LONGHORN ARMY AMMUNITION PLANT KARNACK, TEXAS

ADMINISTRATIVE RECORD

Volume 8

2022

Bate Stamp Numbers
01084896 – 01086714

Prepared for

Department of the Army
Longhorn Army Ammunition Plant

1976–2022

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

VOLUME 8

2022

A. Title: (Cont.) Report – Draft Final First Annual Remedial Action Operation Report, LHAAP-16 Landfill, Longhorn Army Ammunition Plant, Karnack, Texas, March 2022
Author(s): Department of the Army
Recipient: U.S. Environmental Protection Agency and Texas Commission on Environmental Quality
Date: March 7, 2022
Bate Stamp: 01084896 – 01086674

B. Title: Minutes – Final Monthly Managers' Meeting (MMM), Longhorn Army Ammunition Plant (LHAAP), February 15, 2022
Author(s): Department of the Army
Recipient: All Parties
Date: March 9, 2022
Bate Stamp: 01086675 – 01086714

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000735
Project:	HS20071328	**Date Collected:**	NA
Sample Matrix:	Soil	**Date Received:**	NA
		Date Extracted:	8/11/20
		Date Analyzed:	8/20/20 12:51
Sample Name:	Duplicate Lab Control Sample	**Units:**	µg/Kg
Lab Code:	EQ2000339-03	**Basis:**	Dry

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method:	6850	**Analysis Lot:**	691993
Prep Method:	Method	**Extraction Lot:**	363305
Data File Name:	I:\LCMS01\DATA\20200820\20200820_025	**Instrument Name:**	E-LCMS-01
		Dilution Factor:	1

CAS No.	Analyte Name	Result	Q	LOQ	LOD	MDL	Note
14797-73-0	Perchlorate	**90.7**		0.991	0.750	0.300	

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000735
Project:	HS20071328	**Date Collected:**	7/28/20
Sample Matrix:	Soil	**Date Received:**	7/29/20
		Date Analyzed:	8/21/20

Matrix Spike Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Sample Name:	16EW07-200728	**Units:**	µg/Kg
Lab Code:	E2000735-012	**Basis:**	As Received

Analytical Method: 6850
Prep Method: Method

		16EW07-200728MS				16EW07-200728DMS					
		Matrix Spike				**Duplicate Matrix Spike**					
		EQ2000339-04				EQ2000339-05					
Analyte Name	**Sample Result**	**Result**	**Spike Amount**	**% Rec**		**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Perchlorate	4.68	85.9	96.7	84		93.7	101	88	84 - 121	9	15

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

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

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

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000735
Project:	HS20071328	**Date Collected:**	7/28/20 0815
Sample Matrix:	Soil	**Date Received:**	7/29/20
		Date Extracted:	8/11/20
		Date Analyzed:	8/21/20 10:34
Sample Name:	16EW07-200728	**Units:**	µg/Kg
Lab Code:	EQ2000339-04	**Basis:**	As Received
Run Type:	Matrix Spike		

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method:	6850	**Analysis Lot:**	691993
Prep Method:	Method	**Extraction Lot:**	363305
Data File Name:	I:\LCMS01\DATA\20200821\20200821_008	**Instrument Name:**	E-LCMS-01
		Dilution Factor:	10

CAS No.	Analyte Name	Result	Q	LOQ	LOD	MDL	Note
14797-73-0	Perchlorate	**85.9**		9.67	7.50	3.00	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000735
Project:	HS20071328	**Date Collected:**	7/28/20 0815
Sample Matrix:	Soil	**Date Received:**	7/29/20
		Date Extracted:	8/11/20
		Date Analyzed:	8/21/20 10:58
Sample Name:	16EW07-200728	**Units:**	µg/Kg
Lab Code:	EQ2000339-05	**Basis:**	As Received
Run Type:	Duplicate Matrix Spike		

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method:	6850	**Analysis Lot:**	691993
Prep Method:	Method	**Extraction Lot:**	363305
Data File Name:	I:\LCMS01\DATA\20200821\20200821_009	**Instrument Name:**	E-LCMS-01
		Dilution Factor:	10

CAS No.	Analyte Name	Result	Q	LOQ	LOD	MDL	Note
14797-73-0	Perchlorate	**93.7**		10.1	7.59	3.04	

Initial Calibration

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

20200819

1st Review: Kneir
2nd Review: Hvan

Injection Log
LCMS01 -Shimadzu 8050

ICAL Date: 7/19/2020
Cal. Std. xp: 11/18/2020
ICAL ID: **EC2000022**

Mobile Phases **A:** 0.75% Formic Acid/Water 3100807-09 **B:** MeOH 3100802-01

			File Name	Acquisition Method	Dilution	R	Comments	Date/Time
1	PERCHLORATE1		20200819_005	Perchlorate6850b.lcm	1x	☒	3100806-05	8/19/2020 10:42
2	PERCHLORATE2		20200819_006	Perchlorate6850b.lcm	1x	☒	3100806-06	8/19/2020 10:50
3	PERCHLORATE3		20200819_007	Perchlorate6850b.lcm	1x	☒	3100806-07	8/19/2020 10:58
4	PERCHLORATE4		20200819_008	Perchlorate6850b.lcm	1x	☒	3100807-01	8/19/2020 11:06
5	PERCHLORATE5		20200819_009	Perchlorate6850b.lcm	1x	☒	3100807-02	8/19/2020 11:14
6	PERCHLORATE6		20200819_010	Perchlorate6850b.lcm	1x	☒	3100807-03	8/19/2020 11:22
7	PERCHLORATE7		20200819_011	Perchlorate6850b.lcm	1x	☒	3100807-04	8/19/2020 11:30
8	PERCHLORATE8		20200819_012	Perchlorate6850b.lcm	1x	☒	3100807-05	8/19/2020 11:38
9	PERCHLORATE9		20200819_013	Perchlorate6850b.lcm	1x	☒	3100807-06	8/19/2020 11:45
10	PERCHLORATE10		20200819_014	Perchlorate6850b.lcm	1x	☒	3100807-07	8/19/2020 11:53
11	PERCHLORATEICV		20200819_016	Perchlorate6850b.lcm	1x	☒	3100807-08	8/19/2020 12:09
12	LODV		20200819_017	Perchlorate6850b.lcm	1x	☒		8/19/2020 12:17
13	EQ2000337-01		20200819_019	Perchlorate6850b.lcm	1x	☒		8/19/2020 12:38
14	EQ2000337-02		20200819_020	Perchlorate6850b.lcm	1x	☒		8/19/2020 12:46
15	EQ2000337-03		20200819_021	Perchlorate6850b.lcm	1x	☒		8/19/2020 12:53
16	E2000723-001		20200819_022	Perchlorate6850b.lcm	1x	☒		8/19/2020 13:01
17	PERCHLORATE7		20200819_023	Perchlorate6850b.lcm	1x	☒	3100807-04	8/19/2020 13:09
18	E2000680-002X10		20200819_024	Perchlorate6850b.lcm	10x	☒		8/19/2020 13:17
19	E2000680-004X2		20200819_025	Perchlorate6850b.lcm	2x	☒		8/19/2020 13:25
20	E2000680-007X10		20200819_026	Perchlorate6850b.lcm	10x	☒		8/19/2020 13:33
21	E2000680-009X10		20200819_027	Perchlorate6850b.lcm	10x	☒		8/19/2020 13:41
22	E2000680-010X10		20200819_028	Perchlorate6850b.lcm	10x	☒		8/19/2020 13:49
23	E2000680-011X10		20200819_029	Perchlorate6850b.lcm	10x	☒		8/19/2020 13:57
24	EQ2000327-01		20200819_030	Perchlorate6850b.lcm	1x	☒		8/19/2020 14:04
25	EQ2000327-02		20200819_031	Perchlorate6850b.lcm	1x	☒		8/19/2020 14:12
26	EQ2000327-03		20200819_033	Perchlorate6850b.lcm	1x	☒		8/19/2020 14:21
27	PERCHLORATE7		20200819_034	Perchlorate6850b.lcm	1x	☒	3100807-04	8/19/2020 14:29
28	E2000735-001		20200819_035	Perchlorate6850b.lcm	1x	☒		8/19/2020 14:37
29	E2000735-002		20200819_036	Perchlorate6850b.lcm	1x	☒		8/19/2020 14:45
30	E2000735-003		20200819_037	Perchlorate6850b.lcm	1x	☒		8/19/2020 14:53
31	E2000735-004		20200819_038	Perchlorate6850b.lcm	1x	☒		8/19/2020 15:01
32	E2000735-005		20200819_039	Perchlorate6850b.lcm	1x	☒		8/19/2020 15:09
33	E2000735-006		20200819_040	Perchlorate6850b.lcm	1x	☒		8/19/2020 15:16
34	E2000735-007		20200819_041	Perchlorate6850b.lcm	1x	☒		8/19/2020 15:24
35	E2000735-008		20200819_042	Perchlorate6850b.lcm	1x	☒		8/19/2020 15:32
36	E2000735-009		20200819_043	Perchlorate6850b.lcm	1x	☒		8/19/2020 15:44
37	PERCHLORATE7		20200819_044	Perchlorate6850b.lcm	1x	☒	3100807-04	8/19/2020 15:52
38	E2000735-010		20200819_045	Perchlorate6850b.lcm	1x	☒		8/19/2020 16:00
39	E2000735-011		20200819_046	Perchlorate6850b.lcm	1x	☒		8/19/2020 16:08
40	E2000735-013		20200819_047	Perchlorate6850b.lcm	1x	☒		8/19/2020 16:16
41	E2000735-014		20200819_048	Perchlorate6850b.lcm	1x	☒		8/19/2020 16:24
42	E2000735-015		20200819_049	Perchlorate6850b.lcm	1x	☒		8/19/2020 16:32
43	E2000735-016		20200819_050	Perchlorate6850b.lcm	1x	☒		8/19/2020 16:40
44	E2000735-017		20200819_051	Perchlorate6850b.lcm	1x	☒		8/19/2020 16:47
45	E2000735-018		20200819_052	Perchlorate6850b.lcm	1x	☒		8/19/2020 16:55
46	E2000735-019		20200819_053	Perchlorate6850b.lcm	1x	☒		8/19/2020 17:03
47	PERCHLORATE7		20200819_054	Perchlorate6850b.lcm	1x	☒	3100807-04	8/19/2020 17:11
48	EQ2000339-01		20200819_055	Perchlorate6850b.lcm	1x	☒		8/19/2020 17:19
49	EQ2000339-02		20200819_056	Perchlorate6850b.lcm	1x	☒		8/19/2020 17:27
50	EQ2000339-03		20200819_057	Perchlorate6850b.lcm	1x	☒		8/19/2020 17:35
51	E2000712-001		20200819_058	Perchlorate6850b.lcm	1x	☒		8/19/2020 17:43
52	E2000712-002		20200819_059	Perchlorate6850b.lcm	1x	☒		8/19/2020 17:51
53	E2000712-003		20200819_060	Perchlorate6850b.lcm	1x	☒		8/19/2020 17:59
54	IB		20200819_061	Perchlorate6850b.lcm	1x	☒		8/19/2020 18:08
55	IB		20200819_062	Perchlorate6850b.lcm	1x	☒		8/19/2020 18:16
56	IB		20200819_063	Perchlorate6850b.lcm	1x	☒		8/19/2020 18:24
57	IB		20200819_064	Perchlorate6850b.lcm	1x	☒		8/19/2020 18:32
58	PERCHLORATE7		20200819_065	Perchlorate6850b.lcm	1x	☒	3100807-04	8/19/2020 18:40
59	E2000712-004		20200819_066	Perchlorate6850b.lcm	1x	☒		8/19/2020 18:48
60	E2000712-005		20200819_067	Perchlorate6850b.lcm	1x	☒		8/19/2020 18:56
61	E2000712-006		20200819_068	Perchlorate6850b.lcm	1x	☒		8/19/2020 19:04

