-5_341545** SeqNo: **5146407** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.09101	0.010	0.08	0	114	40 - 140	0.0905	0.564	20	
Surr: 2-Fluorobiphenyl	*0.09652*	*0*	*0.08*	*0*	*121*	*40 - 140*	*0.07767*	*21.6*	*20*	R
Surr: 4-Terphenyl-d14	*0.09713*	*0*	*0.08*	*0*	*121*	*40 - 140*	*0.08433*	*14.1*	*20*	
Surr: Nitrobenzene-d5	*0.1084*	*0*	*0.08*	*0*	*135*	*40 - 140*	*0.08991*	*18.6*	*20*	

The following samples were analyzed in this batch: HS19061083-01 HS19061083-02 HS19061083-03 HS19061083-04 HS19061083-05 HS19061083-06

Revision: 2

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 11-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061083

QC BATCH REPORT

Batch ID: R341546 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-190628** Units: **UG/L** Analysis Date: **28-Jun-2019 11:38**
Client ID: Run ID: **VOA6_341546** SeqNo: **5146430** 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

Revision: 2

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 11-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061083

QC BATCH REPORT

Batch ID: R341546 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-190628** Units: **UG/L** Analysis Date: **28-Jun-2019 11:38**
Client ID: Run ID: **VOA6_341546** SeqNo: **5146430** 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	*46.64*	*1.0*	*50*	*0*	*93.3*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*45.03*	*1.0*	*50*	*0*	*90.1*	*85 - 114*				
Surr: Dibromofluoromethane	*44.27*	*1.0*	*50*	*0*	*88.5*	*80 - 119*				
Surr: Toluene-d8	*45.03*	*1.0*	*50*	*0*	*90.1*	*89 - 112*				

Revision: 2

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 11-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061083

QC BATCH REPORT

Batch ID: R341546 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-190628** Units: **UG/L** Analysis Date: **28-Jun-2019 10:50**
Client ID: Run ID: **VOA6_341546** SeqNo: **5146429** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	18.71	1.0	20	0	93.5	78 - 124				
1,1,1-Trichloroethane	18.86	1.0	20	0	94.3	74 - 131				
1,1,2,2-Tetrachloroethane	21.83	1.0	20	0	109	71 - 121				
1,1,2-Trichloroethane	20.31	1.0	20	0	102	80 - 119				
1,1-Dichloroethane	19.37	1.0	20	0	96.9	77 - 125				
1,1-Dichloroethene	19.49	1.0	20	0	97.5	71 - 131				
1,1-Dichloropropene	18.57	1.0	20	0	92.9	78 - 125				
1,2,3-Trichlorobenzene	27.19	1.0	20	0	136	69 - 129				S
1,2,3-Trichloropropane	22.5	1.0	20	0	113	73 - 122				
1,2,4-Trichlorobenzene	23.25	1.0	20	0	116	69 - 130				
1,2,4-Trimethylbenzene	18.63	1.0	20	0	93.2	76 - 124				
1,2-Dibromo-3-chloropropane	23.82	1.0	20	0	119	62 - 128				
1,2-Dibromoethane	20.03	1.0	20	0	100	77 - 121				
1,2-Dichlorobenzene	19.12	1.0	20	0	95.6	80 - 119				
1,2-Dichloroethane	18.81	1.0	20	0	94.1	73 - 128				
1,2-Dichloropropane	18.83	1.0	20	0	94.2	78 - 122				
1,3,5-Trimethylbenzene	17.9	1.0	20	0	89.5	75 - 124				
1,3-Dichlorobenzene	18.42	1.0	20	0	92.1	80 - 119				
1,3-Dichloropropane	20.28	1.0	20	0	101	80 - 119				
1,4-Dichlorobenzene	19.67	1.0	20	0	98.3	79 - 118				
2,2-Dichloropropane	19.99	1.0	20	0	99.9	60 - 139				
2-Butanone	49.3	2.0	40	0	123	56 - 143				
2-Chlorotoluene	19.48	1.0	20	0	97.4	79 - 122				
2-Hexanone	43.05	2.0	40	0	108	57 - 139				
4-Chlorotoluene	19.99	1.0	20	0	99.9	78 - 122				
4-Isopropyltoluene	17.77	1.0	20	0	88.9	77 - 127				
4-Methyl-2-pentanone	41.38	2.0	40	0	103	67 - 130				
Acetone	54.41	2.0	40	0	136	39 - 160				
Benzene	19.29	1.0	20	0	96.4	79 - 120				
Bromobenzene	18.42	1.0	20	0	92.1	80 - 120				
Bromochloromethane	18.67	1.0	20	0	93.3	78 - 123				
Bromodichloromethane	19.53	1.0	20	0	97.6	79 - 125				
Bromoform	20.73	1.0	20	0	104	66 - 130				
Bromomethane	22.75	1.0	20	0	114	53 - 141				

Revision: 2

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 11-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061083

QC BATCH REPORT

Batch ID: R341546 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

LCS Sample ID: **VLCSW-190628** Units: **UG/L** Analysis Date: **28-Jun-2019 10:50**
Client ID: Run ID: **VOA6_341546** SeqNo: **5146429** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	37.03	2.0	40	0	92.6	64 - 133				
Carbon tetrachloride	18.08	1.0	20	0	90.4	72 - 136				
Chlorobenzene	18.69	1.0	20	0	93.5	82 - 118				
Chloroethane	20.86	1.0	20	0	104	60 - 138				
Chloroform	20.01	1.0	20	0	100	79 - 124				
Chloromethane	18.7	1.0	20	0	93.5	50 - 139				
cis-1,2-Dichloroethene	19.38	1.0	20	0	96.9	78 - 123				
cis-1,3-Dichloropropene	18.8	1.0	20	0	94.0	75 - 124				
Dibromochloromethane	19.26	1.0	20	0	96.3	74 - 126				
Dibromomethane	19.49	1.0	20	0	97.4	79 - 123				
Dichlorodifluoromethane	17.68	1.0	20	0	88.4	32 - 152				
Ethylbenzene	18.26	1.0	20	0	91.3	79 - 121				
Hexachlorobutadiene	21.78	1.0	20	0	109	66 - 134				
Isopropylbenzene	17.76	1.0	20	0	88.8	72 - 131				
m,p-Xylene	36.78	2.0	40	0	92.0	80 - 121				
Methylene chloride	19.74	2.0	20	0	98.7	74 - 124				
Naphthalene	25.7	1.0	20	0	128	61 - 128				S
n-Butylbenzene	17.78	1.0	20	0	88.9	75 - 128				
n-Propylbenzene	19.05	1.0	20	0	95.3	76 - 126				
o-Xylene	18.37	1.0	20	0	91.8	78 - 122				
sec-Butylbenzene	18.27	1.0	20	0	91.4	77 - 126				
Styrene	19.37	1.0	20	0	96.9	78 - 123				
tert-Butylbenzene	18.73	1.0	20	0	93.7	78 - 124				
Tetrachloroethene	17.11	1.0	20	0	85.5	74 - 129				
Toluene	18.5	1.0	20	0	92.5	80 - 121				
trans-1,2-Dichloroethene	19.5	1.0	20	0	97.5	75 - 124				
trans-1,3-Dichloropropene	19.19	1.0	20	0	96.0	73 - 127				
Trichloroethene	18.25	1.0	20	0	91.2	79 - 123				
Trichlorofluoromethane	18.83	1.0	20	0	94.1	65 - 141				
Vinyl chloride	18.93	1.0	20	0	94.6	58 - 137				
Surr: 1,2-Dichloroethane-d4	*52.6*	*1.0*	*50*	*0*	*105*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.75*	*1.0*	*50*	*0*	*102*	*85 - 114*				
Surr: Dibromofluoromethane	*51.89*	*1.0*	*50*	*0*	*104*	*80 - 119*				
Surr: Toluene-d8	*47.75*	*1.0*	*50*	*0*	*95.5*	*89 - 112*				

Revision: 2

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 11-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061083

QC BATCH REPORT

Batch ID: R341546 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MS Sample ID: **HS19061157-02MS** Units: **UG/L** Analysis Date: **28-Jun-2019 14:49**
Client ID: Run ID: **VOA6_341546** SeqNo: **5146438** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	17.73	1.0	20	0	88.6	78 - 124				
1,1,1-Trichloroethane	19.03	1.0	20	0	95.2	74 - 131				
1,1,2,2-Tetrachloroethane	20.66	1.0	20	0	103	71 - 121				
1,1,2-Trichloroethane	18.94	1.0	20	0	94.7	80 - 119				
1,1-Dichloroethane	17.57	1.0	20	0	87.9	77 - 125				
1,1-Dichloroethene	19.66	1.0	20	0	98.3	71 - 131				
1,1-Dichloropropene	19.33	1.0	20	0	96.6	78 - 125				
1,2,3-Trichlorobenzene	24.14	1.0	20	0	121	69 - 129				
1,2,3-Trichloropropane	20.5	1.0	20	0	102	73 - 122				
1,2,4-Trichlorobenzene	21.59	1.0	20	0	108	69 - 130				
1,2,4-Trimethylbenzene	18.47	1.0	20	0	92.3	76 - 124				
1,2-Dibromo-3-chloropropane	21.81	1.0	20	0	109	62 - 128				
1,2-Dibromoethane	17.9	1.0	20	0	89.5	77 - 121				
1,2-Dichlorobenzene	18.33	1.0	20	0	91.7	80 - 119				
1,2-Dichloroethane	17.43	1.0	20	0	87.1	73 - 128				
1,2-Dichloropropane	17.55	1.0	20	0	87.7	78 - 122				
1,3,5-Trimethylbenzene	18.27	1.0	20	0	91.4	75 - 124				
1,3-Dichlorobenzene	17.46	1.0	20	0	87.3	80 - 119				
1,3-Dichloropropane	18.65	1.0	20	0	93.2	80 - 119				
1,4-Dichlorobenzene	18.88	1.0	20	0	94.4	79 - 118				
2,2-Dichloropropane	18.91	1.0	20	0	94.5	60 - 139				
2-Butanone	42.59	2.0	40	0	106	56 - 143				
2-Chlorotoluene	19.4	1.0	20	0	97.0	79 - 122				
2-Hexanone	38.42	2.0	40	0	96.0	57 - 139				
4-Chlorotoluene	19.35	1.0	20	0	96.7	78 - 122				
4-Isopropyltoluene	19.33	1.0	20	0	96.6	77 - 127				
4-Methyl-2-pentanone	38.74	2.0	40	0	96.9	67 - 130				
Acetone	46.92	2.0	40	5.359	104	39 - 160				
Benzene	18.35	1.0	20	0	91.7	79 - 120				
Bromobenzene	16.8	1.0	20	0	84.0	80 - 120				
Bromochloromethane	16.09	1.0	20	0	80.4	78 - 123				
Bromodichloromethane	18.04	1.0	20	0	90.2	79 - 125				
Bromoform	18.53	1.0	20	0	92.6	66 - 130				
Bromomethane	13.53	1.0	20	0	67.6	53 - 141				

Revision: 2

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 11-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061083

QC BATCH REPORT

Batch ID: R341546 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS19061157-02MS** Units: **UG/L** Analysis Date: **28-Jun-2019 14:49**
Client ID: Run ID: **VOA6_341546** SeqNo: **5146438** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	34.31	2.0	40	0	85.8	64 - 133				
Carbon tetrachloride	19.13	1.0	20	0	95.6	72 - 136				
Chlorobenzene	17.61	1.0	20	0	88.1	82 - 118				
Chloroethane	20.41	1.0	20	0	102	60 - 138				
Chloroform	18.1	1.0	20	0	90.5	79 - 124				
Chloromethane	29.09	1.0	20	0	145	50 - 139				S
cis-1,2-Dichloroethene	19.95	1.0	20	0	99.8	78 - 123				
cis-1,3-Dichloropropene	17.23	1.0	20	0	86.1	75 - 124				
Dibromochloromethane	17.55	1.0	20	0	87.7	74 - 126				
Dibromomethane	17.65	1.0	20	0	88.3	79 - 123				
Dichlorodifluoromethane	18.02	1.0	20	0	90.1	32 - 152				
Ethylbenzene	18.28	1.0	20	0	91.4	79 - 121				
Hexachlorobutadiene	23.73	1.0	20	0	119	66 - 134				
Isopropylbenzene	18.91	1.0	20	0	94.5	72 - 131				
m,p-Xylene	37.07	2.0	40	0	92.7	80 - 121				
Methylene chloride	25.8	2.0	20	0	129	74 - 124				S
Naphthalene	23.22	1.0	20	0	116	61 - 128				
n-Butylbenzene	19.75	1.0	20	0	98.7	75 - 128				
n-Propylbenzene	20.08	1.0	20	0	100	76 - 126				
o-Xylene	17.73	1.0	20	0	88.6	78 - 122				
sec-Butylbenzene	20.67	1.0	20	0	103	77 - 126				
Styrene	18.57	1.0	20	0	92.9	78 - 123				
tert-Butylbenzene	20.06	1.0	20	0	100	78 - 124				
Tetrachloroethene	18.08	1.0	20	0	90.4	74 - 129				
Toluene	17.83	1.0	20	0	89.2	80 - 121				
trans-1,2-Dichloroethene	18.21	1.0	20	0	91.0	75 - 124				
trans-1,3-Dichloropropene	17.88	1.0	20	0	89.4	73 - 127				
Trichloroethene	17.77	1.0	20	0	88.9	79 - 123				
Trichlorofluoromethane	20.23	1.0	20	0	101	65 - 141				
Vinyl chloride	18.22	1.0	20	0	91.1	58 - 137				
Surr: 1,2-Dichloroethane-d4	*50.38*	*1.0*	*50*	*0*	*101*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.99*	*1.0*	*50*	*0*	*102*	*85 - 114*				
Surr: Dibromofluoromethane	*49.29*	*1.0*	*50*	*0*	*98.6*	*80 - 119*				
Surr: Toluene-d8	*48.04*	*1.0*	*50*	*0*	*96.1*	*89 - 112*				

Revision: 2

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 11-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061083

QC BATCH REPORT

Batch ID: R341546 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS19061157-02MSD** Units: **UG/L** Analysis Date: **28-Jun-2019 15:13**
Client ID: Run ID: **VOA6_341546** SeqNo: **5146439** 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	17.53	1.0	20	0	87.7	78 - 124	17.73	1.11	20	
1,1,1-Trichloroethane	18.55	1.0	20	0	92.7	74 - 131	19.03	2.57	20	
1,1,2,2-Tetrachloroethane	21.38	1.0	20	0	107	71 - 121	20.66	3.41	20	
1,1,2-Trichloroethane	19.17	1.0	20	0	95.9	80 - 119	18.94	1.26	20	
1,1-Dichloroethane	17.86	1.0	20	0	89.3	77 - 125	17.57	1.63	20	
1,1-Dichloroethene	19.11	1.0	20	0	95.5	71 - 131	19.66	2.85	20	
1,1-Dichloropropene	19.03	1.0	20	0	95.1	78 - 125	19.33	1.56	20	
1,2,3-Trichlorobenzene	25.23	1.0	20	0	126	69 - 129	24.14	4.4	20	
1,2,3-Trichloropropane	20.93	1.0	20	0	105	73 - 122	20.5	2.06	20	
1,2,4-Trichlorobenzene	21.92	1.0	20	0	110	69 - 130	21.59	1.52	20	
1,2,4-Trimethylbenzene	18.33	1.0	20	0	91.7	76 - 124	18.47	0.739	20	
1,2-Dibromo-3-chloropropane	22.89	1.0	20	0	114	62 - 128	21.81	4.81	20	
1,2-Dibromoethane	18.73	1.0	20	0	93.7	77 - 121	17.9	4.54	20	
1,2-Dichlorobenzene	18.43	1.0	20	0	92.1	80 - 119	18.33	0.521	20	
1,2-Dichloroethane	17.55	1.0	20	0	87.8	73 - 128	17.43	0.726	20	
1,2-Dichloropropane	17.93	1.0	20	0	89.7	78 - 122	17.55	2.16	20	
1,3,5-Trimethylbenzene	18.28	1.0	20	0	91.4	75 - 124	18.27	0.0341	20	
1,3-Dichlorobenzene	17.74	1.0	20	0	88.7	80 - 119	17.46	1.57	20	
1,3-Dichloropropane	19.01	1.0	20	0	95.1	80 - 119	18.65	1.93	20	
1,4-Dichlorobenzene	19.13	1.0	20	0	95.6	79 - 118	18.88	1.28	20	
2,2-Dichloropropane	18.53	1.0	20	0	92.6	60 - 139	18.91	2.03	20	
2-Butanone	44.5	2.0	40	0	111	56 - 143	42.59	4.39	20	
2-Chlorotoluene	19.45	1.0	20	0	97.2	79 - 122	19.4	0.245	20	
2-Hexanone	40.16	2.0	40	0	100	57 - 139	38.42	4.43	20	
4-Chlorotoluene	19.29	1.0	20	0	96.5	78 - 122	19.35	0.277	20	
4-Isopropyltoluene	19.26	1.0	20	0	96.3	77 - 127	19.33	0.313	20	
4-Methyl-2-pentanone	39.71	2.0	40	0	99.3	67 - 130	38.74	2.45	20	
Acetone	50.25	2.0	40	5.359	112	39 - 160	46.92	6.85	20	
Benzene	18.36	1.0	20	0	91.8	79 - 120	18.35	0.0865	20	
Bromobenzene	16.88	1.0	20	0	84.4	80 - 120	16.8	0.466	20	
Bromochloromethane	16.49	1.0	20	0	82.4	78 - 123	16.09	2.45	20	
Bromodichloromethane	18.36	1.0	20	0	91.8	79 - 125	18.04	1.78	20	
Bromoform	19.36	1.0	20	0	96.8	66 - 130	18.53	4.42	20	
Bromomethane	16.13	1.0	20	0	80.7	53 - 141	13.53	17.6	20	

Revision: 2

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 11-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061083

QC BATCH REPORT

Batch ID: R341546 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS19061157-02MSD** Units: **UG/L** Analysis Date: **28-Jun-2019 15:13**
Client ID: Run ID: **VOA6_341546** SeqNo: **5146439** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Carbon disulfide	34.41	2.0	40	0	86.0	64 - 133	34.31	0.298	20	
Carbon tetrachloride	18.94	1.0	20	0	94.7	72 - 136	19.13	0.978	20	
Chlorobenzene	17.62	1.0	20	0	88.1	82 - 118	17.61	0.0136	20	
Chloroethane	18.76	1.0	20	0	93.8	60 - 138	20.41	8.41	20	
Chloroform	18.25	1.0	20	0	91.3	79 - 124	18.1	0.822	20	
Chloromethane	23.96	1.0	20	0	120	50 - 139	29.09	19.4	20	
cis-1,2-Dichloroethene	18.61	1.0	20	0	93.1	78 - 123	19.95	6.93	20	
cis-1,3-Dichloropropene	17.39	1.0	20	0	87.0	75 - 124	17.23	0.946	20	
Dibromochloromethane	18.07	1.0	20	0	90.3	74 - 126	17.55	2.93	20	
Dibromomethane	18.25	1.0	20	0	91.3	79 - 123	17.65	3.33	20	
Dichlorodifluoromethane	17.78	1.0	20	0	88.9	32 - 152	18.02	1.36	20	
Ethylbenzene	18.25	1.0	20	0	91.3	79 - 121	18.28	0.178	20	
Hexachlorobutadiene	23.8	1.0	20	0	119	66 - 134	23.73	0.3	20	
Isopropylbenzene	18.76	1.0	20	0	93.8	72 - 131	18.91	0.782	20	
m,p-Xylene	36.69	2.0	40	0	91.7	80 - 121	37.07	1.03	20	
Methylene chloride	20.47	2.0	20	0	102	74 - 124	25.8	23.1	20	R
Naphthalene	24.28	1.0	20	0	121	61 - 128	23.22	4.46	20	
n-Butylbenzene	20.17	1.0	20	0	101	75 - 128	19.75	2.1	20	
n-Propylbenzene	20.11	1.0	20	0	101	76 - 126	20.08	0.148	20	
o-Xylene	17.67	1.0	20	0	88.4	78 - 122	17.73	0.292	20	
sec-Butylbenzene	20.54	1.0	20	0	103	77 - 126	20.67	0.606	20	
Styrene	18.44	1.0	20	0	92.2	78 - 123	18.57	0.717	20	
tert-Butylbenzene	20.01	1.0	20	0	100	78 - 124	20.06	0.251	20	
Tetrachloroethene	18.05	1.0	20	0	90.2	74 - 129	18.08	0.156	20	
Toluene	17.82	1.0	20	0	89.1	80 - 121	17.83	0.055	20	
trans-1,2-Dichloroethene	18.18	1.0	20	0	90.9	75 - 124	18.21	0.146	20	
trans-1,3-Dichloropropene	18	1.0	20	0	90.0	73 - 127	17.88	0.68	20	
Trichloroethene	17.66	1.0	20	0	88.3	79 - 123	17.77	0.648	20	
Trichlorofluoromethane	19.72	1.0	20	0	98.6	65 - 141	20.23	2.53	20	
Vinyl chloride	17.84	1.0	20	0	89.2	58 - 137	18.22	2.1	20	
Surr: 1,2-Dichloroethane-d4	*51.79*	*1.0*	*50*	*0*	*104*	*81 - 118*	*50.38*	*2.77*	*20*	
Surr: 4-Bromofluorobenzene	*50.7*	*1.0*	*50*	*0*	*101*	*85 - 114*	*50.99*	*0.571*	*20*	
Surr: Dibromofluoromethane	*49.25*	*1.0*	*50*	*0*	*98.5*	*80 - 119*	*49.29*	*0.0914*	*20*	
Surr: Toluene-d8	*47.25*	*1.0*	*50*	*0*	*94.5*	*89 - 112*	*48.04*	*1.66*	*20*	

Revision: 2

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ALS Houston, US Date: 11-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061083

QC BATCH REPORT

Batch ID: R341546 (0)	Instrument: VOA6	Method: VOLATILES ORGANICS BY METHOD 8260C

The following samples were analyzed in this batch:

HS19061083-01	HS19061083-02	HS19061083-03	HS19061083-04
HS19061083-05	HS19061083-06	HS19061083-07	HS19061083-08

ALS Houston, US Date: 11-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061083

QC BATCH REPORT

Batch ID: R341659 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-190701** Units: **UG/L** Analysis Date: **01-Jul-2019 13:13**
Client ID: Run ID: **VOA6_341659** SeqNo: **5149141** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Trichloroethene	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*50.46*	*1.0*	*50*	*0*	*101*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*47.58*	*1.0*	*50*	*0*	*95.2*	*85 - 114*				
Surr: Dibromofluoromethane	*47*	*1.0*	*50*	*0*	*94.0*	*80 - 119*				
Surr: Toluene-d8	*50.26*	*1.0*	*50*	*0*	*101*	*89 - 112*				

LCS Sample ID: **VLCSW-190701** Units: **UG/L** Analysis Date: **01-Jul-2019 12:25**
Client ID: Run ID: **VOA6_341659** SeqNo: **5149140** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Trichloroethene	19.73	1.0	20	0	98.7	79 - 123				
Surr: 1,2-Dichloroethane-d4	*56.59*	*1.0*	*50*	*0*	*113*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*54.46*	*1.0*	*50*	*0*	*109*	*85 - 114*				
Surr: Dibromofluoromethane	*54.8*	*1.0*	*50*	*0*	*110*	*80 - 119*				
Surr: Toluene-d8	*53.87*	*1.0*	*50*	*0*	*108*	*89 - 112*				

MS Sample ID: **HS19061210-04MS** Units: **UG/L** Analysis Date: **01-Jul-2019 15:13**
Client ID: Run ID: **VOA6_341659** SeqNo: **5149146** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Trichloroethene	17.51	1.0	20	0	87.5	79 - 123				
Surr: 1,2-Dichloroethane-d4	*49.83*	*1.0*	*50*	*0*	*99.7*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.6*	*1.0*	*50*	*0*	*101*	*85 - 114*				
Surr: Dibromofluoromethane	*47.78*	*1.0*	*50*	*0*	*95.6*	*80 - 119*				
Surr: Toluene-d8	*50.33*	*1.0*	*50*	*0*	*101*	*89 - 112*				

ALS Houston, US Date: 11-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061083

QC BATCH REPORT

Batch ID: R341659 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS19061210-04MSD** Units: **UG/L** Analysis Date: **01-Jul-2019 15:37**
Client ID: Run ID: **VOA6_341659** SeqNo: **5149147** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Trichloroethene	17.2	1.0	20	0	86.0	79 - 123	17.51	1.78	20	
Surr: 1,2-Dichloroethane-d4	*50.94*	*1.0*	*50*	*0*	*102*	*81 - 118*	*49.83*	*2.21*	*20*	
Surr: 4-Bromofluorobenzene	*50.71*	*1.0*	*50*	*0*	*101*	*85 - 114*	*50.6*	*0.217*	*20*	
Surr: Dibromofluoromethane	*49.23*	*1.0*	*50*	*0*	*98.5*	*80 - 119*	*47.78*	*2.99*	*20*	
Surr: Toluene-d8	*50.46*	*1.0*	*50*	*0*	*101*	*89 - 112*	*50.33*	*0.265*	*20*	

The following samples were analyzed in this batch: HS19061083-06 HS19061083-07

Revision: 2

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ALS Houston, US Date: 11-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: **HS19061083**

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	20-Dec-2021
Kansas	E-10352 2018-2019	31-Jul-2019
Kentucky	123043, 2019-2020	30-Apr-2020
Louisiana	03087, 2019-2020	30-Jun-2020
Maryland	343, 2019-2020	30-Jun-2020
North Carolina	624-2019	31-Dec-2019
Oklahoma	2018-156	31-Aug-2019
Texas	TX104704231-19-23	30-Apr-2020

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ALS Houston, US Date: 11-Jul-19

Sample Receipt Checklist

Client Name: Bhate Environmental
Work Order: HS19061083
Date/Time Received: **20-Jun-2019 08:30**
Received by: **NDR**

Checklist completed by: *Paresh M. Giga* eSignature — 20-Jun-2019 Date
Reviewed by: *RJ Modashia* eSignature — 21-Jun-2019 Date

Matrices: **Groundwater/Water**
Carrier name: **FedEx**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:None
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	2.0c U/C	IR11
Cooler(s)/Kit(s):	25093	
Date/Time sample(s) sent to storage:	6/20/19 17:05	

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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bhate ENVIRONMENTAL CONSTRUCTION ENERGY

1608 13th Avenue South, Suite 300
Birmingham Alabama 35205
Tel: 205-918-4000
Fax: 205-918-4050

Chain of Custody and Analytical Request

Page: ____ of ____

Project/Phase No: NWO1312.0150

COC Number(1): ____

LIMS Number: ____

Facility/Base I.D.: LHAAP

Project/Site Name: LHAAP / Site 18/24

Client Name:

Collected by: Scott Beesinger

Field Sample ID (30 Characters Max)	ERPIMS LOCID (15 Characters Max)	Date Collected (dd-mmm-yyyy)	Time Collected (Military) (hhmm)	Sample Depth (beginning - ending)	SA Code (2)	Sample Number (3)	Sample Matrix (4)	Number of containers	VOC	PERCHLORATE	TOTAL METALS	1, 4 - DIOXANE	Ambient Blank Lot Control Number	Equipment Blank Lot Control Number	Trip Blank Lot Control Number	Cooler ID
MW2_061919		19 Jun 2019	0855	-	N		WG	5	X	X		X				
MW2_061919_a		19 Jun 2019	0855	-	FD		WG	5	X	X		X				
18CPTMW01DW_061919		19 Jun 2019	0950	-	N		WG	6	X	X	X	X				
18CPTMW01SW_061919		19 Jun 2019	1040		N		WG	6	X	X	X	X				
18CPTMW04SW_061919		19 Jun 2019	1135		N		WG	6	X	X	X	X				
18CPTMW04_061919		19 Jun 2019	1225	-	N		WG	5	X	X		X				
MW1_061919		19 Jun 2019	1315	-	N		WG	5	X	X	X					
TRIP BLANK		19 Jun 2019		-	TB		W	2	X							
				-												
				-												
				-												

Sample Analysis Requested (5) | Quality Assurance Samples (6)

HS19061083
Bhate Environmental Associates, Inc.
LHAAP 18 24

COMMENTS: ____

Custody Transfers Prior to Receipt by Laboratory

Relinquished By (Signed)	Date	Time	Received by (signed)	Date	Time
1. Scott Beesinger	6/19/19	1430	1. NA	6-20-19	08:30
2.			2.		
3.			3.		

Sample Delivery Details / Laboratory Receipt

Delivered Directly to Lab: ____ Shipped ____ No.:

Method of Shipment: ____

Fed Ex ____ Airbill Number:

Analytical Lab: ALS 10450 Stancliff Rd. Suite 210 Houston, TX 77099 (281) 530-5656

ATTN: SONIA WEST Lab Recipient: Delivery Date/Time:

1.) Chain of Custody Number = date collected + custody number (e.g. 09-02-1999-01)

2.) Sample Type (SA) Codes: N = Normal Sample, TB = Trip Blank (-c) Sample, FD = Field Duplicate (-a) Samples, FR = Field Replicate (-b) Samples, EB = Equipment Blank (-d) Samples, MS = Matrix Spike, SD = Matrix Spike Duplicate, AB = Ambient Blank (-e)

3.) Sample Number: Unique sample number collected from a particular location per day. (e.g. Groundwater sample collected from MW-1 on 10/10/99 = 01, if sampled again on 10/10/99 = 02, etc.)

4.) Matrix Codes: GS = Soil Gas, WG = Groundwater, WS = Surface Water, SO = Soil, SE = Sediment, SL = Sludge, SS = Surface Soil Samples, WQ = Aqueous Blank Samples (trip, equipment, ambient, etc), SQ = Soil Blanks

5.) Sample Analysis Requested: Analytical method requested and number of containers provided for each.

6.) Quality assurance samples are assigned by date (ddmmyy) and the sample number associated with the sample (01, 02, etc) (e.g. Equipment blank collected in association with MW-1 on 10/10/99 will be designated 10109901 in the Equipment Blank Lot Control

Cooler # 25093
Temp 4°C
2.0

IR # 11 C/F

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00940662

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

-5093

CUSTODY SEAL

Date: 6/19/19 Time: 1430
Name: Scott Beesinger
Company: BHATE

Seal Broken By: SM
Date: 06/20/19

25093 JUN 20 2019

Must Deliver Next Business Day
Time and Tempature Sensitive!

25093

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: 24MAY19
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 & SURFACE WATER - RJ

RMA:

FedEx Express

FedEx
TRK# 0221 4809 7834 3170

THU - 20 JUN 10:30A
PRIORITY OVERNIGHT

AB SGRA

77099
TX-US IAH

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Case Narrative

Method: 6850
Analysis: Perchlorate
Analysis SOP: LC-MS-CLO4
ALS WO ID(s): 1917698, 1917856, 1918052

Client: ALS Laboratories (Houston, TX)
Matrix: Water
ELMS Batch (HBN): 2266 (242597)

General Set Information: There were seventeen field samples in these Work Orders. The samples were analyzed for perchlorate.

Method Summary: Each sample was prepared as noted below and analyzed using an Agilent 1100 LC/MSD system in select ion monitoring (SIM) mode at m/z 83 and 85, which corresponds to the loss of one oxygen atom from the perchlorate molecule. ChemStation software was used for instrument control and data analysis. The ion ratio of m/z 83 to 85 was used to positively identify the response peak as perchlorate. Quantitation was performed using the m/z 83 peak area. An internal standard (ISTD) of ^{18}O labeled perchlorate was added to each sample to establish the perchlorate peak retention time and used in quantitation.

Sample Preparation: A 10.0mL aliquot of each sample was transferred into a 15-mL centrifuge tube. 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: The following samples were analyzed and reported from various dilutions as specified. 1917698001/02/04-08; 1918052001: 1:1,000. 1917698003; 1917856006/07: 1:100. 1918052002/03: 1:10,000. The reporting limits have been adjusted accordingly.

Method QC data: The method blank (LMB 661480) was less than 1/2 the CRDL. The recovery for the LCS (661481) was within acceptable parameters.

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MS/MSD Analysis: MS/MSD was performed on samples 1917698005/06 (Client ID: MW5_061819). 4.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. The spike target was 4.µg/L. The parent sample and the MS/MSD were analyzed and reported from 1:1,000 dilutions. The effective spike target was 4,000.µg/L. The MS/MSD percent recoveries and relative percent difference 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 – 661478) is reported from the analysis of the Laboratory Control Sample (LCS – 661481) at a level of 4.0µg/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: 19MARI03) along with datafile 01JULD15.

Thomas Bosch July 5, 2019
Analyst Date

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ANALYTICAL REPORT
Amended-20190711

Report Date: July 11, 2019

RJ Modashia
ALS Environmental (Houston)
10450 Stancliff Road
Suite 210
Houston, TX 77099

Phone: 281 530-5656

E-mail: RJ.Modashia@ALSGlobal.com

Workorder: **34-1917856**
Project ID: HS19061083
Purchase Order: HS19061083
Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
MW2_061919	1917856001	06/19/19	06/21/19	
MW2_061919_a	1917856002	06/19/19	06/21/19	
18CPTMW01DW_061919	1917856003	06/19/19	06/21/19	
18CPTMW01SW_061919	1917856004	06/19/19	06/21/19	
18CPTMW04SW_061919	1917856005	06/19/19	06/21/19	
18CPTMW04_061919	1917856006	06/19/19	06/21/19	
MW1_061919	1917856007	06/19/19	06/21/19	

ANALYTICAL REPORT
Amended-20190711

Workorder: 34-1917856
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **MW2_061919** | Sampling Site: NA | Collected: 06/19/2019
Lab ID: 1917856001 | Media: 125 mL Nalgene | Received: 06/21/2019
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/2266 (HBN: 242597) | **Percent Solid:** NA
Analyzed: 07/01/2019 14:39 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: **MW2_061919_a** | Sampling Site: NA | Collected: 06/19/2019
Lab ID: 1917856002 | Media: 125 mL Nalgene | Received: 06/21/2019
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/2266 (HBN: 242597) | **Percent Solid:** NA
Analyzed: 07/01/2019 15:07 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: **18CPTMW01DW_061919** | Sampling Site: NA | Collected: 06/19/2019
Lab ID: 1917856003 | Media: 125 mL Nalgene | Received: 06/21/2019
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/2266 (HBN: 242597) | **Percent Solid:** NA
Analyzed: 07/01/2019 11:52 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: **18CPTMW01SW_061919** | Sampling Site: NA | Collected: 06/19/2019
Lab ID: 1917856004 | Media: 125 mL Nalgene | Received: 06/21/2019
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/2266 (HBN: 242597) | **Percent Solid:** NA
Analyzed: 07/01/2019 12:06 | **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

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ANALYTICAL REPORT
Amended-20190711

Workorder: 34-1917856
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **18CPTMW04SW_061919** | Sampling Site: NA | Collected: 06/19/2019
Lab ID: 1917856005 | Media: 125 mL Nalgene | Received: 06/21/2019
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/2266 (HBN: 242597) | **Percent Solid:** NA
Analyzed: 07/01/2019 12:34 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: **18CPTMW04_061919** | Sampling Site: NA | Collected: 06/19/2019
Lab ID: 1917856006 | Media: 125 mL Nalgene | Received: 06/21/2019
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/2266 (HBN: 242597) | **Percent Solid:** NA
Analyzed: 07/01/2019 12:48 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	**620**	100	200	400	100	

Sample ID: **MW1_061919** | Sampling Site: NA | Collected: 06/19/2019
Lab ID: 1917856007 | Media: 125 mL Nalgene | Received: 06/21/2019
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/2266 (HBN: 242597) | **Percent Solid:** NA
Analyzed: 07/01/2019 13:02 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	**590**	100	200	400	100	

Comments

Quality Control: **EPA 6850, DoD QSM - (HBN: 242597)**

The following samples were analyzed and reported from various dilutions as specified. 1917698001/02/04-08; 1918052001: 1:1,000. 1917698003; 1917856006/07: 1:100. 1918052002/03: 1:10,000. The reporting limits have been adjusted accordingly.

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

Method	Analyst	Peer Review
EPA 6850, DoD QSM	/S/ Thomas Bosch 07/03/2019 09:40	/S/ Stephen Brose 07/05/2019 11:57

ANALYTICAL REPORT
Amended-20190711

Workorder: 34-1917856
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

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

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
	Nevada (TNI)	UT00953201-1	https://ndep.nv.gov/water/lab-certification
	Iowa (TNI)	IA# 376	http://www.shl.uiowa.edu/labcert/idnr/
	Kansas	E-10416	http://www.kdheks.gov/envlab/disclaimer.html
	Oklahoma (TNI)	IJ# 9980	http://www.deq.state.ok.us/CSDnew/labcert.htm
	Texas (TNI)	T104704456-18-9	https://www.tceq.texas.gov/assets/public/compliance/compliance_support/qa/txnelap_lab_list.pdf
Industrial Hygiene	AIHA (ISO 17025 & AIHA IHLAP)	101574	http://www.aihaaccreditedlabs.org
	DOECAP-AP	L18-606	http://www.pjlabs.com
	Washington	C596	https://ecology.wa.gov/Regulations-Permits/Permits-certifications/Laboratory-Accreditation
Dietary Supplements	PJLA (ISO 17025)	L17-507-R1	http://www.pjlabs.com

ANALYTICAL REPORT
Amended-20190711

Workorder: 34-1917856
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Result Symbol Definitions

MDL = Method Detection Limit, a statistical estimate of method/media/instrument sensitivity.
RL = Reporting Limit, a verified value of method/media/instrument sensitivity.
CRDL = Contract Required Detection Limit
Reg. Limit = Regulatory Limit.
ND = Not Detected, testing result not detected above the MDL or RL.
< Means this testing result is less than the numerical value.
** No result could be reported, see sample comments for details.

Qualifier Symbol Definitions

U = Qualifier indicates that the analyte was not detected above the MDL.
J = Qualifier Indicates that the analyte value is between the MDL and the RL. It is also used to indicate an estimated value for tentatively identified compounds in mass spectrometry where a 1:1 response is assumed.
B = Qualifier indicates that the analyte was detected in the blank.
E = Qualifier indicates that the analyte result exceeds calibration range.
P = Qualifier indicates that the RPD between the two columns is greater than 40%.

Quality Control Sample Batch Report

Analysis Information

Workorder: 1917856

Limits:	Client SOW/Contract Specified	**Preparation:**	NA	**Analysis:**	EPA 6850, DoD QSM
Basis:	DoD QSM	**Batch:**	NA	**Batch:**	ELMS/2266 (HBN: 242597)
		Prepared By:	NA	**Analyzed By:**	Thomas Bosch

Blank

LMB: 661480
Analyzed: 07/01/2019 09:16
Units: ug/L

Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 661481
Analyzed: 07/01/2019 08:48
Dilution: 1
Units: ug/L

Analyte	Result	Target	% Rec	QC Limits	
Perchlorate	4.28	4.00	107	78.8	123.8

Matrix Spike - Matrix Spike Duplicate

Sample:	1917698004	**MS:**	1917698005	**MSD:**	1917698006
Analyzed:	07/01/2019 10:12	**Analyzed:**	07/01/2019 10:28	**Analyzed:**	07/01/2019 10:43
Dilution:	1000	**Dilution:**	1000	**Dilution:**	1000
Units:	ug/L	**Units:**	ug/L	**Units:**	ug/L

Analyte	Result	Result	Target	% Rec	QC Limits		Result	% Rec	RPD	QC Limits	
Perchlorate	4400	8910	4000	113	78.8	123.8	8810	110	1.19	0.0	20.0

Comments

The following samples were analyzed and reported from various dilutions as specified. 1917698001/02/04-08; 1918052001: 1:1,000. 1917698003; 1917856006/07: 1:100. 1918052002/03: 1:10,000. The reporting limits have been adjusted accordingly.

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

Analyst	Peer Review
/S/ Thomas Bosch	/S/ Stephen Brose
07/03/2019 12:16	07/05/2019 11:57

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

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ALS Environmental

CHAIN-OF-CUSTODY

Project / Job / Task: HS19061083	Split:	Workorder ID: 1917856	Level: ENV_LVL4
Client: ALS Environmental (Houston)		Account: 8101	Type: 125Poly
Comments:			Preservatives: COOL

Item	Collect Date/Time	Sample ID	Lab ID	QC	Matrix	Containers ID(s)	Count	Requested Analysis: EPA 6850, DoD QSM
1	06/19/2019 08:55	MW2_061919	1917856001		Water	A	1	A
2	06/19/2019 08:55	MW2_061919_a	1917856002		Water	A	1	A
3	06/19/2019 09:50	18CPTMW01DW_061919	1917856003		Water	A	1	A
4	06/19/2019 10:40	18CPTMW015W_061919	1917856004		Water	A	1	A
5	06/19/2019 11:35	18CPTMW045W_061919	1917856005		Water	A	1	A
6	06/19/2019 12:25	18CPTMW04_061919	1917856006		Water	A	1	A
7	06/19/2019 13:15	MW1_061919	1917856007		Water	A	1	A
8								
9								
10								

ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location
Werath, Julie	06/21/2019 09:45	ALS Sample Receiving	Sample Login
R-33.1	6/21/19 1430 6-27-16/12:20	EB T. Bush	Storage 6850

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

Fri, 06/21/19 2:10 PM

ALSCOCV3.1

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00940672





10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

18698/#2

Subcontract Chain of Custody

SAMPLING STATE: **Texas**

COC ID: **11643**

1917856

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:	HS19061083
TSR:	Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS19061083-01**	**MW2_061919**	**Groundwater**	**19 Jun 2019 08:55**
	SUB_Perch-6850			28 Jun 2019
2.	**HS19061083-02**	**MW2_061919_a**	**Groundwater**	**19 Jun 2019 08:55**
	SUB_Perch-6850			28 Jun 2019
3.	**HS19061083-03**	**18CPTMW01DW_061919**	**Groundwater**	**19 Jun 2019 09:50**
	SUB_Perch-6850			28 Jun 2019
4.	**HS19061083-04**	**18CPTMW015W_061919**	**Groundwater**	**19 Jun 2019 10:40**
	SUB_Perch-6850			28 Jun 2019
5.	**HS19061083-05**	**18CPTMW045W_061919**	**Groundwater**	**19 Jun 2019 11:35**
	SUB_Perch-6850			28 Jun 2019
6.	**HS19061083-06**	**18CPTMW04_061919**	**Groundwater**	**19 Jun 2019 12:25**
	SUB_Perch-6850			28 Jun 2019
7.	**HS19061083-07**	**MW1_061919**	**Groundwater**	**19 Jun 2019 13:15**
	SUB_Perch-6850			28 Jun 2019

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

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Subcontract Chain of Custody

SAMPLING STATE: **Texas** **COC ID:** **11643**

QC Level: DOD IV (DoD Data Package)

Relinquished By:		Date/Time:	6/20/19 1800.
Received By:	Meredith Allen	Date/Time:	6/21/2019 945
Cooler ID(s):	07714	Temperature(s):	3°

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ALS Environmental

CHAIN-OF-CUSTODY

Project / Job / Task: HS19061083	Split:	Workorder ID: 1917856	Level: ENV_LVL4
Client: ALS Environmental (Houston)		Account: 8101	Type: 125Poly
Comments:			Preservatives: COOL

Item	Collect Date/Time	Sample ID	Lab ID	QC	Matrix	Containers ID(s)	Containers Count	Requested Analysis: EPA 6850, DoD QSM
1	06/19/2019 08:55	MW2_061919	1917856001		Water	A	1	A
2	06/19/2019 08:55	MW2_061919_a	1917856002		Water	A	1	A
3	06/19/2019 09:50	18CPTMW01DW_061919	1917856003		Water	A	1	A
4	06/19/2019 10:40	18CPTMW015W_061919	1917856004		Water	A	1	A
5	06/19/2019 11:35	18CPTMW045W_061919	1917856005		Water	A	1	A
6	06/19/2019 12:25	18CPTMW04_061919	1917856006		Water	A	1	A
7	06/19/2019 13:15	MW1_061919	1917856007		Water	A	1	A
8								
9								
10								

ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location
Werath, Julie	06/21/2019 09:45	ALS Sample Receiving	Sample Login
R-33.1	6/21/19 1430 6-27-16/12:20	EB T. Bush	Storage 6850

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

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00940675

ALS-Salt Lake City-Related Information Report (CRIR)

Cooler or Container Information Checklist (Fill In or Circle)

Client Name: ALS Houston

Project/Task/Site: 1907856

Date/Time of Receipt: 6/21/2024 945

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	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.
1	C19 97/6	3 °C	4	C19	°C	7	C19	°C
2	C19	°C	5	C19	°C	8	C19	°C
3	C19	°C	6	C19	°C	9	C19	°C

Taken By: Meredith Edens (Signature) Meredith Edens (Printed Name) 6/21/2024 (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

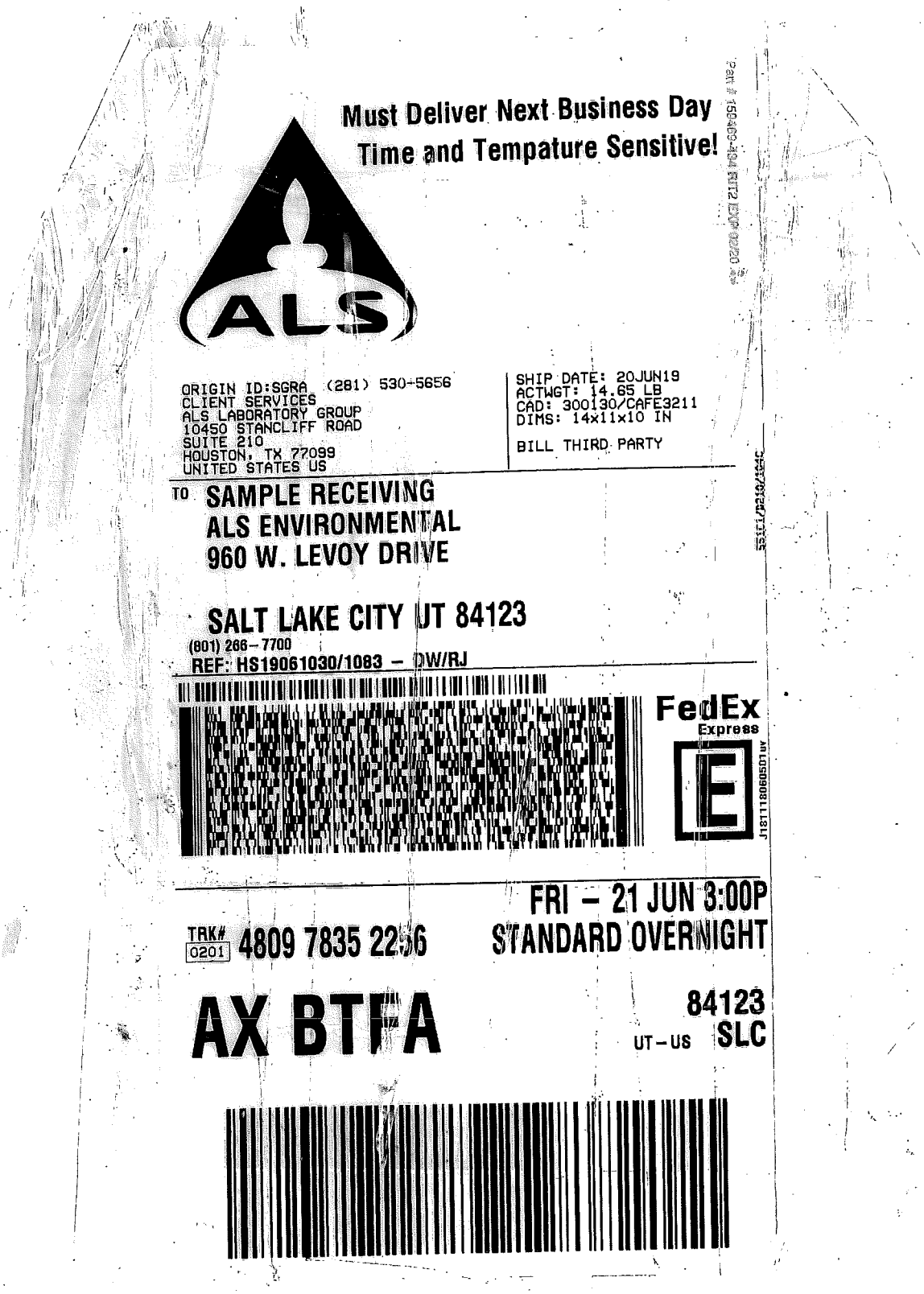
Project Manager Comments:

ALS Project Manager: _____ (Printed Name) Returned to Sample Receipt by: _____ (Signature) Date: _____

CRIR.doc

Revised 01/01/2018

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Must Deliver Next Business Day
Time and Tempature Sensitive!