20200819

1st Review: Kneir
2nd Review: Hvan

Injection Log
LCMS01 -Shimadzu 8050

ICAL Date: 7/19/2020
Cal. Std. xp: 11/18/2020
ICAL ID: **EC2000022**

Mobile Phases **A:** 0.75% Formic Acid/Water 3100807-09 **B:** MeOH 3100802-01

			File Name	Acquisition Method	Dilution	R	Comments	Date/Time
62	E2000712-007		20200819_069	Perchlorate6850b.lcm	1x	☒		8/19/2020 19:12
63	E2000694-012		20200819_070	Perchlorate6850b.lcm	1x	☒		8/19/2020 19:19
64	E2000694-012MS		20200819_071	Perchlorate6850b.lcm	1x	☒		8/19/2020 19:27
65	E2000694-012MSD		20200819_072	Perchlorate6850b.lcm	1x	☒		8/19/2020 19:35
66	E2000711-001		20200819_073	Perchlorate6850b.lcm	1x	☒		8/19/2020 19:43
67	E2000711-002		20200819_074	Perchlorate6850b.lcm	1x	☒		8/19/2020 19:51
68	E2000724-001		20200819_075	Perchlorate6850b.lcm	1x	☒		8/19/2020 19:59
69	PERCHLORATE7		20200819_076	Perchlorate6850b.lcm	1x	☒	3100807-04	8/19/2020 20:07
70	E2000724-002		20200819_077	Perchlorate6850b.lcm	1x	☒		8/19/2020 20:15
71	E2000724-003		20200819_078	Perchlorate6850b.lcm	1x	☒		8/19/2020 20:22
72	E2000724-004		20200819_079	Perchlorate6850b.lcm	1x	☒		8/19/2020 20:30
73	E2000728-001		20200819_080	Perchlorate6850b.lcm	1x	☒		8/19/2020 20:38
74	E2000728-002		20200819_081	Perchlorate6850b.lcm	1x	☒		8/19/2020 20:46
75	E2000729-001		20200819_082	Perchlorate6850b.lcm	1x	☒		8/19/2020 20:54
76	R2006493-001		20200819_083	Perchlorate6850b.lcm	1x	☒		8/19/2020 21:02
77	R2006493-003		20200819_084	Perchlorate6850b.lcm	1x	☒		8/19/2020 21:10
78	R2006493-005		20200819_085	Perchlorate6850b.lcm	1x	☒		8/19/2020 21:18
79	R2006493-007		20200819_086	Perchlorate6850b.lcm	1x	☒		8/19/2020 21:26
80	PERCHLORATE7		20200819_087	Perchlorate6850b.lcm	1x	☒	3100807-04	8/19/2020 21:33
81	R2006493-009		20200819_088	Perchlorate6850b.lcm	1x	☒		8/19/2020 21:41
82	R2006493-011		20200819_089	Perchlorate6850b.lcm	1x	☒		8/19/2020 21:49
83	R2006493-013		20200819_090	Perchlorate6850b.lcm	1x	☒		8/19/2020 21:57
84	R2006493-015		20200819_091	Perchlorate6850b.lcm	1x	☒		8/19/2020 22:05
85	PERCHLORATE7		20200819_092	Perchlorate6850b.lcm	1x	☒	3100807-04	8/19/2020 22:13
86	EQ2000338-01		20200819_093	Perchlorate6850b.lcm	1x	☒		8/19/2020 22:21
87	EQ2000338-02		20200819_094	Perchlorate6850b.lcm	1x	☒		8/19/2020 22:29
88	EQ2000338-03		20200819_095	Perchlorate6850b.lcm	1x	☒		8/19/2020 22:37
89	EQ2000338-04		20200819_096	Perchlorate6850b.lcm	1x	☒		8/19/2020 22:44
90	EQ2000338-05		20200819_097	Perchlorate6850b.lcm	1x	☒		8/19/2020 22:52
91	R2006532-001		20200819_098	Perchlorate6850b.lcm	1x	☒		8/19/2020 23:00
92	R2006532-003		20200819_099	Perchlorate6850b.lcm	1x	☒		8/19/2020 23:08
93	R2006532-005		20200819_100	Perchlorate6850b.lcm	1x	☒		8/19/2020 23:16
94	R2006532-007		20200819_101	Perchlorate6850b.lcm	1x	☒		8/19/2020 23:24
95	R2006532-009		20200819_102	Perchlorate6850b.lcm	1x	☒		8/19/2020 23:32
96	PERCHLORATE7		20200819_103	Perchlorate6850b.lcm	1x	☒	3100807-04	8/19/2020 23:40
97	R2006532-011		20200819_104	Perchlorate6850b.lcm	1x	☒		8/19/2020 23:47
98	R2006555-002		20200819_105	Perchlorate6850b.lcm	1x	☒		8/19/2020 23:55
99	R2006555-004		20200819_106	Perchlorate6850b.lcm	1x	☒		8/20/2020 0:03
100	R2006555-006		20200819_107	Perchlorate6850b.lcm	1x	☒		8/20/2020 0:11
101	R2006555-008		20200819_108	Perchlorate6850b.lcm	1x	☒		8/20/2020 0:19
102	R2006555-010		20200819_109	Perchlorate6850b.lcm	1x	☒		8/20/2020 0:27
103	R2006555-012		20200819_110	Perchlorate6850b.lcm	1x	☒		8/20/2020 0:35
104	R2006617-001		20200819_111	Perchlorate6850b.lcm	1x	☒		8/20/2020 0:43
105	R2006617-003		20200819_112	Perchlorate6850b.lcm	1x	☒		8/20/2020 0:50
106	R2006617-005		20200819_113	Perchlorate6850b.lcm	1x	☒		8/20/2020 0:58
107	PERCHLORATE7		20200819_114	Perchlorate6850b.lcm	1x	☒	3100807-04	8/20/2020 1:06
108	R2006617-007		20200819_115	Perchlorate6850b.lcm	1x	☒		8/20/2020 1:14
109	R2006617-009		20200819_116	Perchlorate6850b.lcm	1x	☒		8/20/2020 1:22
110	R2006617-010		20200819_117	Perchlorate6850b.lcm	1x	☒		8/20/2020 1:30
111	PERCHLORATE7		20200819_118	Perchlorate6850b.lcm	1x	☒	3100807-04	8/20/2020 1:38

Initial Calibration - Detailed Report

Calibration ID: EC2000022 **Instrument ID:** E-LCMS-01
Column Name: 1

#	Lab Code	Sample Name	File Location	Aquisition Date
01	EC2000022-01	PERCHLORATE1	20200819_005	08/19/2020 10:42
02	EC2000022-02	PERCHLORATE2	20200819_006	08/19/2020 10:50
03	EC2000022-03	PERCHLORATE3	20200819_007	08/19/2020 10:58
04	EC2000022-04	PERCHLORATE4	20200819_008	08/19/2020 11:06
05	EC2000022-05	PERCHLORATE5	20200819_009	08/19/2020 11:14
06	EC2000022-06	PERCHLORATE6	20200819_010	08/19/2020 11:22
07	EC2000022-07	PERCHLORATE7	20200819_011	08/19/2020 11:30
08	EC2000022-08	PERCHLORATE8	20200819_012	08/19/2020 11:38
09	EC2000022-09	PERCHLORATE9	20200819_013	08/19/2020 11:45
10	EC2000022-10	PERCHLORATE10	20200819_014	08/19/2020 11:53

Analyte **Curve Fit** **Weighting**

Perchlorate **Average RF** **RSD = 5.952** **Average RF = 0.1131**

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.1000	0.1299	02	0.5000	0.113	03	0.7000	0.1123	04	1.0000	0.1147
05	2.0000	0.1134	06	5.0000	0.1082	07	10.0000	0.1069	08	20.0000	0.1158
09	30.0000	0.1094	10	50.0000	0.107						

Analyte

Perchlorate

#	Amount	Calculated Conc	%D	#	Amount	Calculated Conc	%D	#	Amount	Calculated Conc	%D
01	0.1000	0.115	14.9	02	0.5000	0.500	-0.1	03	0.7000	0.695	-0.7
04	1.0000	1.01	1.5	05	2.0000	2.01	0.3	06	5.0000	4.78	-4.3
07	10.0000	9.46	-5.4	08	20.0000	20.5	2.4	09	30.0000	29.0	-3.2
10	50.0000	47.3	-5.4								

Initial Calibration Verification Summary Report

Calibration ID:	EC2000022	**Instrument ID:**	E-LCMS-01
Datafile ID:	20200819_016	**Column Name:**	1

Analyte	Lab Code	Type	Curve Fit	True Value	Calc Conc	Units	Result	Criteria
Perchlorate	EC2000022-11	T	Average RF	10	9.352	ng/mL	-6.5	<= 15

ALS Group Houston

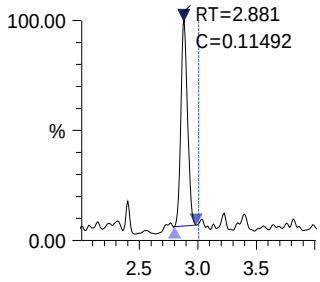
PERCHLORATE1

Date acquired: 8/19/2020 10:42:37 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200819\20200819_005.lcd
Vial: 5 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE1	8/19/2020 10:42:37 AM	3802	0.11492	20200819_005	2.881	25.0000	1.0000	5
Sodium Perchlorate-18O4_IS	PERCHLORATE1	8/19/2020 10:42:37 AM	292622	1.00000	20200819_005	2.877	25.0000	1.0000	5

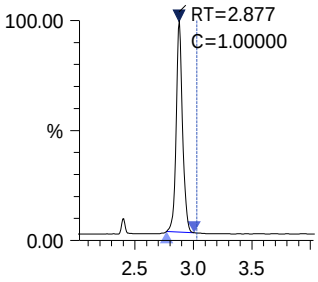
Perchlorate

Conc 0.11492
Area 3802
Q 99.00>83.00 (-) 1.00e3



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 292622
ISTD 107.00>89.00 (-) 7.83e4



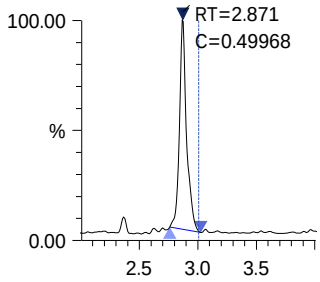
PERCHLORATE2

Date acquired: 8/19/2020 10:50:33 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200819\20200819_006.lcd
Vial: 6 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE2	8/19/2020 10:50:33 AM	18036	0.49968	20200819_006	2.871	25.0000	1.0000	6
Sodium Perchlorate-18O4_IS	PERCHLORATE2	8/19/2020 10:50:33 AM	319274	1.00000	20200819_006	2.870	25.0000	1.0000	6

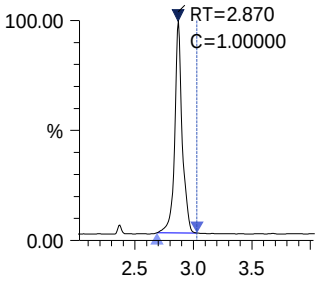
Perchlorate

Conc 0.49968
Area 18036
Q 99.00>83.00 (-) 4.32e3



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 319274
ISTD 107.00>89.00 (-) 7.26e4



ALS Group Houston

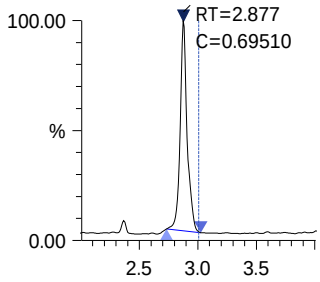
PERCHLORATE3

Date acquired: 8/19/2020 10:58:27 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200819\20200819_007.lcd
Vial: 7 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE3	8/19/2020 10:58:27 AM	24394	0.69510	20200819_007	2.877	25.0000	1.0000	7
Sodium Perchlorate-18O4_IS	PERCHLORATE3	8/19/2020 10:58:27 AM	310422	1.00000	20200819_007	2.874	25.0000	1.0000	7

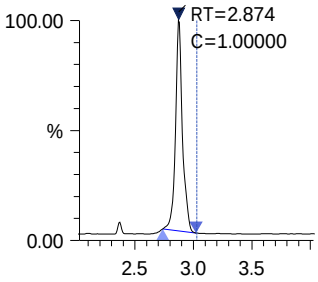
Perchlorate

Conc 0.69510
Area 24394
Q 99.00>83.00 (-) 5.99e3



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 310422
ISTD 107.00>89.00 (-) 7.56e4



ALS Group Houston

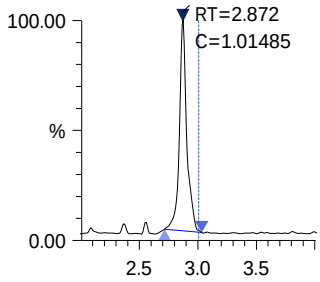
PERCHLORATE4

Date acquired: 8/19/2020 11:06:22 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200819\20200819_008.lcd
Vial: 8 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE4	8/19/2020 11:06:22 AM	33591	1.01485	20200819_008	2.872	25.0000	1.0000	8
Sodium Perchlorate-18O4_IS	PERCHLORATE4	8/19/2020 11:06:22 AM	292786	1.00000	20200819_008	2.872	25.0000	1.0000	8