ALS

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

SHIP DATE: 20JUN19
ACTWGT: 14.65 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: HS19061030/1083 - DW/RJ

FedEx Express

FRI - 21 JUN 3:00P
STANDARD OVERNIGHT

TRK# 0201 4809 7835 22:6

AX BTFA

84123
UT-US SLC

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Batch Worklist

Batch: ELMS/ 2266 **Created:** 7/1/2019 08:25 **Instrument:** LCMS04 **HBN:** 242597
Rule: EPA 6850, DoD QSM Water **Analyst:** T. Bosch **Status:** WP

Workorder: 1917698 [ENV_LVL4]
Workorder: 1917856 [ENV_LVL4]
Workorder: 1918052 [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	661477	CCV for HBN 242597 [ELMS/2266]				CCV	3		E685041C3Q	5311		7/3/2019	7/1/2019
2	661481	LCS for HBN 242597 [ELMS/2266]				LCS	3		E6850Q413Q	5311		7/3/2019	7/1/2019
3	661479	ICS for HBN 242597 [ELMS/2266]				ICS	3		E6850..D3Q	5311		7/3/2019	7/1/2019
4	661480	LMB for HBN 242597 [ELMS/2266]				LMB	3		E6850Q413Q	5311		7/3/2019	7/1/2019
5	1917698001	18CPTMW08SW_061819				SAMPLE	3	1917698001-A	E6850Q41.3	5480	7/16/2019	7/3/2019	7/1/2019
6	1917698002	MW5_061819				SAMPLE	3	1917698002-A	E6850Q41.3	5480	7/16/2019	7/3/2019	7/1/2019
7	1917698004	MW6_061819				SAMPLE	3	1917698004-A	E6850Q41.3	5480	7/16/2019	7/3/2019	7/1/2019
8	1917698005	MW6_061819MS				MS	3	1917698005-A	E6850Q413Q	5480		7/3/2019	7/1/2019
9	1917698006	MW6_061819MSD				MSD	3	1917698006-A	E6850Q413Q	5480		7/3/2019	7/1/2019
10	1917698007	109_061819				SAMPLE	3	1917698007-A	E6850Q41.3	5480	7/16/2019	7/3/2019	7/1/2019
13	1917856003	18CPTMW01DW_061919				SAMPLE	3	1917856003-A	E6850Q41.3	5480	7/17/2019	7/5/2019	7/1/2019
14	1917856004	18CPTMW015W_061919				SAMPLE	3	1917856004-A	E6850Q41.3	5480	7/17/2019	7/5/2019	7/1/2019
15	661482	CCV for HBN 242597 [ELMS/2266]				CCV	3		E685041C3Q	5311		7/3/2019	7/1/2019
16	1917856005	18CPTMW045W_061919				SAMPLE	3	1917856005-A	E6850Q41.3	5480	7/17/2019	7/5/2019	7/1/2019
17	1917856006	18CPTMW04_061919				SAMPLE	3	1917856006-A	E6850Q41.3	5480	7/17/2019	7/5/2019	7/1/2019
18	1917856007	MW1_061919				SAMPLE	3	1917856007-A	E6850Q41.3	5480	7/17/2019	7/5/2019	7/1/2019
19	1918052001	120_062019				SAMPLE	3	1918052001-A	E6850Q41.3	5480	7/18/2019	7/5/2019	7/1/2019
20	1918052002	MW14_062019				SAMPLE	3	1918052002-A	E6850Q41.3	5480	7/18/2019	7/5/2019	7/1/2019
21	1918052003	MW14_062019_a				SAMPLE	3	1918052003-A	E6850Q41.3	5480	7/18/2019	7/5/2019	7/1/2019
22	1918052004	MW12_062019				SAMPLE	3	1918052004-A	E6850Q41.3	5480	7/18/2019	7/5/2019	7/1/2019
23	1917698003	19CPTMW08DW_061819				SAMPLE	3	1917698003-A	E6850Q41.3	5480	7/16/2019	7/3/2019	7/1/2019
24	1917698008	MW21_061819				SAMPLE	3	1917698008-A	E6850Q41.3	5480	7/16/2019	7/3/2019	7/1/2019
25	1917856001	MW2_061919				SAMPLE	3	1917856001-A	E6850Q41.3	5480	7/17/2019	7/5/2019	7/1/2019
26	661483	CCV for HBN 242597 [ELMS/2266]				CCV	3		E685041C3Q	5311		7/3/2019	7/1/2019
27	1917856002	MW2_061919_a				SAMPLE	3	1917856002-A	E6850Q41.3	5480	7/17/2019	7/5/2019	7/1/2019
28	661478	RLVS for HBN 242597 [ELMS/2266				RLVS	3		E685041C3Q	5311		7/3/2019	7/1/2019
29	661661	CCV for HBN 242597 [ELMS/2266]				CCV	3		E685041C3Q	5311		7/3/2019	7/1/2019

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00940678

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Work Order #'s & Sample #( )'s: 1917698 (001-08), 1917856 (001-07), 1918052 (001-04)
ELMS Batch/HBN ID: 2266 (242597)
Prep Date: 06/27/2019 Analysis Date: 07/01/2019 Analyst: T. Bosch
Analyte: **Perchlorate** Matrix: **Water** Method: **6850**
Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2019\JUL\01JUL19D.s
Reported DL: **1.0µg/L** Reported LOD: **2.0µg/L** Reported LOQ: **4.0µg/L**

SAMPLE PREPARATION/ANALYSIS:

Water: Samples were prepared by Thomas 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 AH015-4)/0.1% glacial acetic acid (JT-Baker Lot 04802).
Eluent B1: 95% ACN (B&J Lot AH015-4)/ 5% ASTM Type II water (ALS)/0.1% glacial acetic acid (JT-Baker Lot 04802).

STANDARDS: Internal Standard Spiking Solution Horizon# 43730. Dilutions of Working Standard Solution ID 43702 used for CCV's, LODV's, RLVS and IPC.

CALIBRATION CURVE: Used curve from 03/19/2019, sequence 19MAR19D.s Offline Quantitation Method: CLO4-DP2.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: 7 Injection Volume: 35µL
Column: KP-RPPX C8 separator, 250mm Mobile Phase: 70% Eluent A1; 30% Eluent B1

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: 4.0µL of QC Solution Horizon ID 47516 was used for LCS 661481; Target = 4.0µg/L. ASTM type II water was used for LMB 661480.

MS/MSD: The Matrix Spike and duplicate (MS/MSD) were performed on samples 1917698005/06 (Client ID: MW6_061819). 4.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. Spike target = 4.0µg/L. The parent sample and the MS/MSD were analyzed and reported from 1:1,000 dilutions. The effective spike target was 4,000.µg/L.

COMMENTS:

1) Results reported in µg/L. The following samples were analyzed and reported from various dilutions as specified. 1917698001/02/04-08; 1918052001: 1:1,000. 1917698003; 1917856006/07: 1:100. 1918052002/03: 1:10,000. The reporting limits have been adjusted accordingly.
2) All QC, Blank, CCV, and MS/MSD results were within method parameters.
3) Sample data can be viewed at two directories within the ALS system: \\ALSLTWS013\LCMS\LCMS04\2019\JUL\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
4) Notebook: \\alsltws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2019\242597-DoD-ALS-Hstn LCMS4 or through \\ALSLTWS013\DATAREVIEW\HBN#
5) The Reporting Limit Verification Standard (RLVS – 661478) is reported from the analysis of the Laboratory Control Sample (LCS – 661481) at a level of 4.0µg/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: 19MARI03) along with datafiles 01JULD15.

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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: 2266 HBN: 242597 Sample Set IDs if Applicable: 1917698/1917856/1918052	Analyst Initials	Reviewer Initials
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
Method Blanks 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 flags applied on QC reports; LCSs analyzed and meet acceptance criteria when performed	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 checked	TB	SB
Preparation and analysis calculations checked	TB	SB
NCRs are completed as necessary NC/CAR#	—	—
Report forms are complete and accurate	TB	SB
Manual integrations checked	TB	SB

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STANDARD REPORT

Working Standard - CLO4 WRK

CLO4 WRK — Description - 6850 WKG Std 100.ug/L

Standard: 43702
MFG: ALS/SLC
MFG Lot: TNB: 09/18/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/18/2018 02:09PM

Amount: 10 mL
Expires: 09/18/2019
Usable: Yes
Lab Lot: CLO4 WRK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	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
43701	CLO4 INT	6850 Intermdt AccStd 10.ug/mL	CLO4 INT	0.1 mL	09/18/2019

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: No
Lab Lot: CLO4 STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	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			

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STANDARD REPORT

Constituent

Working Standard - CLO4 INT

CLO4 INT — Description - 6850 Intermdt AccStd 10.ug/mL

Standard: 43701
MFG: ALS/SLC
MFG Lot: TNB: 09/18/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/18/2018 02:09PM

Amount: 10 mL
Expires: 09/18/2019
Usable: Yes
Lab Lot: CLO4 INT

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
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

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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			

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STANDARD REPORT

Constituent

Stock Standard - CLO4 QCSTOCK

CLO4 QCSTOCK — Description - 6850 QC Stock STD 1,000ug/mL

Standard: 36748
MFG: Ultra Scientific
MFG Lot: CP-0860
Part ID: ICC-013

Created By: Thomas Bosch
Create Date: 05/11/2017 01:05PM

Amount: 100 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL

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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

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STANDARD REPORT

Working Standard - CLO4ISTDWRK

CLO4ISTDWRK — Description - Perchlorate ISTD Wrk 1,000ug/L

Standard: 43730
MFG: ALS/SLC
MFG Lot: TNB: 05/09/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/20/2018 09:09AM
Verified By: Thomas Bosch
Verify Date:

Amount: 25 mL
Expires: 09/20/2019
Usable: Yes
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
43729	CLO4ISTDSTK	Perchlorate ISTD Stock	CLO4ISTDSTK	0.25 mL	04/28/2026

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STANDARD REPORT

Constituent

Stock Standard - CLO4ISTDSTK

CLO4ISTDSTK — Description - Perchlorate ISTD Stock

Standard: 43729
MFG: Cambridge Isotope
MFG Lot: SDFF-012A
Part ID: OLM-7310-S

Created By: Thomas Bosch
Create Date: 09/20/2018 09:09AM
Verified By: Thomas Bosch
Verify Date:

Amount: 1 mL
Expires: 04/28/2026
Usable: Yes
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

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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

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 ANAB ACCREDITED

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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

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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*

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

GHS

Signal Word: None

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

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

OR-ORG/INO-001
Rev. 5/18

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Cambridge Isotope Laboratories, Inc.

Certificate of Analysis

Quality Standards:
ISO Guide 34 • ISO/IEC 17025 • ISO 13485 • cGMP

23118

Product Name: (Isotopic Label & Enrichment Specification)	PERCHLORIC ACID, SODIUM SALT (18O4, 90%+) 100 UG/ML IN WATER
Lot Number:	SDDG-013
Catalog Number:	OLM-7310-S

Product Information

Chemical Purity Specification:	≥98%
Labeled CAS Number:	NA
Unlabeled CAS Number:	7601-89-0
MW*:	130.4
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.

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.

* *For isotopically labeled compounds, MW listed is for the fully enriched product.*

Approved by: T. J. Eckersley

Timothy I. Eckersley, Ph.D., Quality Assurance

Quality Control Tests and Results

QC Release Date	2/27/2014
Expiration Date	2/27/2024
Concentration Based on Gravimetry	102 µg/mL
Chemical Purity of Neat Material(s)	98%
LC/MS for Concentration	109.4 ± 2.8 µg/mL (k=2)

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ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

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Batch Report: C:\HPCHEM\1\DATA\01JUL19D\01JUL19S.B

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP2.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
*	661477 CCV@25	Vial 71	1	Control	1	1.94364e6	8.502	26.12624
*	661481 QC@4.0	Vial 72	1	Control	2	3.56116e5	8.215	4.27672
*	661479 ICS@4.0	Vial 73	1	Control	3	2.74101e5	8.013	3.76269
*	661480 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	1917698001 1K	Vial 75	1	Sample	5	1.80575e6	8.547	2.30697e4
*	1917698002 1K	Vial 76	1	Sample	6	2.06010e6	8.593	2.58627e4
*	1917698004 1K	Vial 78	1	Sample	8	3.25841e5	8.618	4410.00331
*	1917698005 MS	Vial 79	1	Sample	9	6.67091e5	8.655	8914.28717
*	1917698006 MSD	Vial 80	1	Sample	10	6.51482e5	8.597	8808.96977
*	1917698007 1K	Vial 81	1	Sample	11	7.47888e5	8.647	1.04112e4
*	1917856001	Vial 83	1	Sample	13	0.00000	0.000	0.00000
*	1917856002	Vial 84	1	Sample	14	0.00000	0.000	0.00000
*	1917856003	Vial 85	1	Sample	15	0.00000	0.000	0.00000
*	1917856004	Vial 86	1	Sample	16	0.00000	0.000	0.00000
*	661482 CCV@25	Vial 71	1	Control	17	1.60409e6	8.558	25.00349
*	1917856005	Vial 87	1	Sample	18	0.00000	0.000	0.00000
*	1917856006 100	Vial 88	1	Sample	19	4.03838e5	8.639	621.06433
*	1917856007 100	Vial 89	1	Sample	20	4.34274e5	8.657	588.15812
*	1918052001 1K	Vial 90	1	Sample	21	9.58579e5	8.665	1.34755e4
*	1918052002 10K	Vial 91	1	Sample	22	1.70174e6	8.689	2.36511e5
*	1918052003 10K	Vial 92	1	Sample	23	1.68203e6	8.679	2.30798e5
*	1918052004	Vial 93	1	Sample	24	0.00000	0.000	0.00000
*	1917698003 100	Vial 94	1	Sample	25	3.02113e6	8.615	4300.62656
*	1917698008 1K	Vial 95	1	Sample	26	1.64048e6	8.691	2.37316e4
*	1917856001 RE	Vial 83	1	Sample	27	0.00000	0.000	0.00000
*	661483 CCV@25	Vial 71	1	Control	28	1.50603e6	8.597	25.41985
*	1917856002 RE	Vial 84	1	Sample	29	0.00000	0.000	0.00000
*	661661 CCV@25	Vial 71	1	Control	30	1.45949e6	8.576	25.10137

#*	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
*	661477 CCV@25	Vial 71	1	Control	1	5.88479e5	8.517	26.62967
*	661481 QC@4.0	Vial 72	1	Control	2	1.16200e5	8.258	4.54646
*	661479 ICS@4.0	Vial 73	1	Control	3	8.51455e4	8.028	3.78922
*	661480 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	1917698001 1K	Vial 75	1	Sample	5	5.48648e5	8.553	2.35743e4
*	1917698002 1K	Vial 76	1	Sample	6	6.20226e5	8.595	2.62187e4
*	1917698004 1K	Vial 78	1	Sample	8	1.08064e5	8.621	4769.85352
*	1917698005 MS	Vial 79	1	Sample	9	2.16450e5	8.652	9609.46002
*	1917698006 MSD	Vial 80	1	Sample	10	2.06556e5	8.628	9281.28672
*	1917698007 1K	Vial 81	1	Sample	11	2.34170e5	8.675	1.08652e4
*	1917856001	Vial 83	1	Sample	13	0.00000	0.000	0.00000
*	1917856002	Vial 84	1	Sample	14	0.00000	0.000	0.00000
*	1917856003	Vial 85	1	Sample	15	0.00000	0.000	0.00000
*	1917856004	Vial 86	1	Sample	16	0.00000	0.000	0.00000
*	661482 CCV@25	Vial 71	1	Control	17	4.85334e5	8.571	25.46167
*	1917856005	Vial 87	1	Sample	18	0.00000	0.000	0.00000
*	1917856006 100	Vial 88	1	Sample	19	1.32726e5	8.663	672.87107
*	1917856007 100	Vial 89	1	Sample	20	1.40119e5	8.663	624.82071
*	1918052001 1K	Vial 90	1	Sample	21	2.95207e5	8.681	1.38848e4
*	1918052002 10K	Vial 91	1	Sample	22	5.16167e5	8.701	2.41334e5
*	1918052003 10K	Vial 92	1	Sample	23	5.17000e5	8.701	2.38460e5
*	1918052004	Vial 93	1	Sample	24	0.00000	0.000	0.00000
*	1917698003 100	Vial 94	1	Sample	25	8.88076e5	8.626	4275.40488
*	1917698008 1K	Vial 95	1	Sample	26	4.99687e5	8.711	2.43133e4
*	1917856001 RE	Vial 83	1	Sample	27	0.00000	0.000	0.00000
*	661483 CCV@25	Vial 71	1	Control	28	4.53099e5	8.615	25.74994
*	1917856002 RE	Vial 84	1	Sample	29	0.00000	0.000	0.00000
*	661661 CCV@25	Vial 71	1	Control	30	4.45116e5	8.600	25.75597

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Batch Report: C:\HPCHEM\1\DATA\01JUL19D\01JUL19S.B

#	*	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
	*	661477 CCV@25	Vial 71	1	Control	1	2.25730e5	8.518	5.00000
	*	661481 QC@4.0	Vial 72	1	Control	2	2.73485e5	8.237	5.00000
	*	661479 ICS@4.0	Vial 73	1	Control	3	2.40789e5	8.048	5.00000
	*	661480 LMB	Vial 74	1	Control	4	2.63576e5	8.496	5.00000
	*	1917698001 1K	Vial 75	1	Sample	5	2.39255e5	8.564	5000.00000
	*	1917698002 1K	Vial 76	1	Sample	6	2.41844e5	8.612	5000.00000
	*	1917698004 1K	Vial 78	1	Sample	8	2.42320e5	8.640	5000.00000
	*	1917698005 MS	Vial 79	1	Sample	9	2.38518e5	8.669	5000.00000
	*	1917698006 MSD	Vial 80	1	Sample	10	2.35827e5	8.629	5000.00000
	*	1917698007 1K	Vial 81	1	Sample	11	2.27615e5	8.679	5000.00000
	*	1917856001	Vial 83	1	Sample	13	9.31342e4	7.613	5.00000
	*	1917856002	Vial 84	1	Sample	14	8.79498e4	7.621	5.00000
	*	1917856003	Vial 85	1	Sample	15	2.30973e5	7.860	5.00000
	*	1917856004	Vial 86	1	Sample	16	2.08544e5	7.904	5.00000
	*	661482 CCV@25	Vial 71	1	Control	17	1.95182e5	8.589	5.00000
	*	1917856005	Vial 87	1	Sample	18	2.92027e5	7.936	5.00000
	*	1917856006 100	Vial 88	1	Sample	19	2.10142e5	8.654	500.00000
	*	1917856007 100	Vial 89	1	Sample	20	2.39145e5	8.684	500.00000
	*	1918052001 1K	Vial 90	1	Sample	21	2.23102e5	8.672	5000.00000
	*	1918052002 10K	Vial 91	1	Sample	22	2.19618e5	8.709	5.00000e4
	*	1918052003 10K	Vial 92	1	Sample	23	2.22758e5	8.695	5.00000e4
	*	1918052004	Vial 93	1	Sample	24	1.88746e5	7.876	5.00000
	*	1917698003 100	Vial 94	1	Sample	25	2.05249e5	8.640	500.00000
	*	1917698008 1K	Vial 95	1	Sample	26	2.10954e5	8.695	5000.00000
	*	1917856001 RE	Vial 83	1	Sample	27	1.44962e5	7.630	5.00000
	*	661483 CCV@25	Vial 71	1	Control	28	1.80070e5	8.618	5.00000
	*	1917856002 RE	Vial 84	1	Sample	29	1.42651e5	7.637	5.00000
	*	661661 CCV@25	Vial 71	1	Control	30	1.76854e5	8.601	5.00000

*** End of Report ***

RIGHT SOLUTIONS | RIGHT PARTNER

Sequence Table:

Method and Injection Info Part:

Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	661477 CCV@25	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	661481 QC@4.0	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	661479 ICS@4.0	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	661480 LMB	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	1917698001 1K	CLO4-AQN	1	Sample		
6	Vial 76	1917698002 1K	CLO4-AQN	1	Sample		
7	Vial 77	1917698003 1K	CLO4-AQN	1	Sample		
8	Vial 78	1917698004 1K	CLO4-AQN	1	Sample		
9	Vial 79	1917698005 MS	CLO4-AQN	1	Sample		
10	Vial 80	1917698006 MSD	CLO4-AQN	1	Sample		
11	Vial 81	1917698007 1K	CLO4-AQN	1	Sample		
12	Vial 82	1917698008 10K	CLO4-AQN	1	Sample		
13	Vial 83	1917856001	CLO4-AQN	1	Sample		
14	Vial 84	1917856002	CLO4-AQN	1	Sample		
15	Vial 85	1917856003	CLO4-AQN	1	Sample		
16	Vial 86	1917856004	CLO4-AQN	1	Sample		
17	Vial 71	661482 CCV@25	CLO4-AQN	1	Ctrl Samp		
18	Vial 87	1917856005	CLO4-AQN	1	Sample		
19	Vial 88	1917856006 100	CLO4-AQN	1	Sample		
20	Vial 89	1917856007 100	CLO4-AQN	1	Sample		
21	Vial 90	1918052001 1K	CLO4-AQN	1	Sample		
22	Vial 91	1918052002 10K	CLO4-AQN	1	Sample		
23	Vial 92	1918052003 10K	CLO4-AQN	1	Sample		
24	Vial 93	1918052004	CLO4-AQN	1	Sample		
25	Vial 94	1917698003 100	CLO4-AQN	1	Sample		
26	Vial 95	1917698008 1K	CLO4-AQN	1	Sample		
27	Vial 83	1917856001 RE	CLO4-AQN	1	Sample		
28	Vial 71	661483 CCV@25	CLO4-AQN	1	Ctrl Samp		
29	Vial 84	1917856002 RE	CLO4-AQN	1	Sample		
30	Vial 71	661661 CCV@25	CLO4-AQN	1	Ctrl Samp		

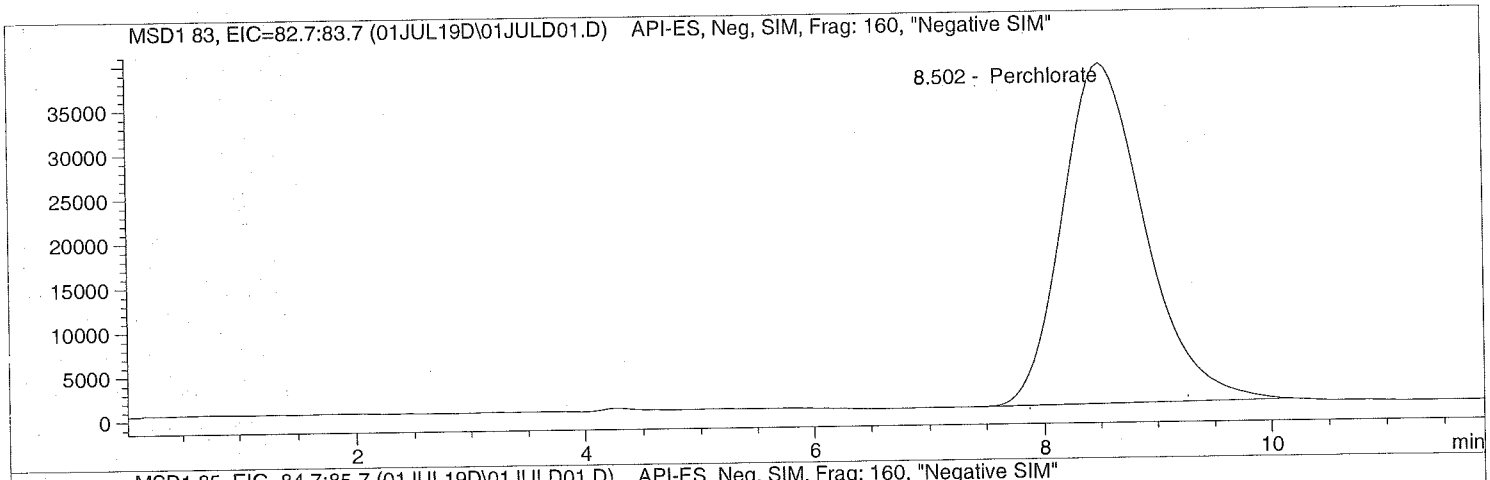
RIGHT SOLUTIONS | RIGHT PARTNER

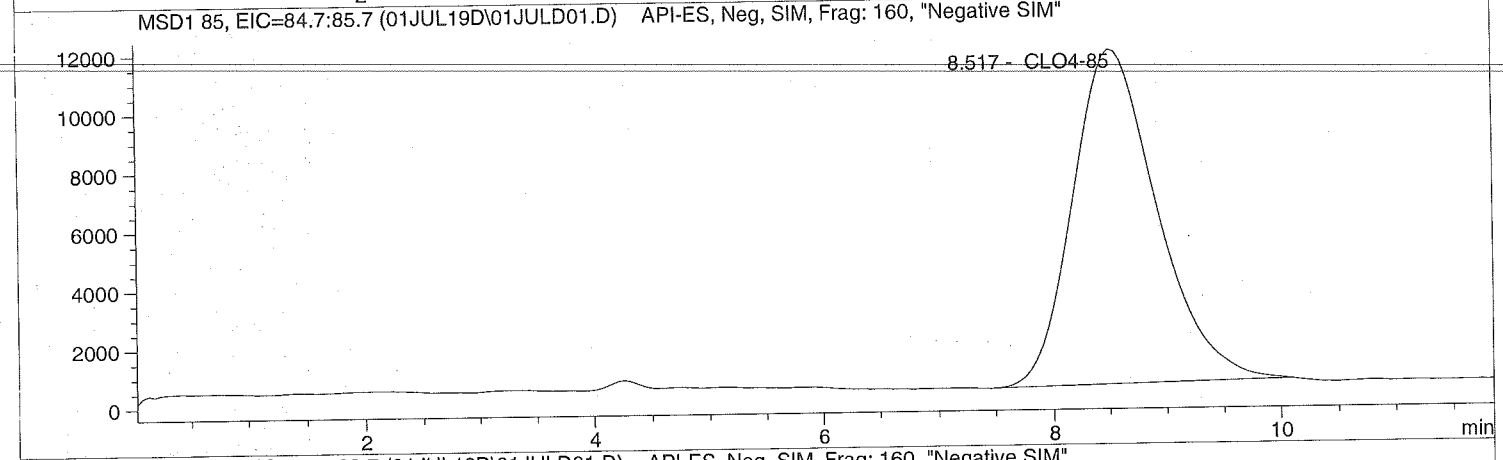
Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD01.D Sample Name: 661477 CCV@25

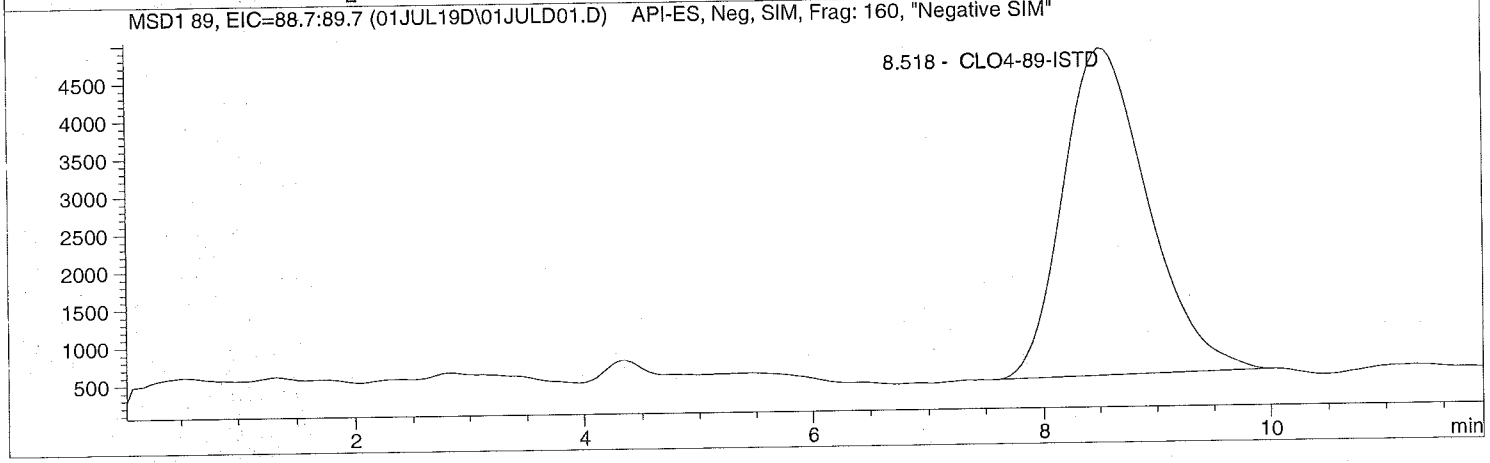
Injection Date:	7/01/2019 08:34:23	Seq Line:	1
Sample Name:	661477 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD01.D Sample Name: 661477 CCV@25

Injection Date:	7/01/2019 08:34:23	Seq Line:	1
Sample Name:	661477 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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.502	PBA	1943636.6	26.1262	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.517	PBA	588479.1	26.6297	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.518	PBA	225730.5	5.0000	CLO4-89-ISTD

*** End of Report ***

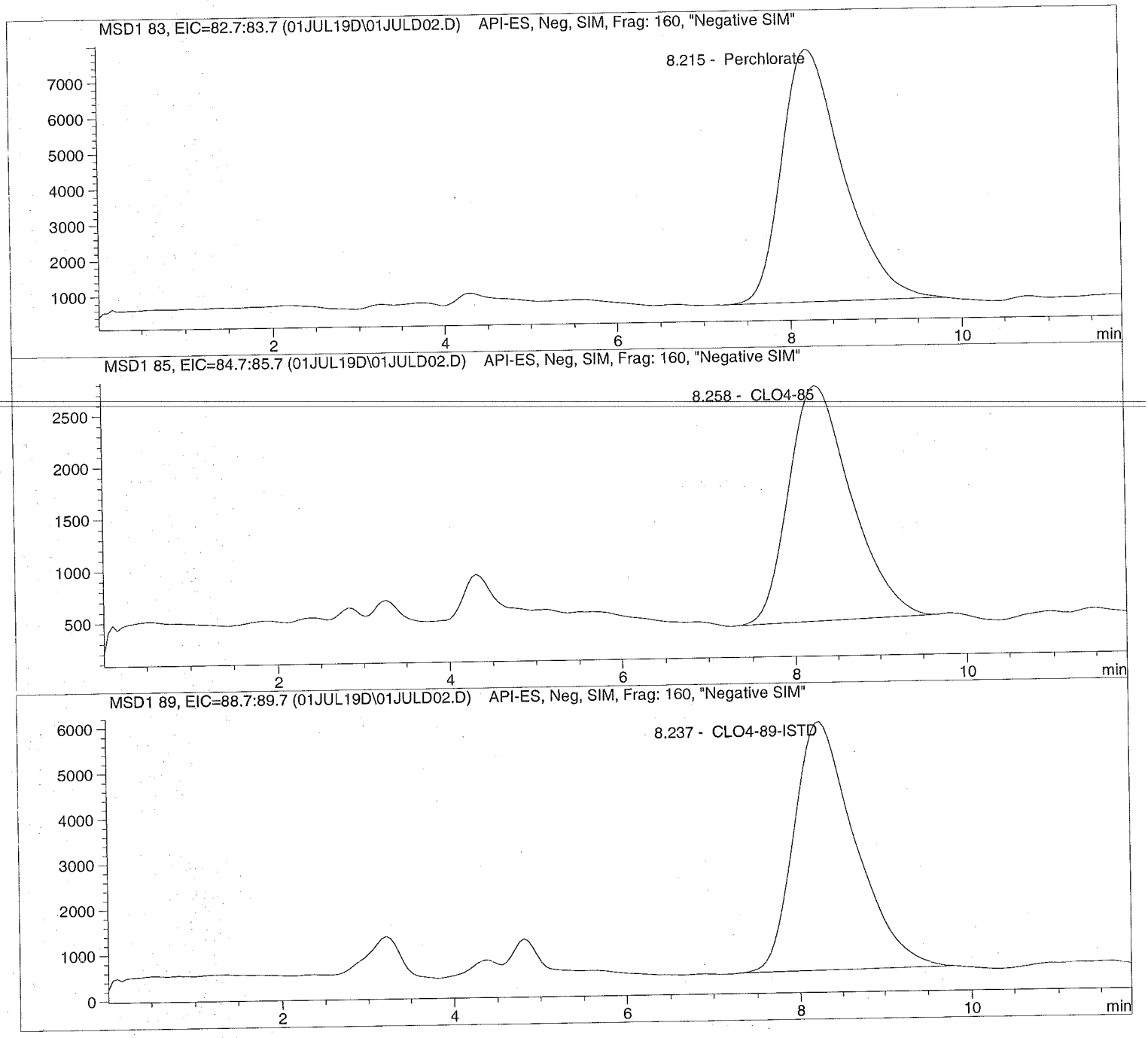
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD02.D Sample Name: 661481 QC@4.0

Injection Date:	7/01/2019 08:48:56	Seq Line:	2
Sample Name:	661481 QC@4.0	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD02.D Sample Name: 661481 QC@4.0

Injection Date:	7/01/2019 08:48:56	Seq Line:	2
Sample Name:	661481 QC@4.0	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.215	PBA	356116.2	4.2767	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.258	PBA	116199.5	4.5465	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.237	PBA	273484.5	5.0000	CLO4-89-ISTD

*** End of Report ***

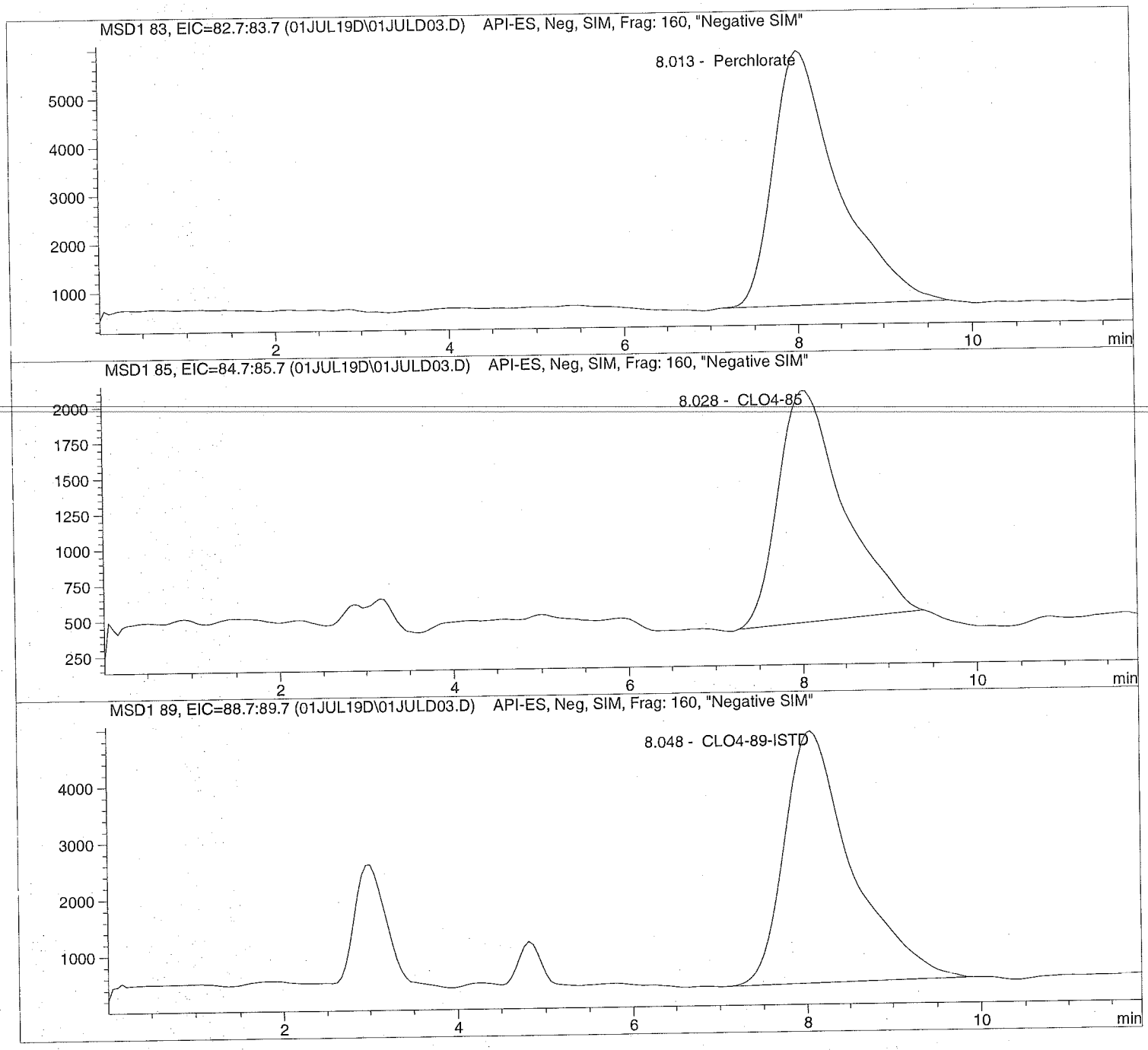
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD03.D Sample Name: 661479 ICS@4.0

Injection Date:	7/01/2019 09:02:47	Seq Line:	3
Sample Name:	661479 ICS@4.0	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



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Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD03.D Sample Name: 661479 ICS@4.0

Injection Date:	7/01/2019 09:02:47	Seq Line:	3
Sample Name:	661479 ICS@4.0	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.013	BBA	274101.4	3.7627	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.028	PBA	85145.5	3.7892	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.048	PBA	240788.6	5.0000	CLO4-89-ISTD

*** End of Report ***

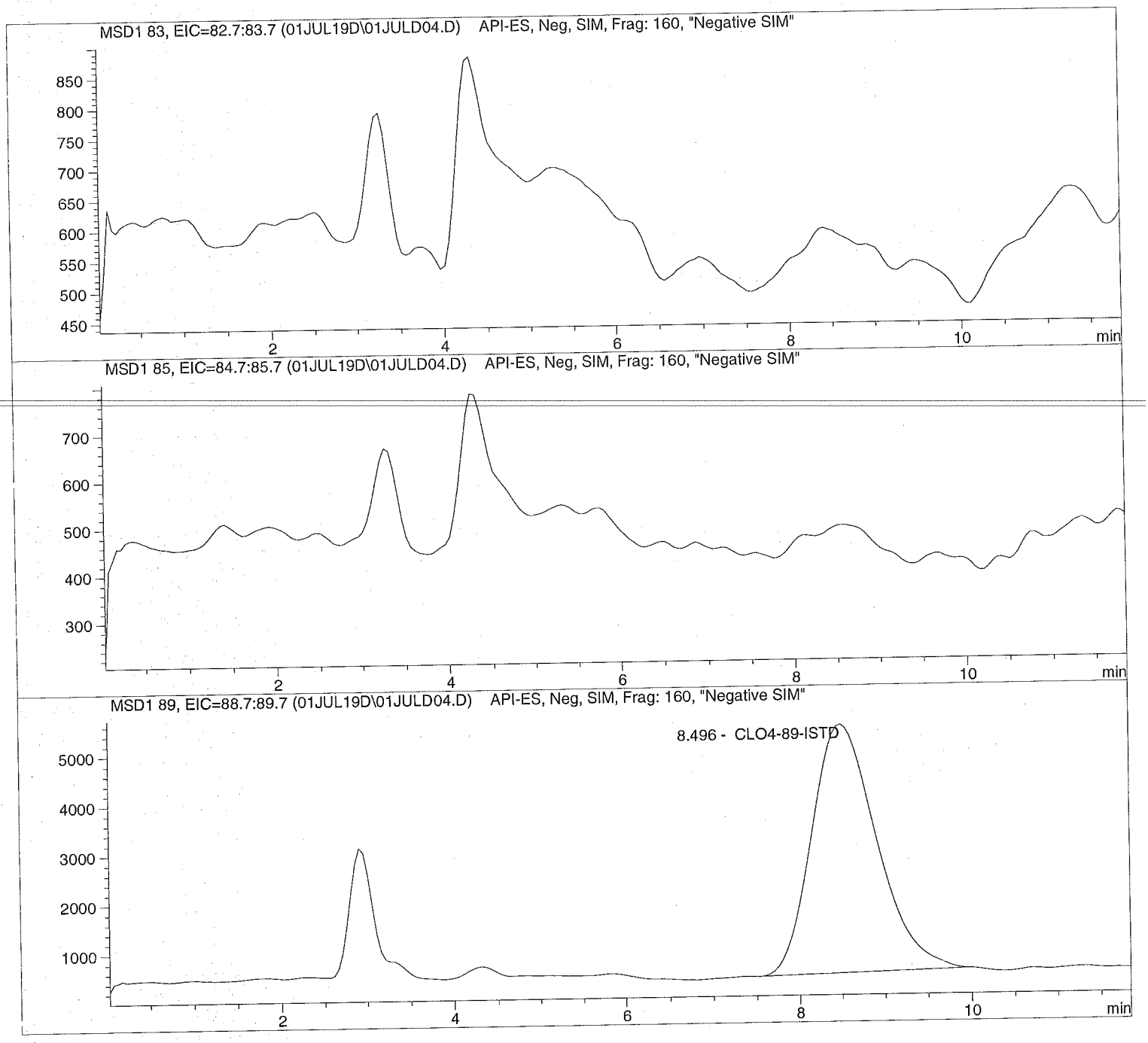
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD04.D Sample Name: 661480 LMB

Injection Date:	7/01/2019 09:16:47	Seq Line:	4
Sample Name:	661480 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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD04.D Sample Name: 661480 LMB

Injection Date: 7/01/2019 09:16:47
Sample Name: 661480 LMB
Acq Operator: TNB

Seq Line: 4
Location: Vial 74
Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Fri, 12. Apr. 2019,07:52:58 am
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
8.496	PBA	263576.3	5.0000	CLO4-89-ISTD

*** End of Report ***

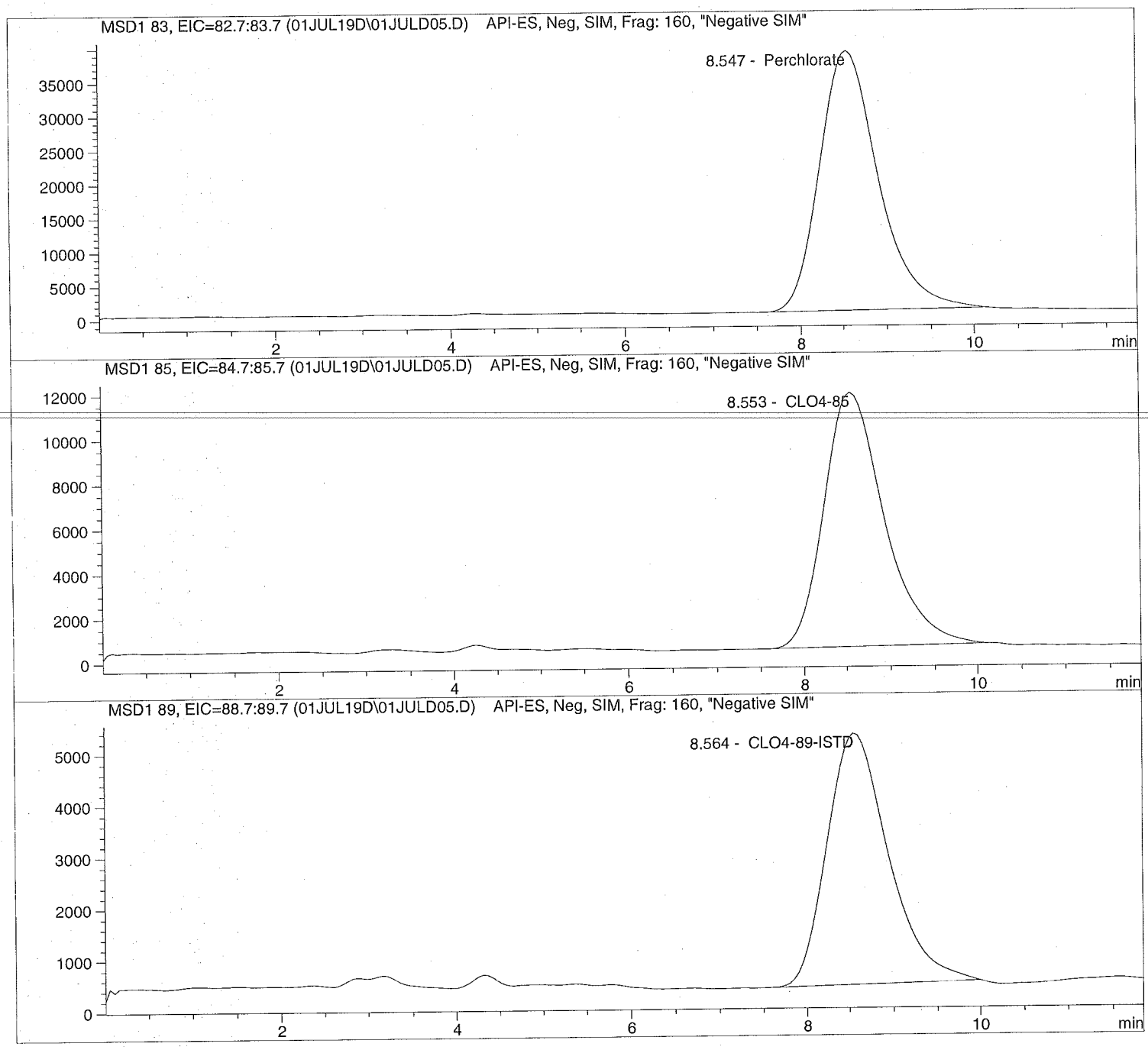
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD05.D Sample Name: 1917698001 1K

Injection Date:	7/01/2019 09:30:40	Seq Line:	5
Sample Name:	1917698001 1K	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD05.D Sample Name: 1917698001 1K

Injection Date:	7/01/2019 09:30:40	Seq Line:	5
Sample Name:	1917698001 1K	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.547	PBA	1805754.9	23069.7173	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.553	PBA	548647.9	23574.3344	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.564	PBA	239254.8	5000.0000	CLO4-89-ISTD

*** End of Report ***

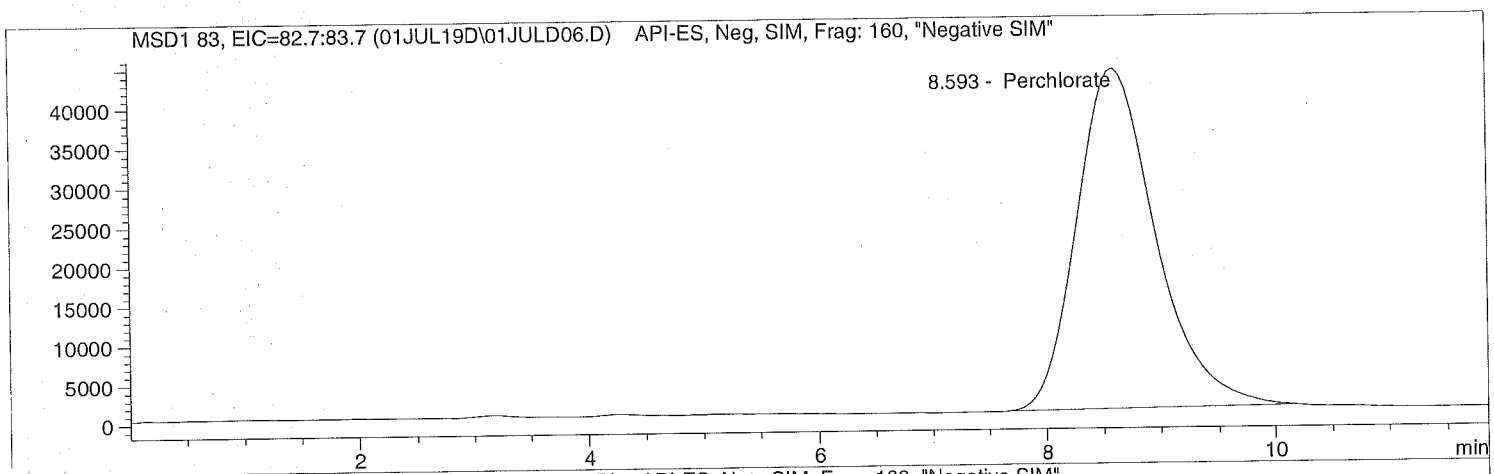
RIGHT SOLUTIONS | RIGHT PARTNER

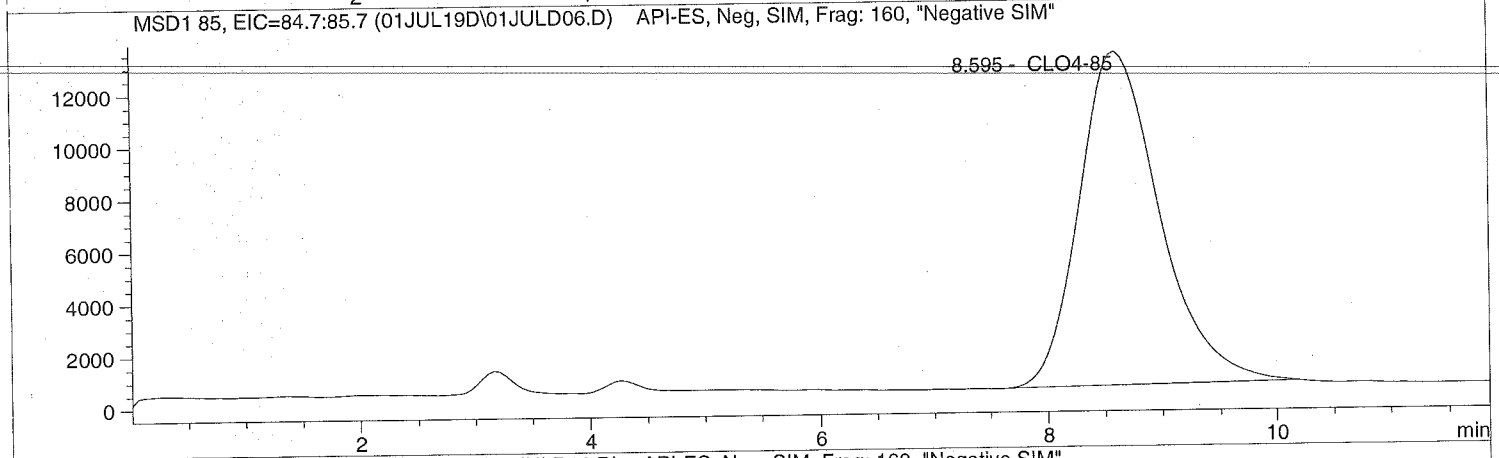
Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD06.D Sample Name: 1917698002 1K

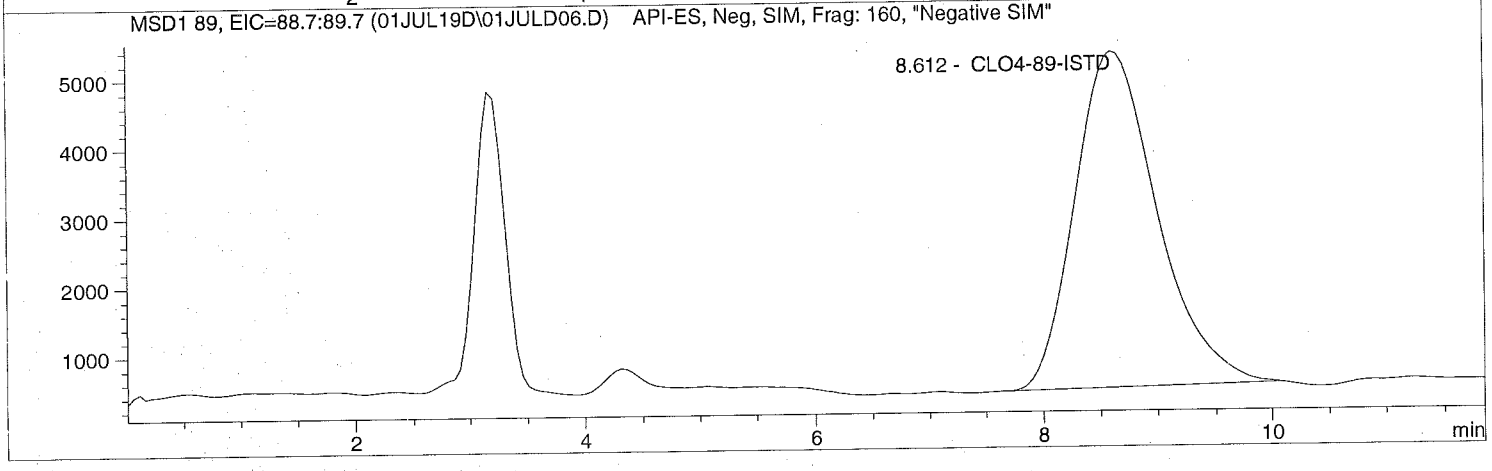
Injection Date:	7/01/2019 09:44:35	Seq Line:	6
Sample Name:	1917698002 1K	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD06.D Sample Name: 1917698002 1K

Injection Date:	7/01/2019 09:44:35	Seq Line:	6
Sample Name:	1917698002 1K	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.593	PBA	2060095.9	25862.7348	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.595	PBA	620225.7	26218.7320	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.612	PBA	241844.5	5000.0000	CLO4-89-ISTD

*** End of Report ***

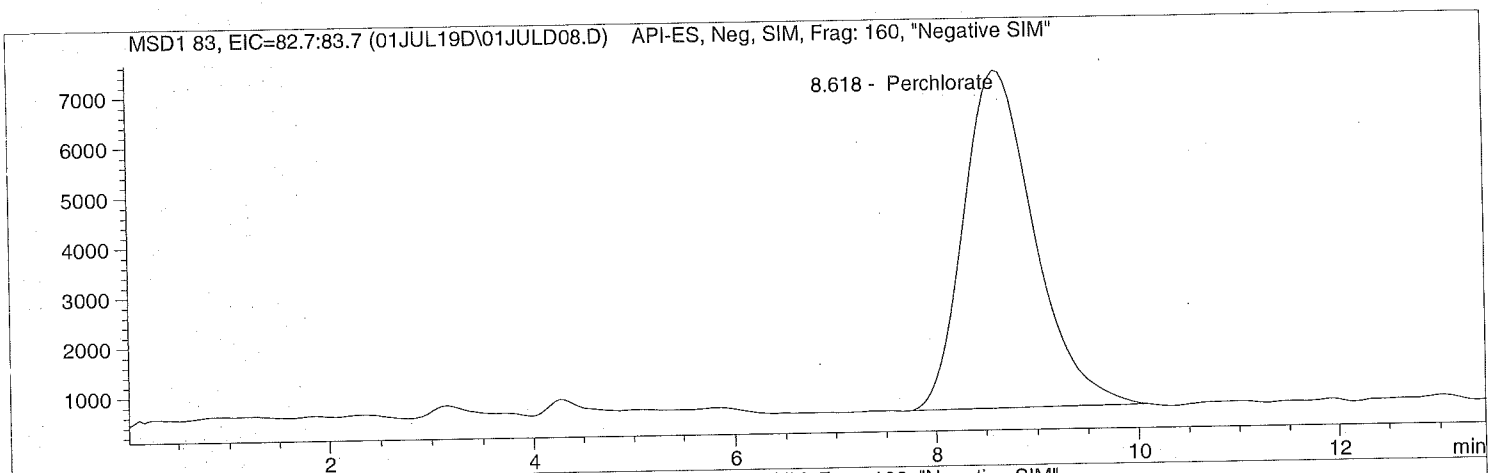
RIGHT SOLUTIONS | RIGHT PARTNER

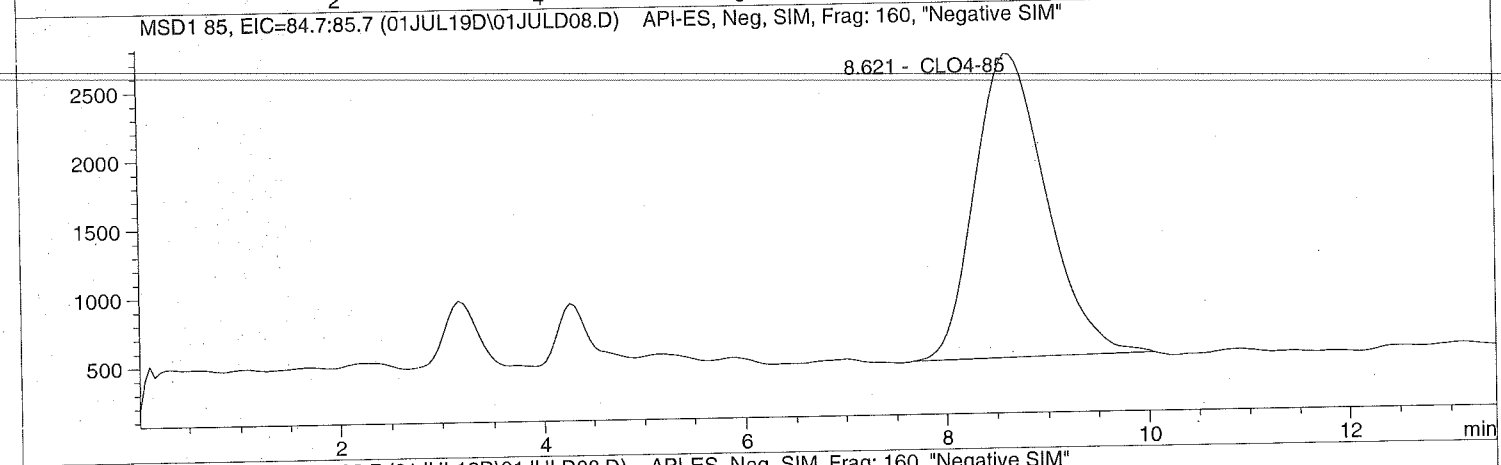
Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD08.D Sample Name: 1917698004 1K

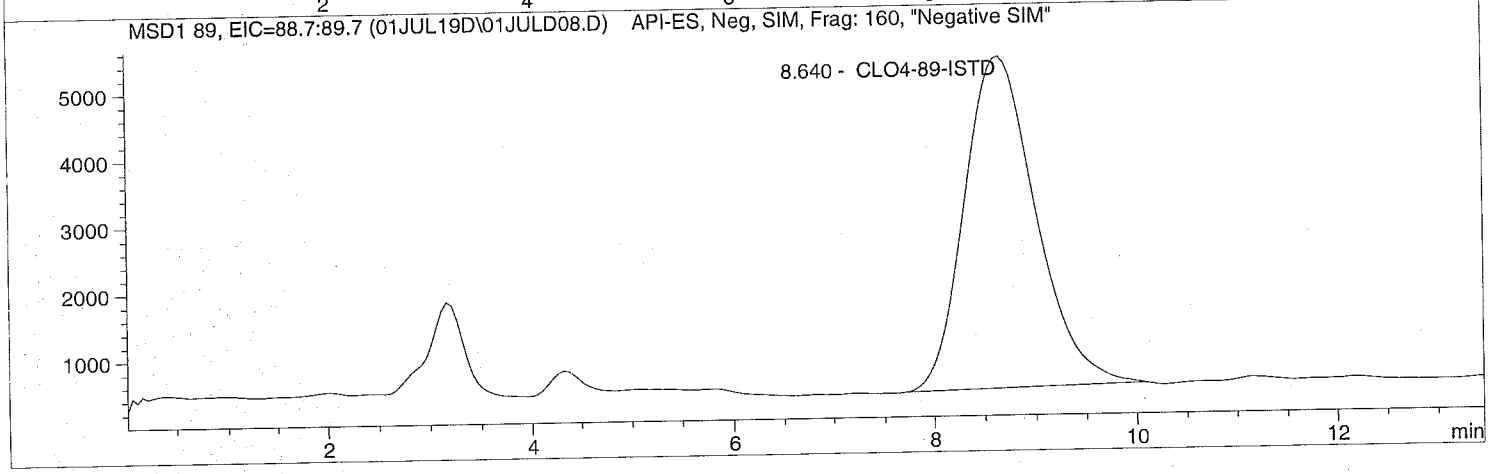
Injection Date:	7/01/2019 10:12:34	Seq Line:	8
Sample Name:	1917698004 1K	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD08.D Sample Name: 1917698004 1K

Injection Date:	7/01/2019 10:12:34	Seq Line:	8
Sample Name:	1917698004 1K	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.618	PBA	325841.4	4410.0033	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.621	PBA	108064.0	4769.8535	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.640	PBA	242319.7	5000.0000	CLO4-89-ISTD

*** End of Report ***

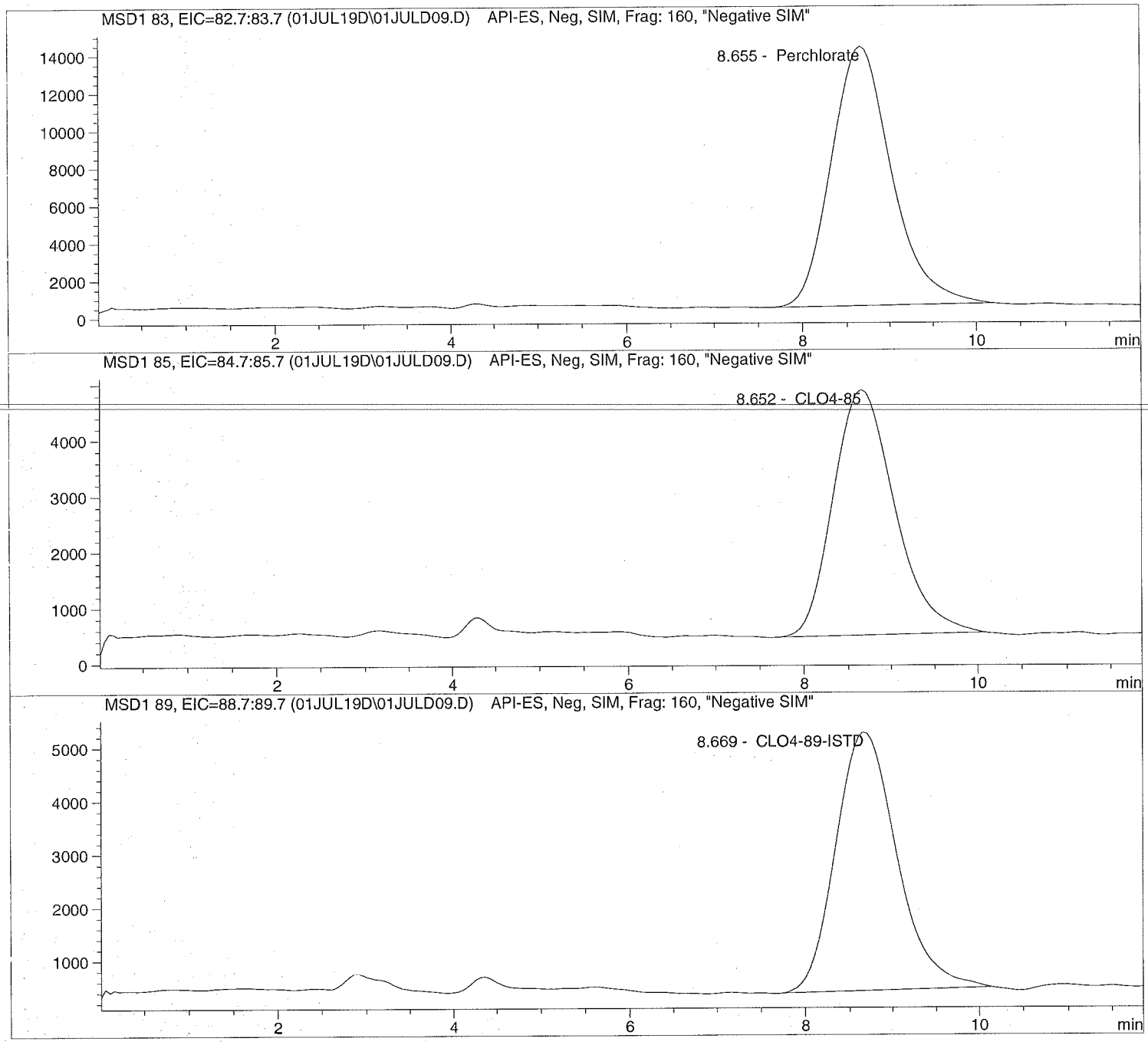
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD09.D Sample Name: 1917698005 MS

Injection Date:	7/01/2019 10:28:15	Seq Line:	9
Sample Name:	1917698005 MS	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD09.D Sample Name: 1917698005 MS

Injection Date:	7/01/2019 10:28:15	Seq Line:	9
Sample Name:	1917698005 MS	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.655	PBA	667091.1	8914.2872	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.652	PBA	216450.0	9609.4600	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.669	PBA	238517.6	5000.0000	CLO4-89-ISTD

*** End of Report ***

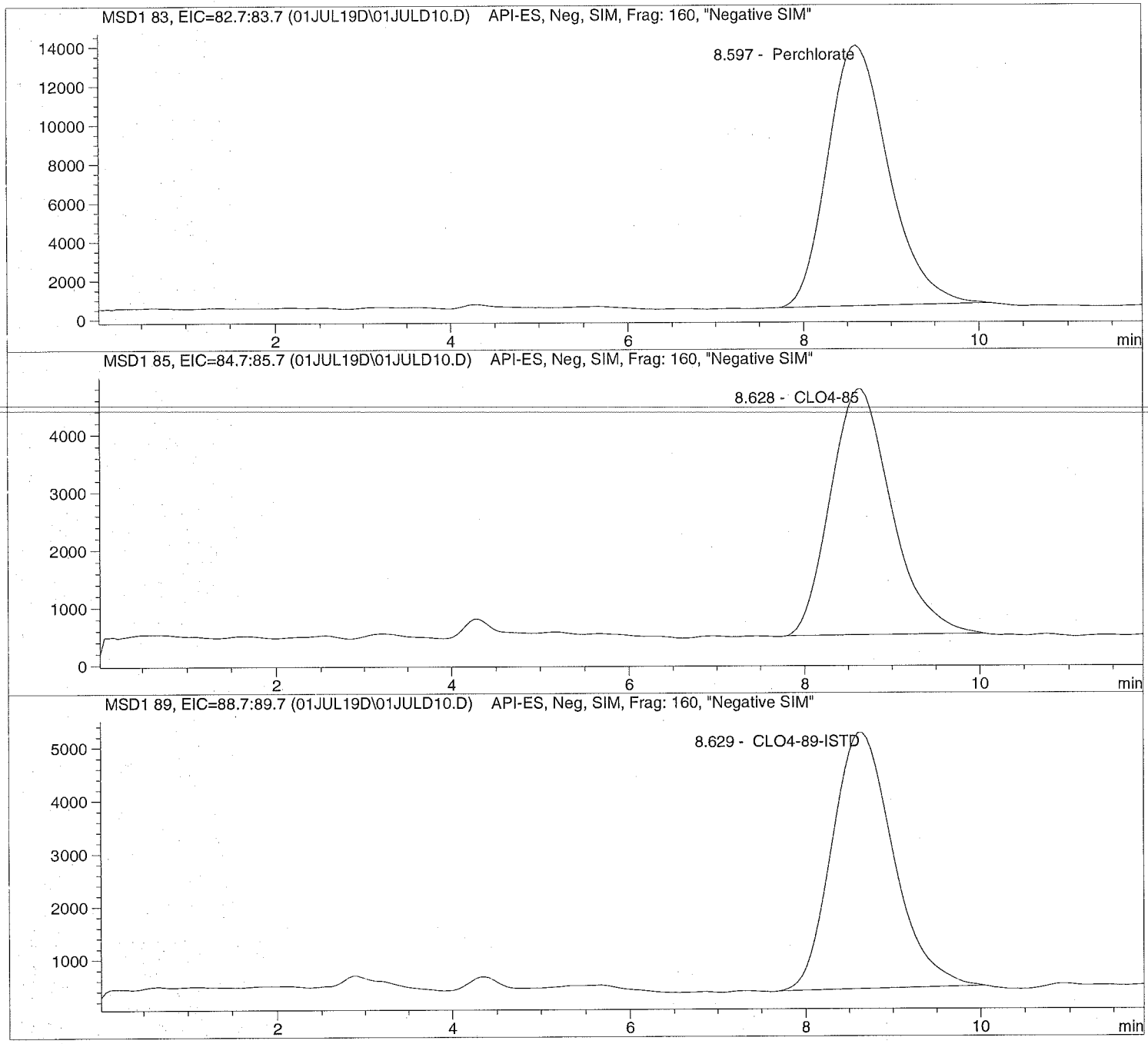
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD10.D Sample Name: 1917698006 MSD

Injection Date:	7/01/2019 10:43:07	Seq Line:	10
Sample Name:	1917698006 MSD	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD10.D Sample Name: 1917698006 MSD

Injection Date:	7/01/2019 10:43:07	Seq Line:	10
Sample Name:	1917698006 MSD	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.597	PBA	651481.5	8808.9698	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.628	BBA	206556.3	9281.2867	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.629	PBA	235827.1	5000.0000	CLO4-89-ISTD

*** End of Report ***

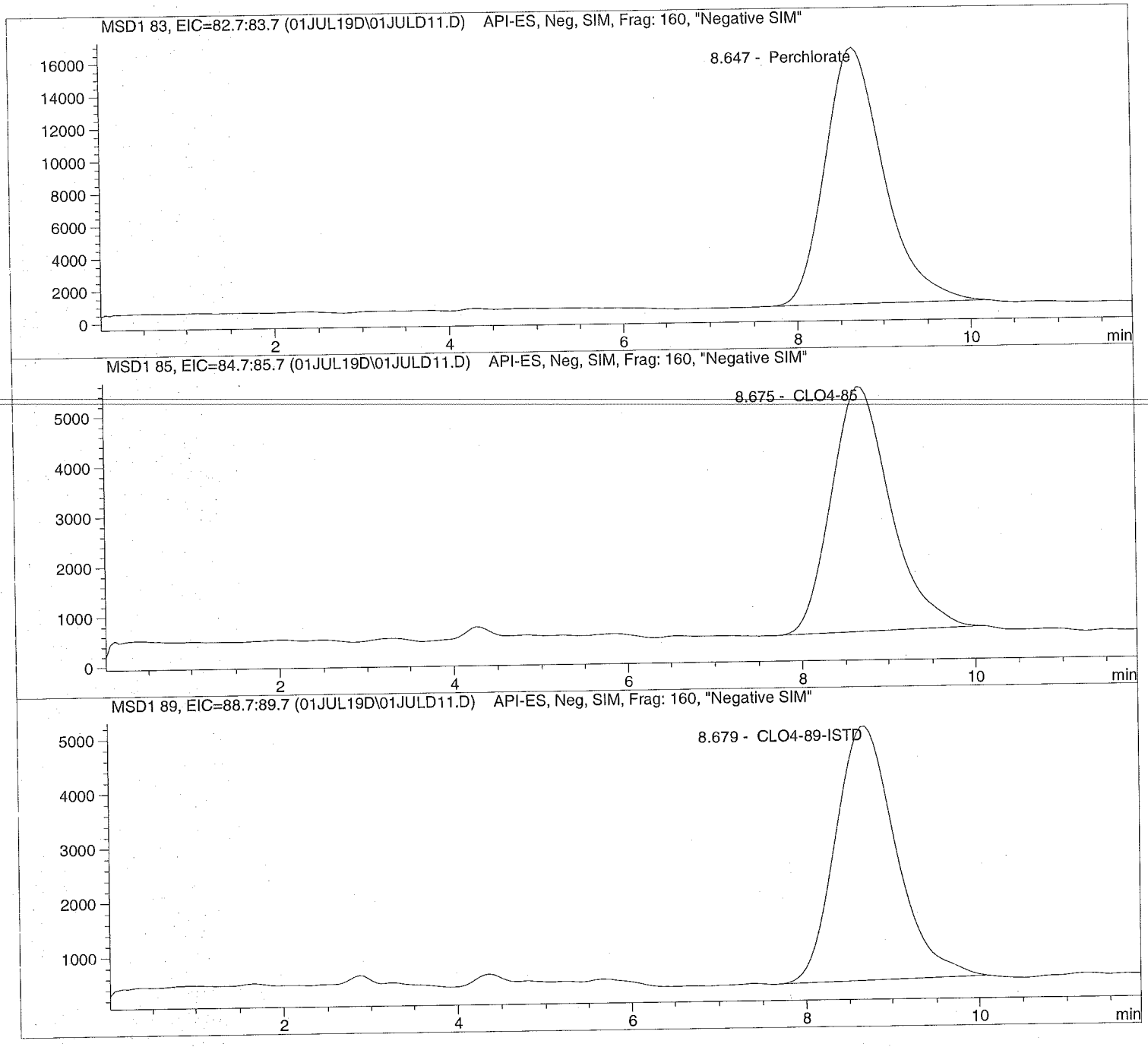
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD11.D Sample Name: 1917698007 1K

Injection Date:	7/01/2019 10:56:59	Seq Line:	11
Sample Name:	1917698007 1K	Location:	Vial 81
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD11.D Sample Name: 1917698007 1K

Injection Date:	7/01/2019 10:56:59	Seq Line:	11
Sample Name:	1917698007 1K	Location:	Vial 81
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.647	PBA	747887.6	10411.1564	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.675	PBA	234170.4	10865.1642	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.679	PBA	227614.9	5000.0000	CLO4-89-ISTD

*** End of Report ***

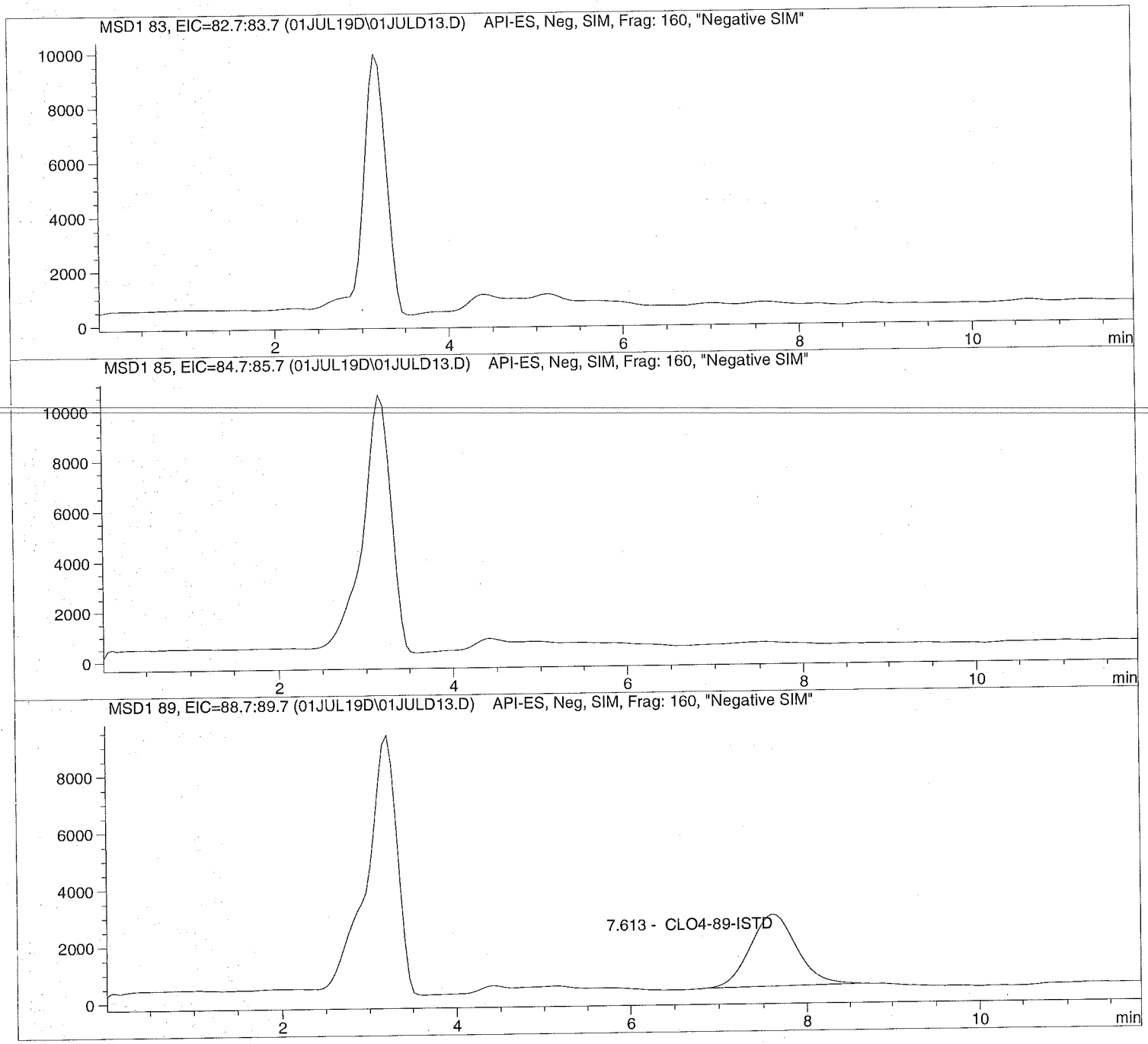
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD13.D Sample Name: 1917856001

Injection Date:	7/01/2019 11:24:46	Seq Line:	13
Sample Name:	1917856001	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD13.D Sample Name: 1917856001

Injection Date:	7/01/2019 11:24:46	Seq Line:	13
Sample Name:	1917856001	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-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
7.613	PBA	93134.2	5.0000	CLO4-89-ISTD

*** End of Report ***

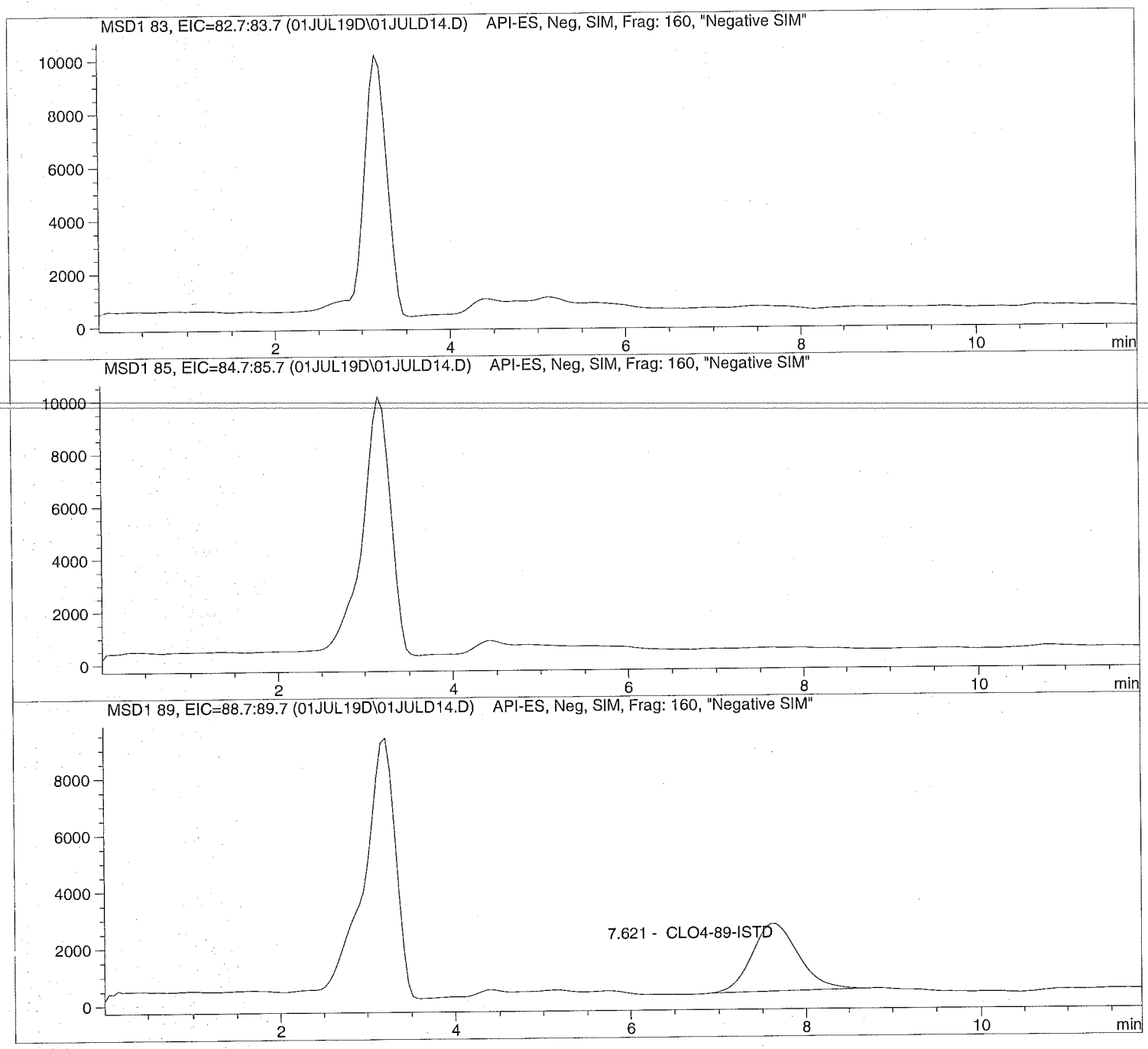
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD14.D Sample Name: 1917856002

Injection Date:	7/01/2019 11:38:38	Seq Line:	14
Sample Name:	1917856002	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD14.D Sample Name: 1917856002

Injection Date:	7/01/2019 11:38:38	Seq Line:	14
Sample Name:	1917856002	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-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
7.621	PBA	87949.8	5.0000	CLO4-89-ISTD

*** End of Report ***

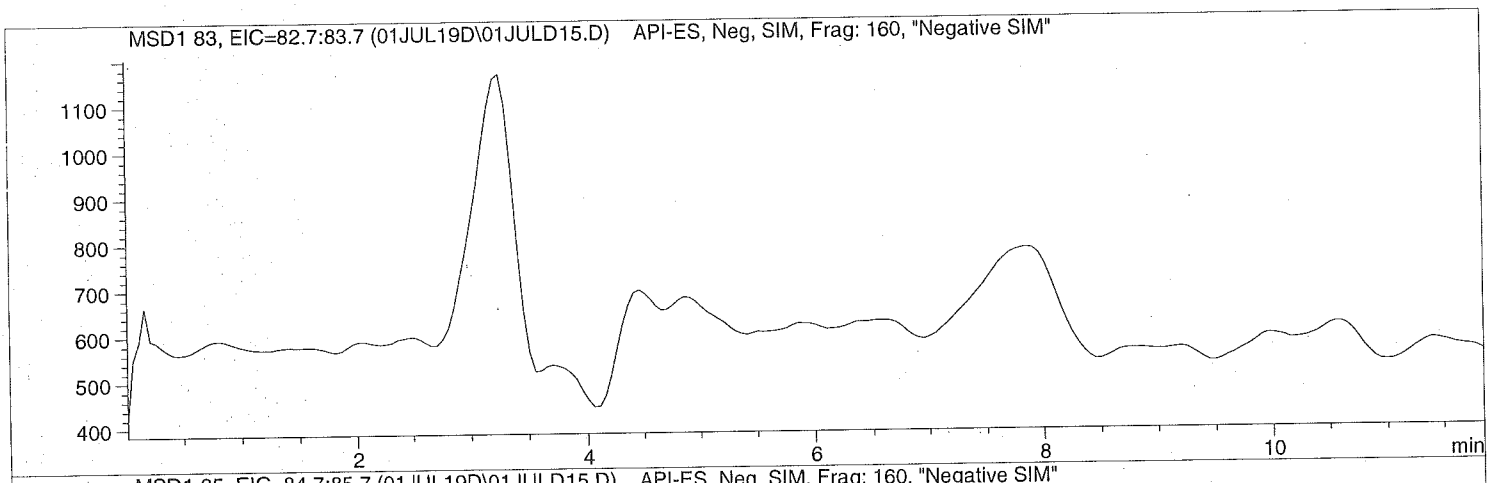
RIGHT SOLUTIONS | RIGHT PARTNER

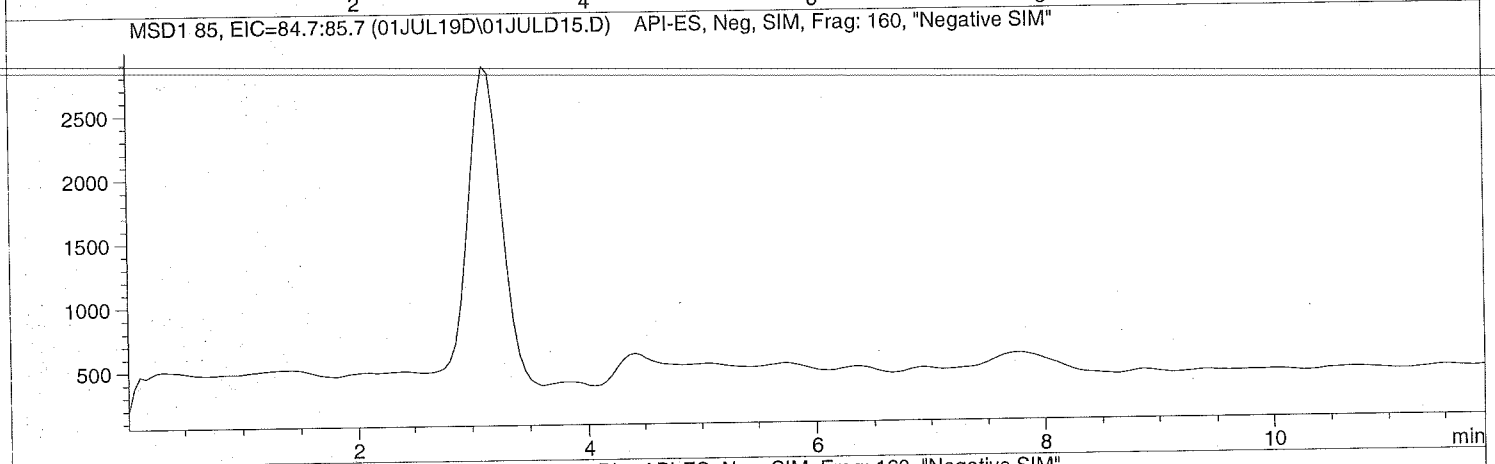
Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD15.D Sample Name: 1917856003

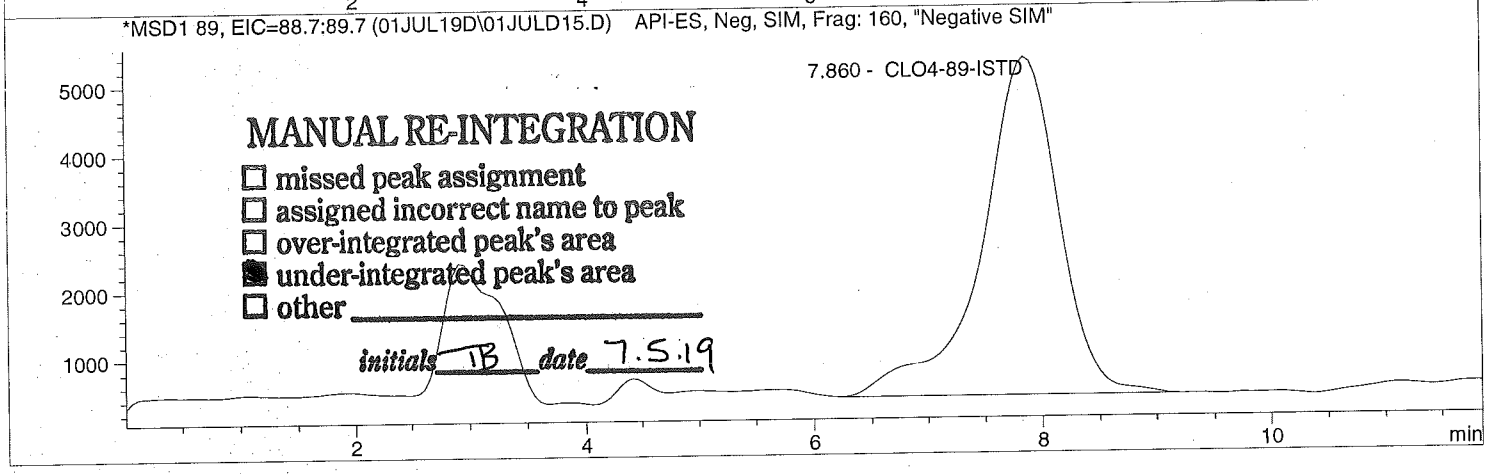
Injection Date:	7/01/2019 11:52:34	Seq Line:	15
Sample Name:	1917856003	Location:	Vial 85
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







MANUAL RE-INTEGRATION
- ☐ missed peak assignment
- ☐ assigned incorrect name to peak
- ☐ over-integrated peak's area
- ■ under-integrated peak's area
- ☐ other _____

initials TB date 7.5.19

RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD15.D Sample Name: 1917856003

Injection Date:	7/01/2019 11:52:34	Seq Line:	15
Sample Name:	1917856003	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-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
7.860	MM	230973.5	5.0000	CLO4-89-ISTD

*** End of Report ***

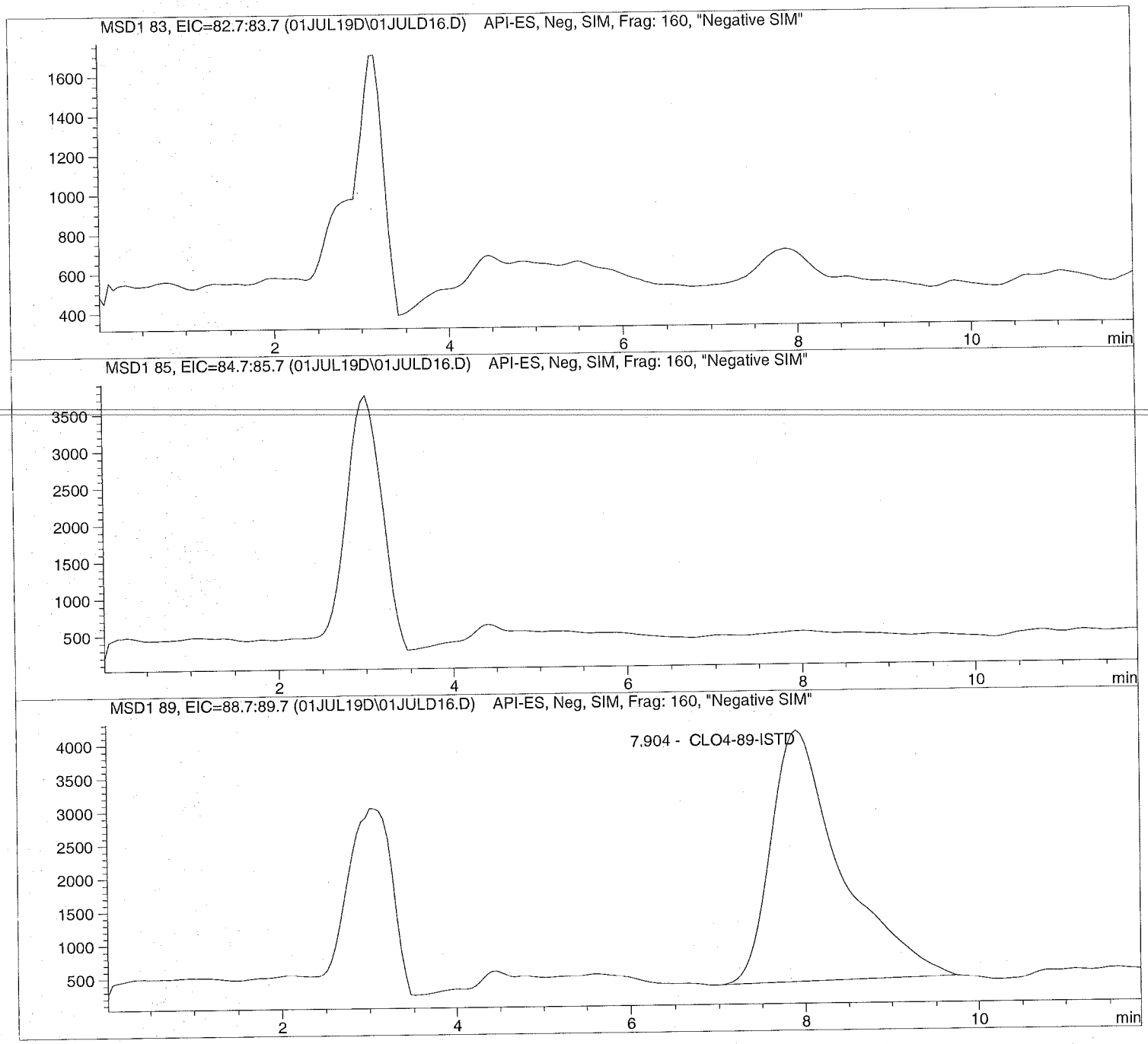
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD16.D Sample Name: 1917856004

Injection Date:	7/01/2019 12:06:28	Seq Line:	16
Sample Name:	1917856004	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-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD16.D Sample Name: 1917856004

Injection Date:	7/01/2019 12:06:28	Seq Line:	16
Sample Name:	1917856004	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
7.904	PBA	208544.4	5.0000	CLO4-89-ISTD

*** End of Report ***

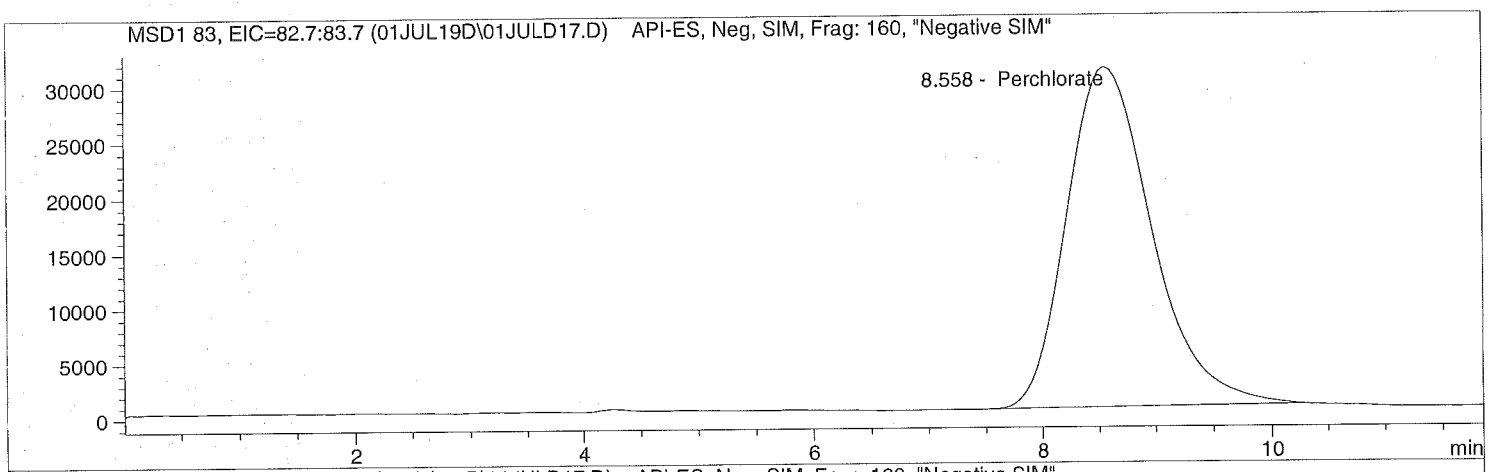
RIGHT SOLUTIONS | RIGHT PARTNER

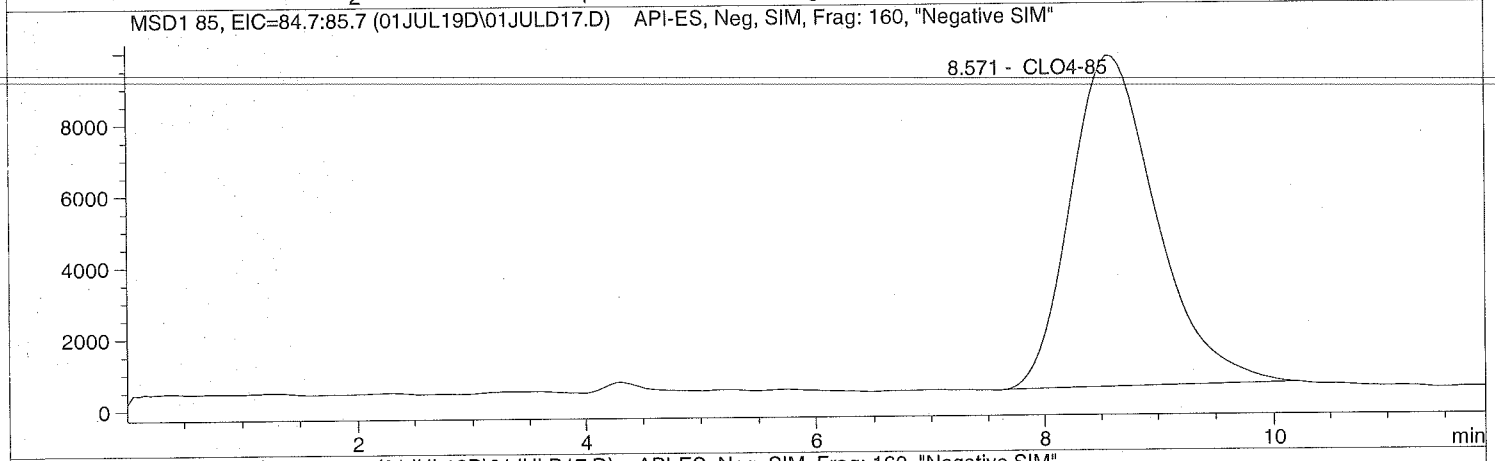
Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD17.D Sample Name: 661482 CCV@25

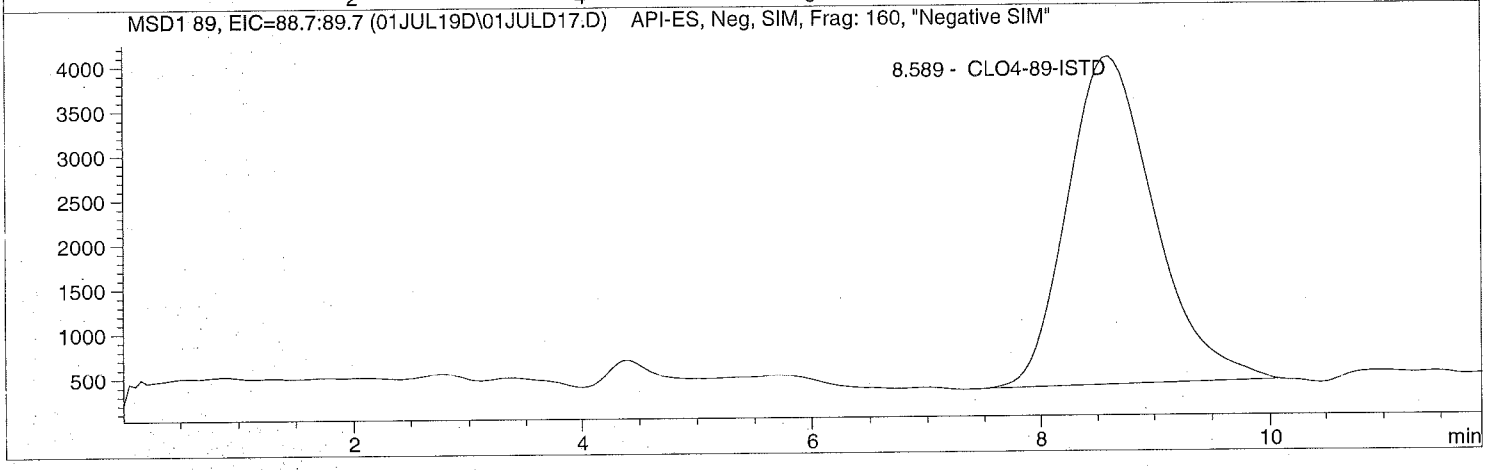
Injection Date:	7/01/2019 12:20:29	Seq Line:	17
Sample Name:	661482 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD17.D Sample Name: 661482 CCV@25

Injection Date:	7/01/2019 12:20:29	Seq Line:	17
Sample Name:	661482 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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.558	PBA	1604090.1	25.0035	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.571	PBA	485334.3	25.4617	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.589	PBA	195182.3	5.0000	CLO4-89-ISTD

*** End of Report ***

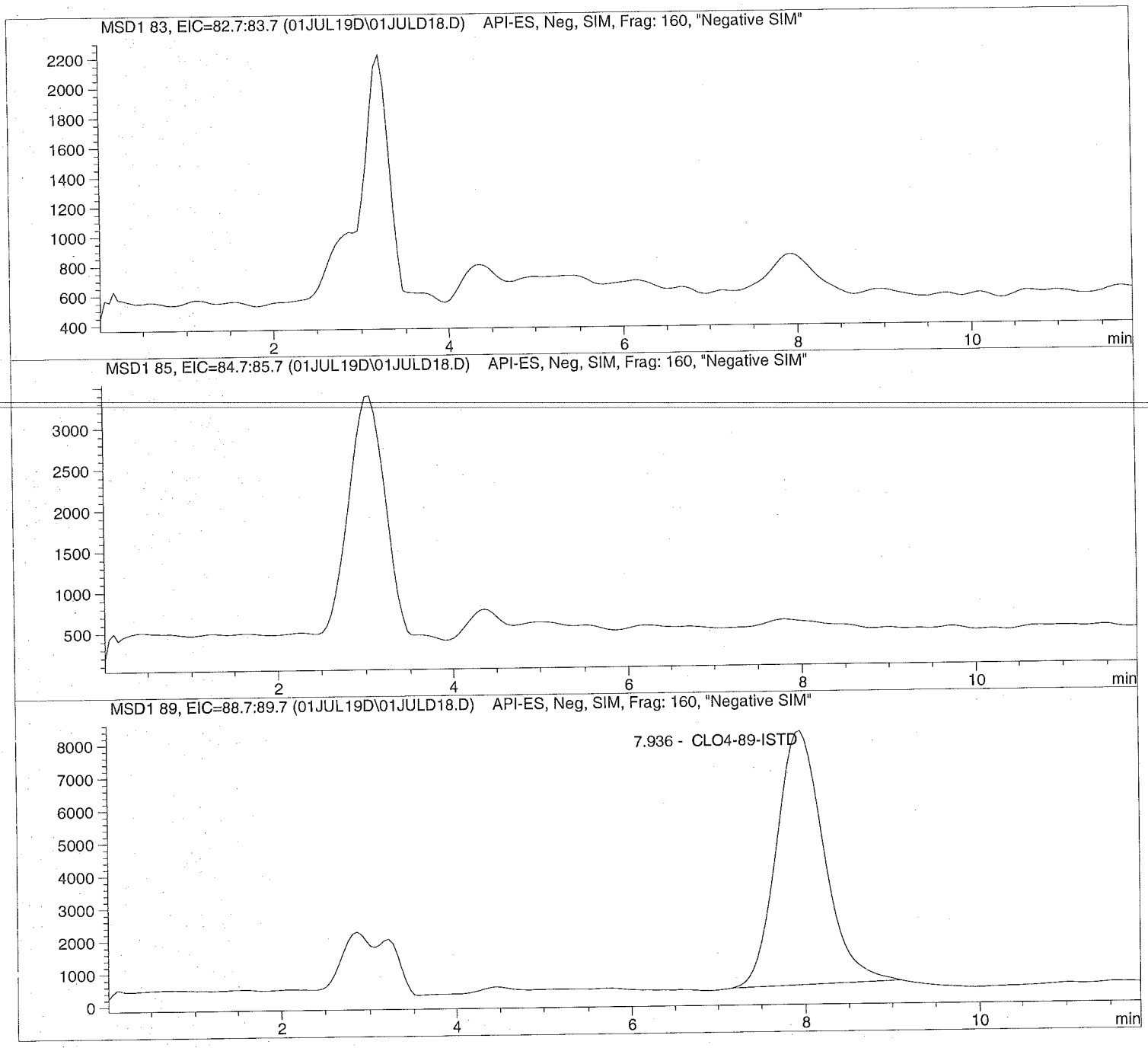
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD18.D Sample Name: 1917856005

Injection Date:	7/01/2019 12:34:22	Seq Line:	18
Sample Name:	1917856005	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD18.D Sample Name: 1917856005

Injection Date:	7/01/2019 12:34:22	Seq Line:	18
Sample Name:	1917856005	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
7.936	PBA	292027.4	5.0000	CLO4-89-ISTD