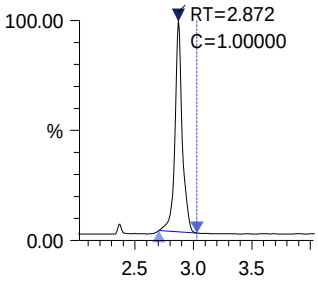
Perchlorate

Conc 1.01485
Area 33591
Q 99.00>83.00 (-) 7.70e3



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 292786
ISTD 107.00>89.00 (-) 6.80e4



ALS Group Houston

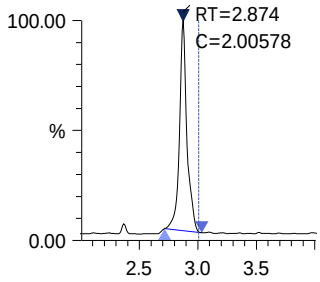
PERCHLORATE5

Date acquired: 8/19/2020 11:14:18 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200819\20200819_009.lcd
Vial: 9 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE5	8/19/2020 11:14:18 AM	65114	2.00578	20200819_009	2.874	25.0000	1.0000	9
Sodium Perchlorate-18O4_IS	PERCHLORATE5	8/19/2020 11:14:18 AM	287158	1.00000	20200819_009	2.873	25.0000	1.0000	9

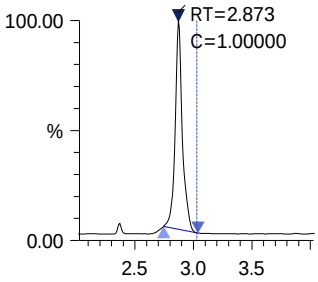
Perchlorate

Conc 2.00578
Area 65114
Q 99.00>83.00 (-) 1.49e4



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 287158
ISTD 107.00>89.00 (-) 6.84e4



ALS Group Houston

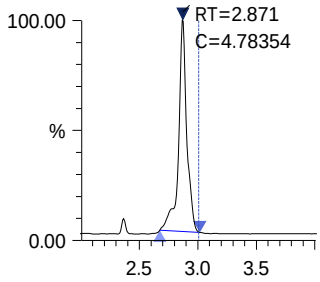
PERCHLORATE6

Date acquired: 8/19/2020 11:22:10 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200819\20200819_010.lcd
Vial: 10 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE6	8/19/2020 11:22:10 AM	167892	4.78354	20200819_010	2.871	25.0000	1.0000	10
Sodium Perchlorate-18O4_IS	PERCHLORATE6	8/19/2020 11:22:10 AM	310462	1.00000	20200819_010	2.870	25.0000	1.0000	10

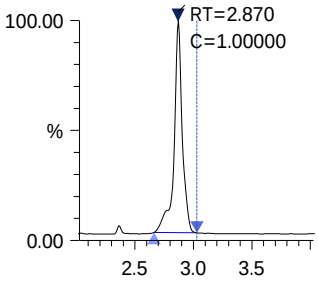
Perchlorate

Conc 4.78354
Area 167892
Q 99.00>83.00 (-) 3.45e4



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 310462
ISTD 107.00>89.00 (-) 6.38e4



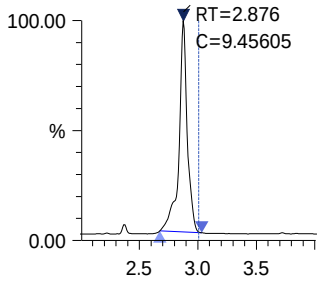
PERCHLORATE7

Date acquired: 8/19/2020 11:30:05 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200819\20200819_011.lcd
Vial: 4 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE7	8/19/2020 11:30:05 AM	309830	9.45605	20200819_011	2.876	25.0000	1.0000	4
Sodium Perchlorate-18O4_IS	PERCHLORATE7	8/19/2020 11:30:05 AM	289828	1.00000	20200819_011	2.875	25.0000	1.0000	4

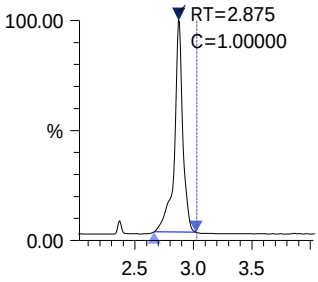
Perchlorate

Conc 9.45605
Area 309830
Q 99.00>83.00 (-) 6.35e4



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 289828
ISTD 107.00>89.00 (-) 5.81e4



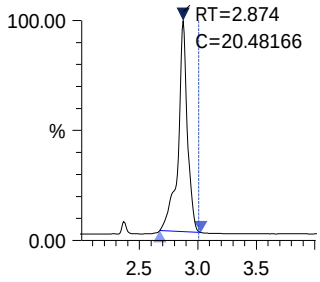
PERCHLORATE8

Date acquired: 8/19/2020 11:38:00 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200819\20200819_012.lcd
Vial: 11 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE8	8/19/2020 11:38:00 AM	587088	20.48166	20200819_012	2.874	25.0000	1.0000	11
Sodium Perchlorate-18O4_IS	PERCHLORATE8	8/19/2020 11:38:00 AM	253551	1.00000	20200819_012	2.873	25.0000	1.0000	11

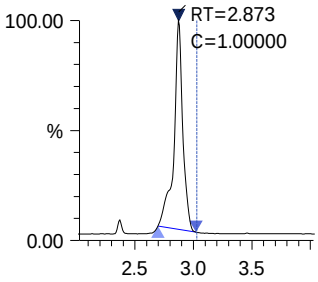
Perchlorate

Conc 20.48166
Area 587088
Q 99.00>83.00 (-) 1.09e5



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 253551
ISTD 107.00>89.00 (-) 4.87e4



ALS Group Houston

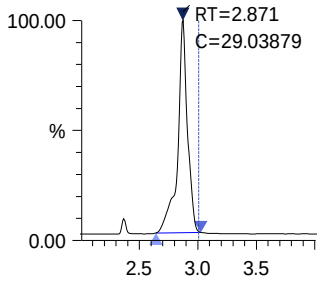
PERCHLORATE9

Date acquired: 8/19/2020 11:45:53 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200819\20200819_013.lcd
Vial: 12 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE9	8/19/2020 11:45:53 AM	849278	29.03879	20200819_013	2.871	25.0000	1.0000	12
Sodium Perchlorate-18O4_IS	PERCHLORATE9	8/19/2020 11:45:53 AM	258702	1.00000	20200819_013	2.870	25.0000	1.0000	12

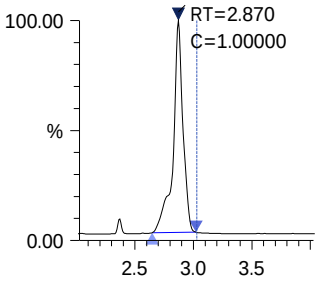
Perchlorate

Conc 29.03879
Area 849278
Q 99.00>83.00 (-) 1.48e5



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 258702
ISTD 107.00>89.00 (-) 4.43e4



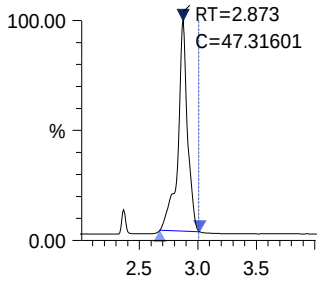
PERCHLORATE10

Date acquired: 8/19/2020 11:53:48 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200819\20200819_014.lcd
Vial: 13 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE10	8/19/2020 11:53:48 AM	1220253	47.31601	20200819_014	2.873	25.0000	1.0000	13
Sodium Perchlorate-18O4_IS	PERCHLORATE10	8/19/2020 11:53:48 AM	228123	1.00000	20200819_014	2.871	25.0000	1.0000	13

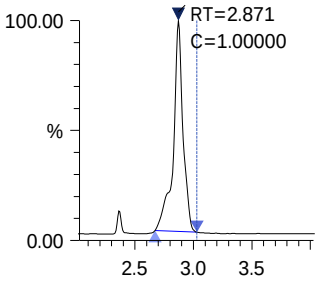
Perchlorate

Conc 47.31601
Area 1220253
Q 99.00>83.00 (-) 2.17e5



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 228123
ISTD 107.00>89.00 (-) 3.99e4