*** End of Report ***

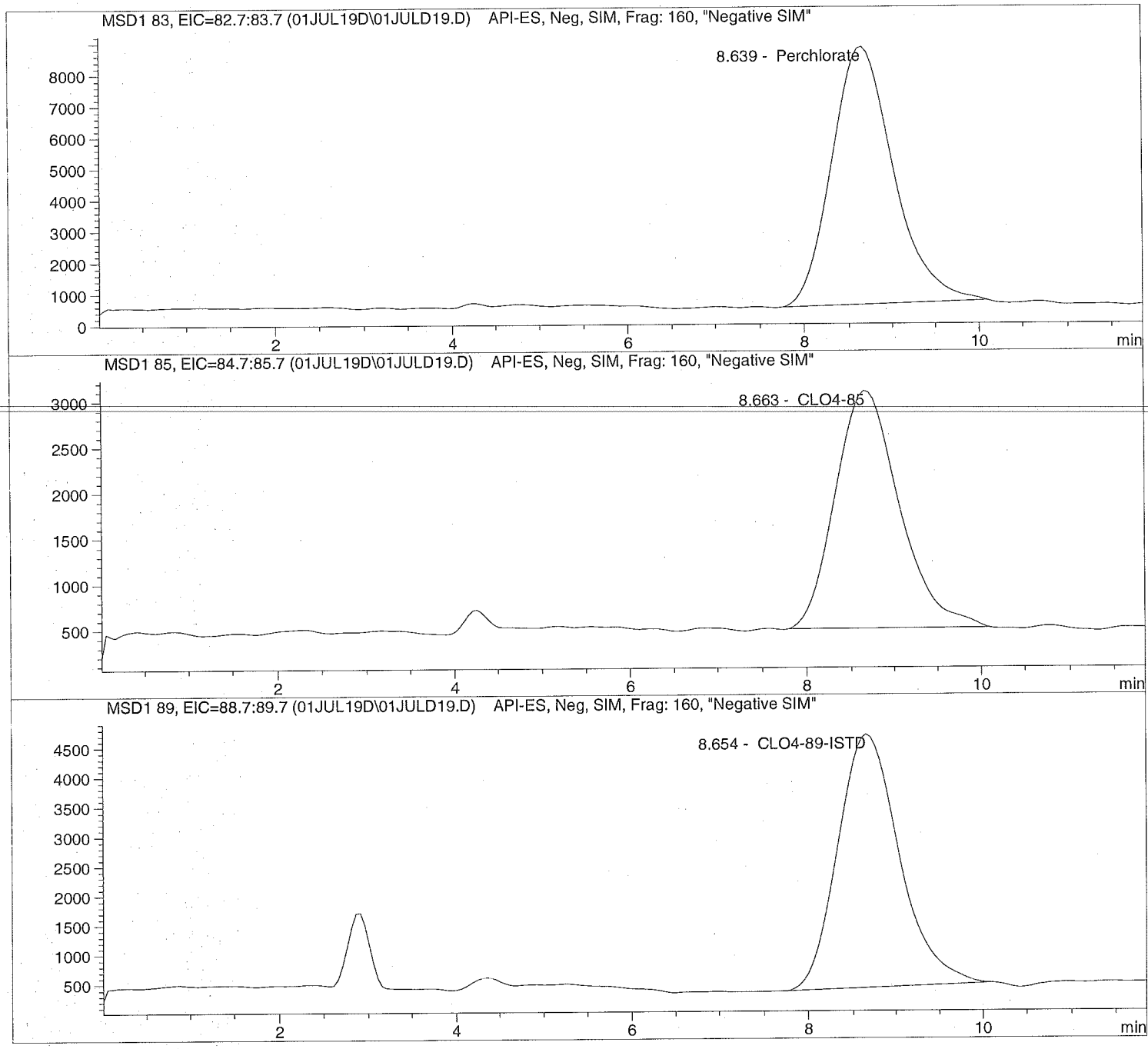
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD19.D Sample Name: 1917856006 100

Injection Date:	7/01/2019 12:48:15	Seq Line:	19
Sample Name:	1917856006 100	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD19.D Sample Name: 1917856006 100

Injection Date:	7/01/2019 12:48:15	Seq Line:	19
Sample Name:	1917856006 100	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.639	PBA	403838.0	621.0643	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.663	BBA	132725.9	672.8711	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.654	PBA	210141.8	500.0000	CLO4-89-ISTD

*** End of Report ***

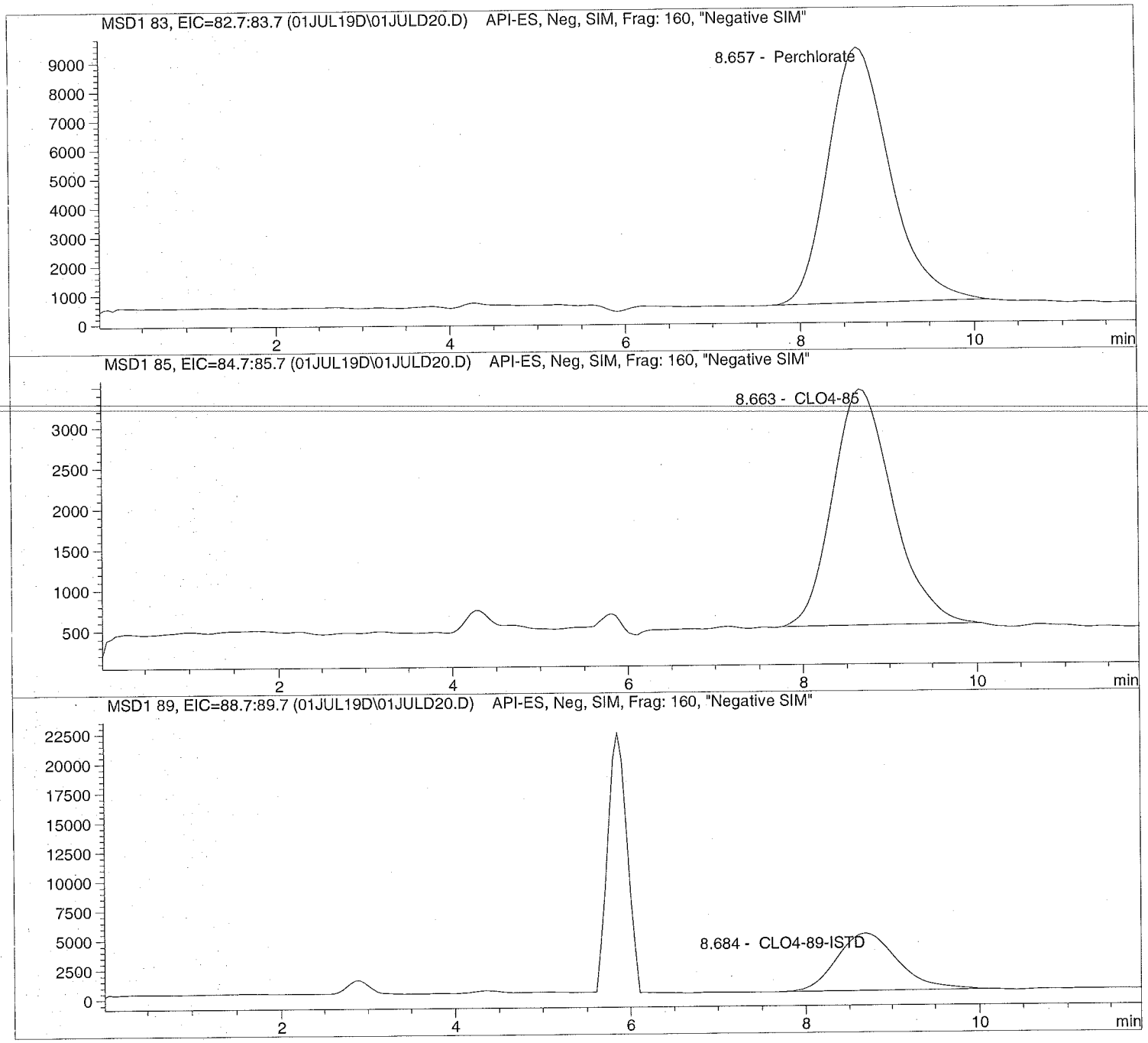
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD20.D Sample Name: 1917856007 100

Injection Date:	7/01/2019 13:02:10	Seq Line:	20
Sample Name:	1917856007 100	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD20.D Sample Name: 1917856007 100

Injection Date:	7/01/2019 13:02:10	Seq Line:	20
Sample Name:	1917856007 100	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.657	PBA	434273.7	588.1581	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.663	BBA	140119.4	624.8207	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.684	PBA	239145.3	500.0000	CLO4-89-ISTD

*** End of Report ***

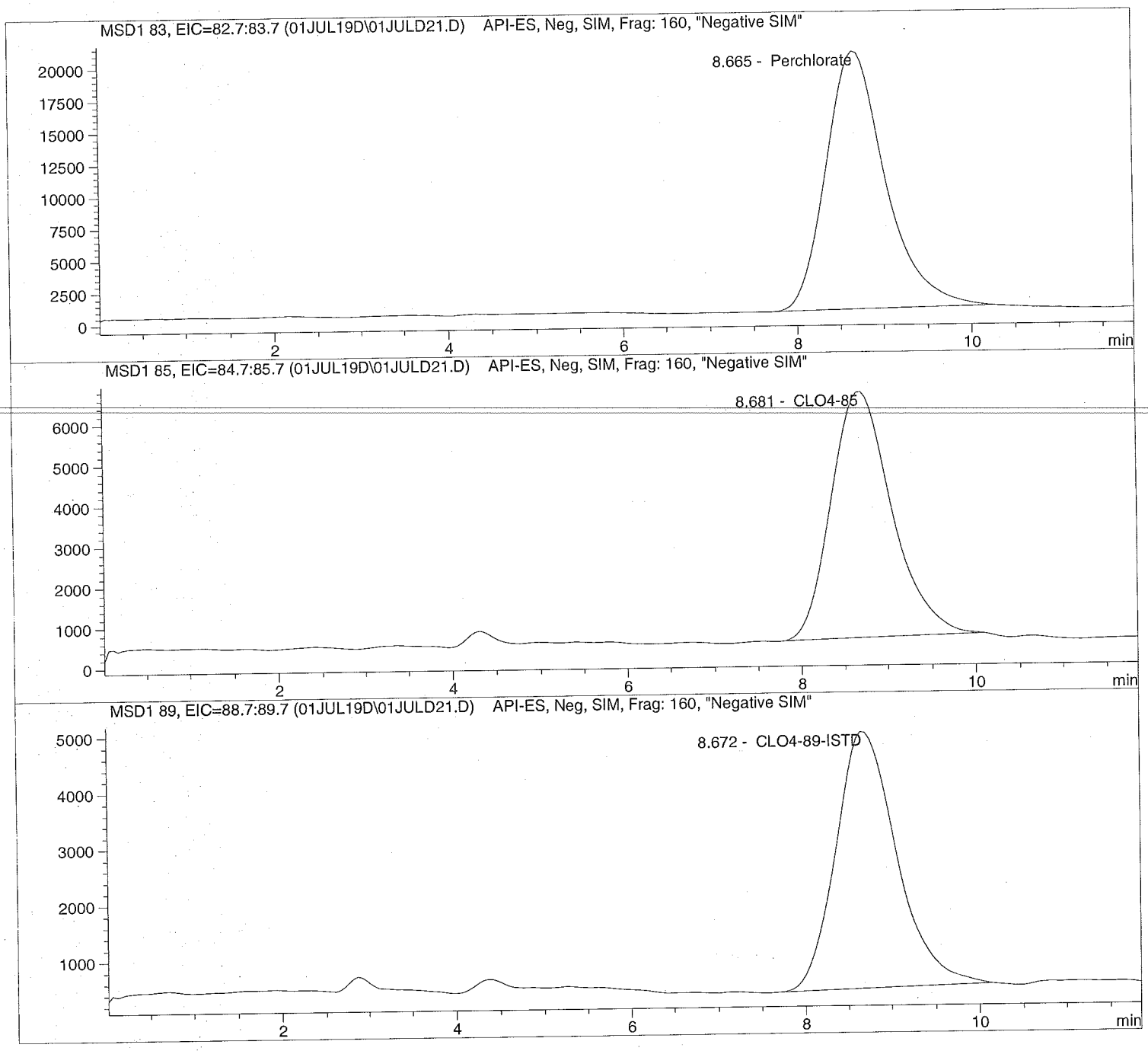
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD21.D Sample Name: 1918052001 1K

Injection Date:	7/01/2019 13:16:12	Seq Line:	21
Sample Name:	1918052001 1K	Location:	Vial 90
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD21.D Sample Name: 1918052001 1K

Injection Date:	7/01/2019 13:16:12	Seq Line:	21
Sample Name:	1918052001 1K	Location:	Vial 90
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.665	PBA	958578.9	13475.4930	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.681	PBA	295207.3	13884.7680	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.672	PBA	223102.2	5000.0000	CLO4-89-ISTD

*** End of Report ***

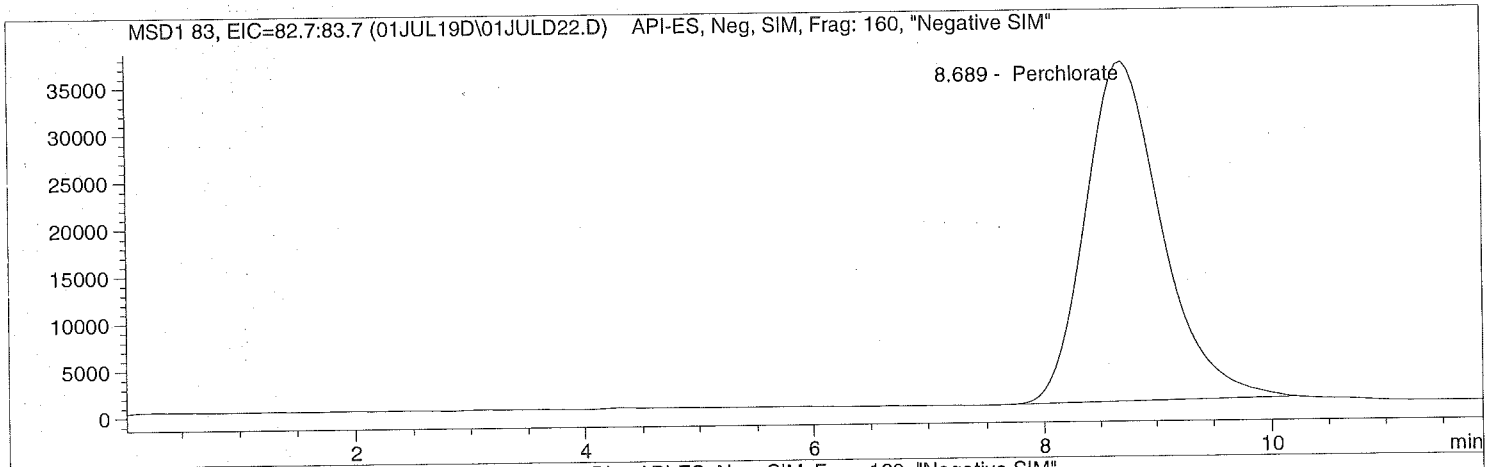
RIGHT SOLUTIONS | RIGHT PARTNER

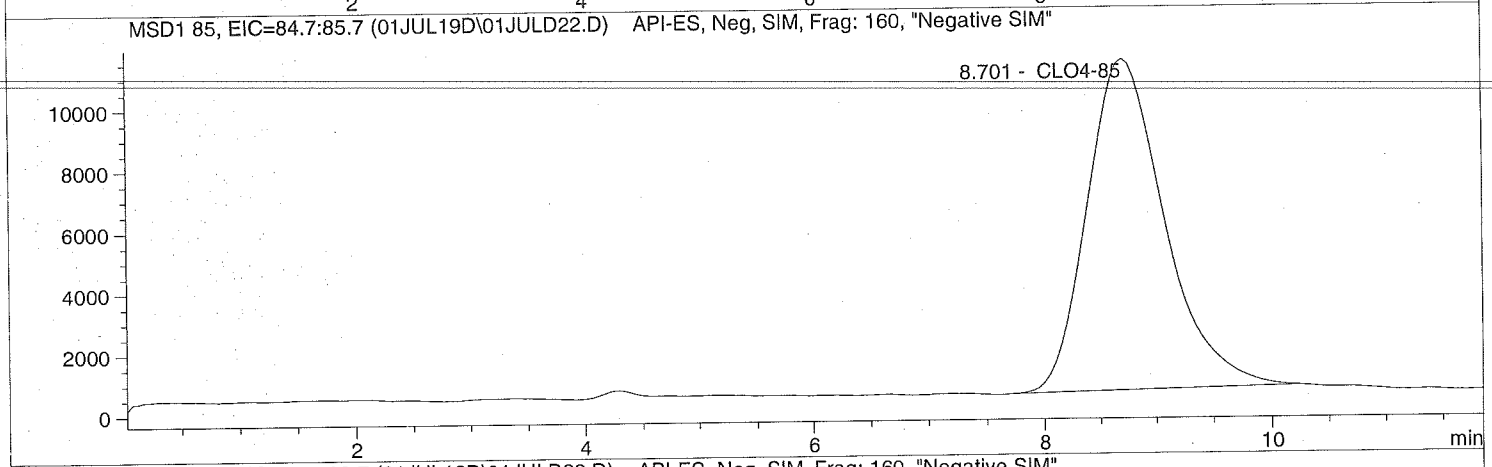
Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD22.D Sample Name: 1918052002 10K

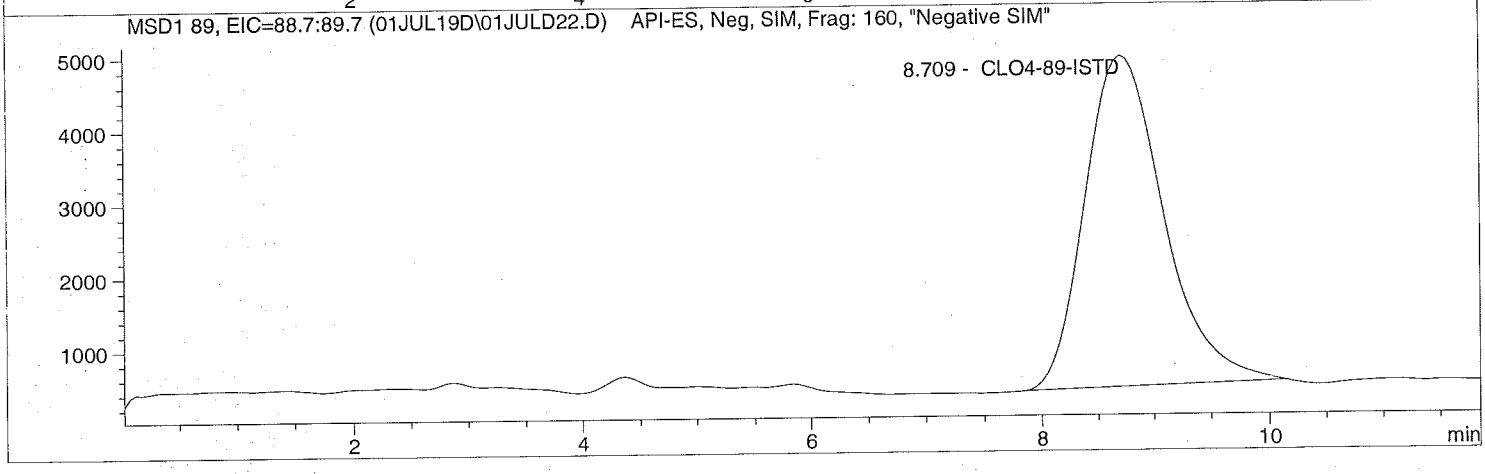
Injection Date:	7/01/2019 13:30:09	Seq Line:	22
Sample Name:	1918052002 10K	Location:	Vial 91
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD22.D Sample Name: 1918052002 10K

Injection Date:	7/01/2019 13:30:09	Seq Line:	22
Sample Name:	1918052002 10K	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	10000.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.689	PBA	1701736.0	236511.4245	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.701	PBA	516167.1	241333.7557	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.709	PBA	219618.3	50000.0000	CLO4-89-ISTD

*** End of Report ***

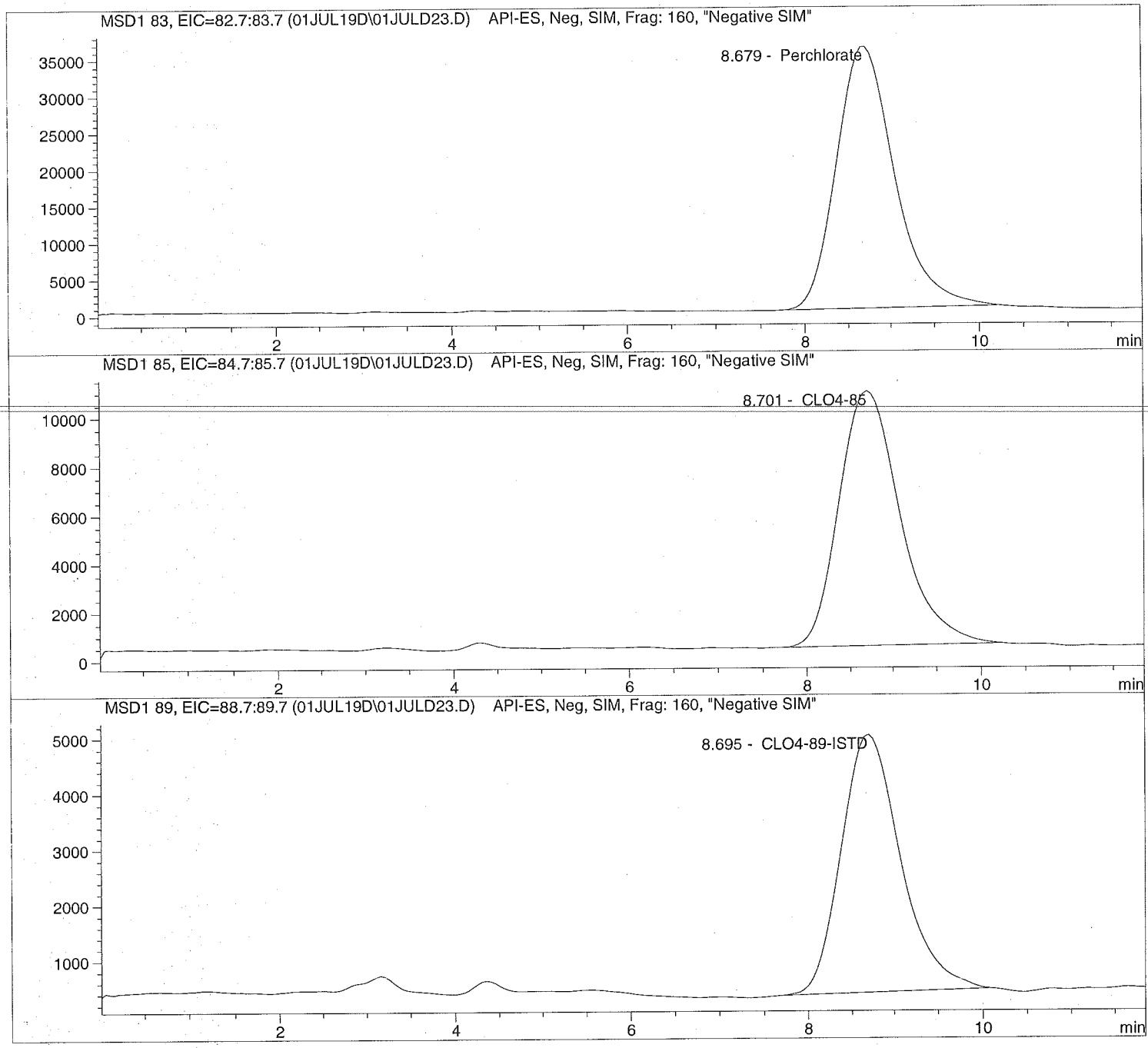
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD23.D Sample Name: 1918052003 10K

Injection Date:	7/01/2019 13:44:04	Seq Line:	23
Sample Name:	1918052003 10K	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD23.D Sample Name: 1918052003 10K

Injection Date:	7/01/2019 13:44:04	Seq Line:	23
Sample Name:	1918052003 10K	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	10000.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.679	PBA	1682027.8	230798.4297	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.701	PBA	516999.9	238459.8445	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.695	PBA	222758.2	50000.0000	CLO4-89-ISTD

*** End of Report ***

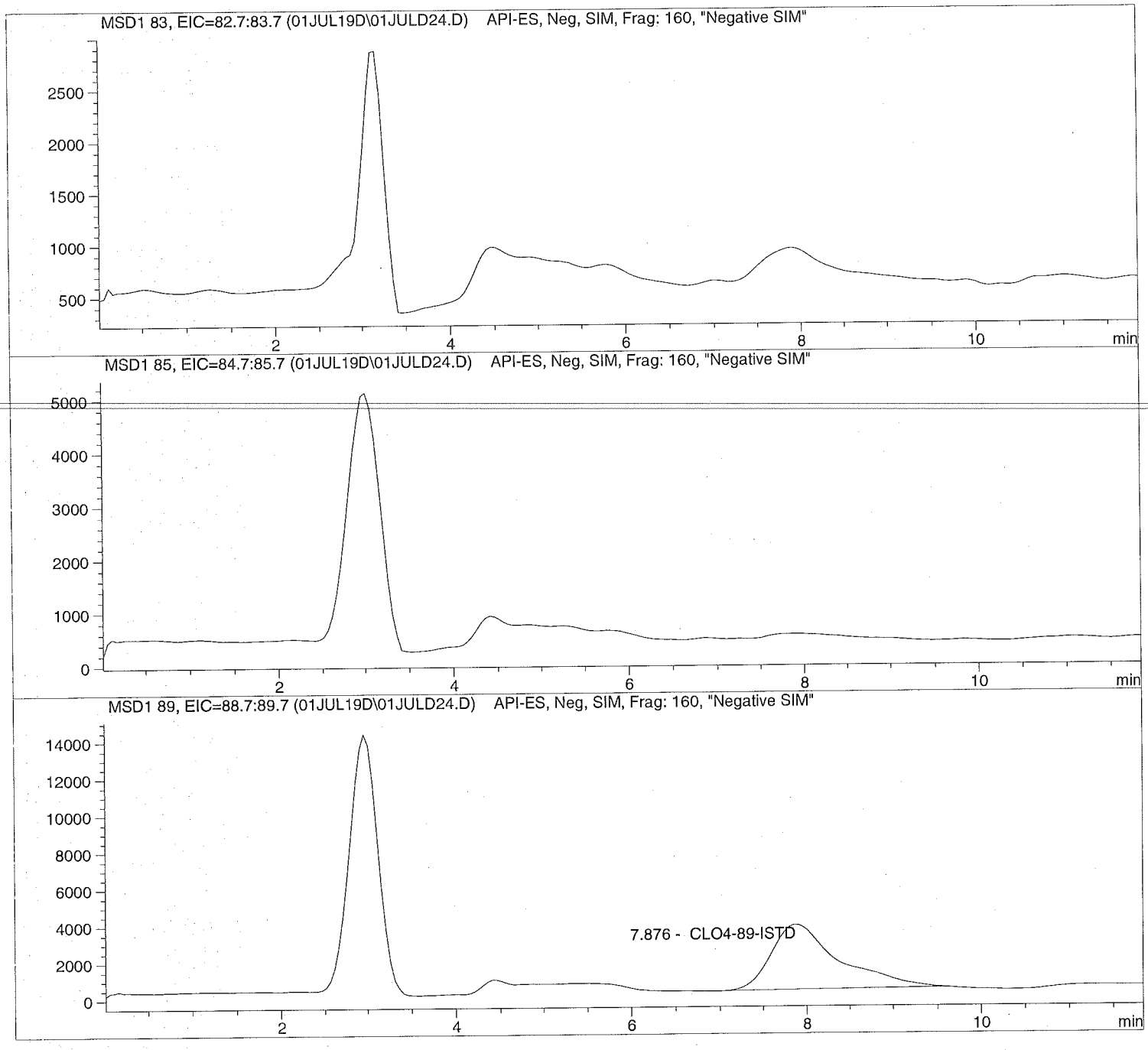
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD24.D Sample Name: 1918052004

Injection Date:	7/01/2019 13:57:58	Seq Line:	24
Sample Name:	1918052004	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD24.D Sample Name: 1918052004

Injection Date:	7/01/2019 13:57:58	Seq Line:	24
Sample Name:	1918052004	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Fri, 12. Apr. 2019,07:52:58 am
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
7.876	PBA	188746.5	5.0000	CLO4-89-ISTD

*** End of Report ***

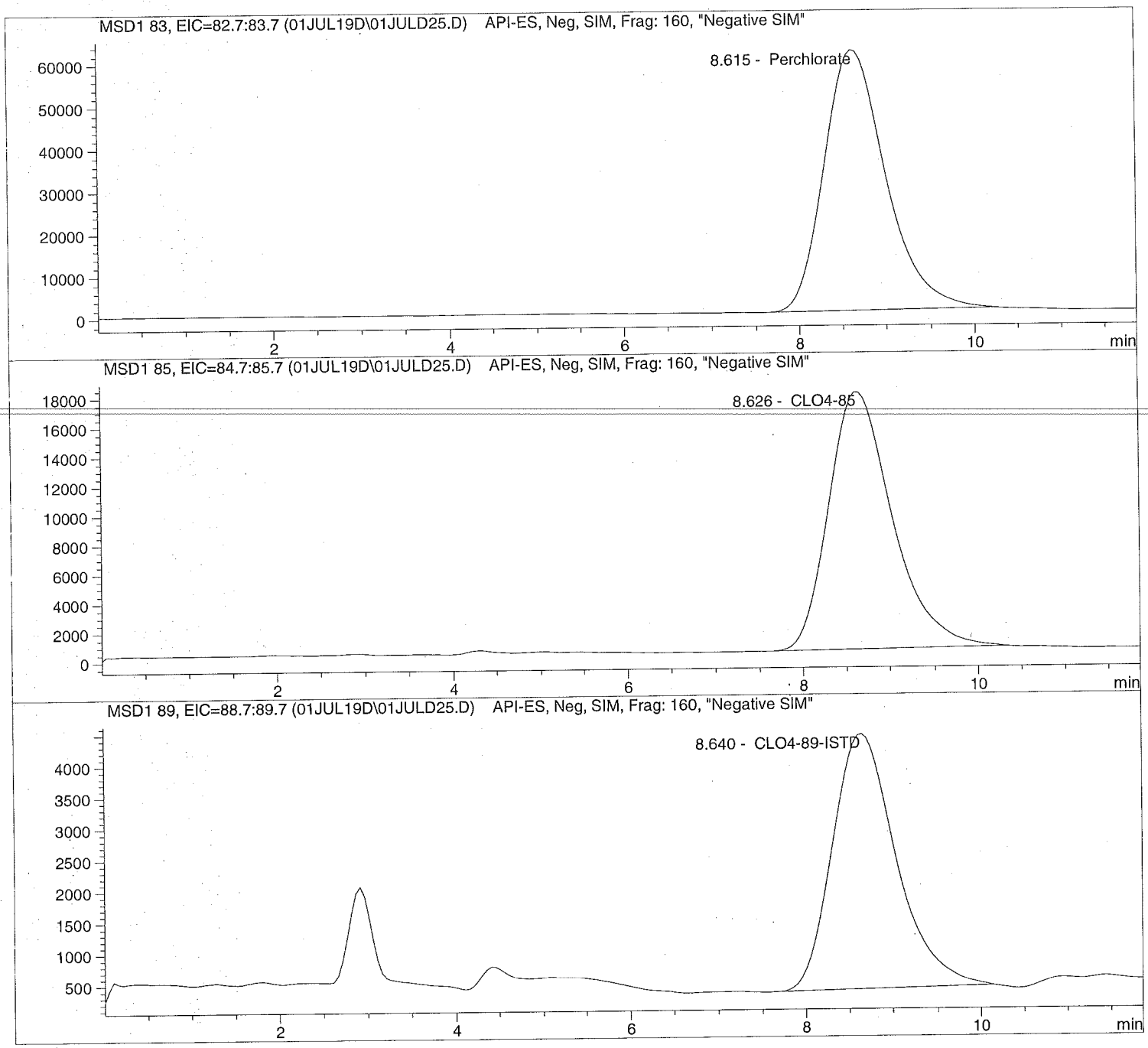
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD25.D Sample Name: 1917698003 100

Injection Date:	7/01/2019 14:11:59	Seq Line:	25
Sample Name:	1917698003 100	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD25.D Sample Name: 1917698003 100

Injection Date:	7/01/2019 14:11:59	Seq Line:	25
Sample Name:	1917698003 100	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.615	PBA	3021130.8	4300.6266	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.626	PBA	888075.5	4275.4049	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.640	PBA	205249.1	500.0000	CLO4-89-ISTD

*** End of Report ***

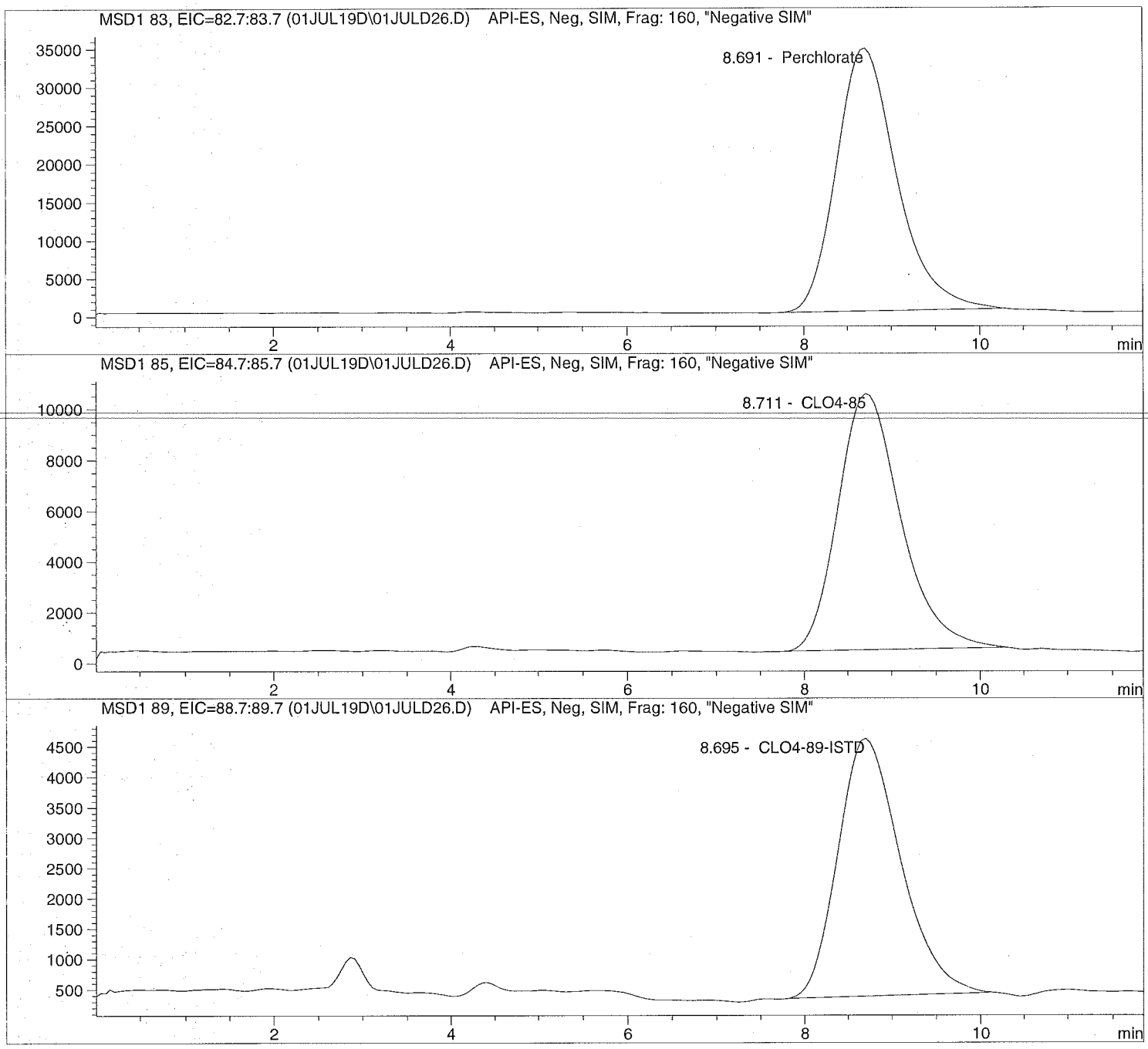
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD26.D Sample Name: 1917698008 1K

Injection Date:	7/01/2019 14:25:54	Seq Line:	26
Sample Name:	1917698008 1K	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD26.D Sample Name: 1917698008 1K

Injection Date:	7/01/2019 14:25:54	Seq Line:	26
Sample Name:	1917698008 1K	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.691	PBA	1640477.0	23731.5795	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.711	PBA	499687.1	24313.2650	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.695	PBA	210953.7	5000.0000	CLO4-89-ISTD

*** End of Report ***

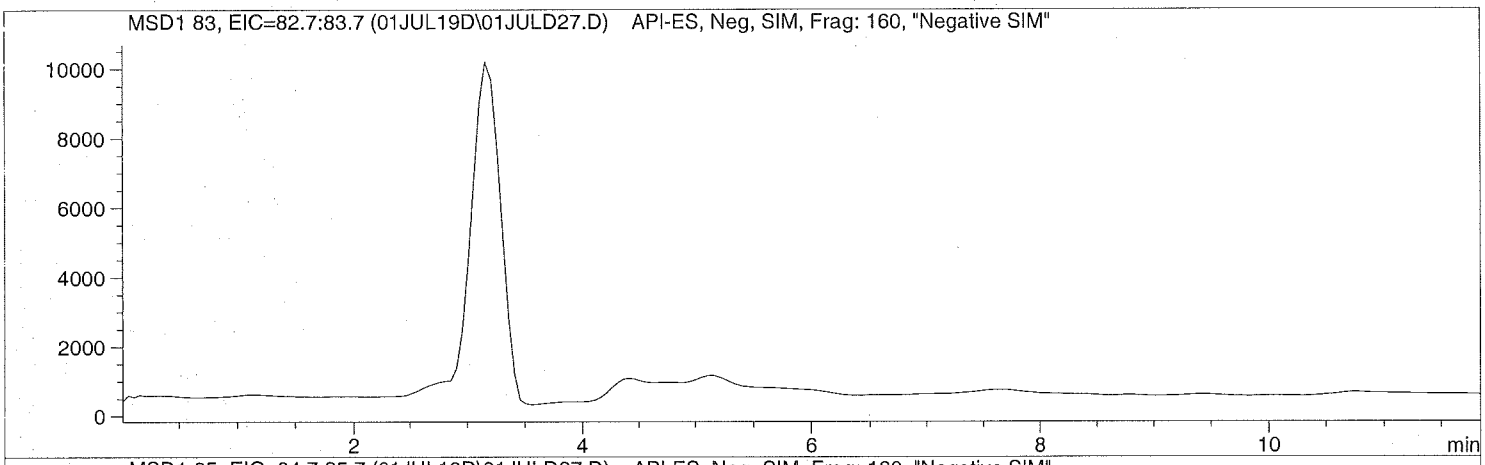
RIGHT SOLUTIONS | RIGHT PARTNER

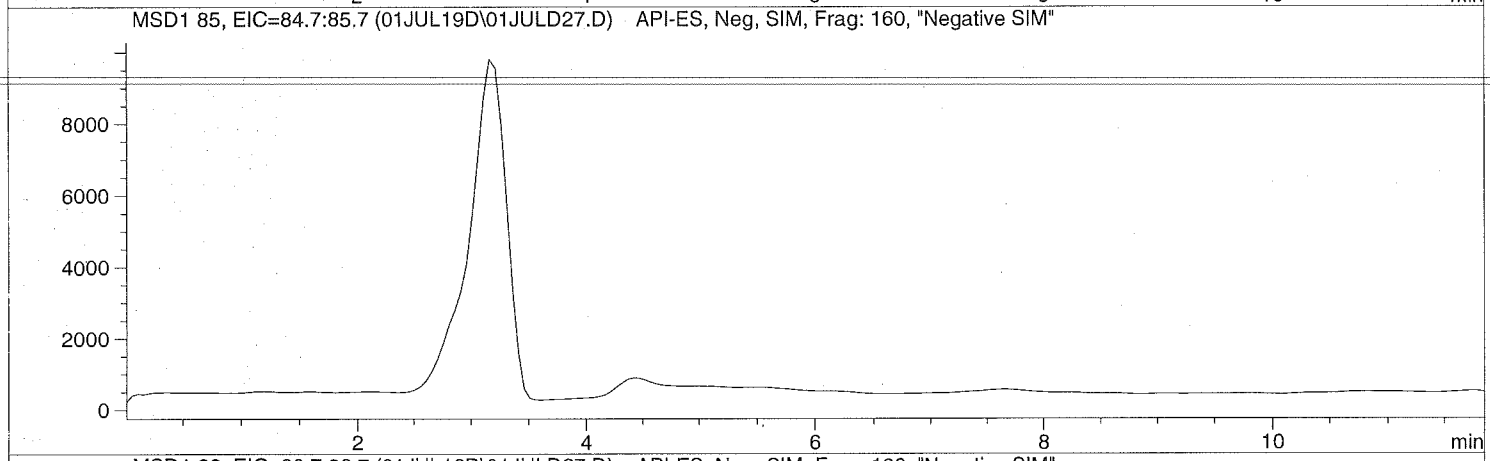
Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD27.D Sample Name: 1917856001 RE

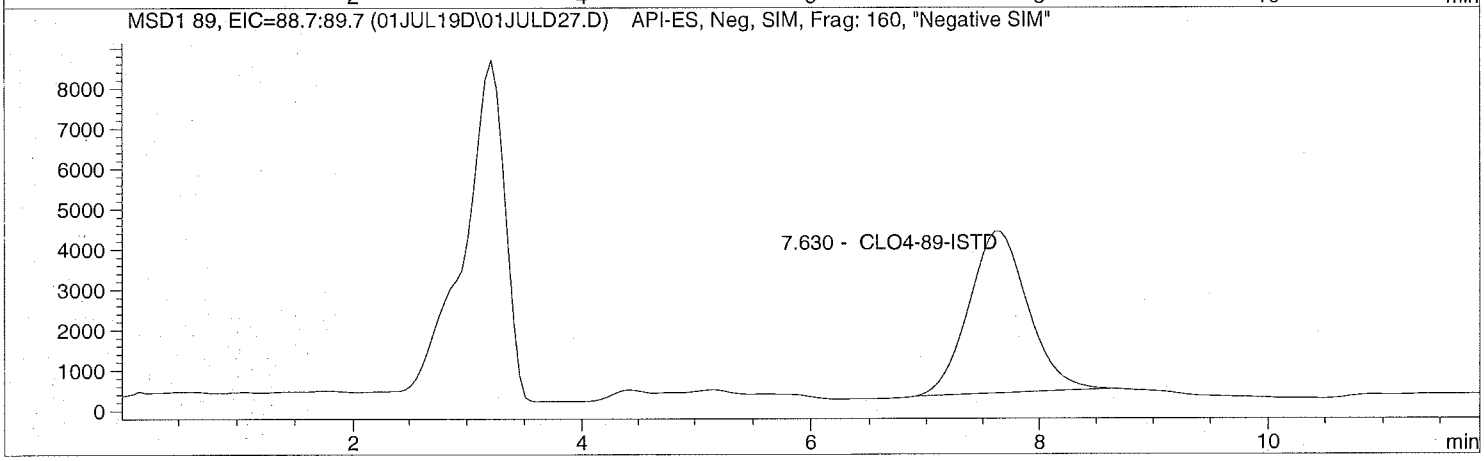
Injection Date:	7/01/2019 14:39:49	Seq Line:	27
Sample Name:	1917856001 RE	Location:	Vial 83
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD27.D Sample Name: 1917856001 RE

Injection Date:	7/01/2019 14:39:49	Seq Line:	27
Sample Name:	1917856001 RE	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-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
7.630	PBA	144962.0	5.0000	CLO4-89-ISTD

*** End of Report ***

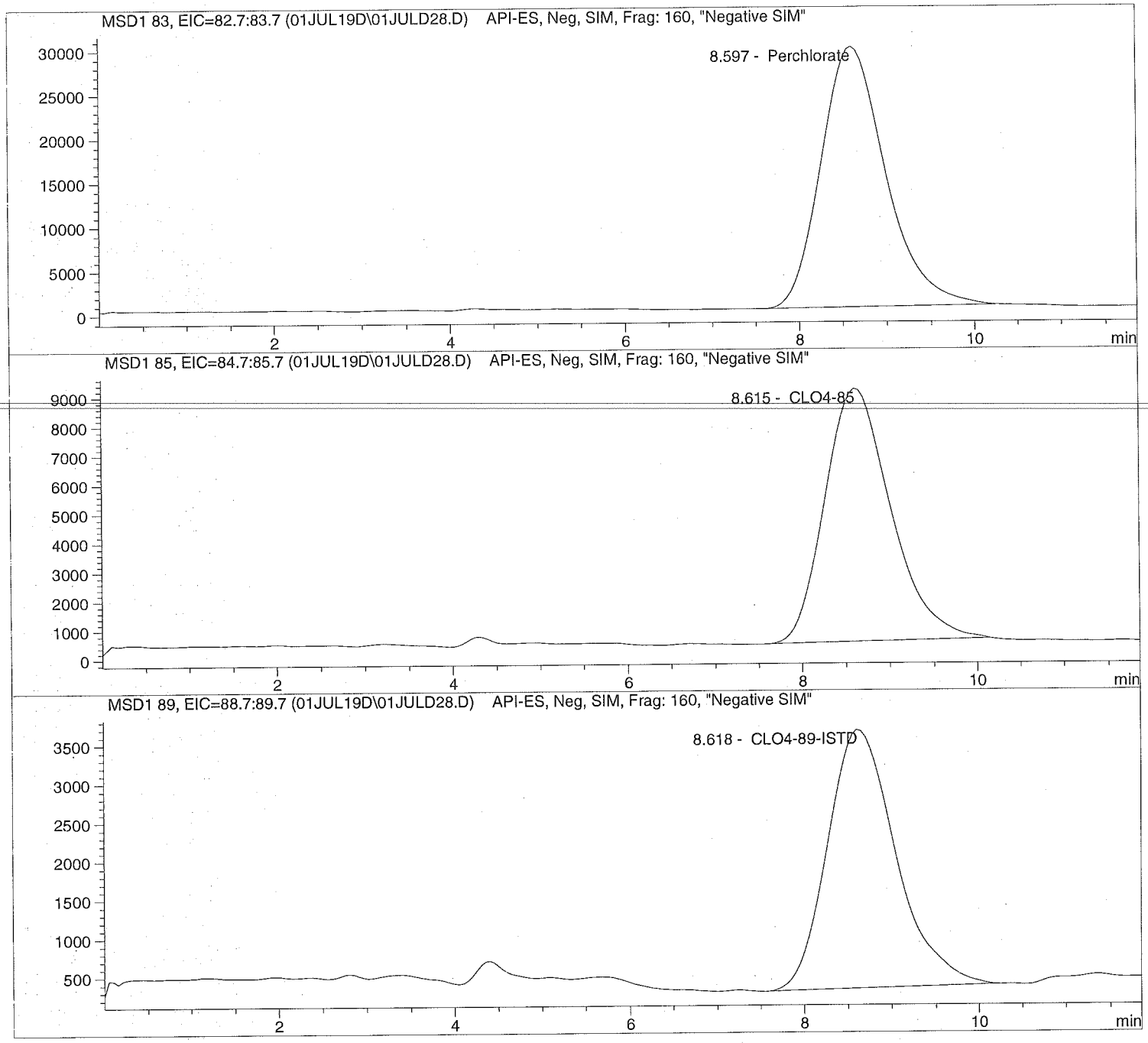
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD28.D Sample Name: 661483 CCV@25

Injection Date:	7/01/2019 14:53:42	Seq Line:	28
Sample Name:	661483 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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD28.D Sample Name: 661483 CCV@25

Injection Date:	7/01/2019 14:53:42	Seq Line:	28
Sample Name:	661483 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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.597	PBA	1506029.6	25.4198	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.615	PBA	453099.1	25.7499	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.618	PBA	180069.9	5.0000	CLO4-89-ISTD

*** End of Report ***

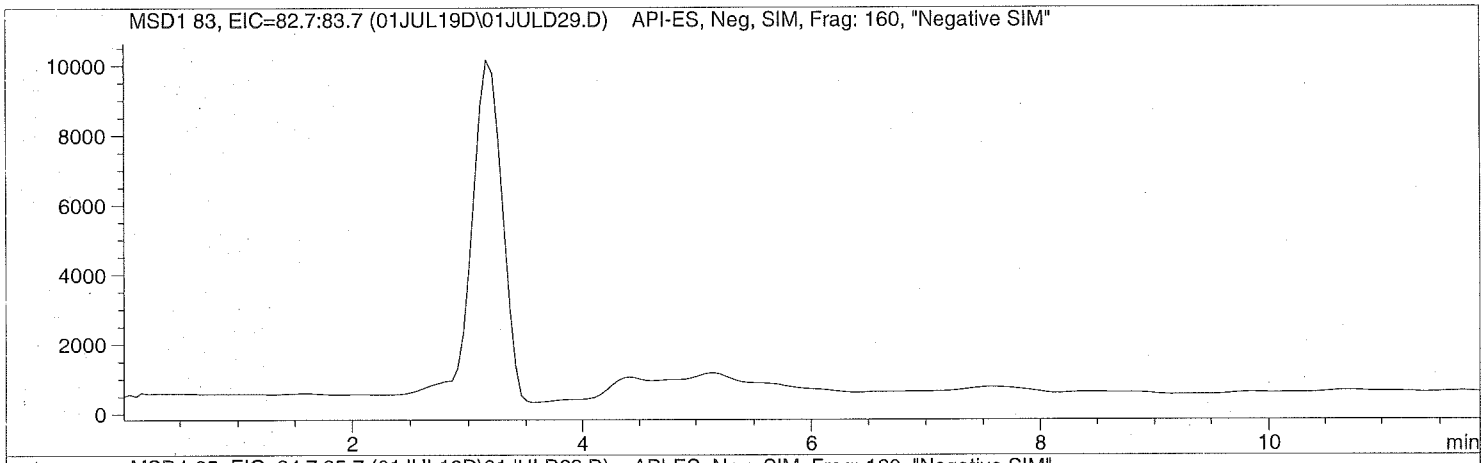
RIGHT SOLUTIONS | RIGHT PARTNER

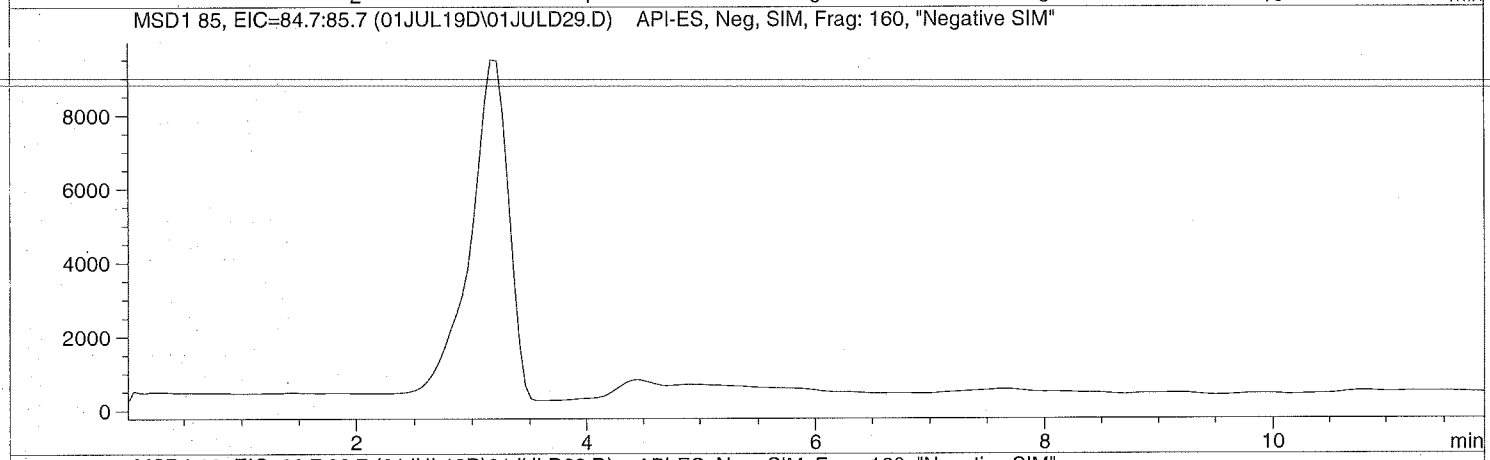
Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD29.D Sample Name: 1917856002 RE