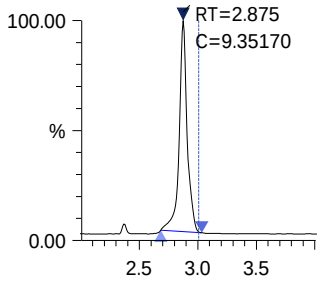
PERCHLORATEICV

Date acquired: 8/19/2020 12:09:35 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200819\20200819_016.lcd
Vial: 14 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATEICV	8/19/2020 12:09:35 PM	294031	9.35170	20200819_016	2.875	25.0000	1.0000	14
Sodium Perchlorate-18O4_IS	PERCHLORATEICV	8/19/2020 12:09:35 PM	278118	1.00000	20200819_016	2.873	25.0000	1.0000	14

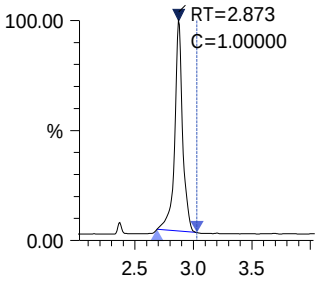
Perchlorate

Conc 9.35170
Area 294031
Q 99.00>83.00 (-) 6.27e4



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 278118
ISTD 107.00>89.00 (-) 5.98e4



Chromatograms and Selected Ion Monitoring

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 320, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

20200819

ALS Environmental

ICAL Date: 7/19/2020
Cal. Std. xp: 11/18/2020
ICAL ID: **EC2000022**

1st Review: Kneir
2nd Review: Hvan

Injection Log
LCMS01 -Shimadzu 8050

Mobile Phases **A:** 0.75% Formic Acid/Water 3100807-09 **B:** MeOH 3100802-01

			File Name	Acquisition Method	Dilution	R	Comments	Date/Time
1	PERCHLORATE1		20200819_005	Perchlorate6850b.lcm	1x	☒	3100806-05	8/19/2020 10:42
2	PERCHLORATE2		20200819_006	Perchlorate6850b.lcm	1x	☒	3100806-06	8/19/2020 10:50
3	PERCHLORATE3		20200819_007	Perchlorate6850b.lcm	1x	☒	3100806-07	8/19/2020 10:58
4	PERCHLORATE4		20200819_008	Perchlorate6850b.lcm	1x	☒	3100807-01	8/19/2020 11:06
5	PERCHLORATE5		20200819_009	Perchlorate6850b.lcm	1x	☒	3100807-02	8/19/2020 11:14
6	PERCHLORATE6		20200819_010	Perchlorate6850b.lcm	1x	☒	3100807-03	8/19/2020 11:22
7	PERCHLORATE7		20200819_011	Perchlorate6850b.lcm	1x	☒	3100807-04	8/19/2020 11:30
8	PERCHLORATE8		20200819_012	Perchlorate6850b.lcm	1x	☒	3100807-05	8/19/2020 11:38
9	PERCHLORATE9		20200819_013	Perchlorate6850b.lcm	1x	☒	3100807-06	8/19/2020 11:45
10	PERCHLORATE10		20200819_014	Perchlorate6850b.lcm	1x	☒	3100807-07	8/19/2020 11:53
11	PERCHLORATEICV		20200819_016	Perchlorate6850b.lcm	1x	☒	3100807-08	8/19/2020 12:09
12	LODV		20200819_017	Perchlorate6850b.lcm	1x	☒		8/19/2020 12:17
13	EQ2000337-01		20200819_019	Perchlorate6850b.lcm	1x	☒		8/19/2020 12:38
14	EQ2000337-02		20200819_020	Perchlorate6850b.lcm	1x	☒		8/19/2020 12:46
15	EQ2000337-03		20200819_021	Perchlorate6850b.lcm	1x	☒		8/19/2020 12:53
16	E2000723-001		20200819_022	Perchlorate6850b.lcm	1x	☒		8/19/2020 13:01
17	PERCHLORATE7		20200819_023	Perchlorate6850b.lcm	1x	☒	3100807-04	8/19/2020 13:09
18	E2000680-002X10		20200819_024	Perchlorate6850b.lcm	10x	☒		8/19/2020 13:17
19	E2000680-004X2		20200819_025	Perchlorate6850b.lcm	2x	☒		8/19/2020 13:25
20	E2000680-007X10		20200819_026	Perchlorate6850b.lcm	10x	☒		8/19/2020 13:33
21	E2000680-009X10		20200819_027	Perchlorate6850b.lcm	10x	☒		8/19/2020 13:41
22	E2000680-010X10		20200819_028	Perchlorate6850b.lcm	10x	☒		8/19/2020 13:49
23	E2000680-011X10		20200819_029	Perchlorate6850b.lcm	10x	☒		8/19/2020 13:57
24	EQ2000327-01		20200819_030	Perchlorate6850b.lcm	1x	☒		8/19/2020 14:04
25	EQ2000327-02		20200819_031	Perchlorate6850b.lcm	1x	☒		8/19/2020 14:12
26	EQ2000327-03		20200819_033	Perchlorate6850b.lcm	1x	☒		8/19/2020 14:21
27	PERCHLORATE7		20200819_034	Perchlorate6850b.lcm	1x	☒	3100807-04	8/19/2020 14:29
28	E2000735-001		20200819_035	Perchlorate6850b.lcm	1x	☒		8/19/2020 14:37
29	E2000735-002		20200819_036	Perchlorate6850b.lcm	1x	☒		8/19/2020 14:45
30	E2000735-003		20200819_037	Perchlorate6850b.lcm	1x	☒		8/19/2020 14:53
31	E2000735-004		20200819_038	Perchlorate6850b.lcm	1x	☒		8/19/2020 15:01
32	E2000735-005		20200819_039	Perchlorate6850b.lcm	1x	☒		8/19/2020 15:09
33	E2000735-006		20200819_040	Perchlorate6850b.lcm	1x	☒		8/19/2020 15:16
34	E2000735-007		20200819_041	Perchlorate6850b.lcm	1x	☒		8/19/2020 15:24
35	E2000735-008		20200819_042	Perchlorate6850b.lcm	1x	☒		8/19/2020 15:32
36	E2000735-009		20200819_043	Perchlorate6850b.lcm	1x	☒		8/19/2020 15:44
37	PERCHLORATE7		20200819_044	Perchlorate6850b.lcm	1x	☒	3100807-04	8/19/2020 15:52
38	E2000735-010		20200819_045	Perchlorate6850b.lcm	1x	☒		8/19/2020 16:00
39	E2000735-011		20200819_046	Perchlorate6850b.lcm	1x	☒		8/19/2020 16:08
40	E2000735-013		20200819_047	Perchlorate6850b.lcm	1x	☒		8/19/2020 16:16
41	E2000735-014		20200819_048	Perchlorate6850b.lcm	1x	☒		8/19/2020 16:24
42	E2000735-015		20200819_049	Perchlorate6850b.lcm	1x	☒		8/19/2020 16:32
43	E2000735-016		20200819_050	Perchlorate6850b.lcm	1x	☒		8/19/2020 16:40
44	E2000735-017		20200819_051	Perchlorate6850b.lcm	1x	☒		8/19/2020 16:47
45	E2000735-018		20200819_052	Perchlorate6850b.lcm	1x	☒		8/19/2020 16:55
46	E2000735-019		20200819_053	Perchlorate6850b.lcm	1x	☒		8/19/2020 17:03
47	PERCHLORATE7		20200819_054	Perchlorate6850b.lcm	1x	☒	3100807-04	8/19/2020 17:11
48	EQ2000339-01		20200819_055	Perchlorate6850b.lcm	1x	☒		8/19/2020 17:19
49	EQ2000339-02		20200819_056	Perchlorate6850b.lcm	1x	☒		8/19/2020 17:27
50	EQ2000339-03		20200819_057	Perchlorate6850b.lcm	1x	☒		8/19/2020 17:35
51	E2000712-001		20200819_058	Perchlorate6850b.lcm	1x	☒		8/19/2020 17:43
52	E2000712-002		20200819_059	Perchlorate6850b.lcm	1x	☒		8/19/2020 17:51
53	E2000712-003		20200819_060	Perchlorate6850b.lcm	1x	☒		8/19/2020 17:59
54	IB		20200819_061	Perchlorate6850b.lcm	1x	☒		8/19/2020 18:08
55	IB		20200819_062	Perchlorate6850b.lcm	1x	☒		8/19/2020 18:16
56	IB		20200819_063	Perchlorate6850b.lcm	1x	☒		8/19/2020 18:24
57	IB		20200819_064	Perchlorate6850b.lcm	1x	☒		8/19/2020 18:32
58	PERCHLORATE7		20200819_065	Perchlorate6850b.lcm	1x	☒	3100807-04	8/19/2020 18:40
59	E2000712-004		20200819_066	Perchlorate6850b.lcm	1x	☒		8/19/2020 18:48
60	E2000712-005		20200819_067	Perchlorate6850b.lcm	1x	☒		8/19/2020 18:56
61	E2000712-006		20200819_068	Perchlorate6850b.lcm	1x	☒		8/19/2020 19:04

20200819

1st Review: Kneir
2nd Review: Hvan

Injection Log
LCMS01 -Shimadzu 8050

ICAL Date: 7/19/2020
Cal. Std. xp: 11/18/2020
ICAL ID: **EC2000022**

Mobile Phases **A:** 0.75% Formic Acid/Water 3100807-09 **B:** MeOH 3100802-01

			File Name	Acquisition Method	Dilution	R	Comments	Date/Time
62	E2000712-007		20200819_069	Perchlorate6850b.lcm	1x	☒		8/19/2020 19:12
63	E2000694-012		20200819_070	Perchlorate6850b.lcm	1x	☒		8/19/2020 19:19
64	E2000694-012MS		20200819_071	Perchlorate6850b.lcm	1x	☒		8/19/2020 19:27
65	E2000694-012MSD		20200819_072	Perchlorate6850b.lcm	1x	☒		8/19/2020 19:35
66	E2000711-001		20200819_073	Perchlorate6850b.lcm	1x	☒		8/19/2020 19:43
67	E2000711-002		20200819_074	Perchlorate6850b.lcm	1x	☒		8/19/2020 19:51
68	E2000724-001		20200819_075	Perchlorate6850b.lcm	1x	☒		8/19/2020 19:59
69	PERCHLORATE7		20200819_076	Perchlorate6850b.lcm	1x	☒	3100807-04	8/19/2020 20:07
70	E2000724-002		20200819_077	Perchlorate6850b.lcm	1x	☒		8/19/2020 20:15
71	E2000724-003		20200819_078	Perchlorate6850b.lcm	1x	☒		8/19/2020 20:22
72	E2000724-004		20200819_079	Perchlorate6850b.lcm	1x	☒		8/19/2020 20:30
73	E2000728-001		20200819_080	Perchlorate6850b.lcm	1x	☒		8/19/2020 20:38
74	E2000728-002		20200819_081	Perchlorate6850b.lcm	1x	☒		8/19/2020 20:46
75	E2000729-001		20200819_082	Perchlorate6850b.lcm	1x	☒		8/19/2020 20:54
76	R2006493-001		20200819_083	Perchlorate6850b.lcm	1x	☒		8/19/2020 21:02
77	R2006493-003		20200819_084	Perchlorate6850b.lcm	1x	☒		8/19/2020 21:10
78	R2006493-005		20200819_085	Perchlorate6850b.lcm	1x	☒		8/19/2020 21:18
79	R2006493-007		20200819_086	Perchlorate6850b.lcm	1x	☒		8/19/2020 21:26
80	PERCHLORATE7		20200819_087	Perchlorate6850b.lcm	1x	☒	3100807-04	8/19/2020 21:33
81	R2006493-009		20200819_088	Perchlorate6850b.lcm	1x	☒		8/19/2020 21:41
82	R2006493-011		20200819_089	Perchlorate6850b.lcm	1x	☒		8/19/2020 21:49
83	R2006493-013		20200819_090	Perchlorate6850b.lcm	1x	☒		8/19/2020 21:57
84	R2006493-015		20200819_091	Perchlorate6850b.lcm	1x	☒		8/19/2020 22:05
85	PERCHLORATE7		20200819_092	Perchlorate6850b.lcm	1x	☒	3100807-04	8/19/2020 22:13
86	EQ2000338-01		20200819_093	Perchlorate6850b.lcm	1x	☒		8/19/2020 22:21
87	EQ2000338-02		20200819_094	Perchlorate6850b.lcm	1x	☒		8/19/2020 22:29
88	EQ2000338-03		20200819_095	Perchlorate6850b.lcm	1x	☒		8/19/2020 22:37
89	EQ2000338-04		20200819_096	Perchlorate6850b.lcm	1x	☒		8/19/2020 22:44
90	EQ2000338-05		20200819_097	Perchlorate6850b.lcm	1x	☒		8/19/2020 22:52
91	R2006532-001		20200819_098	Perchlorate6850b.lcm	1x	☒		8/19/2020 23:00
92	R2006532-003		20200819_099	Perchlorate6850b.lcm	1x	☒		8/19/2020 23:08
93	R2006532-005		20200819_100	Perchlorate6850b.lcm	1x	☒		8/19/2020 23:16
94	R2006532-007		20200819_101	Perchlorate6850b.lcm	1x	☒		8/19/2020 23:24
95	R2006532-009		20200819_102	Perchlorate6850b.lcm	1x	☒		8/19/2020 23:32
96	PERCHLORATE7		20200819_103	Perchlorate6850b.lcm	1x	☒	3100807-04	8/19/2020 23:40
97	R2006532-011		20200819_104	Perchlorate6850b.lcm	1x	☒		8/19/2020 23:47
98	R2006555-002		20200819_105	Perchlorate6850b.lcm	1x	☒		8/19/2020 23:55
99	R2006555-004		20200819_106	Perchlorate6850b.lcm	1x	☒		8/20/2020 0:03
100	R2006555-006		20200819_107	Perchlorate6850b.lcm	1x	☒		8/20/2020 0:11
101	R2006555-008		20200819_108	Perchlorate6850b.lcm	1x	☒		8/20/2020 0:19
102	R2006555-010		20200819_109	Perchlorate6850b.lcm	1x	☒		8/20/2020 0:27
103	R2006555-012		20200819_110	Perchlorate6850b.lcm	1x	☒		8/20/2020 0:35
104	R2006617-001		20200819_111	Perchlorate6850b.lcm	1x	☒		8/20/2020 0:43
105	R2006617-003		20200819_112	Perchlorate6850b.lcm	1x	☒		8/20/2020 0:50
106	R2006617-005		20200819_113	Perchlorate6850b.lcm	1x	☒		8/20/2020 0:58
107	PERCHLORATE7		20200819_114	Perchlorate6850b.lcm	1x	☒	3100807-04	8/20/2020 1:06
108	R2006617-007		20200819_115	Perchlorate6850b.lcm	1x	☒		8/20/2020 1:14
109	R2006617-009		20200819_116	Perchlorate6850b.lcm	1x	☒		8/20/2020 1:22
110	R2006617-010		20200819_117	Perchlorate6850b.lcm	1x	☒		8/20/2020 1:30
111	PERCHLORATE7		20200819_118	Perchlorate6850b.lcm	1x	☒	3100807-04	8/20/2020 1:38