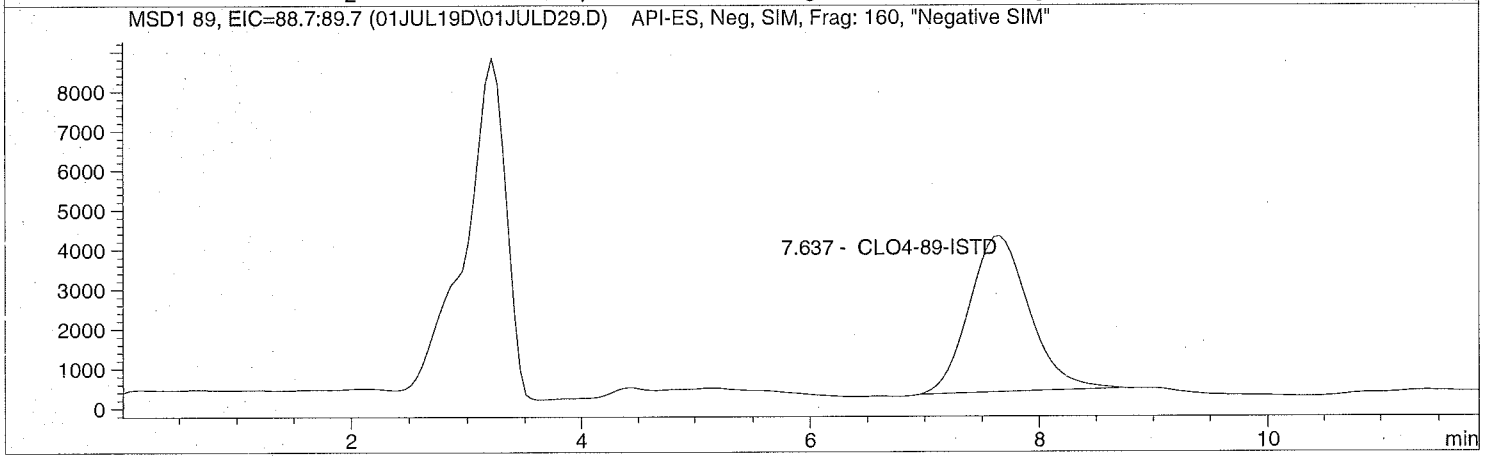
Injection Date:	7/01/2019 15:07:32	Seq Line:	29
Sample Name:	1917856002 RE	Location:	Vial 84
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD29.D Sample Name: 1917856002 RE

Injection Date:	7/01/2019 15:07:32	Seq Line:	29
Sample Name:	1917856002 RE	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
7.637	PBA	142651.0	5.0000	CLO4-89-ISTD

*** End of Report ***

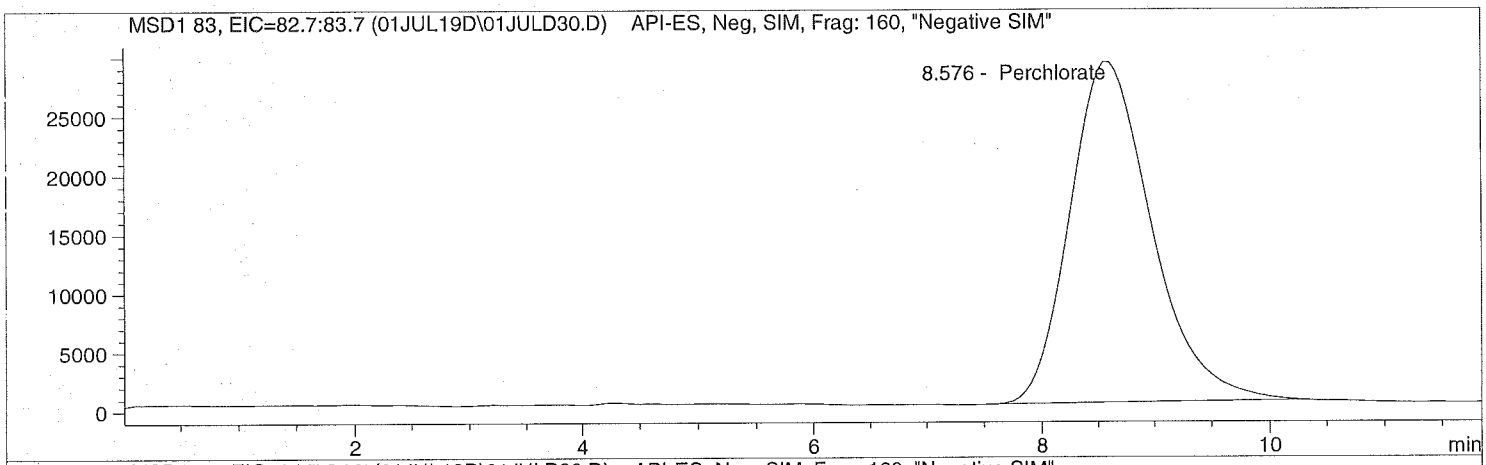
RIGHT SOLUTIONS | RIGHT PARTNER

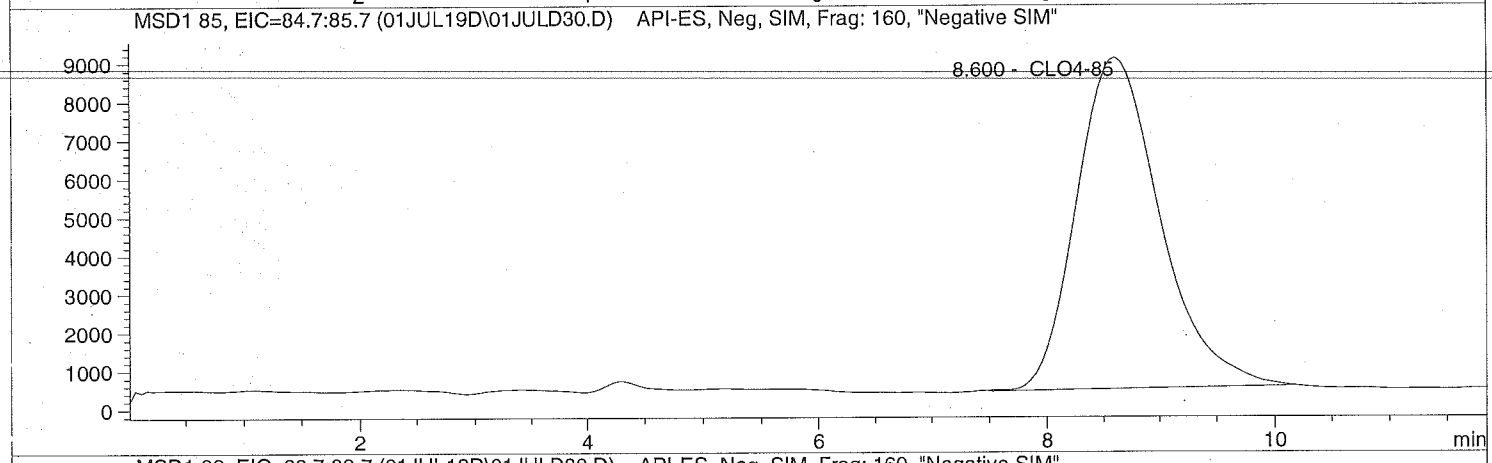
Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD30.D Sample Name: 661661 CCV@25

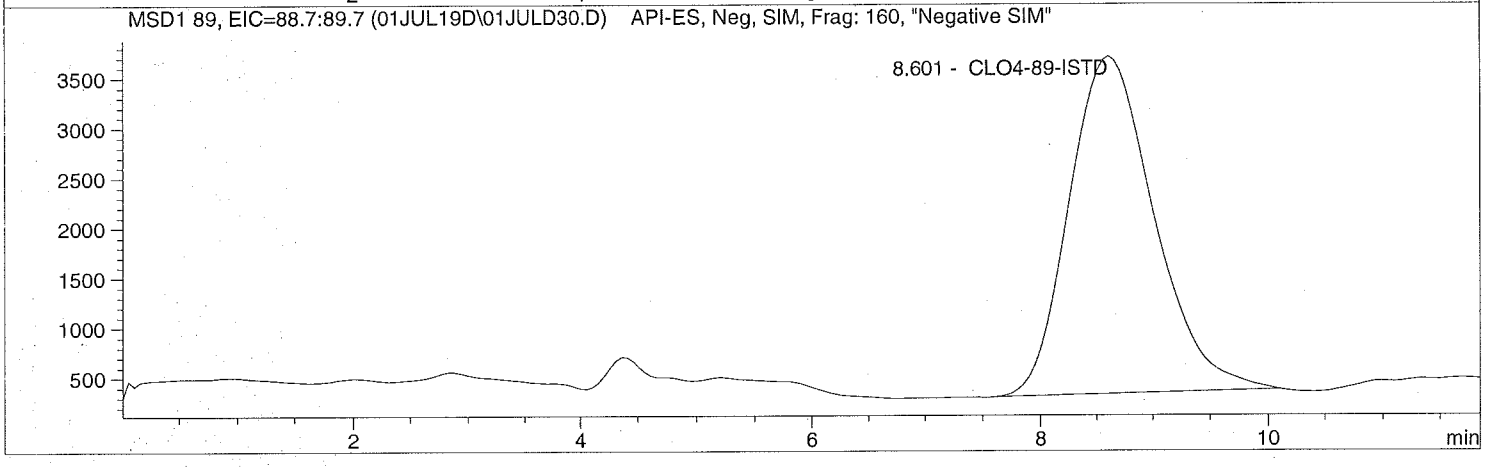
Injection Date:	7/01/2019 15:21:25	Seq Line:	30
Sample Name:	661661 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







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Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD30.D Sample Name: 661661 CCV@25

Injection Date:	7/01/2019 15:21:25	Seq Line:	30
Sample Name:	661661 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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.576	PBA	1459488.9	25.1014	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.600	BBA	445116.2	25.7560	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.601	PBA	176853.7	5.0000	CLO4-89-ISTD

*** End of Report ***

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ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Initial Calibration

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Calibration Table

Perchlorate

Calib. Data Modified : 3/19/2019 2:35:19 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
8.744	1	1	1.00000	7.76074e4	1.28854e-5		1	Perchlorate
		2	2.00000	1.35273e5	1.47849e-5			
		3	5.00000	3.37764e5	1.48033e-5			
		4	10.00000	6.83454e5	1.46316e-5			
		5	25.00000	2.08433e6	1.19943e-5			
		6	50.00000	4.13334e6	1.20968e-5			
		7	75.00000	5.99313e6	1.25143e-5			
8.755	2	1	1.00000	2.36780e4	4.22333e-5		1	CLO4-85
		2	2.00000	4.69486e4	4.25998e-5			
		3	5.00000	1.06124e5	4.71147e-5			
		4	10.00000	2.13523e5	4.68335e-5			
		5	25.00000	6.14295e5	4.06971e-5			
		6	50.00000	1.19814e6	4.17315e-5			
		7	75.00000	1.78355e6	4.20509e-5			
8.766	3	1	5.00000	2.73208e5	1.83011e-5	+I1		CLO4-89-ISTD
		2	5.00000	2.24886e5	2.22335e-5			
		3	5.00000	2.33196e5	2.14412e-5			
		4	5.00000	2.34454e5	2.13262e-5			
		5	5.00000	2.50568e5	1.99547e-5			
		6	5.00000	2.30977e5	2.16472e-5			

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RetTime [min]	Sig	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
		7	5.00000	2.21504e5	2.25729e-5			

More compound-specific settings:

Compound: Perchlorate
- Time Window : From 6.654 min To 12.544 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 0.5
  - Level 3 : 0.2
  - Level 4 : 0.1
  - Level 5 : 0.04
  - Level 6 : 0.02
  - Level 7 : 0.013333

Compound: CLO4-85
- Time Window : From 6.650 min To 12.505 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 0.5
  - Level 3 : 0.2
  - Level 4 : 0.1
  - Level 5 : 0.04
  - Level 6 : 0.02
  - Level 7 : 0.013333

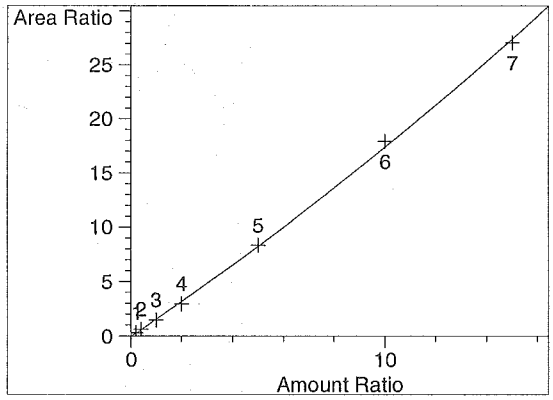
Compound: CLO4-89-ISTD
- Time Window : From 6.659 min To 12.466 min
- Curve Type : Linear
- Origin : Included
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 1
  - Level 3 : 1
  - Level 4 : 1
  - Level 5 : 1
  - Level 6 : 1
  - Level 7 : 1

Peak Sum Table

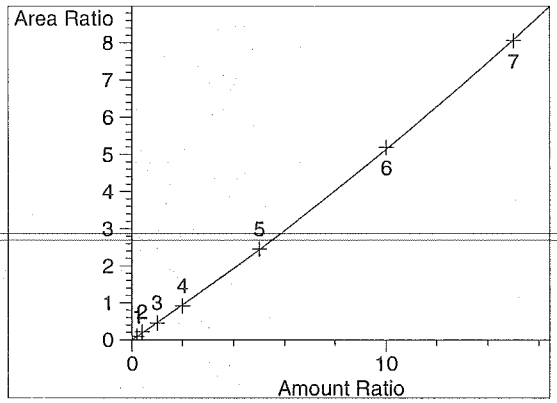
No Entries in table

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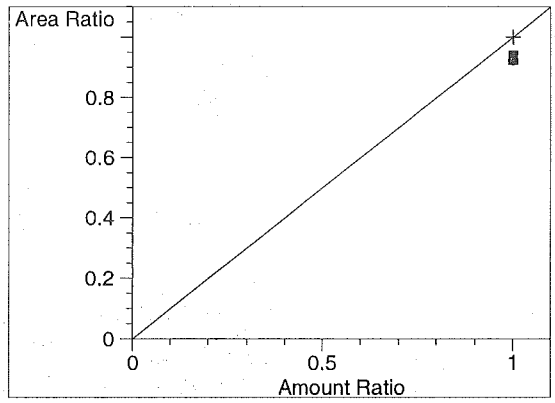
Calibration Curves



Perchlorate at exp. RT: 8.744
MSD1 83, EIC=82.7:83.7
Correlation: 0.99957
Residual Std. Dev.: 0.30744
Formula: y = ax² + bx + c
a: 1.76988e-2
b: 1.56480
c: -4.92430e-2
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.5
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.013333



CLO4-85 at exp. RT: 8.755
MSD1 85, EIC=84.7:85.7
Correlation: 0.99983
Residual Std. Dev.: 0.03473
Formula: y = ax² + bx + c
a: 5.13396e-3
b: 4.62055e-1
c: 4.97209e-4
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.5
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.013333



CLO4-89-ISTD at exp. RT: 8.766
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 1 : 1
Level 2 : 1
Level 3 : 1
Level 4 : 1
Level 5 : 1
Level 6 : 1
Level 7 : 1

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00940760

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP2.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	7.76074e4	8.744	1.06245
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	1.35273e5	8.992	2.06969
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	3.37764e5	8.586	4.73474
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	6.83454e5	8.698	9.27727
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.08433e6	8.451	25.29036
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	4.13334e6	8.810	51.36844
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	5.99313e6	8.586	74.16754
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	7.34719e5	8.702	9.25940

#	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.36780e4	8.755	9.30535e-1
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	4.69486e4	9.012	2.24255
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	1.06124e5	8.602	4.86656
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.13523e5	8.713	9.64312
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	6.14295e5	8.468	25.12159
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	1.19814e6	8.825	50.46721
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	1.78355e6	8.603	74.72019
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.27495e5	8.721	9.54024

#	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	2.73208e5	8.766	5.00000
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	2.24886e5	9.012	5.00000
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	2.33196e5	8.609	5.00000
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.34454e5	8.716	5.00000
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.50568e5	8.472	5.00000
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	2.30977e5	8.825	5.00000
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	2.21504e5	8.610	5.00000
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.52544e5	8.725	5.00000

*** End of Report ***

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Sequence: C:\HPCHEM\1\SEQUENCE\CLO4\2019\MAR\19MAR19I.S

Sequence Table:

Method and Injection Info Part:

Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	CLO4@ 0.2ug/L	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	CLO4@ 0.5ug/L	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	CLO4@ 1.0ug/L	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	CLO4@ 2.0ug/L	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	CLO4@ 5.0ug/L	CLO4-AQN	1	Ctrl Samp		
6	Vial 76	CLO4@ 10.ug/L	CLO4-AQN	1	Ctrl Samp		
7	Vial 77	CLO4@ 25.ug/L	CLO4-AQN	1	Ctrl Samp		
8	Vial 78	CLO4@ 50.ug/L	CLO4-AQN	1	Ctrl Samp		
9	Vial 79	CLO4@ 75.ug/L	CLO4-AQN	1	Ctrl Samp		
10	Vial 80	ICAL Verf@10ug/L	CLO4-AQN	1	Ctrl Samp		

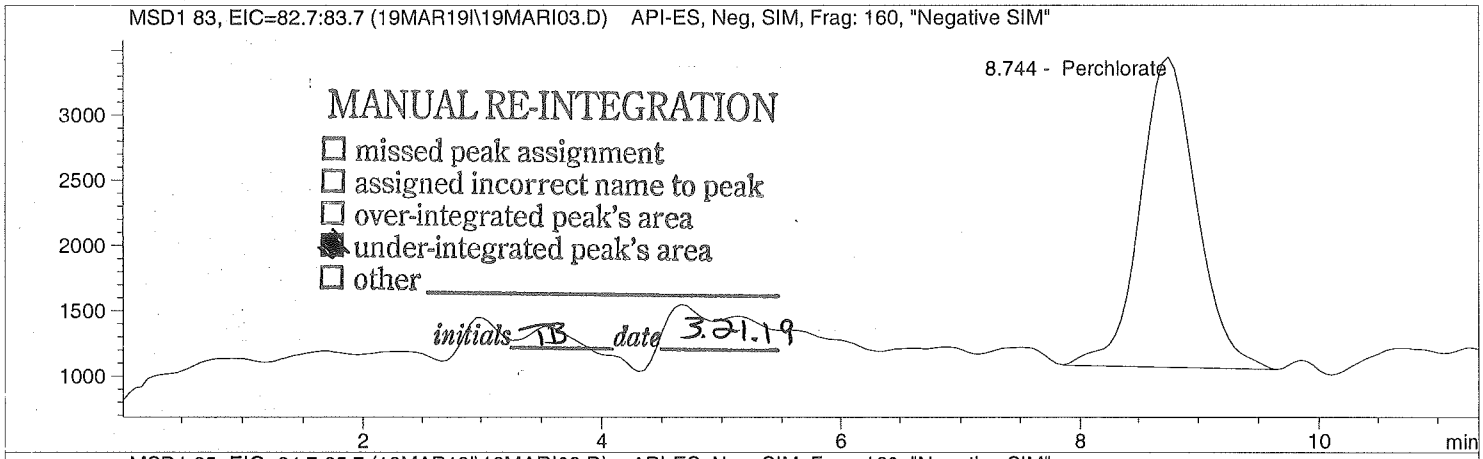
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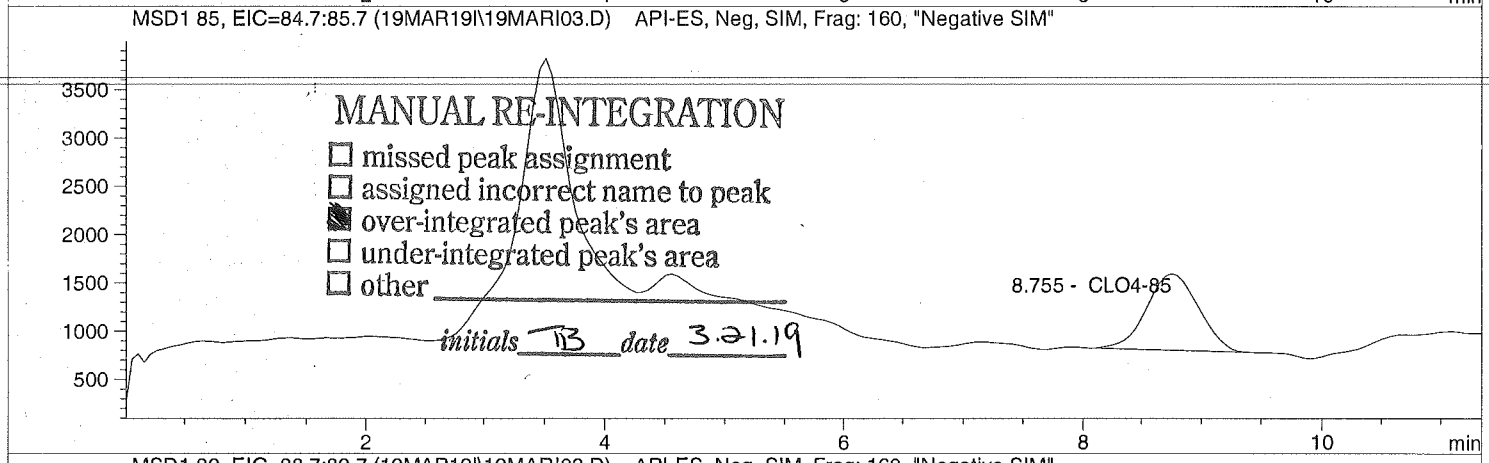
Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

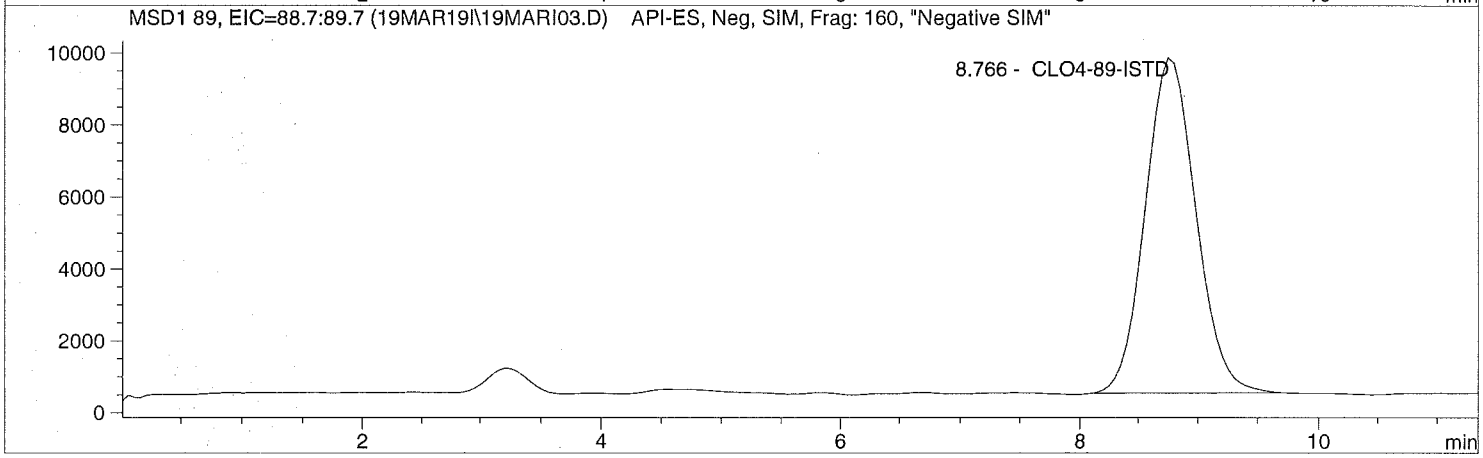
Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis







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Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 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
8.744	MM	77607.4	1.0625	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	MM	23678.0	0.9305	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

*** End of Report ***

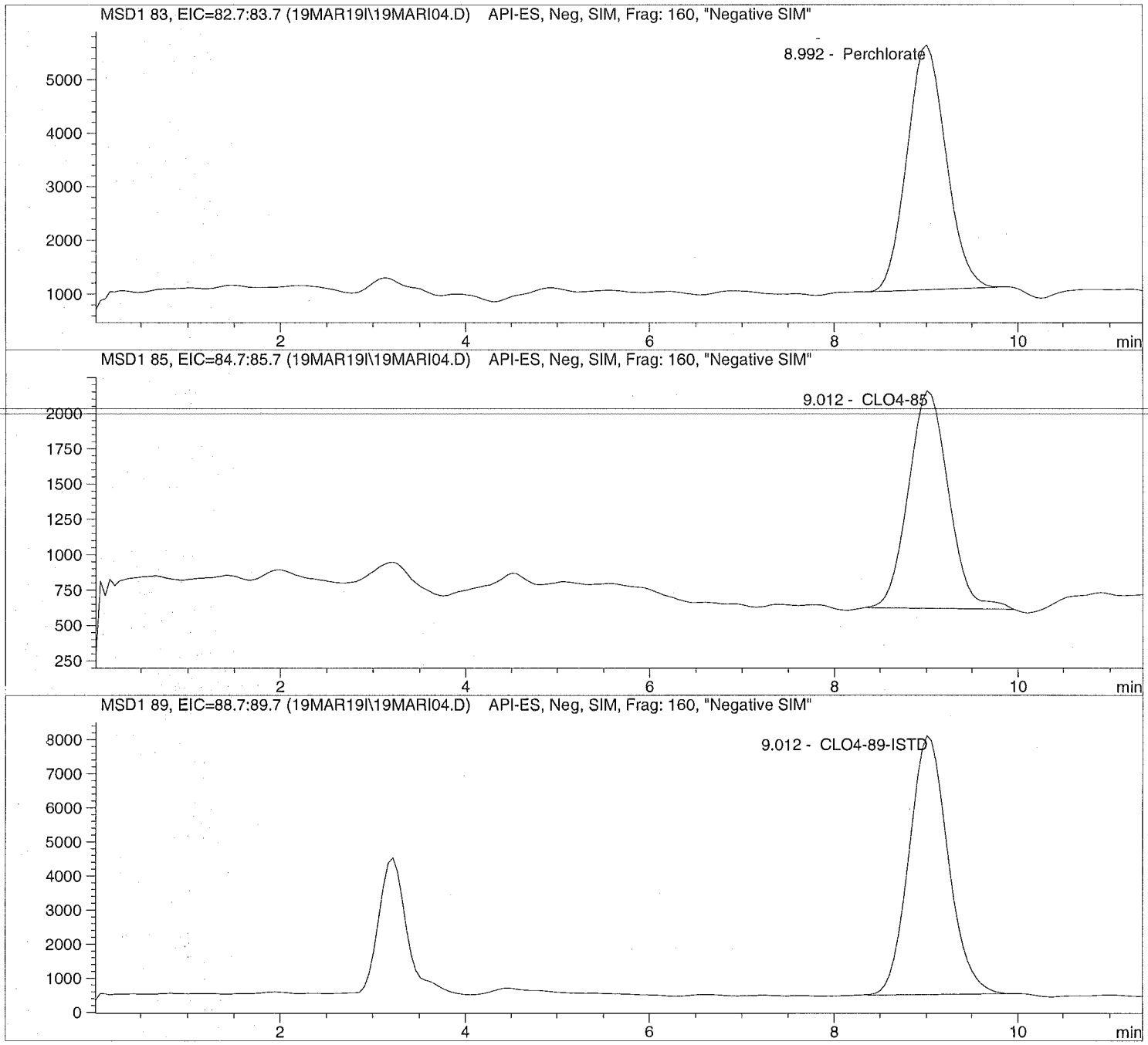
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Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	3/19/2019 09:53:00	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



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Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	3/19/2019 09:53:00	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 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
8.992	BBA	135272.8	2.0697	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	46948.6	2.2425	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	224885.9	5.0000	CLO4-89-ISTD

*** End of Report ***

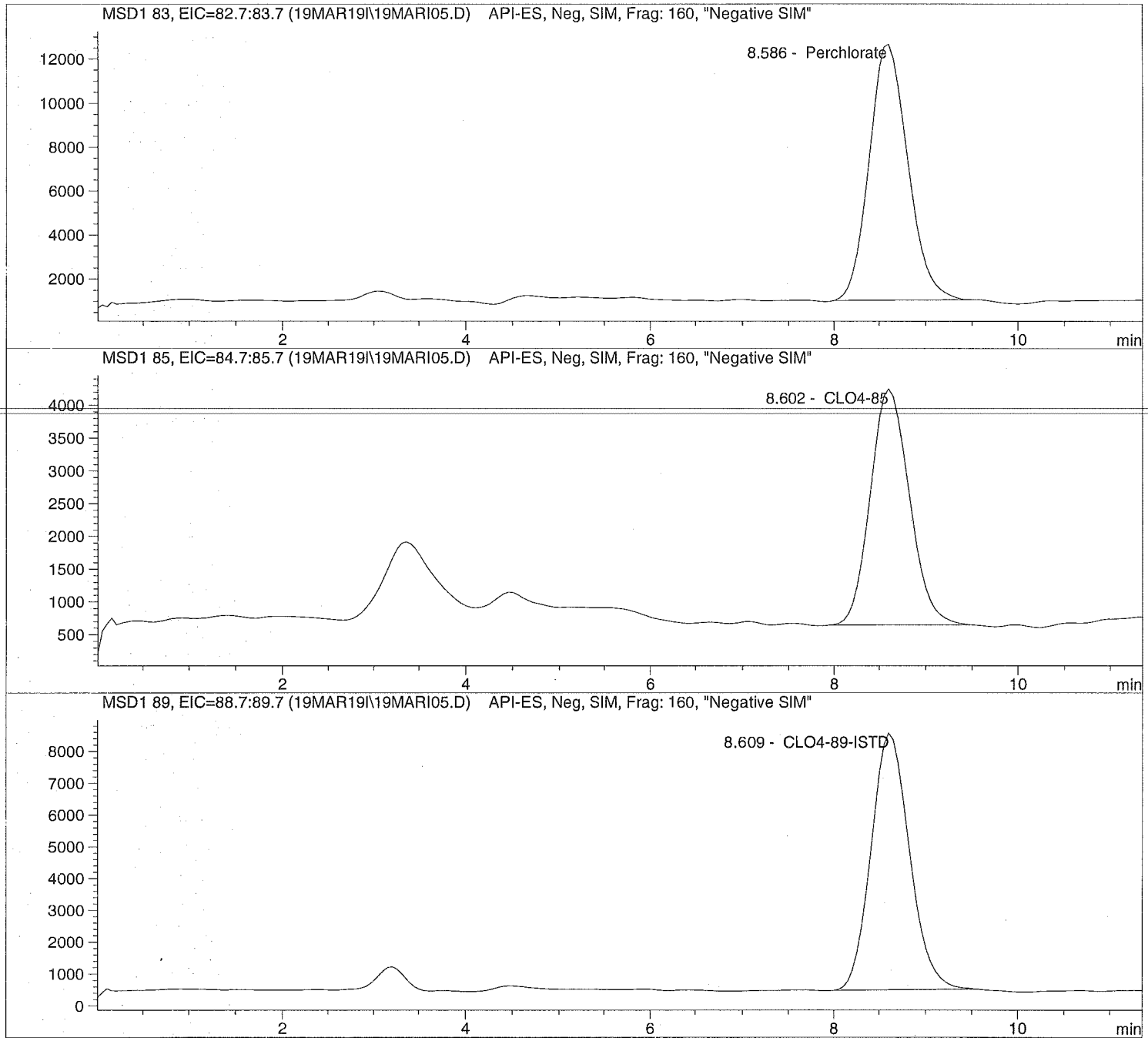
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Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	3/19/2019 10:06:16	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



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Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	3/19/2019 10:06:16	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 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
8.586	PBA	337763.6	4.7347	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.602	PBA	106124.0	4.8666	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.609	PBA	233196.3	5.0000	CLO4-89-ISTD

*** End of Report ***

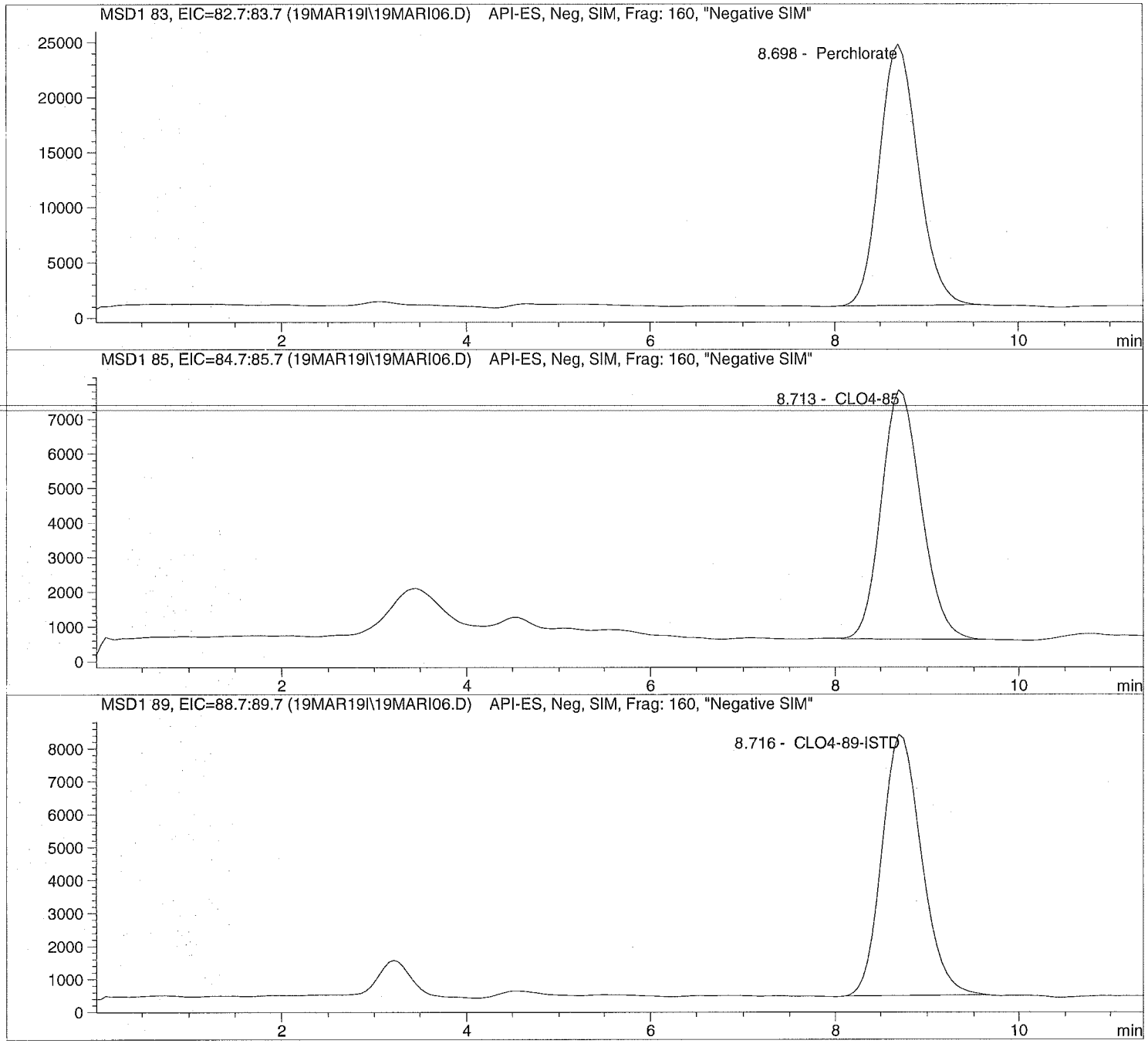
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	3/19/2019 10:19:32	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



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Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	3/19/2019 10:19:32	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 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
8.698	PBA	683454.4	9.2773	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.713	BBA	213522.6	9.6431	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.716	PBA	234453.6	5.0000	CLO4-89-ISTD

*** End of Report ***

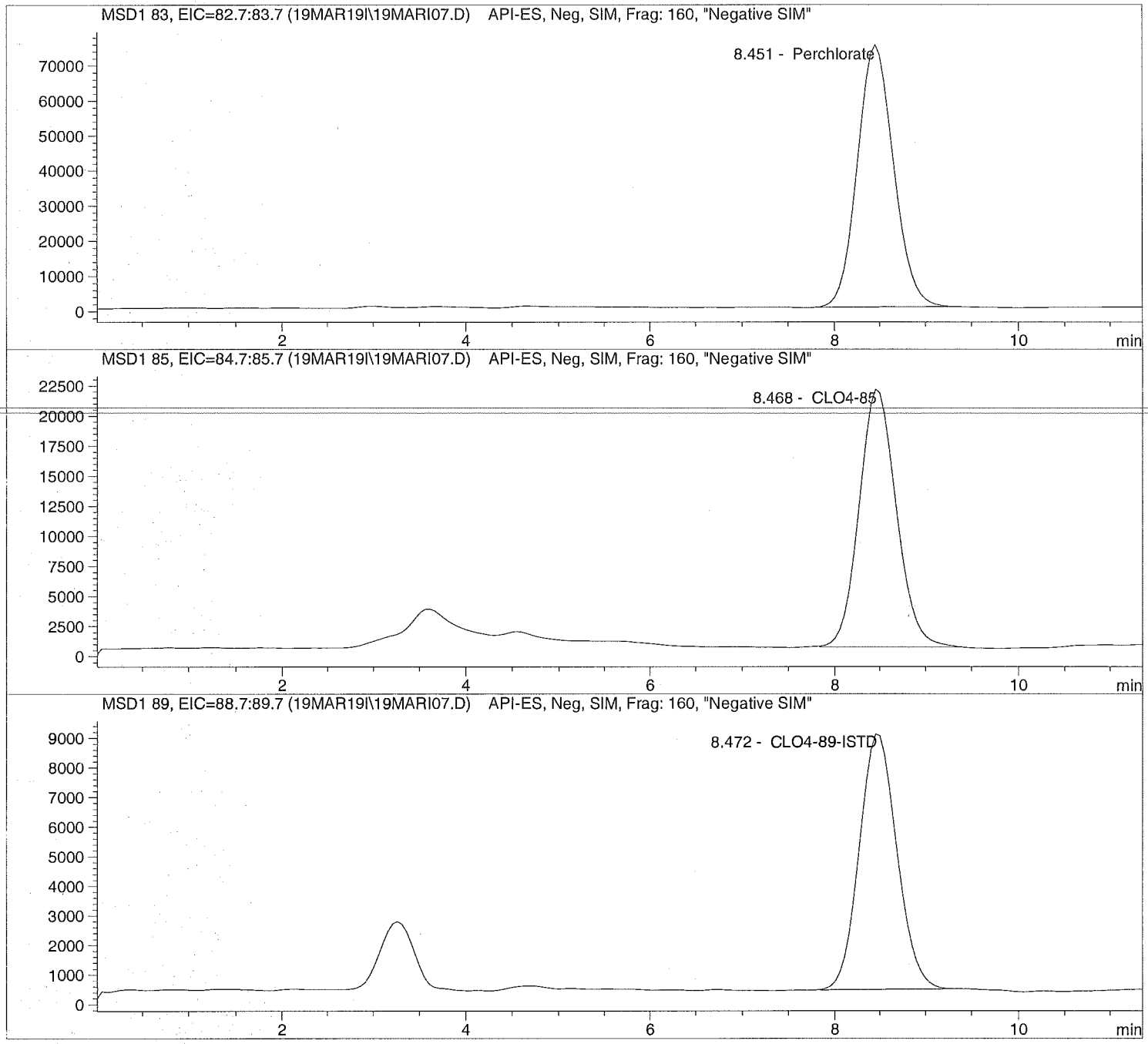
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	3/19/2019 10:32:49	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	3/19/2019 10:32:49	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 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
8.451	PBA	2084327.4	25.2904	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.468	BBA	614294.8	25.1216	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.472	BBA	250568.0	5.0000	CLO4-89-ISTD

*** End of Report ***

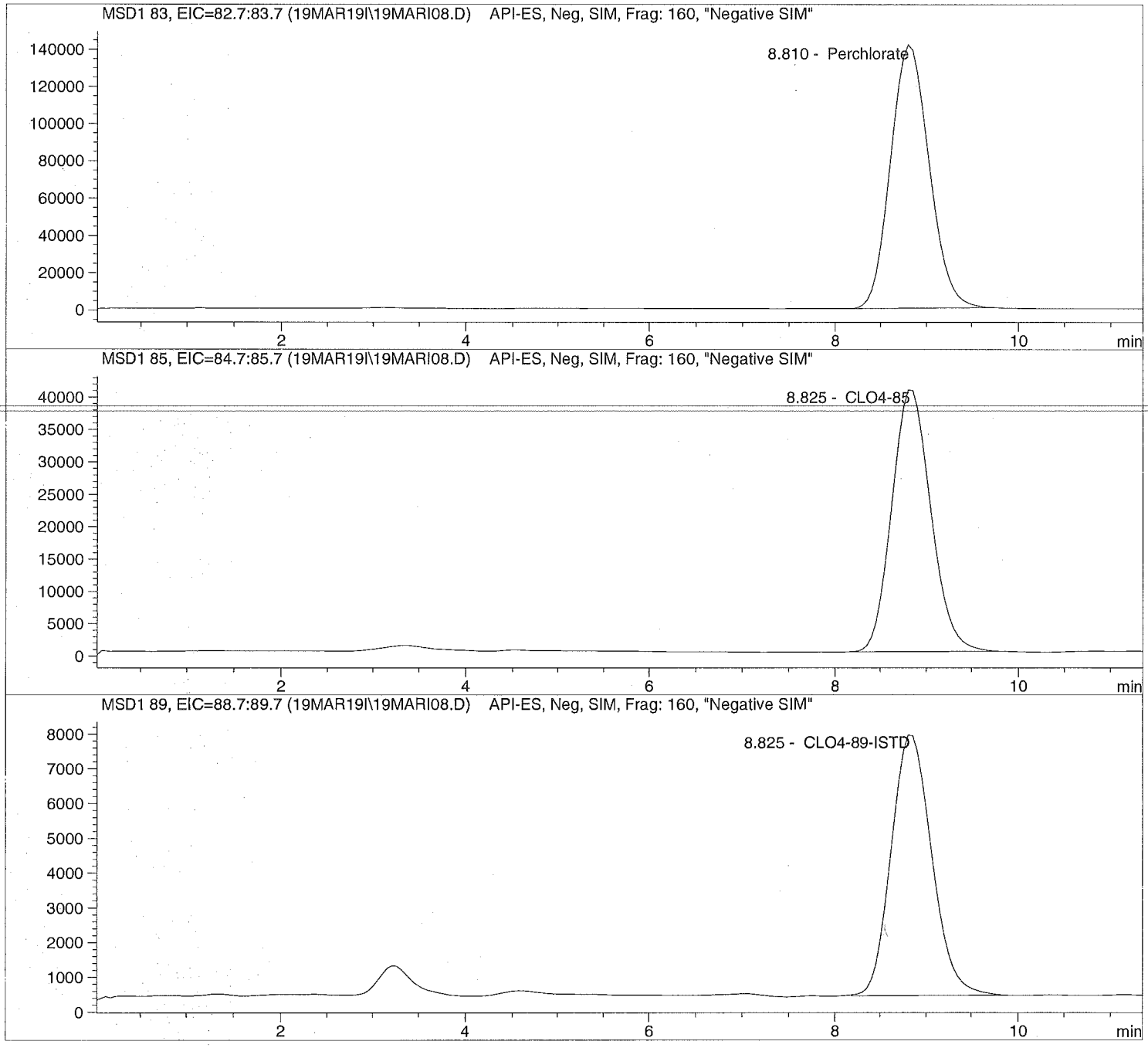
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	3/19/2019 10:46:05	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	3/19/2019 10:46:05	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 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
8.810	PBA	4133340.5	51.3684	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	1198135.6	50.4672	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	230976.7	5.0000	CLO4-89-ISTD

*** End of Report ***

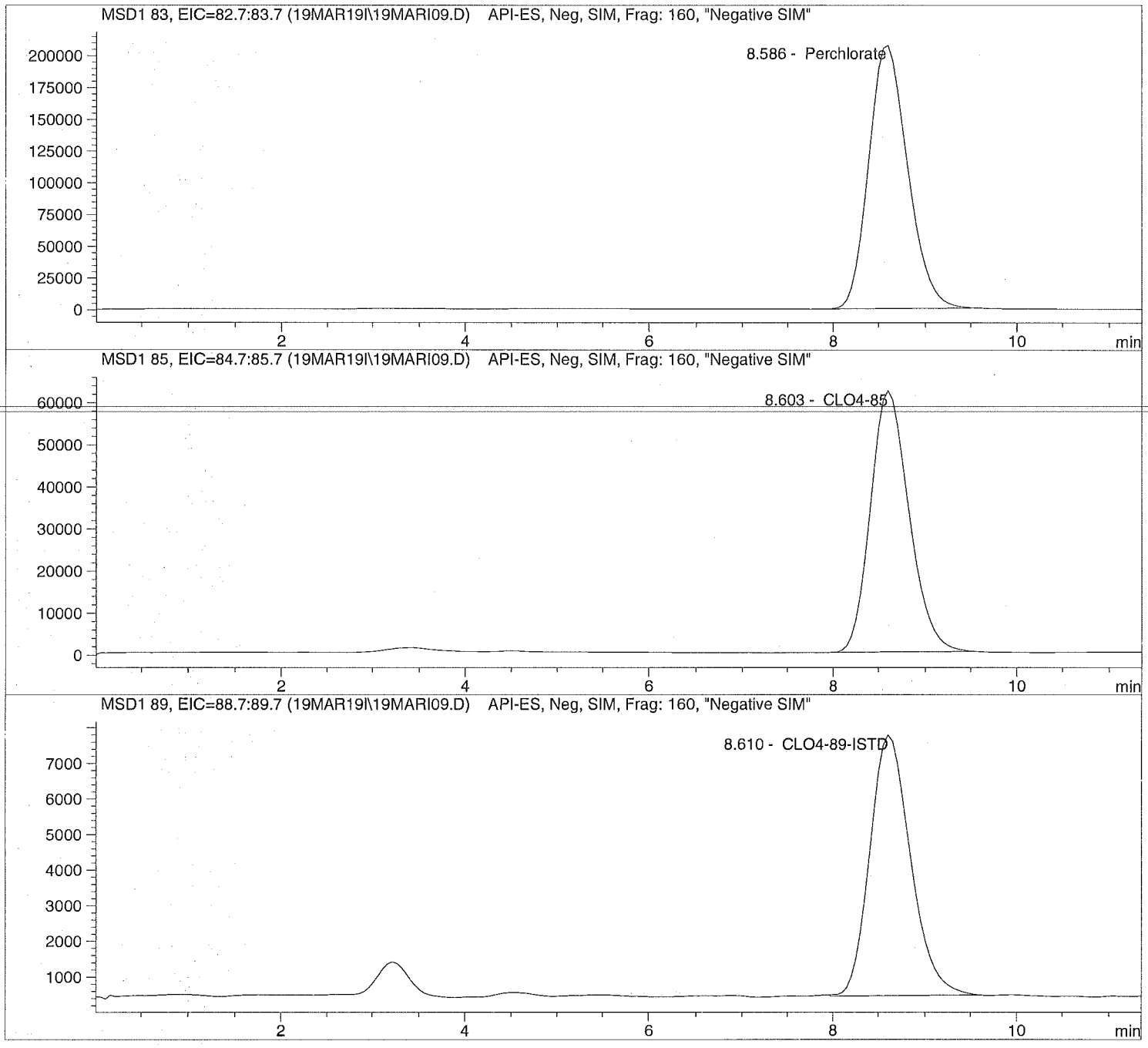
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	3/19/2019 10:59:22	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	3/19/2019 10:59:22	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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 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
8.586	PBA	5993128.0	74.1675	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.603	PBA	1783554.4	74.7202	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.610	BBA	221504.5	5.0000	CLO4-89-ISTD

*** End of Report ***

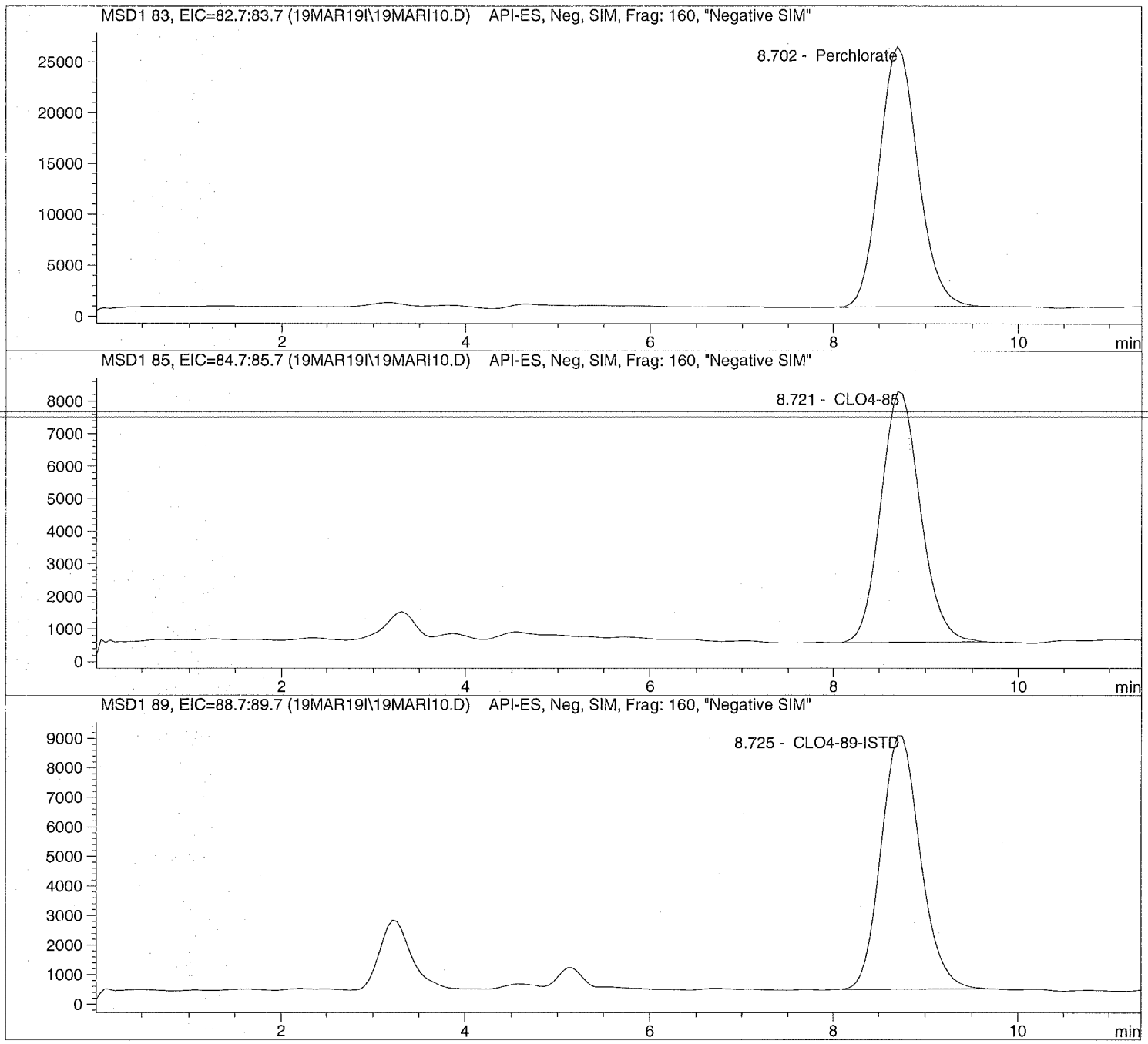
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L