20200820

1st Review: Kneir
2nd Review: Hvan

Injection Log
LCMS01 -Shimadzu 8050

ICAL Date: 7/19/2020
Cal. Std. xp: 11/18/2020
ICAL ID: **EC2000022**

Mobile Phases **A:** 0.75% Formic Acid/Water 3100807-09 **B:** MeOH 3100802-01

			File Name	Acquisition Method	Dilution	R	Comments	Date/Time
1	null		20200820_001	Perchlorate6850b.lcm	1x	☒		8/20/2020 9:48
2	null		20200820_002	Perchlorate6850b.lcm	1x	☒		8/20/2020 9:52
3	IB		20200820_003	Perchlorate6850b.lcm	1x	☒		8/20/2020 9:58
4	IB		20200820_004	Perchlorate6850b.lcm	1x	☒		8/20/2020 10:06
5	LODV		20200820_005	Perchlorate6850b.lcm	1x	☒		8/20/2020 10:14
6	PERCHLORATE7		20200820_006	Perchlorate6850b.lcm	1x	☒	3100807-04	8/20/2020 10:21
7	E2000735-002X2		20200820_007	Perchlorate6850b.lcm	2x	☒		8/20/2020 10:29
8	E2000735-003X10		20200820_008	Perchlorate6850b.lcm	10x	☒		8/20/2020 10:37
9	E2000735-004X10		20200820_009	Perchlorate6850b.lcm	10x	☒		8/20/2020 10:45
10	E2000735-005X10		20200820_010	Perchlorate6850b.lcm	10x	☒		8/20/2020 10:53
11	E2000735-006X10		20200820_011	Perchlorate6850b.lcm	10x	☒		8/20/2020 11:01
12	E2000735-007X10		20200820_012	Perchlorate6850b.lcm	10x	☒		8/20/2020 11:09
13	E2000735-008X2		20200820_013	Perchlorate6850b.lcm	2x	☒		8/20/2020 11:17
14	E2000735-010X10		20200820_014	Perchlorate6850b.lcm	10x	☒		8/20/2020 11:25
15	E2000735-011X10		20200820_015	Perchlorate6850b.lcm	10x	☒		8/20/2020 11:32
16	E2000735-014X10		20200820_016	Perchlorate6850b.lcm	10x	☒		8/20/2020 11:40
17	PERCHLORATE7		20200820_017	Perchlorate6850b.lcm	1x	☒	3100807-04	8/20/2020 11:48
18	E2000735-015X10		20200820_018	Perchlorate6850b.lcm	10x	☒		8/20/2020 11:56
19	E2000735-016X10		20200820_019	Perchlorate6850b.lcm	10x	☒		8/20/2020 12:04
20	E2000735-017		20200820_020	Perchlorate6850b.lcm	1x	☒		8/20/2020 12:12
21	E2000735-018		20200820_021	Perchlorate6850b.lcm	1x	☒		8/20/2020 12:20
22	E2000735-019		20200820_022	Perchlorate6850b.lcm	1x	☒		8/20/2020 12:28
23	EQ2000339-01		20200820_023	Perchlorate6850b.lcm	1x	☒		8/20/2020 12:36
24	EQ2000339-02		20200820_024	Perchlorate6850b.lcm	1x	☒		8/20/2020 12:43
25	EQ2000339-03		20200820_025	Perchlorate6850b.lcm	1x	☒		8/20/2020 12:51
26	E2000712-001X10		20200820_026	Perchlorate6850b.lcm	10x	☒		8/20/2020 12:59
27	E2000712-002X10		20200820_027	Perchlorate6850b.lcm	10x	☒		8/20/2020 13:07
28	PERCHLORATE7		20200820_028	Perchlorate6850b.lcm	1x	☒	3100807-04	8/20/2020 13:16
29	R2006617-009X10		20200820_029	Perchlorate6850b.lcm	10x	☒		8/20/2020 13:24
30	R2006493-005X2		20200820_030	Perchlorate6850b.lcm	2x	☒		8/20/2020 13:32
31	R2006493-007X10		20200820_031	Perchlorate6850b.lcm	10x	☒		8/20/2020 13:40
32	E2000735-008X10		20200820_032	Perchlorate6850b.lcm	10x	☒		8/20/2020 13:48
33	E2000711-002X10		20200820_033	Perchlorate6850b.lcm	10x	☒		8/20/2020 13:55
34	E2000724-001X1000		20200820_034	Perchlorate6850b.lcm	1000x	☒		8/20/2020 14:03
35	E2000724-003X100		20200820_035	Perchlorate6850b.lcm	100x	☒		8/20/2020 14:11
36	E2000724-004X1000		20200820_036	Perchlorate6850b.lcm	1000x	☒		8/20/2020 14:19
37	E2000728-001X10		20200820_037	Perchlorate6850b.lcm	10x	☒		8/20/2020 14:27
38	PERCHLORATE7		20200820_038	Perchlorate6850b.lcm	1x	☒	3100807-04	8/20/2020 14:37

20200821

1st Review: Grivera
2nd Review: Hvan

Injection Log
LCMS01 -Shimadzu 8050

ICAL Date: 7/19/2020
Cal. Std. xp: 11/18/2020
ICAL ID: **EC2000022**

Mobile Phases **A:** 0.75% Formic Acid/Water 3100807-09 **B:** MeOH 3100802-01

			File Name	Acquisition Method	Dilution	R	Comments	Date/Time
1	null		20200821_001	Perchlorate6850b.lcm	1x	☒		8/21/2020 9:44
2	null		20200821_002	Perchlorate6850b.lcm	1x	☒		8/21/2020 9:49
3	IB		20200821_003	Perchlorate6850b.lcm	1x	☒		8/21/2020 9:54
4	IB		20200821_004	Perchlorate6850b.lcm	1x	☒		8/21/2020 10:02
5	LODV		20200821_005	Perchlorate6850b.lcm	1x	☒		8/21/2020 10:10
6	PERCHLORATE7		20200821_006	Perchlorate6850b.lcm	1x	☒	3100807-04	8/21/2020 10:18
7	E2000735-012		20200821_007	Perchlorate6850b.lcm	10x	☒		8/21/2020 10:26
8	EQ2000339-004		20200821_008	Perchlorate6850b.lcm	10x	☒		8/21/2020 10:34
9	EQ2000339-005		20200821_009	Perchlorate6850b.lcm	10x	☒		8/21/2020 10:58
10	PERCHLORATE7		20200821_010	Perchlorate6850b.lcm	1x	☒	3100807-04	8/21/2020 11:06
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								
31								
32								
33								
34								
35								
36								
37								
38								
39								
40								
41								
42								
43								
44								
45								
46								
47								

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000735
Project:	HS20071328	**Date Analyzed:**	8/19/20

Continuing Calibration Verification Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method:	6850	**Calibration Date:**	8/19/20
File ID:	I:\LCMS01\DATA\20200819\20200819_023	**Calibration ID:**	EC2000022
		Analysis Lot:	691702
		Units:	ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Perchlorate	10.0	9.74	0.1131	0.1101	-2.6	NA	± 15 %	Average RF

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000735
Project:	HS20071328	**Date Analyzed:**	8/19/20

Continuing Calibration Verification Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method:	6850	**Calibration Date:**	8/19/20
File ID:	I:\LCMS01\DATA\20200819\20200819_034	**Calibration ID:**	EC2000022
		Analysis Lot:	691702
		Units:	ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Perchlorate	10.0	9.56	0.1131	0.1081	-4.4	NA	± 15 %	Average RF

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000735
Project:	HS20071328	**Date Analyzed:**	8/19/20

Continuing Calibration Verification Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method:	6850	**Calibration Date:**	8/19/20
File ID:	I:\LCMS01\DATA\20200819\20200819_044	**Calibration ID:**	EC2000022
		Analysis Lot:	691702
		Units:	ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Perchlorate	10.0	9.41	0.1131	0.1064	-5.9	NA	± 15 %	Average RF

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS20071328

Service Request: E2000735
Date Analyzed: 8/19/20

Continuing Calibration Verification Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
File ID: I:\LCMS01\DATA\20200819\20200819_054

Calibration Date: 8/19/20
Calibration ID: EC2000022
Analysis Lot: 691702
Units: ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Perchlorate	10.0	9.68	0.1131	0.1094	-3.2	NA	± 15 %	Average RF

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS20071328

Service Request: E2000735
Date Analyzed: 8/19/20

Continuing Calibration Verification Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
File ID: I:\LCMS01\DATA\20200819\20200819_065

Calibration Date: 8/19/20
Calibration ID: EC2000022
Analysis Lot: 691702
Units: ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Perchlorate	10.0	9.60	0.1131	0.1085	-4.0	NA	± 15 %	Average RF

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000735
Project:	HS20071328	**Date Analyzed:**	8/19/20

Continuing Calibration Verification Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method:	6850	**Calibration Date:**	8/19/20
File ID:	I:\LCMS01\DATA\20200819\20200819_076	**Calibration ID:**	EC2000022
		Analysis Lot:	691702
		Units:	ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Perchlorate	10.0	10.9	0.1131	0.1227	8.5	NA	± 15 %	Average RF

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000735
Project:	HS20071328	**Date Analyzed:**	8/19/20

Continuing Calibration Verification Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method:	6850	**Calibration Date:**	8/19/20
File ID:	I:\LCMS01\DATA\20200819\20200819_087	**Calibration ID:**	EC2000022
		Analysis Lot:	691702
		Units:	ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Perchlorate	10.0	9.42	0.1131	0.1064	-5.8	NA	± 15 %	Average RF