Injection Date:	3/19/2019 11:12:42	Seq Line:	10
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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L

Injection Date:	3/19/2019 11:12:42	Seq Line:	10
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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 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
8.702	PBA	734718.7	9.2594	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.721	PBA	227494.7	9.5402	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.725	BBA	252544.4	5.0000	CLO4-89-ISTD

*** End of Report ***

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Unmodified

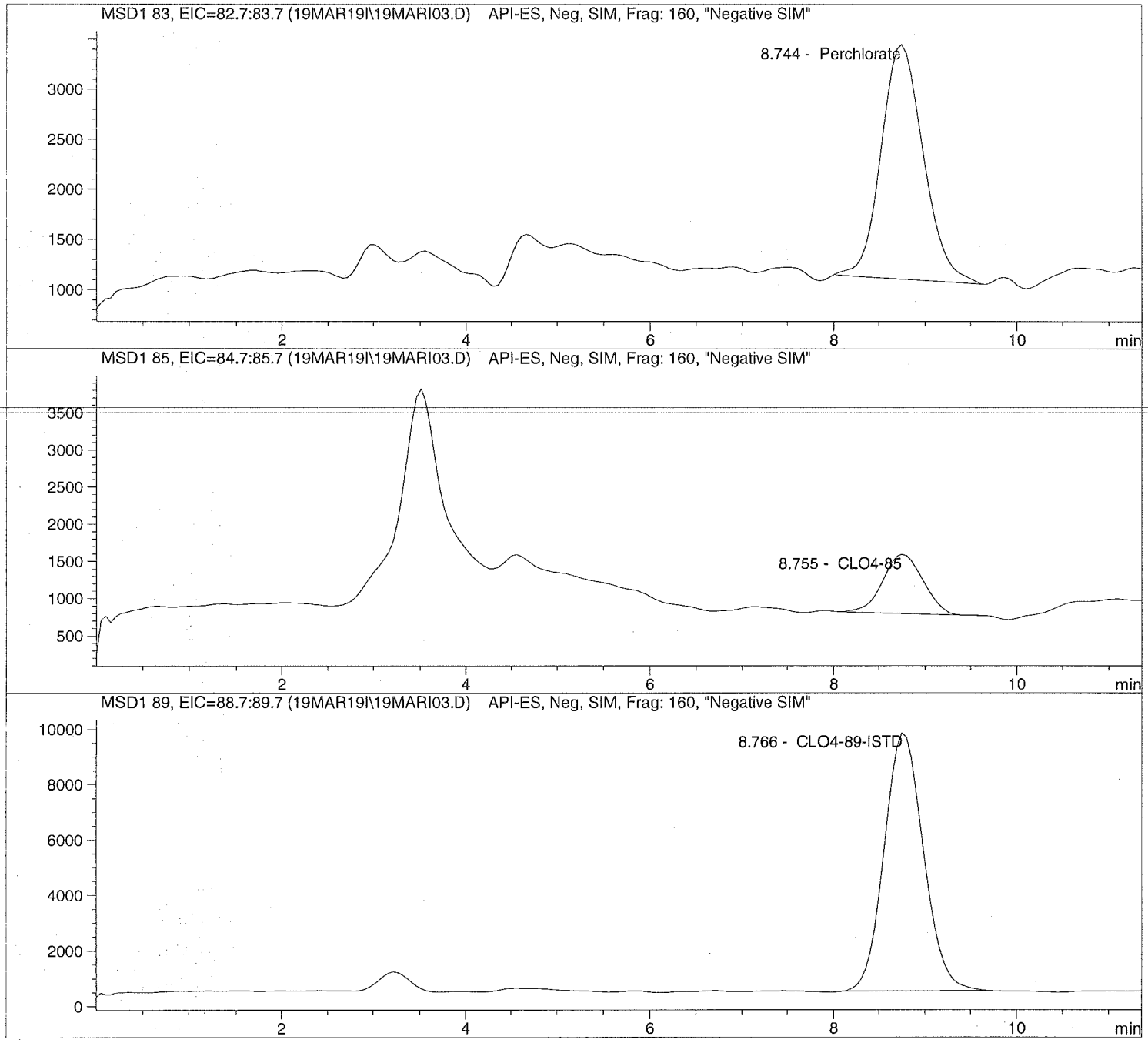
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	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-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	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-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 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
8.744	BBA	74166.3	1.0224	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	BBA	24138.1	0.9487	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

*** End of Report ***

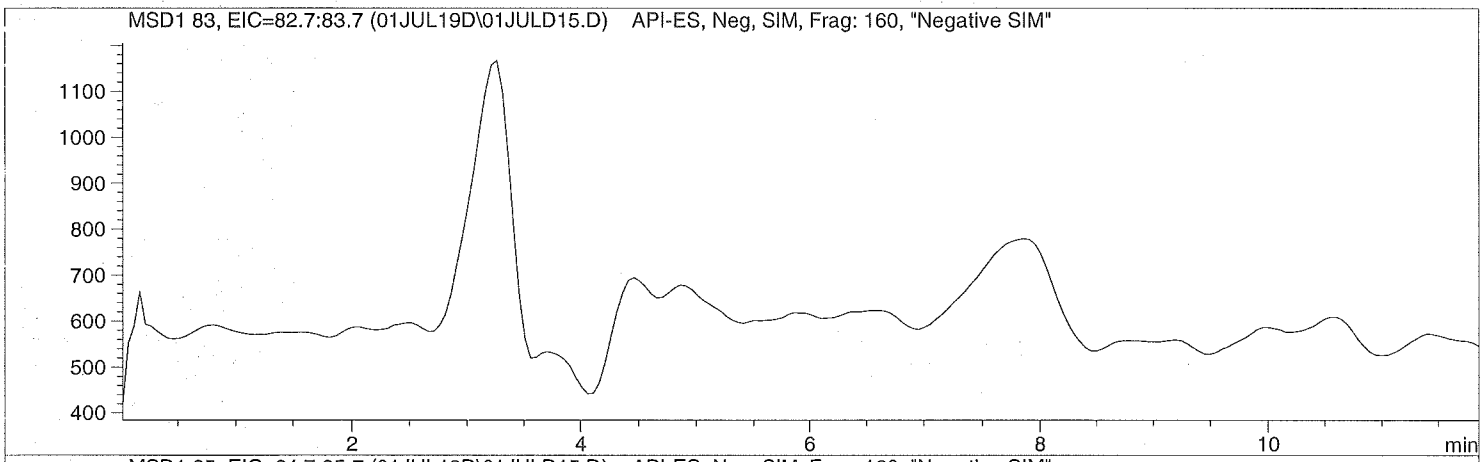
RIGHT SOLUTIONS | RIGHT PARTNER

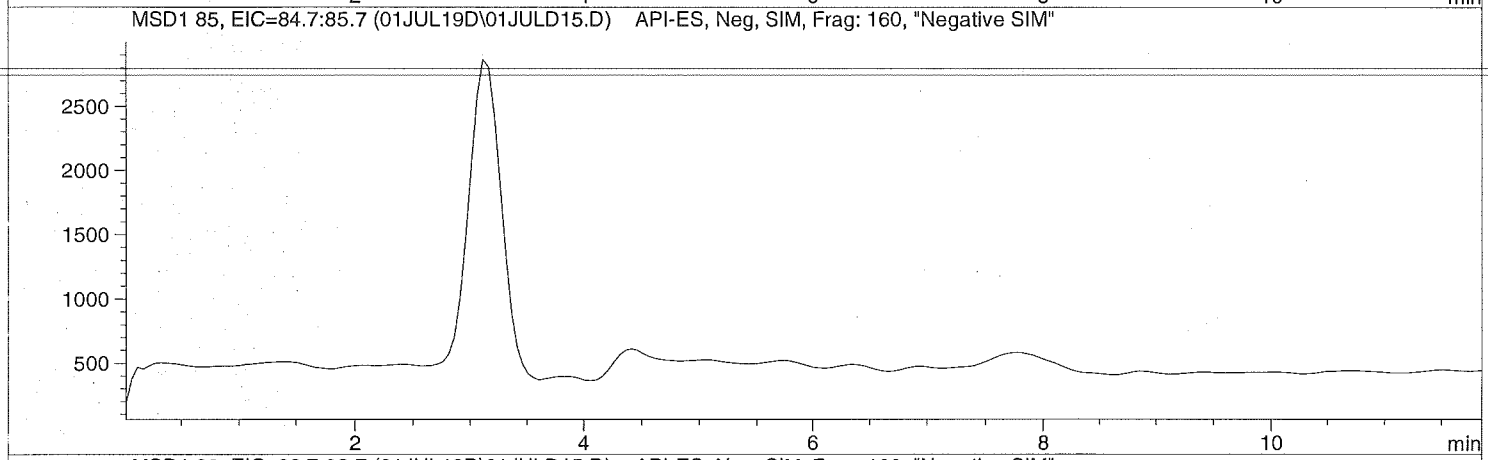
Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD15.D Sample Name: 1917856003

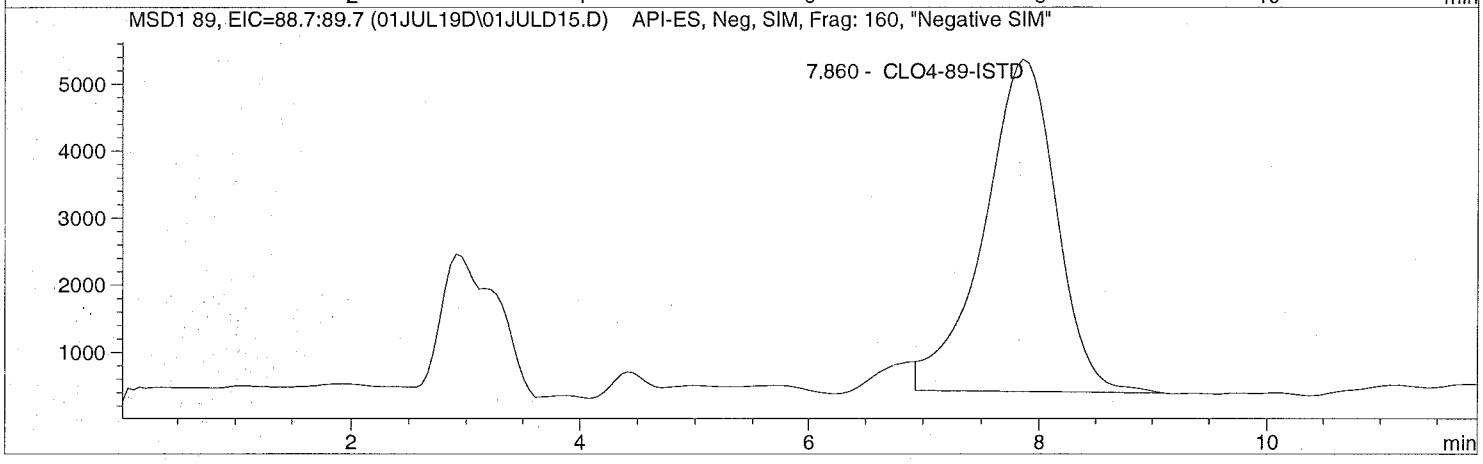
Injection Date:	7/01/2019 11:52:34	Seq Line:	15
Sample Name:	1917856003	Location:	Vial 85
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







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Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD15.D Sample Name: 1917856003

Injection Date:	7/01/2019 11:52:34	Seq Line:	15
Sample Name:	1917856003	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
7.860	BBA	216713.3	5.0000	CLO4-89-ISTD

*** End of Report ***

RIGHT SOLUTIONS | RIGHT PARTNER

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

July 10, 2019

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

Work Order: **HS19061157**

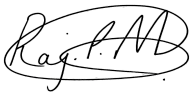
Laboratory Results for: **LHAAP 18 24**

Dear Marcia,

ALS Environmental received 9 sample(s) on Jun 21, 2019 for the analysis presented in the following report.

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

Regards,



Generated By: RJ.MODASHIA
RJ Modashia
Project Manager

ALS Houston, US Date: 10-jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Work Order: HS19061157

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19061157-01	18CPTMW10DW_062019	Groundwater		20-Jun-2019 07:10	21-Jun-2019 09:00	☐
HS19061157-02	18CPTMW10SW_062019	Groundwater		20-Jun-2019 07:55	21-Jun-2019 09:00	☐
HS19061157-03	18WW06_062019	Groundwater		20-Jun-2019 08:50	21-Jun-2019 09:00	☐
HS19061157-04	18WW02_062019	Groundwater		20-Jun-2019 09:40	21-Jun-2019 09:00	☐
HS19061157-05	18CPTMW19_062019	Groundwater		20-Jun-2019 10:35	21-Jun-2019 09:00	☐
HS19061157-06	18CPTMW19SW_062019	Groundwater		20-Jun-2019 11:25	21-Jun-2019 09:00	☐
HS19061157-07	18WW22_062019	Groundwater		20-Jun-2019 12:20	21-Jun-2019 09:00	☐
HS19061157-08	C04_062019	Groundwater		20-Jun-2019 13:10	21-Jun-2019 09:00	☐
HS19061157-09	Trip Blank	Water		20-Jun-2019 00:00	21-Jun-2019 09:00	☐

Revision:1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc. **CASE NARRATIVE**
Project: LHAAP 18 24
Work Order: HS19061157

Work Order Comments

• Revised to correct the reporting limit for Mercury

Work Order Comments

• The analyses for Perchlorate was subcontracted to ALS Environmental in Salt Lake City, UT. Final Report attached

GCMS Semivolatiles by Method SW8270SIM

Batch ID: 142429

Sample ID: LCSD-142429

• LCS/LCSD RPD recovered above the RPD limit. The individual recoveries met acceptance criteria (Surrogate 4-Terphenyl-d14)

GCMS Volatiles by Method SW8260

Batch ID: R341546

Sample ID: 18CPTMW10SW_062019 (HS19061157-02MS)

• MS/MSD /RPD failed QC limits for some few compounds

Sample ID: VLCSW-190628

• 1,2,3_Trichlorobenzene and Naphthalene exceeded QC limits for LCS. CCV is OK. Samples are ND for these compounds.

Metals by Method SW7470

Batch ID: 142560

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

Metals by Method SW6020

Batch ID: 142427

Sample ID: HS19060986-04MS

• MS and MSD are for an unrelated sample

Subcontracted by Method NA

Batch ID: R341930

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW10DW_062019
Collection Date: 20-Jun-2019 07:10

ANALYTICAL REPORT
WorkOrder:HS19061157
Lab ID:HS19061157-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:24
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:24
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 18:24
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:24
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:24
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:24
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:24
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 18:24
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 18:24
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 18:24
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:24
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:24
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:24
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 18:24
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:24
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 18:24
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:24
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 18:24
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:24
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 18:24
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:24
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	28-Jun-2019 18:24
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:24
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	28-Jun-2019 18:24
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 18:24
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:24
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	28-Jun-2019 18:24
Acetone	**3.3**		**0.40**	**1.0**	**2.0**	**UG/L**	1	28-Jun-2019 18:24
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:24
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 18:24
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:24
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:24
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 18:24
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 18:24
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	28-Jun-2019 18:24
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 18:24
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:24
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:24
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:24

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW10DW_062019
Collection Date: 20-Jun-2019 07:10

ANALYTICAL REPORT
WorkOrder:HS19061157
Lab ID:HS19061157-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:24
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:24
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	28-Jun-2019 18:24
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:24
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:24
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:24
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:24
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	28-Jun-2019 18:24
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:24
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	28-Jun-2019 18:24
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	28-Jun-2019 18:24
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 18:24
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:24
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:24
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:24
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:24
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:24
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:24
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:24
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:24
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:24
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:24
Trichloroethene	**1.2**		**0.20**	**0.50**	**1.0**	**UG/L**	1	28-Jun-2019 18:24
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:24
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:24
Surr: 1,2-Dichloroethane-d4	*99.3*			**0**	*81-118*	*%REC*	*1*	*28-Jun-2019 18:24*
Surr: 4-Bromofluorobenzene	*94.7*			**0**	*85-114*	*%REC*	*1*	*28-Jun-2019 18:24*
Surr: Dibromofluoromethane	*93.2*			**0**	*80-119*	*%REC*	*1*	*28-Jun-2019 18:24*
Surr: Toluene-d8	*95.8*			**0**	*89-112*	*%REC*	*1*	*28-Jun-2019 18:24*

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW10DW_062019
Collection Date: 20-Jun-2019 07:10

ANALYTICAL REPORT
WorkOrder:HS19061157
Lab ID:HS19061157-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 25-Jun-2019		Analyst: JHD
Aluminum	**0.611**		**0.00180**	**0.00500**	**0.0100**	**mg/L**	1	27-Jun-2019 18:09
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	27-Jun-2019 18:09
Arsenic	**0.00262**	J	**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 18:09
Barium	**0.108**		**0.00190**	**0.00250**	**0.00500**	**mg/L**	1	27-Jun-2019 18:09
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	28-Jun-2019 15:56
Cadmium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Jun-2019 18:09
Calcium	**6.74**		**0.0340**	**0.0500**	**0.500**	**mg/L**	1	27-Jun-2019 18:09
Chromium	**0.00736**		**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 18:09
Cobalt	**0.000393**	J	**0.000100**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 18:09
Copper	**0.00188**	J	**0.00100**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 18:09
Iron	**2.80**		**0.0120**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 18:09
Lead	**0.000967**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 18:09
Magnesium	**5.34**		**0.0100**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 18:09
Manganese	**0.0448**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 18:09
Nickel	**0.00202**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 18:09
Potassium	**111**		**0.0180**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 18:09
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	27-Jun-2019 18:09
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	27-Jun-2019 18:09
Sodium	**184**		**0.0700**	**0.250**	**1.00**	**mg/L**	5	28-Jun-2019 15:58
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Jun-2019 18:09
Vanadium	**0.00163**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 18:09
Zinc	**0.0244**		**0.00200**	**0.00200**	**0.00500**	**mg/L**	1	27-Jun-2019 18:09
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 28-Jun-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	28-Jun-2019 16:04
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	06-Jul-2019 09:58

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW10SW_062019
Collection Date: 20-Jun-2019 07:55

ANALYTICAL REPORT
WorkOrder:HS19061157
Lab ID:HS19061157-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 13:13
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 13:13
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 13:13
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 13:13
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 13:13
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 13:13
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 13:13
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 13:13
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 13:13
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 13:13
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 13:13
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 13:13
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 13:13
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 13:13
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 13:13
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 13:13
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 13:13
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 13:13
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 13:13
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 13:13
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 13:13
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	28-Jun-2019 13:13
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 13:13
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	28-Jun-2019 13:13
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 13:13
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 13:13
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	28-Jun-2019 13:13
Acetone	**5.4**		**0.40**	**1.0**	**2.0**	**UG/L**	1	28-Jun-2019 13:13
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 13:13
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 13:13
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 13:13
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 13:13
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 13:13
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 13:13
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	28-Jun-2019 13:13
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 13:13
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 13:13
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 13:13
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 13:13

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW10SW_062019
Collection Date: 20-Jun-2019 07:55

ANALYTICAL REPORT
WorkOrder:HS19061157
Lab ID:HS19061157-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 13:13
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 13:13
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	28-Jun-2019 13:13
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 13:13
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 13:13
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 13:13
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 13:13
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	28-Jun-2019 13:13
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 13:13
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	28-Jun-2019 13:13
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	28-Jun-2019 13:13
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 13:13
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 13:13
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 13:13
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 13:13
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 13:13
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 13:13
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 13:13
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 13:13
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 13:13
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 13:13
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 13:13
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 13:13
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 13:13
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 13:13
Surr: 1,2-Dichloroethane-d4	*99.7*			**0**	*81-118*	*%REC*	*1*	*28-Jun-2019 13:13*
Surr: 4-Bromofluorobenzene	*93.3*			**0**	*85-114*	*%REC*	*1*	*28-Jun-2019 13:13*
Surr: Dibromofluoromethane	*93.4*			**0**	*80-119*	*%REC*	*1*	*28-Jun-2019 13:13*
Surr: Toluene-d8	*95.4*			**0**	*89-112*	*%REC*	*1*	*28-Jun-2019 13:13*
SEMIVOLATILES SIM		**Method:SW8270SIM**				Prep:SW3510 / 25-Jun-2019		Analyst: LG
1,4-Dioxane	0.010	U	0.010	0.010	0.010	ug/L	1	28-Jun-2019 01:44
Surr: 2-Fluorobiphenyl	*81.4*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 01:44*
Surr: 4-Terphenyl-d14	*124*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 01:44*
Surr: Nitrobenzene-d5	*106*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 01:44*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	06-Jul-2019 09:58

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18WW06_062019
Collection Date: 20-Jun-2019 08:50

ANALYTICAL REPORT
WorkOrder:HS19061157
Lab ID:HS19061157-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 13:37
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 13:37
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 13:37
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 13:37
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 13:37
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 13:37
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 13:37
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 13:37
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 13:37
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 13:37
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 13:37
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 13:37
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 13:37
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 13:37
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 13:37
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 13:37
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 13:37
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 13:37
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 13:37
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 13:37
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 13:37
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	28-Jun-2019 13:37
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 13:37
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	28-Jun-2019 13:37
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 13:37
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 13:37
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	28-Jun-2019 13:37
Acetone	**3.0**		**0.40**	**1.0**	**2.0**	**UG/L**	1	28-Jun-2019 13:37
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 13:37
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 13:37
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 13:37
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 13:37
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 13:37
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 13:37
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	28-Jun-2019 13:37
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 13:37
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 13:37
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 13:37
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 13:37

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18WW06_062019
Collection Date: 20-Jun-2019 08:50

ANALYTICAL REPORT
WorkOrder:HS19061157
Lab ID:HS19061157-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 13:37
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 13:37
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	28-Jun-2019 13:37
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 13:37
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 13:37
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 13:37
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 13:37
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	28-Jun-2019 13:37
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 13:37
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	28-Jun-2019 13:37
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	28-Jun-2019 13:37
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 13:37
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 13:37
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 13:37
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 13:37
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 13:37
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 13:37
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 13:37
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 13:37
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 13:37
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 13:37
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 13:37
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 13:37
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 13:37
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 13:37
Surr: 1,2-Dichloroethane-d4	*97.9*			**0**	*81-118*	*%REC*	*1*	*28-Jun-2019 13:37*
Surr: 4-Bromofluorobenzene	*93.9*			**0**	*85-114*	*%REC*	*1*	*28-Jun-2019 13:37*
Surr: Dibromofluoromethane	*92.4*			**0**	*80-119*	*%REC*	*1*	*28-Jun-2019 13:37*
Surr: Toluene-d8	*94.7*			**0**	*89-112*	*%REC*	*1*	*28-Jun-2019 13:37*
SEMIVOLATILES SIM		**Method:SW8270SIM**				Prep:SW3510 / 25-Jun-2019		Analyst: LG
1,4-Dioxane	0.010	U	0.010	0.010	0.010	ug/L	1	28-Jun-2019 02:05
Surr: 2-Fluorobiphenyl	*76.9*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 02:05*
Surr: 4-Terphenyl-d14	*124*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 02:05*
Surr: Nitrobenzene-d5	*111*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 02:05*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	06-Jul-2019 09:58

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18WW02_062019
Collection Date: 20-Jun-2019 09:40

ANALYTICAL REPORT
WorkOrder:HS19061157
Lab ID:HS19061157-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 16:25
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 16:25
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 16:25
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 16:25
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 16:25
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 16:25
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 16:25
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 16:25
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 16:25
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 16:25
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 16:25
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 16:25
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 16:25
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 16:25
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 16:25
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 16:25
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 16:25
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 16:25
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 16:25
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 16:25
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 16:25
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	28-Jun-2019 16:25
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 16:25
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	28-Jun-2019 16:25
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 16:25
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 16:25
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	28-Jun-2019 16:25
Acetone	**5.4**		**0.40**	**1.0**	**2.0**	**UG/L**	1	28-Jun-2019 16:25
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 16:25
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 16:25
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 16:25
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 16:25
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 16:25
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 16:25
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	28-Jun-2019 16:25
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 16:25
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 16:25
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 16:25
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 16:25

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18WW02_062019
Collection Date: 20-Jun-2019 09:40

ANALYTICAL REPORT
WorkOrder:HS19061157
Lab ID:HS19061157-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 16:25
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 16:25
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	28-Jun-2019 16:25
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 16:25
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 16:25
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 16:25
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 16:25
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	28-Jun-2019 16:25
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 16:25
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	28-Jun-2019 16:25
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	28-Jun-2019 16:25
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 16:25
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 16:25
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 16:25
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 16:25
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 16:25
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 16:25
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 16:25
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 16:25
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 16:25
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 16:25
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 16:25
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 16:25
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 16:25
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 16:25
Surr: 1,2-Dichloroethane-d4	*101*			**0**	*81-118*	*%REC*	*1*	*28-Jun-2019 16:25*
Surr: 4-Bromofluorobenzene	*96.4*			**0**	*85-114*	*%REC*	*1*	*28-Jun-2019 16:25*
Surr: Dibromofluoromethane	*96.8*			**0**	*80-119*	*%REC*	*1*	*28-Jun-2019 16:25*
Surr: Toluene-d8	*96.7*			**0**	*89-112*	*%REC*	*1*	*28-Jun-2019 16:25*
SEMIVOLATILES SIM		**Method:SW8270SIM**				Prep:SW3510 / 25-Jun-2019		Analyst: LG
1,4-Dioxane	0.010	U	0.010	0.010	0.010	ug/L	1	28-Jun-2019 02:25
Surr: 2-Fluorobiphenyl	*91.5*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 02:25*
Surr: 4-Terphenyl-d14	*132*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 02:25*
Surr: Nitrobenzene-d5	*107*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 02:25*

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18WW02_062019
Collection Date: 20-Jun-2019 09:40

ANALYTICAL REPORT
WorkOrder:HS19061157
Lab ID:HS19061157-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 25-Jun-2019		Analyst: JHD
Aluminum	**1.56**		**0.00180**	**0.00500**	**0.0100**	**mg/L**	1	27-Jun-2019 18:11
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	27-Jun-2019 18:11
Arsenic	**0.000675**	J	**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 18:11
Barium	**0.0506**		**0.00190**	**0.00250**	**0.00500**	**mg/L**	1	27-Jun-2019 18:11
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Jun-2019 18:11
Cadmium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Jun-2019 18:11
Calcium	**7.84**		**0.0340**	**0.0500**	**0.500**	**mg/L**	1	27-Jun-2019 18:11
Chromium	**0.00851**		**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 18:11
Cobalt	**0.000341**	J	**0.000100**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 18:11
Copper	**0.00663**		**0.00100**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 18:11
Iron	**2.46**		**0.0120**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 18:11
Lead	**0.00123**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 18:11
Magnesium	**1.44**		**0.0100**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 18:11
Manganese	**0.0988**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 18:11
Nickel	**0.00574**		**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 18:11
Potassium	**2.12**		**0.0180**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 18:11
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	27-Jun-2019 18:11
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	27-Jun-2019 18:11
Sodium	**25.4**		**0.0140**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 18:11
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Jun-2019 18:11
Vanadium	**0.00394**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 18:11
Zinc	**0.0147**		**0.00200**	**0.00200**	**0.00500**	**mg/L**	1	27-Jun-2019 18:11
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 28-Jun-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	28-Jun-2019 16:09
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	06-Jul-2019 09:58

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW19_062019
Collection Date: 20-Jun-2019 10:35

ANALYTICAL REPORT
WorkOrder:HS19061157
Lab ID:HS19061157-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 16:49
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 16:49
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 16:49
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 16:49
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 16:49
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 16:49
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 16:49
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 16:49
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 16:49
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 16:49
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 16:49
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 16:49
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 16:49
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 16:49
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 16:49
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 16:49
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 16:49
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 16:49
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 16:49
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 16:49
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 16:49
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	28-Jun-2019 16:49
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 16:49
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	28-Jun-2019 16:49
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 16:49
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 16:49
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	28-Jun-2019 16:49
Acetone	**4.8**		**0.40**	**1.0**	**2.0**	**UG/L**	1	28-Jun-2019 16:49
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 16:49
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 16:49
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 16:49
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 16:49
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 16:49
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 16:49
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	28-Jun-2019 16:49
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 16:49
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 16:49
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 16:49
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 16:49

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW19_062019
Collection Date: 20-Jun-2019 10:35

ANALYTICAL REPORT
WorkOrder:HS19061157
Lab ID:HS19061157-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 16:49
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 16:49
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	28-Jun-2019 16:49
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 16:49
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 16:49
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 16:49
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 16:49
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	28-Jun-2019 16:49
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 16:49
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	28-Jun-2019 16:49
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	28-Jun-2019 16:49
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 16:49
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 16:49
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 16:49
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 16:49
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 16:49
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 16:49
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 16:49
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 16:49
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 16:49
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 16:49
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 16:49
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 16:49
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 16:49
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 16:49
Surr: 1,2-Dichloroethane-d4	*101*			**0**	*81-118*	*%REC*	*1*	*28-Jun-2019 16:49*
Surr: 4-Bromofluorobenzene	*95.3*			**0**	*85-114*	*%REC*	*1*	*28-Jun-2019 16:49*
Surr: Dibromofluoromethane	*96.2*			**0**	*80-119*	*%REC*	*1*	*28-Jun-2019 16:49*
Surr: Toluene-d8	*95.2*			**0**	*89-112*	*%REC*	*1*	*28-Jun-2019 16:49*
SEMIVOLATILES SIM		**Method:SW8270SIM**				Prep:SW3510 / 25-Jun-2019		Analyst: LG
1,4-Dioxane	**0.068**		**0.010**	**0.010**	**0.010**	**ug/L**	1	28-Jun-2019 02:46
Surr: 2-Fluorobiphenyl	*87.4*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 02:46*
Surr: 4-Terphenyl-d14	*131*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 02:46*
Surr: Nitrobenzene-d5	*107*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 02:46*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	06-Jul-2019 09:58

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW19SW_062019
Collection Date: 20-Jun-2019 11:25

ANALYTICAL REPORT
WorkOrder:HS19061157
Lab ID:HS19061157-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 17:12
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 17:12
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 17:12
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 17:12
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 17:12
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 17:12
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 17:12
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 17:12
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 17:12
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 17:12
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 17:12
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 17:12
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 17:12
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 17:12
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 17:12
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 17:12
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 17:12
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 17:12
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 17:12
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 17:12
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 17:12
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	28-Jun-2019 17:12
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 17:12
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	28-Jun-2019 17:12
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 17:12
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 17:12
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	28-Jun-2019 17:12
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	28-Jun-2019 17:12
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 17:12
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 17:12
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 17:12
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 17:12
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 17:12
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 17:12
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	28-Jun-2019 17:12
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 17:12
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 17:12
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 17:12
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 17:12

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
ANALYTICAL REPORT
Project: LHAAP 18 24 WorkOrder:HS19061157
Sample ID: 18CPTMW19SW_062019 Lab ID:HS19061157-06
Collection Date: 20-Jun-2019 11:25 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 17:12
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 17:12
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	28-Jun-2019 17:12
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 17:12
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 17:12
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 17:12
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 17:12
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	28-Jun-2019 17:12
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 17:12
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	28-Jun-2019 17:12
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	28-Jun-2019 17:12
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 17:12
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 17:12
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 17:12
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 17:12
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 17:12
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 17:12
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 17:12
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 17:12
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 17:12
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 17:12
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 17:12
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 17:12
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 17:12
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 17:12
Surr: 1,2-Dichloroethane-d4	*102*			**0**	*81-118*	*%REC*	*1*	*28-Jun-2019 17:12*
Surr: 4-Bromofluorobenzene	*94.2*			**0**	*85-114*	*%REC*	*1*	*28-Jun-2019 17:12*
Surr: Dibromofluoromethane	*94.2*			**0**	*80-119*	*%REC*	*1*	*28-Jun-2019 17:12*
Surr: Toluene-d8	*95.1*			**0**	*89-112*	*%REC*	*1*	*28-Jun-2019 17:12*
SEMIVOLATILES SIM		**Method:SW8270SIM**				Prep:SW3510 / 25-Jun-2019		Analyst: LG
1,4-Dioxane	0.010	U	0.010	0.010	0.010	ug/L	1	28-Jun-2019 03:07
Surr: 2-Fluorobiphenyl	*82.7*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 03:07*
Surr: 4-Terphenyl-d14	*129*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 03:07*
Surr: Nitrobenzene-d5	*107*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 03:07*

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW19SW_062019
Collection Date: 20-Jun-2019 11:25

ANALYTICAL REPORT
WorkOrder:HS19061157
Lab ID:HS19061157-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 25-Jun-2019		Analyst: JHD
Aluminum	**0.0745**		**0.00180**	**0.00500**	**0.0100**	**mg/L**	1	27-Jun-2019 18:16
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	27-Jun-2019 18:16
Arsenic	**0.00543**		**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 18:16
Barium	**0.198**		**0.00190**	**0.00250**	**0.00500**	**mg/L**	1	27-Jun-2019 18:16
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	28-Jun-2019 15:16
Cadmium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Jun-2019 18:16
Calcium	**11.2**		**0.0340**	**0.0500**	**0.500**	**mg/L**	1	27-Jun-2019 18:16
Chromium	**0.00171**	J	**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 18:16
Cobalt	**0.0104**		**0.000100**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 18:16
Copper	0.00100	U	0.00100	0.00100	0.00500	mg/L	1	27-Jun-2019 18:16
Iron	**16.1**		**0.0120**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 18:16
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	27-Jun-2019 18:16
Magnesium	**5.98**		**0.0100**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 18:16
Manganese	**0.477**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 18:16
Nickel	**0.00246**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 18:16
Potassium	**1.68**		**0.0180**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 18:16
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	27-Jun-2019 18:16
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	27-Jun-2019 18:16
Sodium	**28.1**		**0.0140**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 18:16
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Jun-2019 18:16
Vanadium	**0.00184**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 18:16
Zinc	**0.0247**		**0.00200**	**0.00200**	**0.00500**	**mg/L**	1	27-Jun-2019 18:16
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 28-Jun-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	28-Jun-2019 16:11
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	06-Jul-2019 09:58

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18WW22_062019
Collection Date: 20-Jun-2019 12:20

ANALYTICAL REPORT
WorkOrder:HS19061157
Lab ID:HS19061157-07
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 17:36
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 17:36
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 17:36
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 17:36
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 17:36
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 17:36
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 17:36
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 17:36
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 17:36
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 17:36
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 17:36
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 17:36
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 17:36
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 17:36
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 17:36
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 17:36
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 17:36
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 17:36
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 17:36
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 17:36
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 17:36
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	28-Jun-2019 17:36
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 17:36
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	28-Jun-2019 17:36
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 17:36
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 17:36
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	28-Jun-2019 17:36
Acetone	**9.1**		**0.40**	**1.0**	**2.0**	**UG/L**	1	28-Jun-2019 17:36
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 17:36
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 17:36
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 17:36
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 17:36
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 17:36
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 17:36
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	28-Jun-2019 17:36
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 17:36
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 17:36
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 17:36
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 17:36

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18WW22_062019
Collection Date: 20-Jun-2019 12:20

ANALYTICAL REPORT
WorkOrder:HS19061157
Lab ID:HS19061157-07
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 17:36
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 17:36
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	28-Jun-2019 17:36
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 17:36
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 17:36
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 17:36
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 17:36
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	28-Jun-2019 17:36
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 17:36
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	28-Jun-2019 17:36
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	28-Jun-2019 17:36
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 17:36
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 17:36
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 17:36
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 17:36
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 17:36
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 17:36
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 17:36
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 17:36
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 17:36
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 17:36
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 17:36
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 17:36
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 17:36
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 17:36
Surr: 1,2-Dichloroethane-d4	*98.4*			**0**	*81-118*	*%REC*	*1*	*28-Jun-2019 17:36*
Surr: 4-Bromofluorobenzene	*93.8*			**0**	*85-114*	*%REC*	*1*	*28-Jun-2019 17:36*
Surr: Dibromofluoromethane	*91.6*			**0**	*80-119*	*%REC*	*1*	*28-Jun-2019 17:36*
Surr: Toluene-d8	*94.8*			**0**	*89-112*	*%REC*	*1*	*28-Jun-2019 17:36*
SEMIVOLATILES SIM		**Method:SW8270SIM**				Prep:SW3510 / 25-Jun-2019		Analyst: LG
1,4-Dioxane	**0.017**		**0.010**	**0.010**	**0.010**	**ug/L**	1	28-Jun-2019 03:27
Surr: 2-Fluorobiphenyl	*117*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 03:27*
Surr: 4-Terphenyl-d14	*137*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 03:27*
Surr: Nitrobenzene-d5	*126*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 03:27*

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18WW22_062019
Collection Date: 20-Jun-2019 12:20

ANALYTICAL REPORT
WorkOrder:HS19061157
Lab ID:HS19061157-07
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 25-Jun-2019		Analyst: JHD
Aluminum	**0.213**		**0.00180**	**0.00500**	**0.0100**	**mg/L**	1	27-Jun-2019 18:18
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	27-Jun-2019 18:18
Arsenic	**0.00175**	J	**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 18:18
Barium	**0.145**		**0.00190**	**0.00250**	**0.00500**	**mg/L**	1	27-Jun-2019 18:18
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	28-Jun-2019 15:18
Cadmium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Jun-2019 18:18
Calcium	**15.2**		**0.0340**	**0.0500**	**0.500**	**mg/L**	1	27-Jun-2019 18:18
Chromium	**0.0245**		**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 18:18
Cobalt	**0.000243**	J	**0.000100**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 18:18
Copper	0.00100	U	0.00100	0.00100	0.00500	mg/L	1	27-Jun-2019 18:18
Iron	**0.0577**	J	**0.0120**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 18:18
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	27-Jun-2019 18:18
Magnesium	**3.50**		**0.0100**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 18:18
Manganese	**0.00169**	J	**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 18:18
Nickel	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	27-Jun-2019 18:18
Potassium	**4.81**		**0.0180**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 18:18
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	27-Jun-2019 18:18
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	27-Jun-2019 18:18
Sodium	**39.1**		**0.0140**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 18:18
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Jun-2019 18:18
Vanadium	**0.0148**		**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 18:18
Zinc	**0.0168**		**0.00200**	**0.00200**	**0.00500**	**mg/L**	1	27-Jun-2019 18:18
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 28-Jun-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	28-Jun-2019 16:13
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	06-Jul-2019 09:58

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
ANALYTICAL REPORT
Project: LHAAP 18 24
WorkOrder:HS19061157
Sample ID: C04_062019
Lab ID:HS19061157-08
Collection Date: 20-Jun-2019 13:10
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:00
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:00
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 18:00
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:00
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:00
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:00
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:00
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 18:00
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 18:00
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 18:00
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:00
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:00
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:00
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 18:00
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:00
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 18:00
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:00
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 18:00
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:00
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 18:00
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:00
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	28-Jun-2019 18:00
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:00
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	28-Jun-2019 18:00
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 18:00
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:00
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	28-Jun-2019 18:00
Acetone	**4.8**		**0.40**	**1.0**	**2.0**	**UG/L**	1	28-Jun-2019 18:00
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:00
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 18:00
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:00
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:00
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 18:00
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 18:00
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	28-Jun-2019 18:00
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 18:00
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:00
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:00
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:00

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: LHAAP 18 24 WorkOrder:HS19061157
Sample ID: C04_062019 Lab ID:HS19061157-08
Collection Date: 20-Jun-2019 13:10 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:00
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:00
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	28-Jun-2019 18:00
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:00
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:00
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:00
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:00
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	28-Jun-2019 18:00
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:00
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	28-Jun-2019 18:00
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	28-Jun-2019 18:00
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 18:00
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:00
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:00
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:00
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:00
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:00
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:00
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:00
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:00
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:00
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:00
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:00
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:00
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:00
Surr: 1,2-Dichloroethane-d4	*99.2*			**0**	*81-118*	*%REC*	*1*	*28-Jun-2019 18:00*
Surr: 4-Bromofluorobenzene	*92.5*			**0**	*85-114*	*%REC*	*1*	*28-Jun-2019 18:00*
Surr: Dibromofluoromethane	*93.0*			**0**	*80-119*	*%REC*	*1*	*28-Jun-2019 18:00*
Surr: Toluene-d8	*93.3*			**0**	*89-112*	*%REC*	*1*	*28-Jun-2019 18:00*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	06-Jul-2019 09:58

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: Trip Blank
Collection Date: 20-Jun-2019 00:00

ANALYTICAL REPORT
WorkOrder:HS19061157
Lab ID:HS19061157-09
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:49
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:49
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 12:49
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:49
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:49
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:49
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:49
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 12:49
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 12:49
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 12:49
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:49
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:49
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:49
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 12:49
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:49
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 12:49
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:49
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 12:49
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:49
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 12:49
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:49
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	28-Jun-2019 12:49
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:49
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	28-Jun-2019 12:49
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 12:49
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:49
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	28-Jun-2019 12:49
Acetone	**21**		**0.40**	**1.0**	**2.0**	**UG/L**	1	28-Jun-2019 12:49
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:49
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 12:49
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:49
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:49
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 12:49
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 12:49
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	28-Jun-2019 12:49
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 12:49
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:49
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:49
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:49

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
ANALYTICAL REPORT
Project: LHAAP 18 24 WorkOrder:HS19061157
Sample ID: Trip Blank Lab ID:HS19061157-09
Collection Date: 20-Jun-2019 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	28-Jun-2019 12:49
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:49
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	28-Jun-2019 12:49
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:49
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:49
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:49
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:49
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	28-Jun-2019 12:49
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:49
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	28-Jun-2019 12:49
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	28-Jun-2019 12:49
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 12:49
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:49
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:49
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:49
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:49
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:49
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:49
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:49
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:49
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:49
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:49
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:49
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:49
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:49
Surr: 1,2-Dichloroethane-d4	*97.5*			**0**	*81-118*	*%REC*	*1*	*28-Jun-2019 12:49*
Surr: 4-Bromofluorobenzene	*93.2*			**0**	*85-114*	*%REC*	*1*	*28-Jun-2019 12:49*
Surr: Dibromofluoromethane	*91.4*			**0**	*80-119*	*%REC*	*1*	*28-Jun-2019 12:49*
Surr: Toluene-d8	*93.3*			**0**	*89-112*	*%REC*	*1*	*28-Jun-2019 12:49*

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

RIGHT SOLUTIONS | RIGHT PARTNER

WEIGHT LOG

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061157

Batch ID: 142427 **Method:** METALS BY ICPMS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19061157-01	1	10	10 (mL)	1
HS19061157-04	1	10	10 (mL)	1
HS19061157-06	1	10	10 (mL)	1
HS19061157-07	1	10	10 (mL)	1

Batch ID: 142429 **Method:** SEMIVOLATILES SIM **Prep:** 3510_B_SIM

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19061157-02	1	1000	1 (mL)	0.001
HS19061157-03	1	1000	1 (mL)	0.001
HS19061157-04	1	1000	1 (mL)	0.001
HS19061157-05	1	1000	1 (mL)	0.001
HS19061157-06	1	1000	1 (mL)	0.001
HS19061157-07	1	1000	1 (mL)	0.001

Batch ID: 142560 **Method:** MERCURY BY SW7470A **Prep:** HG_WPR

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19061157-01	1	10 (mL)	10 (mL)	1
HS19061157-04	1	10 (mL)	10 (mL)	1
HS19061157-06	1	10 (mL)	10 (mL)	1
HS19061157-07	1	10 (mL)	10 (mL)	1

ALS Houston, US Date: 10-jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061157

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID: 142427 (0)	**Test Name :** METALS BY ICPMS BY SW6020A				**Matrix:** Groundwater	
HS19061157-01	18CPTMW10DW_062019	20 Jun 2019 07:10		25 Jun 2019 11:30	28 Jun 2019 15:58	5
HS19061157-01	18CPTMW10DW_062019	20 Jun 2019 07:10		25 Jun 2019 11:30	28 Jun 2019 15:56	1
HS19061157-01	18CPTMW10DW_062019	20 Jun 2019 07:10		25 Jun 2019 11:30	27 Jun 2019 18:09	1
HS19061157-04	18WW02_062019	20 Jun 2019 09:40		25 Jun 2019 11:30	27 Jun 2019 18:11	1
HS19061157-06	18CPTMW19SW_062019	20 Jun 2019 11:25		25 Jun 2019 11:30	28 Jun 2019 15:16	1
HS19061157-06	18CPTMW19SW_062019	20 Jun 2019 11:25		25 Jun 2019 11:30	27 Jun 2019 18:16	1
HS19061157-07	18WW22_062019	20 Jun 2019 12:20		25 Jun 2019 11:30	28 Jun 2019 15:18	1
HS19061157-07	18WW22_062019	20 Jun 2019 12:20		25 Jun 2019 11:30	27 Jun 2019 18:18	1
Batch ID: 142429 (0)	**Test Name :** SEMIVOLATILES SIM				**Matrix:** Groundwater	
HS19061157-02	18CPTMW10SW_062019	20 Jun 2019 07:55		25 Jun 2019 16:16	28 Jun 2019 01:44	1
HS19061157-03	18WW06_062019	20 Jun 2019 08:50		25 Jun 2019 16:16	28 Jun 2019 02:05	1
HS19061157-04	18WW02_062019	20 Jun 2019 09:40		25 Jun 2019 16:16	28 Jun 2019 02:25	1
HS19061157-05	18CPTMW19_062019	20 Jun 2019 10:35		25 Jun 2019 16:16	28 Jun 2019 02:46	1
HS19061157-06	18CPTMW19SW_062019	20 Jun 2019 11:25		25 Jun 2019 16:16	28 Jun 2019 03:07	1
HS19061157-07	18WW22_062019	20 Jun 2019 12:20		25 Jun 2019 16:16	28 Jun 2019 03:27	1
Batch ID: 142560 (0)	**Test Name :** MERCURY BY SW7470A				**Matrix:** Groundwater	
HS19061157-01	18CPTMW10DW_062019	20 Jun 2019 07:10		28 Jun 2019 10:30	28 Jun 2019 16:04	1
HS19061157-04	18WW02_062019	20 Jun 2019 09:40		28 Jun 2019 10:30	28 Jun 2019 16:09	1
HS19061157-06	18CPTMW19SW_062019	20 Jun 2019 11:25		28 Jun 2019 10:30	28 Jun 2019 16:11	1
HS19061157-07	18WW22_062019	20 Jun 2019 12:20		28 Jun 2019 10:30	28 Jun 2019 16:13	1
Batch ID: R341546 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS19061157-09	Trip Blank	20 Jun 2019 00:00			28 Jun 2019 12:49	1
Batch ID: R341546 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS19061157-01	18CPTMW10DW_062019	20 Jun 2019 07:10			28 Jun 2019 18:24	1
HS19061157-02	18CPTMW10SW_062019	20 Jun 2019 07:55			28 Jun 2019 13:13	1
HS19061157-03	18WW06_062019	20 Jun 2019 08:50			28 Jun 2019 13:37	1
HS19061157-04	18WW02_062019	20 Jun 2019 09:40			28 Jun 2019 16:25	1
HS19061157-05	18CPTMW19_062019	20 Jun 2019 10:35			28 Jun 2019 16:49	1
HS19061157-06	18CPTMW19SW_062019	20 Jun 2019 11:25			28 Jun 2019 17:12	1
HS19061157-07	18WW22_062019	20 Jun 2019 12:20			28 Jun 2019 17:36	1
HS19061157-08	C04_062019	20 Jun 2019 13:10			28 Jun 2019 18:00	1

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061157

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID: R341930 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** Groundwater	
HS19061157-01	18CPTMW10DW_062019	20 Jun 2019 07:10			06 Jul 2019 09:58	1
HS19061157-02	18CPTMW10SW_062019	20 Jun 2019 07:55			06 Jul 2019 09:58	1
HS19061157-03	18WW06_062019	20 Jun 2019 08:50			06 Jul 2019 09:58	1
HS19061157-04	18WW02_062019	20 Jun 2019 09:40			06 Jul 2019 09:58	1
HS19061157-05	18CPTMW19_062019	20 Jun 2019 10:35			06 Jul 2019 09:58	1
HS19061157-06	18CPTMW19SW_062019	20 Jun 2019 11:25			06 Jul 2019 09:58	1
HS19061157-07	18WW22_062019	20 Jun 2019 12:20			06 Jul 2019 09:58	1
HS19061157-08	C04_062019	20 Jun 2019 13:10			06 Jul 2019 09:58	1

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061157

QC BATCH REPORT

Batch ID: 142427 (0) **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

MBLK Sample ID: **MBLK-142427** Units: **mg/L** Analysis Date: **27-Jun-2019 17:22**
Client ID: Run ID: **ICPMS06_341376** SeqNo: **5145221** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.002457	0.0100								J
Antimony	0.000500	0.00500								U
Arsenic	0.000500	0.00500								U
Barium	0.00250	0.00500								U
Beryllium	0.000500	0.00200								U
Cadmium	0.000500	0.00200								U
Calcium	0.0500	0.500								U
Chromium	0.000500	0.00500								U
Cobalt	0.000500	0.00500								U
Copper	0.001932	0.00500								J
Iron	0.0500	0.200								U
Lead	0.00100	0.00500								U
Magnesium	0.0500	0.200								U
Manganese	0.00100	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	0.02437	0.200								J
Thallium	0.000500	0.00200								U
Vanadium	0.001051	0.00500								J
Zinc	0.00200	0.00500								U

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061157

QC BATCH REPORT

Batch ID: 142427 (0) **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

LCS Sample ID: **LCS-142427** Units: **mg/L** Analysis Date: **27-Jun-2019 16:58**
Client ID: Run ID: **ICPMS06_341376** SeqNo: **5145214** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.1091	0.0100	0.1	0	109	84 - 117				
Antimony	0.0559	0.00500	0.05	0	112	85 - 117				
Arsenic	0.05618	0.00500	0.05	0	112	84 - 116				
Barium	0.05364	0.00500	0.05	0	107	86 - 114				
Beryllium	0.05694	0.00200	0.05	0	114	83 - 121				
Cadmium	0.05632	0.00200	0.05	0	113	87 - 115				
Calcium	5.323	0.500	5	0	106	87 - 118				
Chromium	0.05591	0.00500	0.05	0	112	85 - 116				
Cobalt	0.05561	0.00500	0.05	0	111	86 - 115				
Copper	0.05732	0.00500	0.05	0	115	85 - 118				
Iron	5.504	0.200	5	0	110	87 - 118				
Lead	0.05401	0.00500	0.05	0	108	88 - 115				
Magnesium	5.42	0.200	5	0	108	83 - 118				
Manganese	0.05651	0.00500	0.05	0	113	87 - 115				
Nickel	0.05699	0.00500	0.05	0	114	85 - 117				
Potassium	5.366	0.200	5	0	107	87 - 115				
Selenium	0.05781	0.00500	0.05	0	116	80 - 120				
Silver	0.05393	0.00500	0.05	0	108	85 - 116				
Sodium	5.418	0.200	5	0	108	85 - 117				
Thallium	0.05098	0.00200	0.05	0	102	82 - 116				
Vanadium	0.05441	0.00500	0.05	0	109	86 - 115				
Zinc	0.05821	0.00500	0.05	0	116	83 - 119				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061157

QC BATCH REPORT

Batch ID: 142427 (0) **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

MS Sample ID: **HS19060986-04MS** Units: **mg/L** Analysis Date: **27-Jun-2019 17:03**
Client ID: Run ID: **ICPMS06_341376** SeqNo: **5145217** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.116	0.0100	0.1	0.01515	101	84 - 117				
Antimony	0.05308	0.00500	0.05	0.000258	106	85 - 117				
Arsenic	0.05627	0.00500	0.05	0.002036	108	84 - 116				
Barium	0.8428	0.00500	0.05	0.8565	-27.4	86 - 114				SO
Beryllium	0.05294	0.00200	0.05	0.000048	106	83 - 121				
Cadmium	0.05116	0.00200	0.05	0.000205	102	87 - 115				
Calcium	35.9	0.500	5	33.03	57.3	87 - 118				SO
Chromium	0.3735	0.00500	0.05	0.2809	185	85 - 116				SO
Cobalt	0.0563	0.00500	0.05	0.005607	101	86 - 115				
Copper	0.058	0.00500	0.05	0.005199	106	85 - 118				
Iron	7.669	0.200	5	2.556	102	87 - 118				
Lead	0.05089	0.00500	0.05	0.000094	102	88 - 115				
Magnesium	31.26	0.200	5	27.76	69.9	83 - 118				SO
Manganese	0.2154	0.00500	0.05	0.164	103	87 - 115				
Nickel	0.2401	0.00500	0.05	0.2011	78.0	85 - 117				SO
Potassium	7.654	0.200	5	2.639	100	87 - 115				
Selenium	0.05384	0.00500	0.05	0.000343	107	80 - 120				
Silver	0.04654	0.00500	0.05	0.000013	93.1	85 - 116				
Sodium	233.3	0.200	5	245	-233	85 - 117				SEO
Thallium	0.04975	0.00200	0.05	0.000043	99.4	82 - 116				
Vanadium	0.0572	0.00500	0.05	0.003781	107	86 - 115				
Zinc	0.07874	0.00500	0.05	0.03582	85.8	83 - 119				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061157

QC BATCH REPORT

Batch ID: 142427 (0) **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

MSD Sample ID: **HS19060986-04MSD** Units: **mg/L** Analysis Date: **27-Jun-2019 17:05**
Client ID: Run ID: **ICPMS06_341376** SeqNo: **5145218** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.1062	0.0100	0.1	0.01515	91.1	84 - 117	0.116	8.82	20	
Antimony	0.04965	0.00500	0.05	0.000258	98.8	85 - 117	0.05308	6.66	20	
Arsenic	0.05281	0.00500	0.05	0.002036	102	84 - 116	0.05627	6.34	20	
Barium	0.8139	0.00500	0.05	0.8565	-85.2	86 - 114	0.8428	3.49	20	SO
Beryllium	0.05024	0.00200	0.05	0.000048	100	83 - 121	0.05294	5.24	20	
Cadmium	0.04833	0.00200	0.05	0.000205	96.2	87 - 115	0.05116	5.7	20	
Calcium	33.36	0.500	5	33.03	6.56	87 - 118	35.9	7.33	20	SO
Cobalt	0.0531	0.00500	0.05	0.005607	95.0	86 - 115	0.0563	5.85	20	
Copper	0.05342	0.00500	0.05	0.005199	96.4	85 - 118	0.058	8.23	20	
Iron	7.023	0.200	5	2.556	89.3	87 - 118	7.669	8.8	20	
Lead	0.04808	0.00500	0.05	0.000094	96.0	88 - 115	0.05089	5.67	20	
Magnesium	28.94	0.200	5	27.76	23.5	83 - 118	31.26	7.71	20	SO
Manganese	0.1904	0.00500	0.05	0.164	52.8	87 - 115	0.2154	12.4	20	S
Nickel	0.2255	0.00500	0.05	0.2011	48.7	85 - 117	0.2401	6.29	20	SO
Potassium	7.309	0.200	5	2.639	93.4	87 - 115	7.654	4.62	20	
Selenium	0.05051	0.00500	0.05	0.000343	100	80 - 120	0.05384	6.37	20	
Silver	0.04575	0.00500	0.05	0.000013	91.5	85 - 116	0.04654	1.71	20	
Sodium	224.6	0.200	5	245	-407	85 - 117	233.3	3.8	20	SEO
Thallium	0.04905	0.00200	0.05	0.000043	98.0	82 - 116	0.04975	1.42	20	
Vanadium	0.05284	0.00500	0.05	0.003781	98.1	86 - 115	0.0572	7.93	20	
Zinc	0.08005	0.00500	0.05	0.03582	88.5	83 - 119	0.07874	1.66	20	

MSD Sample ID: **HS19060986-04MSD** Units: **mg/L** Analysis Date: **28-Jun-2019 15:07**
Client ID: Run ID: **ICPMS06_341483** SeqNo: **5145651** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium	0.343	0.00500	0.05	0.2809	124	85 - 116	0.3735	8.51	20	SO

Revision: 1

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ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061157

QC BATCH REPORT

Batch ID: 142427 (0) **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

PDS Sample ID: **HS19060986-04PDS** Units: **mg/L** Analysis Date: **27-Jun-2019 17:07**
Client ID: Run ID: **ICPMS06_341376** SeqNo: **5145219** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.1008	0.0100	0.1	0.01515	85.7	80 - 120				
Antimony	0.08752	0.00500	0.1	0.000258	87.3	80 - 120				
Arsenic	0.09313	0.00500	0.1	0.002036	91.1	80 - 120				
Beryllium	0.09784	0.00200	0.1	0.000048	97.8	80 - 120				
Cadmium	0.09096	0.00200	0.1	0.000205	90.8	80 - 120				
Cobalt	0.09093	0.00500	0.1	0.005607	85.3	80 - 120				
Copper	0.09101	0.00500	0.1	0.005199	85.8	80 - 120				
Iron	10.93	0.200	10	2.556	83.8	80 - 120				
Lead	0.09017	0.00500	0.1	0.000094	90.1	80 - 120				
Potassium	11.36	0.200	10	2.639	87.2	80 - 120				
Selenium	0.09025	0.00500	0.1	0.000343	89.9	80 - 120				
Silver	0.08464	0.00500	0.1	0.000013	84.6	80 - 120				
Thallium	0.08892	0.00200	0.1	0.000043	88.9	80 - 120				
Vanadium	0.09309	0.00500	0.1	0.003781	89.3	80 - 120				
Zinc	0.1183	0.00500	0.1	0.03582	82.5	80 - 120				

PDS Sample ID: **HS19060986-04PDS** Units: **mg/L** Analysis Date: **28-Jun-2019 15:14**
Client ID: Run ID: **ICPMS06_341483** SeqNo: **5145655** PrepDate: **25-Jun-2019** DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Barium	1.703	0.0500	1	0.7	100	80 - 120				
Calcium	129.7	5.00	100	26.89	103	80 - 120				
Chromium	1.283	0.0500	1	0.2283	105	80 - 120				
Iron	107.4	2.00	100	2.151	105	80 - 120				
Magnesium	125.2	2.00	100	22.92	102	80 - 120				
Manganese	1.175	0.0500	1	0.1367	104	80 - 120				
Nickel	1.217	0.0500	1	0.1678	105	80 - 120				
Potassium	106.9	2.00	100	2.16	105	80 - 120				
Sodium	299.8	2.00	100	202.9	96.9	80 - 120				

Revision: 1

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ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061157

QC BATCH REPORT

Batch ID: 142427 (0) **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

SD Sample ID: **HS19060986-04SD** Units: **mg/L** Analysis Date: **27-Jun-2019 17:02**
Client ID: Run ID: **ICPMS06_341376** SeqNo: **5145216** PrepDate: **25-Jun-2019** DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Aluminum	0.01988	0.0500					0.01515	0	10	J
Antimony	0.00250	0.0250					0.000258	0	10	U
Arsenic	0.002183	0.0250					0.002036	0	10	J
Beryllium	0.00250	0.0100					0.000048	0	10	U
Cadmium	0.00250	0.0100					0.000205	0	10	U
Cobalt	0.004619	0.0250					0.005607	0	10	J
Copper	0.00500	0.0250					0.005199	0	10	U
Lead	0.00500	0.0250					0.000094	0	10	U
Selenium	0.0125	0.0250					0.000343	0	10	U
Silver	0.00250	0.0250					0.000013	0	10	U
Thallium	0.00250	0.0100					0.000043	0	10	U
Vanadium	0.01164	0.0250					0.003781	0	10	J
Zinc	0.038	0.0250					0.03582	6.07	10	

SD Sample ID: **HS19060986-04SD** Units: **mg/L** Analysis Date: **28-Jun-2019 15:13**
Client ID: Run ID: **ICPMS06_341483** SeqNo: **5145654** PrepDate: **25-Jun-2019** DF: **50**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Barium	0.6998	0.250					0.7	0.0306	10	
Calcium	27.1	25.0					26.89	0.761	10	
Chromium	0.234	0.250					0.2283	0	10	J
Iron	2.19	10.0					2.151	0	10	J
Magnesium	22.74	10.0					22.92	0.776	10	
Manganese	0.1567	0.250					0.1367	0	10	J
Nickel	0.1736	0.250					0.1678	0	10	J
Potassium	2.068	10.0					2.16	0	10	J
Sodium	207.1	10.0					202.9	2.06	10	

The following samples were analyzed in this batch: HS19061157-01 HS19061157-04 HS19061157-06 HS19061157-07

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061157

QC BATCH REPORT

Batch ID: 142560 (0) **Instrument: HG03** **Method: MERCURY BY SW7470A**

MBLK Sample ID: **MBLK-142560** Units: **mg/L** Analysis Date: **28-Jun-2019 15:56**
Client ID: Run ID: **HG03_341562** SeqNo: **5147053** PrepDate: **28-Jun-2019** 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-142560** Units: **mg/L** Analysis Date: **28-Jun-2019 15:57**
Client ID: Run ID: **HG03_341562** SeqNo: **5147054** PrepDate: **28-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00509	0.000200	0.005	0	102	80 - 120				

MS Sample ID: **HS19061486-01MS** Units: **mg/L** Analysis Date: **28-Jun-2019 16:01**
Client ID: Run ID: **HG03_341562** SeqNo: **5147056** PrepDate: **28-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00000513	0.000000200	5e-006	-0.0000000010	103	75 - 125				

MSD Sample ID: **HS19061486-01MSD** Units: **mg/L** Analysis Date: **28-Jun-2019 16:03**
Client ID: Run ID: **HG03_341562** SeqNo: **5147057** PrepDate: **28-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00000509	0.000000200	5e-006	-0.0000000010	102	75 - 125	0.000005130	0.783	20	

The following samples were analyzed in this batch: HS19061157-01 HS19061157-04 HS19061157-06 HS19061157-07

Revision: 1

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ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061157

QC BATCH REPORT

Batch ID: 142429 (0) **Instrument: SV-5** **Method: SEMIVOLATILES SIM**

MBLK Sample ID: **MBLK-142429** Units: **ug/L** Analysis Date: **27-Jun-2019 21:35**
Client ID: Run ID: **SV-5_341545** SeqNo: **5146405** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.010	0.010								U
Surr: 2-Fluorobiphenyl	*0.0702*	*0*	*0.08*	*0*	*87.7*	*40 - 140*				
Surr: 4-Terphenyl-d14	*0.0811*	*0*	*0.08*	*0*	*101*	*40 - 140*				
Surr: Nitrobenzene-d5	*0.07172*	*0*	*0.08*	*0*	*89.6*	*40 - 140*				

LCS Sample ID: **LCS-142429** Units: **ug/L** Analysis Date: **27-Jun-2019 21:56**
Client ID: Run ID: **SV-5_341545** SeqNo: **5146406** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.0905	0.010	0.08	0	113	40 - 140				
Surr: 2-Fluorobiphenyl	*0.07767*	*0*	*0.08*	*0*	*97.1*	*40 - 140*				
Surr: 4-Terphenyl-d14	*0.08433*	*0*	*0.08*	*0*	*105*	*40 - 140*				
Surr: Nitrobenzene-d5	*0.08991*	*0*	*0.08*	*0*	*112*	*40 - 140*				

LCSD Sample ID: **LCSD-142429** Units: **ug/L** Analysis Date: **27-Jun-2019 22:17**
Client ID: Run ID: **SV-5_341545** SeqNo: **5146407** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.09101	0.010	0.08	0	114	40 - 140	0.0905	0.564	20	
Surr: 2-Fluorobiphenyl	*0.09652*	*0*	*0.08*	*0*	*121*	*40 - 140*	*0.07767*	*21.6*	*20*	R
Surr: 4-Terphenyl-d14	*0.09713*	*0*	*0.08*	*0*	*121*	*40 - 140*	*0.08433*	*14.1*	*20*	
Surr: Nitrobenzene-d5	*0.1084*	*0*	*0.08*	*0*	*135*	*40 - 140*	*0.08991*	*18.6*	*20*	

The following samples were analyzed in this batch: HS19061157-02 HS19061157-03 HS19061157-04 HS19061157-05 HS19061157-06 HS19061157-07

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061157

QC BATCH REPORT

Batch ID: R341546 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-190628** Units: **UG/L** Analysis Date: **28-Jun-2019 11:38**
Client ID: Run ID: **VOA6_341546** SeqNo: **5146430** 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

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061157

QC BATCH REPORT

Batch ID: R341546 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-190628** Units: **UG/L** Analysis Date: **28-Jun-2019 11:38**
Client ID: Run ID: **VOA6_341546** SeqNo: **5146430** 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	*46.64*	*1.0*	*50*	*0*	*93.3*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*45.03*	*1.0*	*50*	*0*	*90.1*	*85 - 114*				
Surr: Dibromofluoromethane	*44.27*	*1.0*	*50*	*0*	*88.5*	*80 - 119*				
Surr: Toluene-d8	*45.03*	*1.0*	*50*	*0*	*90.1*	*89 - 112*				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061157

QC BATCH REPORT

Batch ID: R341546 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-190628** Units: **UG/L** Analysis Date: **28-Jun-2019 10:50**
Client ID: Run ID: **VOA6_341546** SeqNo: **5146429** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	18.71	1.0	20	0	93.5	78 - 124				
1,1,1-Trichloroethane	18.86	1.0	20	0	94.3	74 - 131				
1,1,2,2-Tetrachloroethane	21.83	1.0	20	0	109	71 - 121				
1,1,2-Trichloroethane	20.31	1.0	20	0	102	80 - 119				
1,1-Dichloroethane	19.37	1.0	20	0	96.9	77 - 125				
1,1-Dichloroethene	19.49	1.0	20	0	97.5	71 - 131				
1,1-Dichloropropene	18.57	1.0	20	0	92.9	78 - 125				
1,2,3-Trichlorobenzene	27.19	1.0	20	0	136	69 - 129				S
1,2,3-Trichloropropane	22.5	1.0	20	0	113	73 - 122				
1,2,4-Trichlorobenzene	23.25	1.0	20	0	116	69 - 130				
1,2,4-Trimethylbenzene	18.63	1.0	20	0	93.2	76 - 124				
1,2-Dibromo-3-chloropropane	23.82	1.0	20	0	119	62 - 128				
1,2-Dibromoethane	20.03	1.0	20	0	100	77 - 121				
1,2-Dichlorobenzene	19.12	1.0	20	0	95.6	80 - 119				
1,2-Dichloroethane	18.81	1.0	20	0	94.1	73 - 128				
1,2-Dichloropropane	18.83	1.0	20	0	94.2	78 - 122				
1,3,5-Trimethylbenzene	17.9	1.0	20	0	89.5	75 - 124				
1,3-Dichlorobenzene	18.42	1.0	20	0	92.1	80 - 119				
1,3-Dichloropropane	20.28	1.0	20	0	101	80 - 119				
1,4-Dichlorobenzene	19.67	1.0	20	0	98.3	79 - 118				
2,2-Dichloropropane	19.99	1.0	20	0	99.9	60 - 139				
2-Butanone	49.3	2.0	40	0	123	56 - 143				
2-Chlorotoluene	19.48	1.0	20	0	97.4	79 - 122				
2-Hexanone	43.05	2.0	40	0	108	57 - 139				
4-Chlorotoluene	19.99	1.0	20	0	99.9	78 - 122				
4-Isopropyltoluene	17.77	1.0	20	0	88.9	77 - 127				
4-Methyl-2-pentanone	41.38	2.0	40	0	103	67 - 130				
Acetone	54.41	2.0	40	0	136	39 - 160				
Benzene	19.29	1.0	20	0	96.4	79 - 120				
Bromobenzene	18.42	1.0	20	0	92.1	80 - 120				
Bromochloromethane	18.67	1.0	20	0	93.3	78 - 123				
Bromodichloromethane	19.53	1.0	20	0	97.6	79 - 125				
Bromoform	20.73	1.0	20	0	104	66 - 130				
Bromomethane	22.75	1.0	20	0	114	53 - 141				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061157

QC BATCH REPORT

Batch ID: R341546 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-190628** Units: **UG/L** Analysis Date: **28-Jun-2019 10:50**
Client ID: Run ID: **VOA6_341546** SeqNo: **5146429** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	37.03	2.0	40	0	92.6	64 - 133				
Carbon tetrachloride	18.08	1.0	20	0	90.4	72 - 136				
Chlorobenzene	18.69	1.0	20	0	93.5	82 - 118				
Chloroethane	20.86	1.0	20	0	104	60 - 138				
Chloroform	20.01	1.0	20	0	100	79 - 124				
Chloromethane	18.7	1.0	20	0	93.5	50 - 139				
cis-1,2-Dichloroethene	19.38	1.0	20	0	96.9	78 - 123				
cis-1,3-Dichloropropene	18.8	1.0	20	0	94.0	75 - 124				
Dibromochloromethane	19.26	1.0	20	0	96.3	74 - 126				
Dibromomethane	19.49	1.0	20	0	97.4	79 - 123				
Dichlorodifluoromethane	17.68	1.0	20	0	88.4	32 - 152				
Ethylbenzene	18.26	1.0	20	0	91.3	79 - 121				
Hexachlorobutadiene	21.78	1.0	20	0	109	66 - 134				
Isopropylbenzene	17.76	1.0	20	0	88.8	72 - 131				
m,p-Xylene	36.78	2.0	40	0	92.0	80 - 121				
Methylene chloride	19.74	2.0	20	0	98.7	74 - 124				
Naphthalene	25.7	1.0	20	0	128	61 - 128				S
n-Butylbenzene	17.78	1.0	20	0	88.9	75 - 128				
n-Propylbenzene	19.05	1.0	20	0	95.3	76 - 126				
o-Xylene	18.37	1.0	20	0	91.8	78 - 122				
sec-Butylbenzene	18.27	1.0	20	0	91.4	77 - 126				
Styrene	19.37	1.0	20	0	96.9	78 - 123				
tert-Butylbenzene	18.73	1.0	20	0	93.7	78 - 124				
Tetrachloroethene	17.11	1.0	20	0	85.5	74 - 129				
Toluene	18.5	1.0	20	0	92.5	80 - 121				
trans-1,2-Dichloroethene	19.5	1.0	20	0	97.5	75 - 124				
trans-1,3-Dichloropropene	19.19	1.0	20	0	96.0	73 - 127				
Trichloroethene	18.25	1.0	20	0	91.2	79 - 123				
Trichlorofluoromethane	18.83	1.0	20	0	94.1	65 - 141				
Vinyl chloride	18.93	1.0	20	0	94.6	58 - 137				
Surr: 1,2-Dichloroethane-d4	*52.6*	*1.0*	*50*	*0*	*105*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.75*	*1.0*	*50*	*0*	*102*	*85 - 114*				
Surr: Dibromofluoromethane	*51.89*	*1.0*	*50*	*0*	*104*	*80 - 119*				
Surr: Toluene-d8	*47.75*	*1.0*	*50*	*0*	*95.5*	*89 - 112*				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061157

QC BATCH REPORT

Batch ID: R341546 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS19061157-02MS** Units: **UG/L** Analysis Date: **28-Jun-2019 14:49**
Client ID: **18CPTMW10SW_062019** Run ID: **VOA6_341546** SeqNo: **5146438** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	17.73	1.0	20	0	88.6	78 - 124				
1,1,1-Trichloroethane	19.03	1.0	20	0	95.2	74 - 131				
1,1,2,2-Tetrachloroethane	20.66	1.0	20	0	103	71 - 121				
1,1,2-Trichloroethane	18.94	1.0	20	0	94.7	80 - 119				
1,1-Dichloroethane	17.57	1.0	20	0	87.9	77 - 125				
1,1-Dichloroethene	19.66	1.0	20	0	98.3	71 - 131				
1,1-Dichloropropene	19.33	1.0	20	0	96.6	78 - 125				
1,2,3-Trichlorobenzene	24.14	1.0	20	0	121	69 - 129				
1,2,3-Trichloropropane	20.5	1.0	20	0	102	73 - 122				
1,2,4-Trichlorobenzene	21.59	1.0	20	0	108	69 - 130				
1,2,4-Trimethylbenzene	18.47	1.0	20	0	92.3	76 - 124				
1,2-Dibromo-3-chloropropane	21.81	1.0	20	0	109	62 - 128				
1,2-Dibromoethane	17.9	1.0	20	0	89.5	77 - 121				
1,2-Dichlorobenzene	18.33	1.0	20	0	91.7	80 - 119				
1,2-Dichloroethane	17.43	1.0	20	0	87.1	73 - 128				
1,2-Dichloropropane	17.55	1.0	20	0	87.7	78 - 122				
1,3,5-Trimethylbenzene	18.27	1.0	20	0	91.4	75 - 124				
1,3-Dichlorobenzene	17.46	1.0	20	0	87.3	80 - 119				
1,3-Dichloropropane	18.65	1.0	20	0	93.2	80 - 119				
1,4-Dichlorobenzene	18.88	1.0	20	0	94.4	79 - 118				
2,2-Dichloropropane	18.91	1.0	20	0	94.5	60 - 139				
2-Butanone	42.59	2.0	40	0	106	56 - 143				
2-Chlorotoluene	19.4	1.0	20	0	97.0	79 - 122				
2-Hexanone	38.42	2.0	40	0	96.0	57 - 139				
4-Chlorotoluene	19.35	1.0	20	0	96.7	78 - 122				
4-Isopropyltoluene	19.33	1.0	20	0	96.6	77 - 127				
4-Methyl-2-pentanone	38.74	2.0	40	0	96.9	67 - 130				
Acetone	46.92	2.0	40	5.359	104	39 - 160				
Benzene	18.35	1.0	20	0	91.7	79 - 120				
Bromobenzene	16.8	1.0	20	0	84.0	80 - 120				
Bromochloromethane	16.09	1.0	20	0	80.4	78 - 123				
Bromodichloromethane	18.04	1.0	20	0	90.2	79 - 125				
Bromoform	18.53	1.0	20	0	92.6	66 - 130				
Bromomethane	13.53	1.0	20	0	67.6	53 - 141				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061157

QC BATCH REPORT

Batch ID: R341546 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS19061157-02MS** Units: **UG/L** Analysis Date: **28-Jun-2019 14:49**
Client ID: **18CPTMW10SW_062019** Run ID: **VOA6_341546** SeqNo: **5146438** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	34.31	2.0	40	0	85.8	64 - 133				
Carbon tetrachloride	19.13	1.0	20	0	95.6	72 - 136				
Chlorobenzene	17.61	1.0	20	0	88.1	82 - 118				
Chloroethane	20.41	1.0	20	0	102	60 - 138				
Chloroform	18.1	1.0	20	0	90.5	79 - 124				
Chloromethane	29.09	1.0	20	0	145	50 - 139				S
cis-1,2-Dichloroethene	19.95	1.0	20	0	99.8	78 - 123				
cis-1,3-Dichloropropene	17.23	1.0	20	0	86.1	75 - 124				
Dibromochloromethane	17.55	1.0	20	0	87.7	74 - 126				
Dibromomethane	17.65	1.0	20	0	88.3	79 - 123				
Dichlorodifluoromethane	18.02	1.0	20	0	90.1	32 - 152				
Ethylbenzene	18.28	1.0	20	0	91.4	79 - 121				
Hexachlorobutadiene	23.73	1.0	20	0	119	66 - 134				
Isopropylbenzene	18.91	1.0	20	0	94.5	72 - 131				
m,p-Xylene	37.07	2.0	40	0	92.7	80 - 121				
Methylene chloride	25.8	2.0	20	0	129	74 - 124				S
Naphthalene	23.22	1.0	20	0	116	61 - 128				
n-Butylbenzene	19.75	1.0	20	0	98.7	75 - 128				
n-Propylbenzene	20.08	1.0	20	0	100	76 - 126				
o-Xylene	17.73	1.0	20	0	88.6	78 - 122				
sec-Butylbenzene	20.67	1.0	20	0	103	77 - 126				
Styrene	18.57	1.0	20	0	92.9	78 - 123				
tert-Butylbenzene	20.06	1.0	20	0	100	78 - 124				
Tetrachloroethene	18.08	1.0	20	0	90.4	74 - 129				
Toluene	17.83	1.0	20	0	89.2	80 - 121				
trans-1,2-Dichloroethene	18.21	1.0	20	0	91.0	75 - 124				
trans-1,3-Dichloropropene	17.88	1.0	20	0	89.4	73 - 127				
Trichloroethene	17.77	1.0	20	0	88.9	79 - 123				
Trichlorofluoromethane	20.23	1.0	20	0	101	65 - 141				
Vinyl chloride	18.22	1.0	20	0	91.1	58 - 137				
Surr: 1,2-Dichloroethane-d4	*50.38*	*1.0*	*50*	*0*	*101*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.99*	*1.0*	*50*	*0*	*102*	*85 - 114*				
Surr: Dibromofluoromethane	*49.29*	*1.0*	*50*	*0*	*98.6*	*80 - 119*				
Surr: Toluene-d8	*48.04*	*1.0*	*50*	*0*	*96.1*	*89 - 112*				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061157

QC BATCH REPORT

Batch ID: R341546 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS19061157-02MSD** Units: **UG/L** Analysis Date: **28-Jun-2019 15:13**
Client ID: **18CPTMW10SW_062019** Run ID: **VOA6_341546** SeqNo: **5146439** 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	17.53	1.0	20	0	87.7	78 - 124	17.73	1.11	20	
1,1,1-Trichloroethane	18.55	1.0	20	0	92.7	74 - 131	19.03	2.57	20	
1,1,2,2-Tetrachloroethane	21.38	1.0	20	0	107	71 - 121	20.66	3.41	20	
1,1,2-Trichloroethane	19.17	1.0	20	0	95.9	80 - 119	18.94	1.26	20	
1,1-Dichloroethane	17.86	1.0	20	0	89.3	77 - 125	17.57	1.63	20	
1,1-Dichloroethene	19.11	1.0	20	0	95.5	71 - 131	19.66	2.85	20	
1,1-Dichloropropene	19.03	1.0	20	0	95.1	78 - 125	19.33	1.56	20	
1,2,3-Trichlorobenzene	25.23	1.0	20	0	126	69 - 129	24.14	4.4	20	
1,2,3-Trichloropropane	20.93	1.0	20	0	105	73 - 122	20.5	2.06	20	
1,2,4-Trichlorobenzene	21.92	1.0	20	0	110	69 - 130	21.59	1.52	20	
1,2,4-Trimethylbenzene	18.33	1.0	20	0	91.7	76 - 124	18.47	0.739	20	
1,2-Dibromo-3-chloropropane	22.89	1.0	20	0	114	62 - 128	21.81	4.81	20	
1,2-Dibromoethane	18.73	1.0	20	0	93.7	77 - 121	17.9	4.54	20	
1,2-Dichlorobenzene	18.43	1.0	20	0	92.1	80 - 119	18.33	0.521	20	
1,2-Dichloroethane	17.55	1.0	20	0	87.8	73 - 128	17.43	0.726	20	
1,2-Dichloropropane	17.93	1.0	20	0	89.7	78 - 122	17.55	2.16	20	
1,3,5-Trimethylbenzene	18.28	1.0	20	0	91.4	75 - 124	18.27	0.0341	20	
1,3-Dichlorobenzene	17.74	1.0	20	0	88.7	80 - 119	17.46	1.57	20	
1,3-Dichloropropane	19.01	1.0	20	0	95.1	80 - 119	18.65	1.93	20	
1,4-Dichlorobenzene	19.13	1.0	20	0	95.6	79 - 118	18.88	1.28	20	
2,2-Dichloropropane	18.53	1.0	20	0	92.6	60 - 139	18.91	2.03	20	
2-Butanone	44.5	2.0	40	0	111	56 - 143	42.59	4.39	20	
2-Chlorotoluene	19.45	1.0	20	0	97.2	79 - 122	19.4	0.245	20	
2-Hexanone	40.16	2.0	40	0	100	57 - 139	38.42	4.43	20	
4-Chlorotoluene	19.29	1.0	20	0	96.5	78 - 122	19.35	0.277	20	
4-Isopropyltoluene	19.26	1.0	20	0	96.3	77 - 127	19.33	0.313	20	
4-Methyl-2-pentanone	39.71	2.0	40	0	99.3	67 - 130	38.74	2.45	20	
Acetone	50.25	2.0	40	5.359	112	39 - 160	46.92	6.85	20	
Benzene	18.36	1.0	20	0	91.8	79 - 120	18.35	0.0865	20	
Bromobenzene	16.88	1.0	20	0	84.4	80 - 120	16.8	0.466	20	
Bromochloromethane	16.49	1.0	20	0	82.4	78 - 123	16.09	2.45	20	
Bromodichloromethane	18.36	1.0	20	0	91.8	79 - 125	18.04	1.78	20	
Bromoform	19.36	1.0	20	0	96.8	66 - 130	18.53	4.42	20	
Bromomethane	16.13	1.0	20	0	80.7	53 - 141	13.53	17.6	20	

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061157

QC BATCH REPORT

Batch ID: R341546 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS19061157-02MSD** Units: **UG/L** Analysis Date: **28-Jun-2019 15:13**
Client ID: **18CPTMW10SW_062019** Run ID: **VOA6_341546** SeqNo: **5146439** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Carbon disulfide	34.41	2.0	40	0	86.0	64 - 133	34.31	0.298	20	
Carbon tetrachloride	18.94	1.0	20	0	94.7	72 - 136	19.13	0.978	20	
Chlorobenzene	17.62	1.0	20	0	88.1	82 - 118	17.61	0.0136	20	
Chloroethane	18.76	1.0	20	0	93.8	60 - 138	20.41	8.41	20	
Chloroform	18.25	1.0	20	0	91.3	79 - 124	18.1	0.822	20	
Chloromethane	23.96	1.0	20	0	120	50 - 139	29.09	19.4	20	
cis-1,2-Dichloroethene	18.61	1.0	20	0	93.1	78 - 123	19.95	6.93	20	
cis-1,3-Dichloropropene	17.39	1.0	20	0	87.0	75 - 124	17.23	0.946	20	
Dibromochloromethane	18.07	1.0	20	0	90.3	74 - 126	17.55	2.93	20	
Dibromomethane	18.25	1.0	20	0	91.3	79 - 123	17.65	3.33	20	
Dichlorodifluoromethane	17.78	1.0	20	0	88.9	32 - 152	18.02	1.36	20	
Ethylbenzene	18.25	1.0	20	0	91.3	79 - 121	18.28	0.178	20	
Hexachlorobutadiene	23.8	1.0	20	0	119	66 - 134	23.73	0.3	20	
Isopropylbenzene	18.76	1.0	20	0	93.8	72 - 131	18.91	0.782	20	
m,p-Xylene	36.69	2.0	40	0	91.7	80 - 121	37.07	1.03	20	
Methylene chloride	20.47	2.0	20	0	102	74 - 124	25.8	23.1	20	R
Naphthalene	24.28	1.0	20	0	121	61 - 128	23.22	4.46	20	
n-Butylbenzene	20.17	1.0	20	0	101	75 - 128	19.75	2.1	20	
n-Propylbenzene	20.11	1.0	20	0	101	76 - 126	20.08	0.148	20	
o-Xylene	17.67	1.0	20	0	88.4	78 - 122	17.73	0.292	20	
sec-Butylbenzene	20.54	1.0	20	0	103	77 - 126	20.67	0.606	20	
Styrene	18.44	1.0	20	0	92.2	78 - 123	18.57	0.717	20	
tert-Butylbenzene	20.01	1.0	20	0	100	78 - 124	20.06	0.251	20	
Tetrachloroethene	18.05	1.0	20	0	90.2	74 - 129	18.08	0.156	20	
Toluene	17.82	1.0	20	0	89.1	80 - 121	17.83	0.055	20	
trans-1,2-Dichloroethene	18.18	1.0	20	0	90.9	75 - 124	18.21	0.146	20	
trans-1,3-Dichloropropene	18	1.0	20	0	90.0	73 - 127	17.88	0.68	20	
Trichloroethene	17.66	1.0	20	0	88.3	79 - 123	17.77	0.648	20	
Trichlorofluoromethane	19.72	1.0	20	0	98.6	65 - 141	20.23	2.53	20	
Vinyl chloride	17.84	1.0	20	0	89.2	58 - 137	18.22	2.1	20	
Surr: 1,2-Dichloroethane-d4	*51.79*	*1.0*	*50*	*0*	*104*	*81 - 118*	*50.38*	*2.77*	*20*	
Surr: 4-Bromofluorobenzene	*50.7*	*1.0*	*50*	*0*	*101*	*85 - 114*	*50.99*	*0.571*	*20*	
Surr: Dibromofluoromethane	*49.25*	*1.0*	*50*	*0*	*98.5*	*80 - 119*	*49.29*	*0.0914*	*20*	
Surr: Toluene-d8	*47.25*	*1.0*	*50*	*0*	*94.5*	*89 - 112*	*48.04*	*1.66*	*20*	

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061157

QC BATCH REPORT

Batch ID: R341546 (0)	Instrument: VOA6	Method: VOLATILES ORGANICS BY METHOD 8260C

The following samples were analyzed in this batch:

HS19061157-01	HS19061157-02	HS19061157-03	HS19061157-04
HS19061157-05	HS19061157-06	HS19061157-07	HS19061157-08
HS19061157-09			

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: **HS19061157**

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	20-Dec-2021
Kansas	E-10352 2018-2019	31-Jul-2019
Kentucky	123043, 2019-2020	30-Apr-2020
Louisiana	03087, 2019-2020	30-Jun-2020
Maryland	343, 2019-2020	30-Jun-2020
North Carolina	624-2019	31-Dec-2019
Oklahoma	2018-156	31-Aug-2019
Texas	TX104704231-19-23	30-Apr-2020

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Work Order: HS19061157

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19061157-01	18CPTMW10DW_062019	Login	21/06/2019 16:36:48	NDR	MET023
HS19061157-01	18CPTMW10DW_062019	Login	21/06/2019 16:36:48	NDR	Sub
HS19061157-01	18CPTMW10DW_062019	Login	21/06/2019 16:36:48	NDR	EXT177
HS19061157-01	18CPTMW10DW_062019	Login	21/06/2019 16:36:48	NDR	VOA192

Revision:1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Sample Receipt Checklist

Client Name: Bhate Environmental
Work Order: HS19061157
Date/Time Received: **21-Jun-2019 09:00**
Received by: **JRM**

Checklist completed by: *Paresh M. Giga* eSignature — 15-Jun-2019 Date
Reviewed by: *RJ Modashia* eSignature — 23-Jun-2019 Date

Matrices: **Groundwater**
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):	1.3c U/c	IR25
Cooler(s)/Kit(s):	43893	
Date/Time sample(s) sent to storage:	6/14/19 18:00	

Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

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bhate ENVIRONMENTAL CONSTRUCTION ENERGY

1608 13th Avenue South, Suite 300
Birmingham Alabama 35205
Tel: 205-918-4000
Fax: 205-918-4050

Chain of Custody and Analytical Request

Page: ____ of ____

Project/Phase No: NWO1312.0150

COC Number(1): ____

LIMS Number: ____

Facility/Base I.D.: LHAAP

Project/Site Name: LHAAP / Site 18/24

Client Name:

Collected by: Scott Beesinger

Field Sample ID (30 Characters Max)	ERPIMS LOCID (15 Characters Max)	Date Collected (dd-mmm-yyyy)	Time Collected (Military) (hhmm)	Sample Depth (beginning - ending)	SA Code (2)	Sample Number (3)	Sample Matrix (4)	Number of containers	VOC	PERCHLORATE	TOTAL METALS	1, 4 - DIOXANE	Ambient Blank Lot Control Number	Equipment Blank Lot Control Number	Trip Blank Lot Control Number	Cooler ID
18CPTMW10DW_062019		20 JUN 2019	0710	-	N		WG	5	X	X	X					
18CPTMW10SW_062019		20 JUN 2019	0755	-	N		WG	5	X	X		X				
18WW06_062019		20 JUN 2019	0850	-	N		WG	5	X	X		X				
18WW02_062019		20 JUN 2019	0940		N		WG	6	X	X	X	X				
18CPTMW19_062019		20 JUN 2019	1035		N		WG	5	X	X		X				
18CPTMW19SW_062019		20 JUN 2019	1125	-	N		WG	6	X	X	X	X				
18WW22_062019		20 JUN 2019	1220	-	N		WG	6	X	X	X	X				
CD4_062019		20 JUN 2019	1310	-	N		WG	4	X	X						
TRIP BLANK		20 JUN 2019		-	TB		W	2	X							
				-												
				-												

Sample Analysis Requested (5) | Quality Assurance Samples (6)

COMMENTS: ____

Bhate Environmental Associates, Inc.
LHAAP 18 24
HS19061157

Custody Transfers Prior to Receipt by Laboratory

Relinquished By (Signed)	Date	Time	Received by (Signed)	Date	Time
1. Scott Beesinger	6/20/19	1430	1. JM	6/21/19	09:00
2.			2.		
3.			3.		

Sample Delivery Details / Laboratory Receipt

Delivered Directly to Lab: ____ Shipped ____ No.:

Method of Shipment: ____

Fed Ex ____ Airbill Number:

Analytical Lab: ALS 10450 Stancliff Rd. Suite 210 Houston, TX 77099 (281) 530-5656

ATTN: SONIA WEST Lab Recipient: Delivery Date/Time:

1.) Chain of Custody Number = date collected + custody number (e.g. 09-02-1999-01)

2.) Sample Type (SA) Codes: N = Normal Sample, TB = Trip Blank (-c) Sample, FD = Field Duplicate (-a) Samples, FR = Field Replicate (-b) Samples, EB = Equipment Blank (-d) Samples, MS = Matrix Spike, SD = Matrix Spike Duplicate, AB = Ambient Blank (-e)

3.) Sample Number: Unique sample number collected from a particular location per day. (e.g. Groundwater sample collected from MW-1 on 10/10/99 = 01, if sampled again on 10/10/99 = 02, etc.)

4.) Matrix Codes: GS = Soil Gas, WG = Groundwater, WS = Surface Water, SO = Soil, SE = Sediment, SL = Sludge, SS = Surface Soil Samples, WQ = Aqueous Blank Samples (trip, equipment, ambient, etc), SQ = Soil Blanks

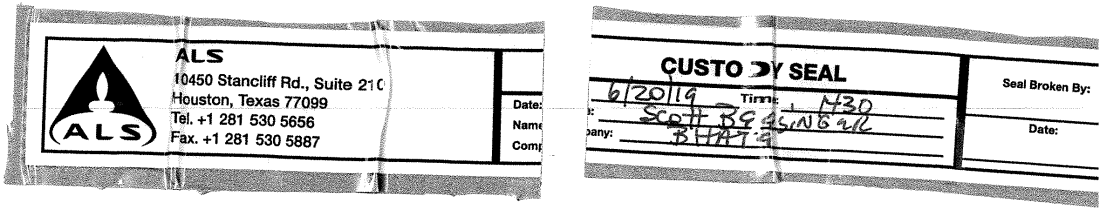
5.) Sample Analysis Requested: Analytical method requested and number of containers provided for each.

6.) Quality assurance samples are assigned by date (ddmmyy) and the sample number associated with the sample (01, 02, etc) (e.g. Equipment blank collected in association with MW-1 on 10/10/99 will be designated 10109901 in the Equipment Blank Lot Control

44789 VIC. 2.2 411 0f 0.3

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00940832





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Case Narrative

Method: 6850
Analysis: Perchlorate
Analysis SOP: LC-MS-CLO4
ALS WO ID(s): 1918260, 1918265

Client: ALS Laboratories (Houston, TX)
Matrix: Water
ELMS Batch (HBN): 2268 (242714)

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 samples 1918260003/08 were analyzed and reported from 1:10 dilutions. Field sample 1918260007 was analyzed and reported from a 1:1,000 dilution. The reporting limits have been adjusted accordingly.

Method QC data: The method blank (LMB 661792) was less than 1/2 the CRDL. The recovery for the LCS (661793) was within acceptable parameters.

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MS/MSD Analysis: MS/MSD was performed on samples 1918260005/06 (Client ID: CO1_062119). 4.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. The MS/MSD percent recoveries and relative percent difference 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 – 661790) is reported from the analysis of the Laboratory Control Sample (LCS – 661793) at a level of 4.0µg/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: 19MARI03) along with datafile 03JULD03/06/19/23.

Thomas Bosch July 5, 2019
Analyst Date

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ANALYTICAL REPORT

Report Date: July 05, 2019

RJ Modashia
ALS Environmental (Houston)
10450 Stancliff Road
Suite 210
Houston, TX 77099

Phone: 281 530-5656

E-mail: RJ.Modashia@ALSGlobal.com

Workorder: **34-1918265**
Project ID: HS19061157
Purchase Order: HS19061157
Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
18CPTMW10DW_062019	1918265001	06/20/19	06/22/19	
18CPTMW10SW_062019	1918265002	06/20/19	06/22/19	
18WW06_062019	1918265003	06/20/19	06/22/19	
18WW02_062019	1918265004	06/20/19	06/22/19	
18CPTMW19_062019	1918265005	06/20/19	06/22/19	
18CPTMW19SW_062019	1918265006	06/20/19	06/22/19	
18WW22_062019	1918265007	06/20/19	06/22/19	
C04_062019	1918265008	06/20/19	06/22/19	

ANALYTICAL REPORT

Workorder: 34-1918265
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **18CPTMW10DW_062019** | Sampling Site: NA | Collected: 06/20/2019
Lab ID: 1918265001 | Media: 125 mL Nalgene | Received: 06/22/2019
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/2268 (HBN: 242714) | **Percent Solid:** NA
Analyzed: 07/03/2019 11:50 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	**9.1**	1.0	2.0	4.0	1	

Sample ID: **18CPTMW10SW_062019** | Sampling Site: NA | Collected: 06/20/2019
Lab ID: 1918265002 | Media: 125 mL Nalgene | Received: 06/22/2019
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/2268 (HBN: 242714) | **Percent Solid:** NA
Analyzed: 07/03/2019 12:18 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: **18WW06_062019** | Sampling Site: NA | Collected: 06/20/2019
Lab ID: 1918265003 | Media: 125 mL Nalgene | Received: 06/22/2019
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/2268 (HBN: 242714) | **Percent Solid:** NA
Analyzed: 07/03/2019 12:31 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: **18WW02_062019** | Sampling Site: NA | Collected: 06/20/2019
Lab ID: 1918265004 | Media: 125 mL Nalgene | Received: 06/22/2019
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/2268 (HBN: 242714) | **Percent Solid:** NA
Analyzed: 07/03/2019 12:45 | **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

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ANALYTICAL REPORT

Workorder: 34-1918265
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **18CPTMW19_062019** | Sampling Site: NA | Collected: 06/20/2019
Lab ID: 1918265005 | Media: 125 mL Nalgene | Received: 06/22/2019
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/2268 (HBN: 242714) | **Percent Solid:** NA
Analyzed: 07/03/2019 12:59 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	**4.1**	1.0	2.0	4.0	1	

Sample ID: **18CPTMW19SW_062019** | Sampling Site: NA | Collected: 06/20/2019
Lab ID: 1918265006 | Media: 125 mL Nalgene | Received: 06/22/2019
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/2268 (HBN: 242714) | **Percent Solid:** NA
Analyzed: 07/03/2019 13:13 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	**39**	1.0	2.0	4.0	1	

Sample ID: **18WW22_062019** | Sampling Site: NA | Collected: 06/20/2019
Lab ID: 1918265007 | Media: 125 mL Nalgene | Received: 06/22/2019
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/2268 (HBN: 242714) | **Percent Solid:** NA
Analyzed: 07/03/2019 13:27 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: **C04_062019** | Sampling Site: NA | Collected: 06/20/2019
Lab ID: 1918265008 | Media: 125 mL Nalgene | Received: 06/22/2019
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/2268 (HBN: 242714) | **Percent Solid:** NA
Analyzed: 07/03/2019 13:41 | **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

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ANALYTICAL REPORT

Workorder: 34-1918265
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Comments

Quality Control: EPA 6850, DoD QSM - (HBN: 242714)

Field samples 1918260003/08 were analyzed and reported from 1:10 dilutions. Field sample 1918260007 was analyzed and reported from a 1:1,000 dilution. The reporting limits have been adjusted accordingly.

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

Method	Analyst	Peer Review
EPA 6850, DoD QSM	/S/ Thomas Bosch 07/05/2019 11:10	/S/ Stephen Brose 07/05/2019 14:20

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

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
	Nevada (TNI)	UT00953201-1	https://ndep.nv.gov/water/lab-certification
	Iowa (TNI)	IA# 376	http://www.shl.uiowa.edu/labcert/idnr/
	Kansas	E-10416	http://www.kdheks.gov/envlab/disclaimer.html
	Oklahoma (TNI)	IJ# 9980	http://www.deq.state.ok.us/CSDnew/labcert.htm
	Texas (TNI)	T104704456-18-9	https://www.tceq.texas.gov/assets/public/compliance/compliance_support/qa/txnelap_lab_list.pdf
Industrial Hygiene	AIHA (ISO 17025 & AIHA IHLAP)	101574	http://www.aihaaccreditedlabs.org
	DOECAP-AP	L18-606	http://www.pjlabs.com
	Washington	C596	https://ecology.wa.gov/Regulations-Permits/Permits-certifications/Laboratory-Accreditation
Dietary Supplements	PJLA (ISO 17025)	L17-507-R1	http://www.pjlabs.com

ANALYTICAL REPORT

Workorder: 34-1918265
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Result Symbol Definitions

MDL = Method Detection Limit, a statistical estimate of method/media/instrument sensitivity.
RL = Reporting Limit, a verified value of method/media/instrument sensitivity.
CRDL = Contract Required Detection Limit
Reg. Limit = Regulatory Limit.
ND = Not Detected, testing result not detected above the MDL or RL.
< Means this testing result is less than the numerical value.
** No result could be reported, see sample comments for details.

Qualifier Symbol Definitions

U = Qualifier indicates that the analyte was not detected above the MDL.
J = Qualifier Indicates that the analyte value is between the MDL and the RL. It is also used to indicate an estimated value for tentatively identified compounds in mass spectrometry where a 1:1 response is assumed.
B = Qualifier indicates that the analyte was detected in the blank.
E = Qualifier indicates that the analyte result exceeds calibration range.
P = Qualifier indicates that the RPD between the two columns is greater than 40%.

Quality Control Sample Batch Report

Analysis Information

Workorder: 1918265

Limits:	Client SOW/Contract Specified	**Analysis:**	EPA 6850, DoD QSM
Basis:	DoD QSM	**Batch:**	ELMS/2268 (HBN: 242714)
Preparation:	NA	**Analyzed By:**	Thomas Bosch
Batch:	NA		
Prepared By:	NA		

Blank

LMB: 661792
Analyzed: 07/03/2019 09:03
Units: ug/L

Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 661793
Analyzed: 07/03/2019 08:35
Dilution: 1
Units: ug/L

Analyte	Result	Target	% Rec	QC Limits	
Perchlorate	4.21	4.00	105	78.8	123.8

Matrix Spike - Matrix Spike Duplicate

Sample:	1918260004	**MS:**	1918260005	**MSD:**	1918260006
Analyzed:	07/03/2019 09:58	**Analyzed:**	07/03/2019 10:12	**Analyzed:**	07/03/2019 10:26
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	3.42	4	85.4	78.8	123.8	3.37	84.1	1.55	0.0	20.0

Comments

Field samples 1918260003/08 were analyzed and reported from 1:10 dilutions. Field sample 1918260007 was analyzed and reported from a 1:1,000 dilution. The reporting limits have been adjusted accordingly.

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

Analyst	Peer Review
/S/ Thomas Bosch	/S/ Stephen Brose
07/05/2019 11:12	07/05/2019 14:20

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

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W 1918265

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18698/#2

Subcontract Chain of Custody

SAMPLING STATE: **Texas**

COC ID: **11648**

SUBCONTRACT TO:

1918265

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:	HS19061157
TSR:	Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS19061157-01**	**18CPTMW10DW_062019**	**Groundwater**	**20 Jun 2019 07:10**
	SUB_Perch-6850			08 Jul 2019
2.	**HS19061157-02**	**18CPTMW10SW_062019**	**Groundwater**	**20 Jun 2019 07:55**
	SUB_Perch-6850			08 Jul 2019
3.	**HS19061157-03**	**18WW06_062019**	**Groundwater**	**20 Jun 2019 08:50** Not Rec'd
	SUB_Perch-6850			08 Jul 2019
4.	**HS19061157-04**	**18WW02_062019**	**Groundwater**	**20 Jun 2019 09:40**
	SUB_Perch-6850			08 Jul 2019
5.	**HS19061157-05**	**18CPTMW19_062019**	**Groundwater**	**20 Jun 2019 10:35**
	SUB_Perch-6850			08 Jul 2019
6.	**HS19061157-06**	**18CPTMW19SW_062019**	**Groundwater**	**20 Jun 2019 11:25**
	SUB_Perch-6850			08 Jul 2019
7.	**HS19061157-07**	**18WW22_062019**	**Groundwater**	**20 Jun 2019 12:20**
	SUB_Perch-6850			08 Jul 2019
8.	**HS19061157-08**	**C04_062019**	**Groundwater**	**20 Jun 2019 13:10**
	SUB_Perch-6850			08 Jul 2019

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Subcontract Chain of Custody

SAMPLING STATE: **Texas** **COC ID:** **11648**

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. Muscutt	Date/Time:	6/21/19 18:00
Received By:		Date/Time:	6/22/19 905
Cooler ID(s):	9788	Temperature(s):	2°

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Subcontract Chain of Custody

SAMPLING STATE: **Texas** **COC ID:** **11648**

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:	HS19061157
TSR:	Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS19061157-01**	**18CPTMW10DW_062019**	**Groundwater**	**20 Jun 2019 07:10**
	SUB_Perch-6850			08 Jul 2019
2.	**HS19061157-02**	**18CPTMW10SW_062019**	**Groundwater**	**20 Jun 2019 07:55**
	SUB_Perch-6850			08 Jul 2019
3.	**HS19061157-03**	**18WW06_062019**	**Groundwater**	**20 Jun 2019 08:50**
	SUB_Perch-6850			08 Jul 2019
4.	**HS19061157-04**	**18WW02_062019**	**Groundwater**	**20 Jun 2019 09:40**
	SUB_Perch-6850			08 Jul 2019
5.	**HS19061157-05**	**18CPTMW19_062019**	**Groundwater**	**20 Jun 2019 10:35**
	SUB_Perch-6850			08 Jul 2019
6.	**HS19061157-06**	**18CPTMW19SW_062019**	**Groundwater**	**20 Jun 2019 11:25**
	SUB_Perch-6850			08 Jul 2019
7.	**HS19061157-07**	**18WW22_062019**	**Groundwater**	**20 Jun 2019 12:20**
	SUB_Perch-6850			08 Jul 2019
8.	**HS19061157-08**	**C04_062019**	**Groundwater**	**20 Jun 2019 13:10**
	SUB_Perch-6850			08 Jul 2019

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Subcontract Chain of Custody

SAMPLING STATE: **Texas** **COC ID:** **11648**

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

QC Level: DOD IV (DoD Data Package)

Relinquished By: [signature] Date/Time: 6/24/19 18:00

Received By: [signature] Date/Time: 06-25-19 8:57

Cooler ID(s): Temperature(s):

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ALS Environmental

CHAIN-OF-CUSTODY

Project / Job / Task: HS19061157 | ***Split:*** | **Workorder ID:** 1918265 | **Level:** ENV_LVL4

Client: ALS Environmental (Houston) | **Account:** 8101 | **Type:** 125Poly

Comments:

Preservatives: COOL

Item	Collect Date/Time	Sample ID	Lab ID	QC	Matrix	Containers ID(s)	Containers Count	Requested Analysis: EPA 6850_DoD QSM
1	06/20/2019 07:10	18CPTMW10DW_062019	1918265001		Water	A	1	A
2	06/20/2019 07:55	18CPTMW10SW_062019	1918265002		Water	A	1	A
3	06/20/2019 08:50	18WW06_062019	1918265003		Water	A	1	A
4	06/20/2019 09:40	18WW02_062019	1918265004		Water	A	1	A
5	06/20/2019 10:35	18CPTMW19_062019	1918265005		Water	A	1	A
6	06/20/2019 11:25	18CPTMW19SW_062019	1918265006		Water	A	1	A
7	06/20/2019 12:20	18WW22_062019	1918265007		Water	A	1	A
8	06/20/2019 13:10	C04_062019	1918265008		Water	A	1	A
9								
10								

ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location
Varath, Julie	06/22/2019 09:05	ALS Sample Receiving	Sample Login
[signature]	6/25/19 1400	LOC	Storage
R.33.1	7.1.19 13:20	T. Bush	6850

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

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00940846

ALS-Salt Lake City-Related Information Report (CRIR)

Cooler or Container Information Checklist (Fill In or Circle)

Client Name: ALS Houston

Project/Task/Site: 19182165

Date/Time of Receipt: 6/22/19 905

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	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.
1	C19 9718	2 °C	4	C19	°C	7	C19	°C
2	C19	°C	5	C19	°C	8	C19	°C
3	C19	°C	6	C19	°C	9	C19	°C

Taken By: [signature] Signature — Meredith Adams Printed Name — 6/22/19 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:

Did not received HSP 06157-08. 8 Bottles Listed. 7 Rcvd.

Client Notified? Yes ☐ No ☐

Response Required Within 24 Hours

Project Management

Project Manager Comments:

missing sample is being shiped for delivery tomorrow

ALS Project Manager: Kevin Griffith Printed Name — Returned to Sample Receipt by: [signature] Signature — Date: 6-24-19

CRIR.doc

Revised 01/01/2018

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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: 06-25-19 8157

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	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.
1	C19 9784	1 °C	4	C19	°C	7	C19	°C
2	C19	°C	5	C19	°C	8	C19	°C
3	C19	°C	6	C19	°C	9	C19	°C

Taken By: Jennifer Vanfossell (Signature) T. Vanfossell (Printed Name) 06-25-19 (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: _____

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Must Deliver Next Business Day
Time and Tempature Sensitive!

Part # 159469-434 RUT2 EXP 02/20

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

SHIP DATE: 24JUN19
ACTWGT: 19.80 LB
CAD: 300130/CAFE3211
DIMS: 19x16x13 IN

BILL THIRD PARTY

TO SAMPLE RECEIVING
ALS ENVIRONMENTAL
960 W. LEVOY DRIVE

SALT LAKE CITY UT 84123
(801) 268-7700
REF: HS19061210/1157 RJ

5S1C1/02210/1010

FedEx Express

TRK# 0201 4809 7835 3035

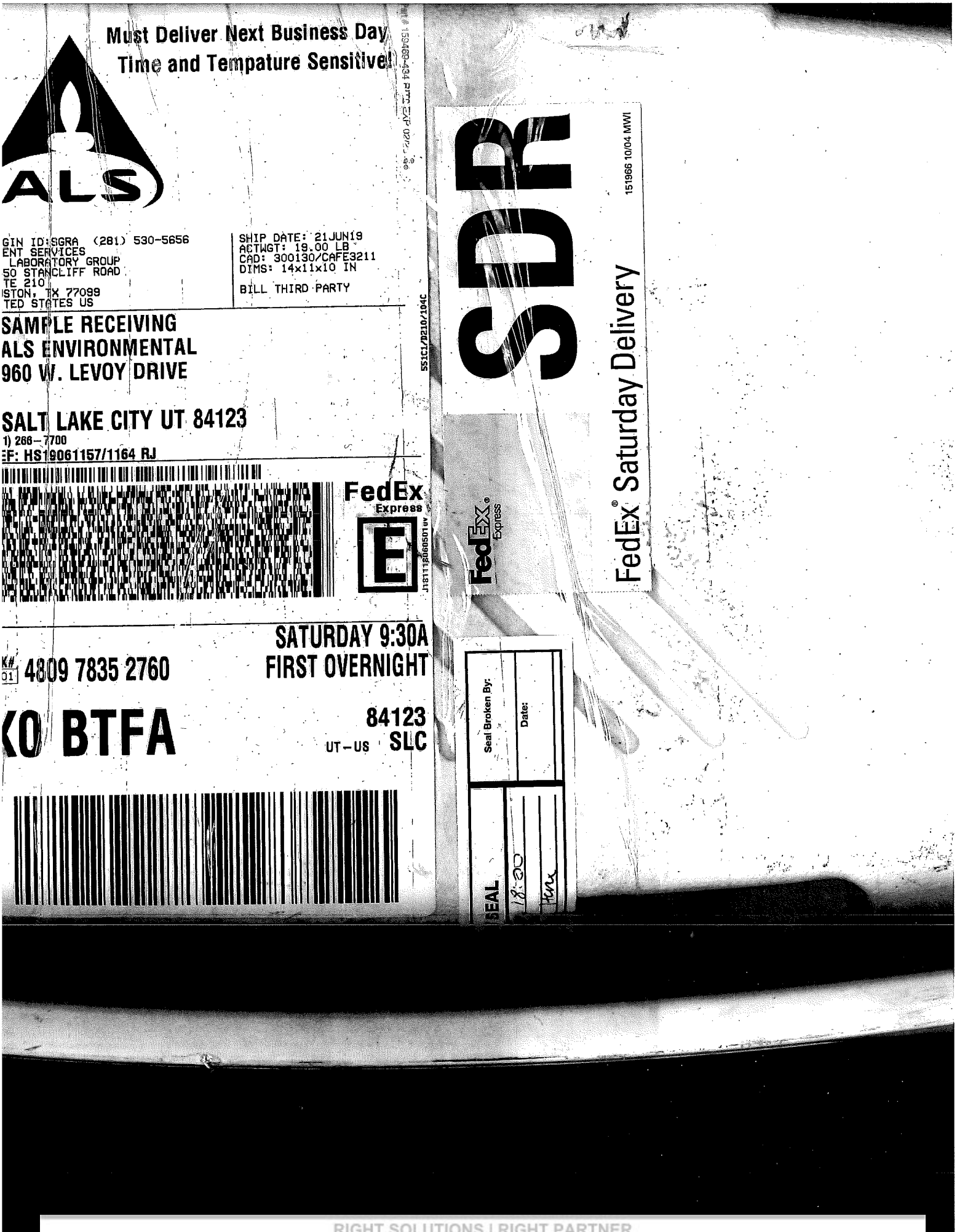
TUE - 25 JUN 3:00P
STANDARD OVERNIGHT

AX BTFA

84123
UT-US SLC

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00940850



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Batch Worklist

Batch: ELMS/ 2268 **Created:** 7/2/2019 08:52 **Instrument:** **HBN:** 242714

Rule: EPA 6850, DoD QSM Water **Analyst:** T. Bosch **Status:** WP

Workorder: 1918260 [ENV_LVL4]

Workorder: 1918265 [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	661789	CCV for HBN 242714 [ELMS/2268]				CCV	3		E685041C3Q	5311		7/5/2019	
2	661790	RLVS for HBN 242714 [ELMS/2268				RLVS	3		E685041C3Q	5311		7/5/2019	
3	661791	ICS for HBN 242714 [ELMS/2268]				ICS	3		E6850..D3Q	5311		7/5/2019	
4	661792	LMB for HBN 242714 [ELMS/2268]				LMB	3		E6850Q413Q	5311		7/5/2019	
5	661793	LCS for HBN 242714 [ELMS/2268]				LCS	3		E6850Q413Q	5311		7/5/2019	
6	1918260001	18CPTMW06_062119				SAMPLE	3	1918260001-A	E6850Q41.3	5480	7/19/2019	7/9/2019	
7	1918260002	18CPTMW06_062119_a				SAMPLE	3	1918260002-A	E6850Q41.3	5480	7/19/2019	7/9/2019	
8	1918260003	MW22_062119				SAMPLE	3	1918260003-A	E6850Q41.3	5480	7/19/2019	7/9/2019	
9	1918260004	CO1_062119				SAMPLE	3	1918260004-A	E6850Q41.3	5480	7/19/2019	7/9/2019	
10	1918260005	CO1_062119MS				MS	3	1918260005-A	E6850Q413Q	5480		7/5/2019	
11	1918260006	CO1_062119MSD				MSD	3	1918260006-A	E6850Q413Q	5480		7/5/2019	
12	1918260007	MW8_062119				SAMPLE	3	1918260007-A	E6850Q41.3	5480	7/19/2019	7/9/2019	
13	1918260008	18CPTMW15_062119				SAMPLE	3	1918260008-A	E6850Q41.3	5480	7/19/2019	7/9/2019	
14	1918260009	18CPTMW03SW_062119				SAMPLE	3	1918260009-A	E6850Q41.3	5480	7/19/2019	7/9/2019	
15	1918260010	AWD3_062119				SAMPLE	3	1918260010-A	E6850Q41.3	5480	7/19/2019	7/9/2019	
16	661794	CCV for HBN 242714 [ELMS/2268]				CCV	3		E685041C3Q	5311		7/5/2019	
17	1918260011	CO8_062119				SAMPLE	3	1918260011-A	E6850Q41.3	5480	7/19/2019	7/9/2019	
18	1918265001	18CPTMW10DW_062019				SAMPLE	3	1918265001-A	E6850Q41.3	5480	7/18/2019	7/5/2019	
19	1918265002	18CPTMW10SW_062019				SAMPLE	3	1918265002-A	E6850Q41.3	5480	7/18/2019	7/5/2019	
20	1918265003	18WW06_062019				SAMPLE	3	1918265003-A	E6850Q41.3	5480	7/18/2019	7/5/2019	
21	1918265004	18WW02_062019				SAMPLE	3	1918265004-A	E6850Q41.3	5480	7/18/2019	7/5/2019	
22	1918265005	18CPTMW19_062019				SAMPLE	3	1918265005-A	E6850Q41.3	5480	7/18/2019	7/5/2019	
23	1918265006	18CPTMW19SW_062019				SAMPLE	3	1918265006-A	E6850Q41.3	5480	7/18/2019	7/5/2019	
24	1918265007	18WW22_062019				SAMPLE	3	1918265007-A	E6850Q41.3	5480	7/18/2019	7/5/2019	
25	1918265008	C04_062019				SAMPLE	3	1918265008-A	E6850Q41.3	5480	7/18/2019	7/5/2019	
26	661795	CCV for HBN 242714 [ELMS/2268]				CCV	3		E685041C3Q	5311		7/5/2019	

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00940851

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

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ALS Work Order #'s & Sample #( )'s: 1918260 (001-11), 1918265 (001-08)
ELMS Batch/HBN ID: 2268 (242714)
Prep Date: 07/01/2019 Analysis Date: 07/03/2019 Analyst: T. Bosch
Analyte: **Perchlorate** Matrix: **Water** Method: **6850**
Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2019\JUL\03JUL19D.s
Reported DL: **1.0µg/L** Reported LOD: **2.0µg/L** Reported LOQ: **4.0µg/L**

SAMPLE PREPARATION/ANALYSIS:

Water: Samples were prepared by Thomas 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 AH015-4)/0.1% glacial acetic acid (JT-Baker Lot 04802).
Eluent B1: 95% ACN (B&J Lot AH015-4)/ 5% ASTM Type II water (ALS)/0.1% glacial acetic acid (JT-Baker Lot 04802).

STANDARDS: Internal Standard Spiking Solution Horizon# 43730. Dilutions of Working Standard Solution ID 43702 used for CCV's, LODV's, RLVS and IPC.

CALIBRATION CURVE: Used curve from 03/19/2019, sequence 19MAR19D.s Offline Quantitation Method: CLO4-DP2.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: 7 Injection Volume: 35µL
Column: KP-RPPX C8 separator, 250mm Mobile Phase: 70% Eluent A1; 30% Eluent B1

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: 4.0µL of QC Solution Horizon ID 47516 was used for LCS 661793; Target = 4.0µg/L. ASTM type II water was used for LMB 661792.

MS/MSD: The Matrix Spike and duplicate (MS/MSD) were performed on samples 1918260005/06 (Client ID: CO1_062119). 4.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. Spike target = 4.0µg/L.

COMMENTS:

1) Results reported in µg/L. Field samples 1918260003/08 were analyzed and reported from 1:10 dilutions. Field sample 1918260007 was analyzed and reported from a 1:1,000 dilution. The reporting limits have been adjusted accordingly.
2) All QC, Blank, CCV, and MS/MSD results were within method parameters.
3) Sample data can be viewed at two directories within the ALS system: \\ALSLTWS013\LCMS\LCMS04\2019\JUL\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
4) Notebook: \\alsltws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2019\242714-DoD-ALS-Hstn LCMS4 or through \\ALSLTWS013\DATAREVIEW\HBN#
5) The Reporting Limit Verification Standard (RLVS – 661790) is reported from the analysis of the Laboratory Control Sample (LCS – 661793) at a level of 4.0µg/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: 19MARI03) along with datafiles 03JULD03/06/19/23.

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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: 2268 HBN: 242714 Sample Set IDs if Applicable: 1918260/1918265	Analyst Initials	Reviewer Initials
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
Method Blanks 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 flags applied on QC reports; LCSs analyzed and meet acceptance criteria when performed	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 checked	TB	SB
Preparation and analysis calculations checked	TB	SB
NCRs are completed as necessary NC/CAR#	—	—
Report forms are complete and accurate	TB	SB
Manual integrations checked	TB	SB

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STANDARD REPORT

Working Standard - CLO4 WRK

CLO4 WRK — Description - 6850 WKG Std 100.ug/L

Standard: 43702
MFG: ALS/SLC
MFG Lot: TNB: 09/18/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/18/2018 02:09PM

Amount: 10 mL
Expires: 09/18/2019
Usable: Yes
Lab Lot: CLO4 WRK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	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
43701	CLO4 INT	6850 Intermdt AccStd 10.ug/mL	CLO4 INT	0.1 mL	09/18/2019

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: No
Lab Lot: CLO4 STOCK

Pos.	Analyte	Name	Concentration 1000 ug/mL
1	14797-73-0	Perchlorate	

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			

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STANDARD REPORT

Constituent

Working Standard - CLO4 INT

CLO4 INT — Description - 6850 Intermdt AccStd 10.ug/mL

Standard: 43701
MFG: ALS/SLC
MFG Lot: TNB: 09/18/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/18/2018 02:09PM

Amount: 10 mL
Expires: 09/18/2019
Usable: Yes
Lab Lot: CLO4 INT

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
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

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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			

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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

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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

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STANDARD REPORT

Working Standard - CLO4ISTDWRK

CLO4ISTDWRK — Description - Perchlorate ISTD Wrk 1,000ug/L

Standard: 43730	**Created By:** Thomas Bosch	**Amount:** 25 mL
MFG: ALS/SLC	**Create Date:** 09/20/2018 09:09AM	**Expires:** 09/20/2019
MFG Lot: TNB: 05/09/2018	**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
43729	CLO4ISTDSTK	Perchlorate ISTD Stock	CLO4ISTDSTK	0.25 mL	04/28/2026

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Constituent

Stock Standard - CLO4ISTDSTK

CLO4ISTDSTK		Description - Perchlorate ISTD Stock
Standard: 43729	Created By: Thomas Bosch	Amount: 1 mL
MFG: Cambridge Isotope	Create Date: 09/20/2018 09:09AM	Expires: 04/28/2026
MFG Lot: SDFF-012A	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

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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

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 ANAB

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ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: JCC-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

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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*

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

GHS

Signal Word: None

Component		SRM #	Prepared Concentration (µg/mL)
ClO_4	Perchlorate	Ind. Std.	1000

The gravimetric uncertainty for this product is ±0.24%.
The final solution was checked against an independent standard to verify its concentration.
We use the highest purity raw materials available to minimize impurity levels in the final solution. Typically 99.999%+ pure starting materials are used as well as ASTM Type I 18 megohm deionized water.
All solutions are filtered through a 0.2 µm filter prior to being bottled.
All glassware used in preparation is Class A and calibrated regularly.
All weights are traceable through NIST, Test No. 822-275872-11
All bottles are triple rinsed with deionized water prior to use.
Shake bottle prior to use and do not pipette directly out of the bottle. Use only cleaned Class A volumetric glassware.
We certify the accuracy of this standard to be ±0.5% of the stated value until its expiration date provided it is kept tightly capped and stored under the conditions stated above.

Certified By: Meigan O'Leary
Meigan O'Leary, Inorganic QC Manager

Page 1 of 1

For use in routine laboratory analysis.

AccuStandard

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Cambridge Isotope Laboratories, Inc.

Certificate of Analysis

Quality Standards:
ISO Guide 34 • ISO/IEC 17025 • ISO 13485 • cGMP

23118

Product Name: (Isotopic Label & Enrichment Specification)	PERCHLORIC ACID, SODIUM SALT (18O4, 90%+) 100 UG/ML IN WATER
Lot Number:	SDDG-013
Catalog Number:	OLM-7310-S

Product Information

Chemical Purity Specification:	≥98%
Labeled CAS Number:	NA
Unlabeled CAS Number:	7601-89-0
MW*:	130.4
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.

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.

* *For isotopically labeled compounds, MW listed is for the fully enriched product.*

Approved by: T. J. Eckersley

Timothy I. Eckersley, Ph.D., Quality Assurance

Quality Control Tests and Results

QC Release Date	2/27/2014
Expiration Date	2/27/2024
Concentration Based on Gravimetry	102 µg/mL
Chemical Purity of Neat Material(s)	98%
LC/MS for Concentration	109.4 ± 2.8 µg/mL (k=2)

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ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

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Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP2.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
*	661789 CCV@25	Vial 71	1	Control	1	2.23045e6	8.436	26.59001
*	661793 QC@4.0	Vial 72	1	Control	2	3.72011e5	8.228	4.20689
*	661791 ICS@4.0	Vial 73	1	Control	3	2.92755e5	8.090	3.90370
*	661792 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	1918260001	Vial 75	1	Sample	5	1.00339e5	7.926	1.72705
*	1918260002	Vial 76	1	Sample	6	0.00000	0.000	0.00000
*	1918260003 10X	Vial 77	1	Sample	7	7.28770e5	8.214	94.51960
*	1918260004	Vial 78	1	Sample	8	0.00000	0.000	0.00000
*	1918260005 MS	Vial 79	1	Sample	9	1.74594e5	7.801	3.41772
*	1918260006 MSD	Vial 80	1	Sample	10	1.72844e5	7.800	3.36507
*	1918260007 1K	Vial 81	1	Sample	11	5.34661e5	8.739	7067.32278
*	1918260008 10X	Vial 82	1	Sample	12	3.53155e6	8.463	409.01406
*	1918260009	Vial 83	1	Sample	13	5.48800e5	7.917	9.89897
*	1918260010	Vial 84	1	Sample	14	1.27411e5	8.284	1.75055
*	1918260011	Vial 85	1	Sample	15	0.00000	0.000	0.00000
*	1918265001	Vial 86	1	Sample	16	7.53597e5	7.981	9.07754
*	661794 CCV@25	Vial 71	1	Control	17	1.99251e6	8.576	26.33220
*	1918265002	Vial 87	1	Sample	18	0.00000	0.000	0.00000
*	1918265003	Vial 88	1	Sample	19	0.00000	0.000	0.00000
*	1918265004	Vial 89	1	Sample	20	0.00000	0.000	0.00000
*	1918265005	Vial 90	1	Sample	21	2.73037e5	8.159	4.14589
*	1918265006	Vial 91	1	Sample	22	3.36289e6	8.129	39.03652
*	1918265007	Vial 92	1	Sample	23	0.00000	0.000	0.00000
*	1918265008	Vial 93	1	Sample	24	0.00000	0.000	0.00000
*	661795 CCV@25	Vial 71	1	Control	25	2.02866e6	8.520	25.81702

#	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
*	661789 CCV@25	Vial 71	1	Control	1	6.67744e5	8.470	26.81724
*	661793 QC@4.0	Vial 72	1	Control	2	1.20101e5	8.255	4.42244
*	661791 ICS@4.0	Vial 73	1	Control	3	9.57778e4	8.096	4.14544
*	661792 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	1918260001	Vial 75	1	Sample	5	3.62166e4	7.941	1.91349
*	1918260002	Vial 76	1	Sample	6	0.00000	0.000	0.00000
*	1918260003 10X	Vial 77	1	Sample	7	2.32604e5	8.238	100.35898
*	1918260004	Vial 78	1	Sample	8	0.00000	0.000	0.00000
*	1918260005 MS	Vial 79	1	Sample	9	6.56059e4	7.810	4.13918
*	1918260006 MSD	Vial 80	1	Sample	10	6.56232e4	7.815	4.11436
*	1918260007 1K	Vial 81	1	Sample	11	1.75075e5	8.767	7652.56480
*	1918260008 10X	Vial 82	1	Sample	12	1.06108e6	8.478	414.80020
*	1918260009	Vial 83	1	Sample	13	1.77272e5	7.934	10.64208
*	1918260010	Vial 84	1	Sample	14	4.40452e4	8.285	1.86025
*	1918260011	Vial 85	1	Sample	15	0.00000	0.000	0.00000
*	1918265001	Vial 86	1	Sample	16	2.38015e5	7.999	9.53324
*	661794 CCV@25	Vial 71	1	Control	17	5.92974e5	8.599	26.40646
*	1918265002	Vial 87	1	Sample	18	0.00000	0.000	0.00000
*	1918265003	Vial 88	1	Sample	19	0.00000	0.000	0.00000
*	1918265004	Vial 89	1	Sample	20	0.00000	0.000	0.00000
*	1918265005	Vial 90	1	Sample	21	8.77046e4	8.185	4.33407
*	1918265006	Vial 91	1	Sample	22	1.01421e6	8.147	39.71903
*	1918265007	Vial 92	1	Sample	23	0.00000	0.000	0.00000
*	1918265008	Vial 93	1	Sample	24	0.00000	0.000	0.00000
*	661795 CCV@25	Vial 71	1	Control	25	6.16068e5	8.540	26.38763

#	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
*	661789 CCV@25	Vial 71	1	Control	1	2.54244e5	8.447	5.00000
*	661793 QC@4.0	Vial 72	1	Control	2	2.90663e5	8.255	5.00000

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#*	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
*	661791 ICS@4.0	Vial 73	1	Control	3	2.47418e5	8.122	5.00000
*	661792 LMB	Vial 74	1	Control	4	2.69965e5	8.571	5.00000
*	1918260001	Vial 75	1	Sample	5	2.03376e5	7.947	5.00000
*	1918260002	Vial 76	1	Sample	6	2.30322e5	7.928	5.00000
*	1918260003 10X	Vial 77	1	Sample	7	2.45205e5	8.229	50.00000
*	1918260004	Vial 78	1	Sample	8	1.64595e5	7.807	5.00000
*	1918260005 MS	Vial 79	1	Sample	9	1.69734e5	7.817	5.00000
*	1918260006 MSD	Vial 80	1	Sample	10	1.70811e5	7.823	5.00000
*	1918260007 1K	Vial 81	1	Sample	11	2.43260e5	8.755	5000.00000
*	1918260008 10X	Vial 82	1	Sample	12	2.53420e5	8.502	50.00000
*	1918260009	Vial 83	1	Sample	13	1.76005e5	7.940	5.00000
*	1918260010	Vial 84	1	Sample	14	2.54426e5	8.295	5.00000
*	1918260011	Vial 85	1	Sample	15	2.32351e5	7.915	5.00000
*	1918265001	Vial 86	1	Sample	16	2.64421e5	8.007	5.00000
*	661794 CCV@25	Vial 71	1	Control	17	2.29484e5	8.599	5.00000
*	1918265002	Vial 87	1	Sample	18	2.14730e5	7.877	5.00000
*	1918265003	Vial 88	1	Sample	19	1.83014e5	7.960	5.00000
*	1918265004	Vial 89	1	Sample	20	2.99495e5	8.239	5.00000
*	1918265005	Vial 90	1	Sample	21	2.16624e5	8.179	5.00000
*	1918265006	Vial 91	1	Sample	22	2.53872e5	8.144	5.00000
*	1918265007	Vial 92	1	Sample	23	2.63295e5	8.143	5.00000
*	1918265008	Vial 93	1	Sample	24	3.21651e5	8.236	5.00000
*	661795 CCV@25	Vial 71	1	Control	25	2.38601e5	8.561	5.00000

*** End of Report ***

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Sequence Table:

Method and Injection Info Part:

Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	661789 CCV@25	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	661793 QC@4.0	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	661791 ICS@4.0	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	661792 LMB	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	1918260001	CLO4-AQN	1	Sample		
6	Vial 76	1918260002	CLO4-AQN	1	Sample		
7	Vial 77	1918260003 10X	CLO4-AQN	1	Sample		
8	Vial 78	1918260004	CLO4-AQN	1	Sample		
9	Vial 79	1918260005 MS	CLO4-AQN	1	Sample		
10	Vial 80	1918260006 MSD	CLO4-AQN	1	Sample		
11	Vial 81	1918260007 1K	CLO4-AQN	1	Sample		
12	Vial 82	1918260008 10X	CLO4-AQN	1	Sample		
13	Vial 83	1918260009	CLO4-AQN	1	Sample		
14	Vial 84	1918260010	CLO4-AQN	1	Sample		
15	Vial 85	1918260011	CLO4-AQN	1	Sample		
16	Vial 86	1918265001	CLO4-AQN	1	Sample		
17	Vial 71	661794 CCV@25	CLO4-AQN	1	Ctrl Samp		
18	Vial 87	1918265002	CLO4-AQN	1	Sample		
19	Vial 88	1918265003	CLO4-AQN	1	Sample		
20	Vial 89	1918265004	CLO4-AQN	1	Sample		
21	Vial 90	1918265005	CLO4-AQN	1	Sample		
22	Vial 91	1918265006	CLO4-AQN	1	Sample		
23	Vial 92	1918265007	CLO4-AQN	1	Sample		
24	Vial 93	1918265008	CLO4-AQN	1	Sample		
25	Vial 71	661795 CCV@25	CLO4-AQN	1	Ctrl Samp		

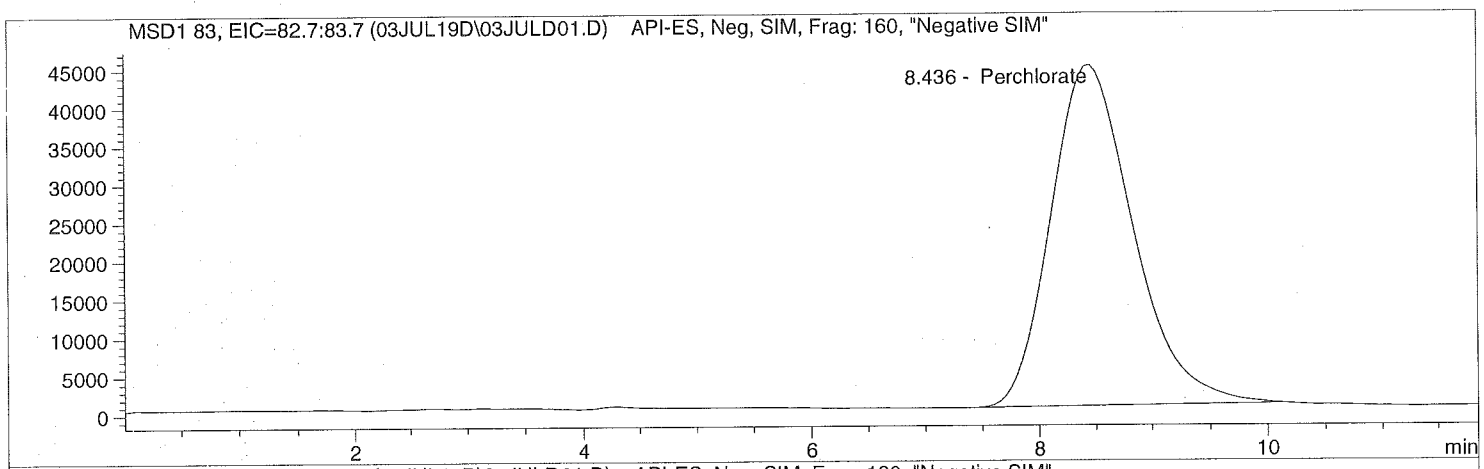
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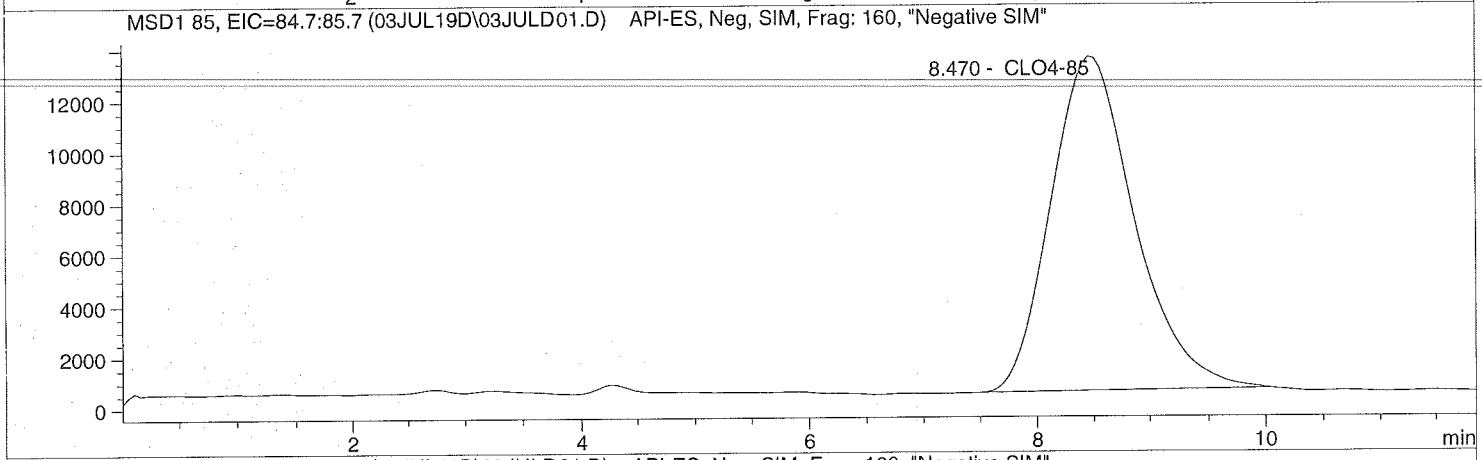
Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD01.D Sample Name: 661789 CCV@25

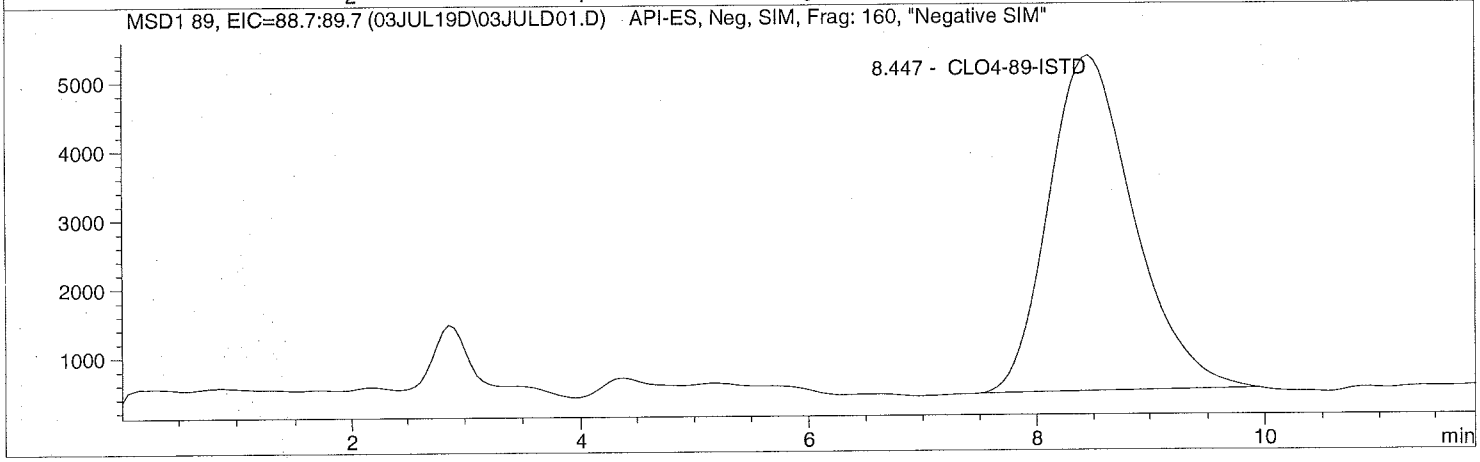
Injection Date:	7/03/2019 08:20:45	Seq Line:	1
Sample Name:	661789 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







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Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD01.D Sample Name: 661789 CCV@25

Injection Date:	7/03/2019 08:20:45	Seq Line:	1
Sample Name:	661789 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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.436	PBA	2230452.0	26.5900	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.470	PBA	667744.2	26.8172	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.447	PBA	254244.0	5.0000	CLO4-89-ISTD

*** End of Report ***

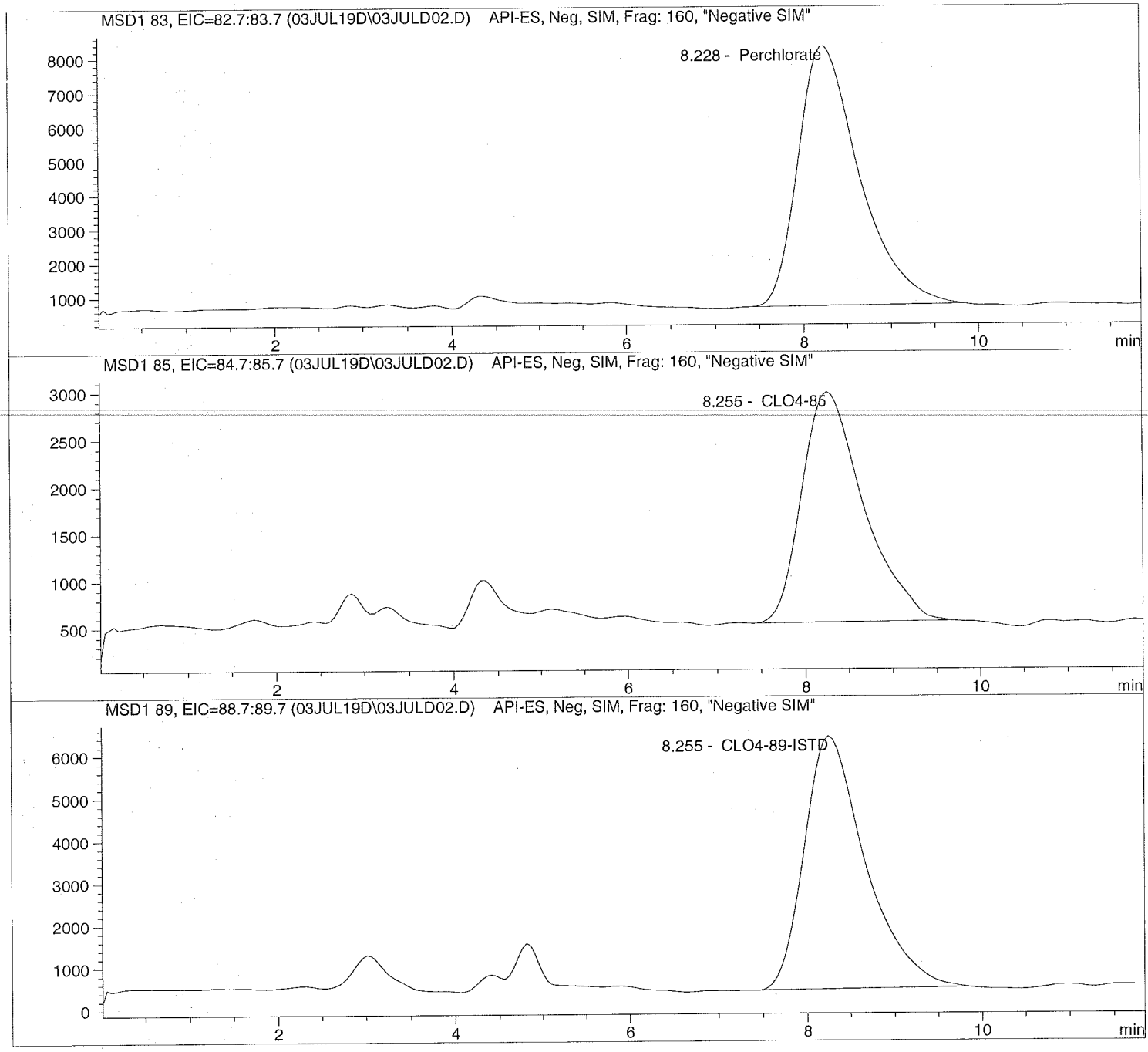
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Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD02.D Sample Name: 661793 QC@4.0

Injection Date:	7/03/2019 08:35:29	Seq Line:	2
Sample Name:	661793 QC@4.0	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



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Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD02.D Sample Name: 661793 QC@4.0

Injection Date:	7/03/2019 08:35:29	Seq Line:	2
Sample Name:	661793 QC@4.0	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.228	PBA	372011.4	4.2069	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.255	PBA	120100.8	4.4224	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.255	PBA	290663.2	5.0000	CLO4-89-ISTD

*** End of Report ***

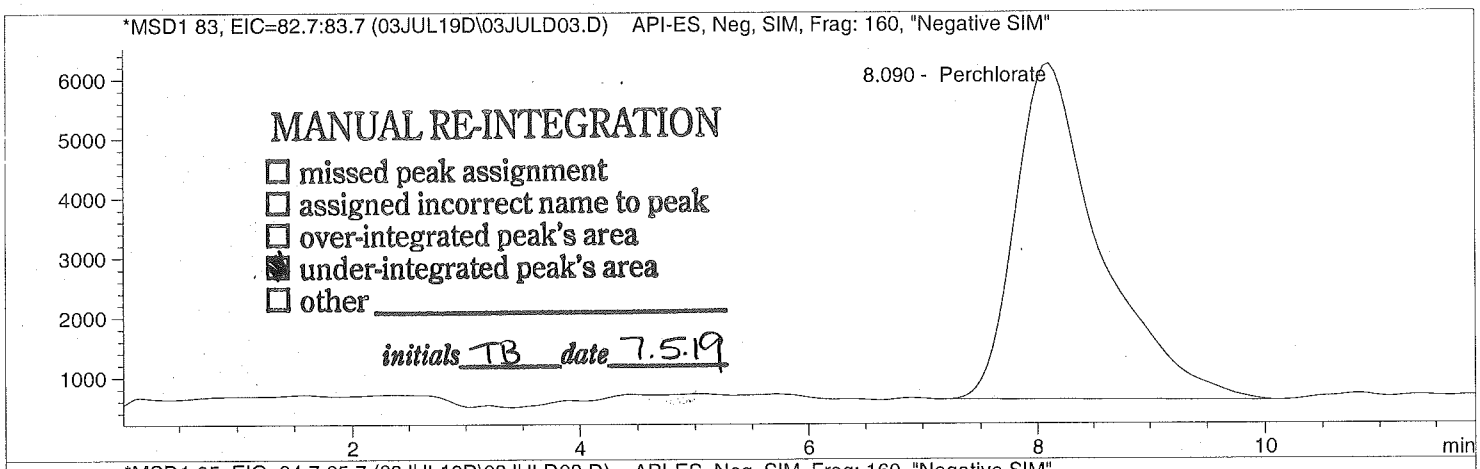
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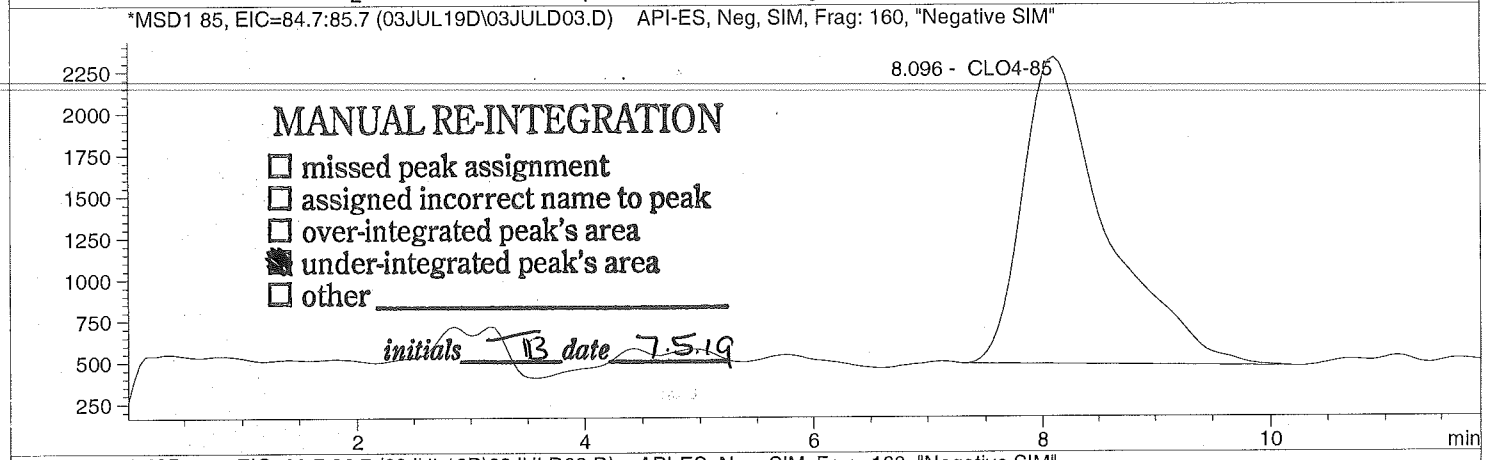
Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD03.D Sample Name: 661791 ICS@4.0

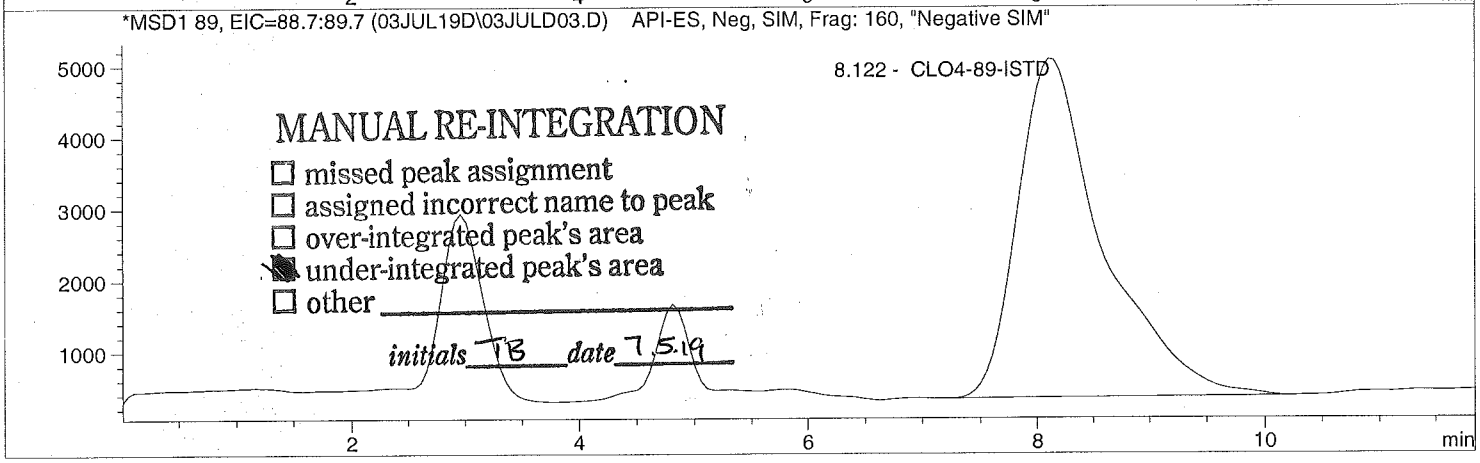
Injection Date:	7/03/2019 08:49:21	Seq Line:	3
Sample Name:	661791 ICS@4.0	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







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Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD03.D Sample Name: 661791 ICS@4.0

Injection Date:	7/03/2019 08:49:21	Seq Line:	3
Sample Name:	661791 ICS@4.0	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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.090	MM	292755.3	3.9037	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.096	MM	95777.8	4.1454	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.122	MM	247417.5	5.0000	CLO4-89-ISTD

*** End of Report ***

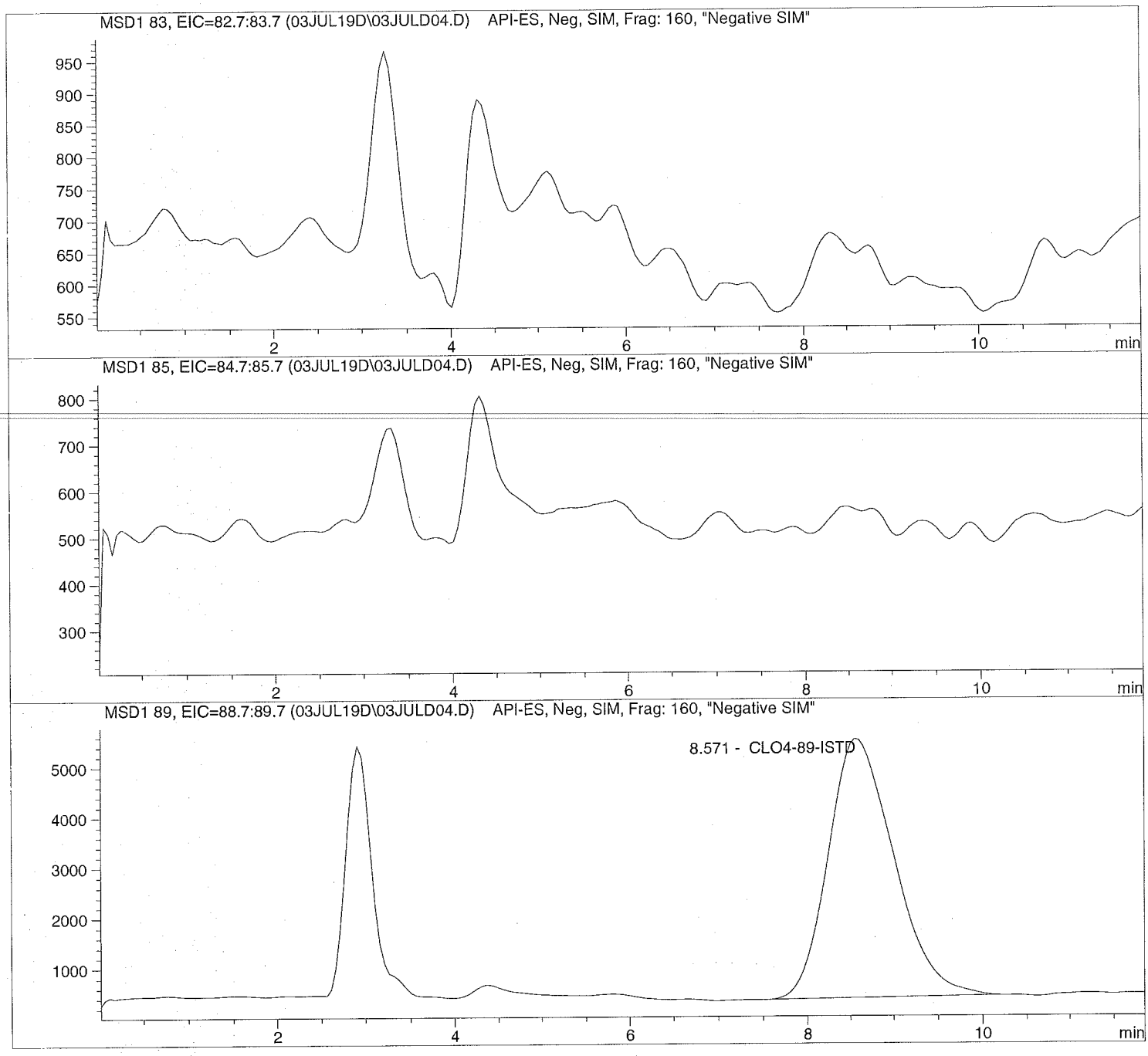
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Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD04.D Sample Name: 661792 LMB

Injection Date:	7/03/2019 09:03:15	Seq Line:	4
Sample Name:	661792 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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



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Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD04.D Sample Name: 661792 LMB

Injection Date:	7/03/2019 09:03:15	Seq Line:	4
Sample Name:	661792 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-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
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
8.571	PBA	269964.7	5.0000	CLO4-89-ISTD

*** End of Report ***

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