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000735
Project:	HS20071328	**Date Analyzed:**	8/19/20

Continuing Calibration Verification Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method:	6850	**Calibration Date:**	8/19/20
File ID:	I:\LCMS01\DATA\20200819\20200819_092	**Calibration ID:**	EC2000022
		Analysis Lot:	691702
		Units:	ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Perchlorate	10.0	9.40	0.1131	0.1063	-6.0	NA	± 15 %	Average RF

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000735
Project:	HS20071328	**Date Analyzed:**	8/19/20

Continuing Calibration Verification Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method:	6850	**Calibration Date:**	8/19/20
File ID:	I:\LCMS01\DATA\20200819\20200819_103	**Calibration ID:**	EC2000022
		Analysis Lot:	691702
		Units:	ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Perchlorate	10.0	9.43	0.1131	0.1066	-5.7	NA	± 15 %	Average RF

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000735
Project:	HS20071328	**Date Analyzed:**	8/20/20

Continuing Calibration Verification Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method:	6850	**Calibration Date:**	8/19/20
File ID:	I:\LCMS01\DATA\20200819\20200819_114	**Calibration ID:**	EC2000022
		Analysis Lot:	691702
		Units:	ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Perchlorate	10.0	9.97	0.1131	0.1127	-0.3	NA	± 15 %	Average RF

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS20071328

Service Request: E2000735
Date Analyzed: 8/20/20

Continuing Calibration Verification Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
File ID: I:\LCMS01\DATA\20200819\20200819_118

Calibration Date: 8/19/20
Calibration ID: EC2000022
Analysis Lot: 691702
Units: ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Perchlorate	10.0	9.28	0.1131	0.1049	-7.2	NA	± 15 %	Average RF

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000735
Project:	HS20071328	**Date Analyzed:**	8/20/20

Continuing Calibration Verification Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method:	6850	**Calibration Date:**	8/19/20
File ID:	I:\LCMS01\DATA\20200820\20200820_006	**Calibration ID:**	EC2000022
		Analysis Lot:	691880
		Units:	ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Perchlorate	10.0	9.53	0.1131	0.1077	-4.7	NA	± 15 %	Average RF

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS20071328

Service Request: E2000735
Date Analyzed: 8/20/20

Continuing Calibration Verification Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
File ID: I:\LCMS01\DATA\20200820\20200820_017

Calibration Date: 8/19/20
Calibration ID: EC2000022
Analysis Lot: 691880
Units: ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Perchlorate	10.0	9.25	0.1131	0.1046	-7.5	NA	± 15 %	Average RF

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000735
Project:	HS20071328	**Date Analyzed:**	8/20/20

Continuing Calibration Verification Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method:	6850	**Calibration Date:**	8/19/20
File ID:	I:\LCMS01\DATA\20200820\20200820_028	**Calibration ID:**	EC2000022
		Analysis Lot:	691880
		Units:	ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Perchlorate	10.0	9.37	0.1131	0.1059	-6.3	NA	± 15 %	Average RF

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000735
Project:	HS20071328	**Date Analyzed:**	8/20/20

Continuing Calibration Verification Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method:	6850	**Calibration Date:**	8/19/20
File ID:	I:\LCMS01\DATA\20200820\20200820_038	**Calibration ID:**	EC2000022
		Analysis Lot:	691880
		Units:	ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Perchlorate	10.0	9.63	0.1131	0.1088	-3.7	NA	± 15 %	Average RF

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000735
Project:	HS20071328	**Date Analyzed:**	8/19/20 13:09

Internal Standard Area and RT Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

File ID:	I:\LCMS01\DATA\20200819\20200819_023	**Lab Code:**	EQ2000350-01
Instrument ID:	E-LCMS-01	**Analysis Lot:**	691702
Analytical Method:	6850	**Signal ID:**	1

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	284,293	2.87
	Upper Limit ==>	426,440	4.87
	Lower Limit ==>	142,147	0.87
Associated Analyses			
Continuing Calibration Verification	EQ2000350-01	275,008	2.87
Method Blank	EQ2000327-01	296,394	2.87
Lab Control Sample	EQ2000327-02	300,790	2.87
Duplicate Lab Control Sample	EQ2000327-03	332,996	2.82

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

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000735
Project:	HS20071328	**Date Analyzed:**	8/19/20 14:29

Internal Standard Area and RT Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

File ID:	I:\LCMS01\DATA\20200819\20200819_034	**Lab Code:**	EQ2000350-02
Instrument ID:	E-LCMS-01	**Analysis Lot:**	691702
Analytical Method:	6850	**Signal ID:**	1

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	284,293	2.87
	Upper Limit ==>	426,440	4.87
	Lower Limit ==>	142,147	0.87
Associated Analyses			
Continuing Calibration Verification	EQ2000350-02	259,146	2.80
16WW32-200727	E2000735-001	197,622	2.87
16WW23-200727	E2000735-009	176,240	2.74

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

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000735
Project:	HS20071328	**Date Analyzed:**	8/19/20 15:52

Internal Standard Area and RT Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

File ID:	I:\LCMS01\DATA\20200819\20200819_044	**Lab Code:**	EQ2000350-03
Instrument ID:	E-LCMS-01	**Analysis Lot:**	691702
Analytical Method:	6850	**Signal ID:**	1

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	284,293	2.87
	Upper Limit ==>	426,440	4.87
	Lower Limit ==>	142,147	0.87
Associated Analyses			
Continuing Calibration Verification	EQ2000350-03	257,649	2.76
16EW08-200728	E2000735-013	175,334	2.85

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

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000735
Project:	HS20071328	**Date Analyzed:**	8/19/20 17:11

Internal Standard Area and RT Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

File ID:	I:\LCMS01\DATA\20200819\20200819_054	**Lab Code:**	EQ2000350-04
Instrument ID:	E-LCMS-01	**Analysis Lot:**	691702
Analytical Method:	6850	**Signal ID:**	1

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	284,293	2.87
	Upper Limit ==>	426,440	4.87
	Lower Limit ==>	142,147	0.87
Associated Analyses			
Continuing Calibration Verification	EQ2000350-04	178,952	2.84

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

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000735
Project:	HS20071328	**Date Analyzed:**	8/19/20 18:40

Internal Standard Area and RT Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

File ID:	I:\LCMS01\DATA\20200819\20200819_065	**Lab Code:**	EQ2000350-05
Instrument ID:	E-LCMS-01	**Analysis Lot:**	691702
Analytical Method:	6850	**Signal ID:**	1

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	284,293	2.87
	Upper Limit ==>	426,440	4.87
	Lower Limit ==>	142,147	0.87
Associated Analyses			
Continuing Calibration Verification	EQ2000350-05	224,737	2.87

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

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000735
Project:	HS20071328	**Date Analyzed:**	8/19/20 20:07

Internal Standard Area and RT Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

File ID:	I:\LCMS01\DATA\20200819\20200819_076	**Lab Code:**	EQ2000350-06
Instrument ID:	E-LCMS-01	**Analysis Lot:**	691702
Analytical Method:	6850	**Signal ID:**	1

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	284,293	2.87
	Upper Limit ==>	426,440	4.87
	Lower Limit ==>	142,147	0.87
Associated Analyses			
Continuing Calibration Verification	EQ2000350-06	216,860	2.87

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

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000735
Project:	HS20071328	**Date Analyzed:**	8/19/20 21:33

Internal Standard Area and RT Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

File ID:	I:\LCMS01\DATA\20200819\20200819_087	**Lab Code:**	EQ2000350-07
Instrument ID:	E-LCMS-01	**Analysis Lot:**	691702
Analytical Method:	6850	**Signal ID:**	1

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	284,293	2.87
	Upper Limit ==>	426,440	4.87
	Lower Limit ==>	142,147	0.87
Associated Analyses			
Continuing Calibration Verification	EQ2000350-07	220,049	2.88

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

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000735
Project:	HS20071328	**Date Analyzed:**	8/19/20 22:13

Internal Standard Area and RT Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

File ID:	I:\LCMS01\DATA\20200819\20200819_092	**Lab Code:**	EQ2000350-08
Instrument ID:	E-LCMS-01	**Analysis Lot:**	691702
Analytical Method:	6850	**Signal ID:**	1

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	284,293	2.87
	Upper Limit ==>	426,440	4.87
	Lower Limit ==>	142,147	0.87
Associated Analyses			
Continuing Calibration Verification	EQ2000350-08	234,006	2.87

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

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000735
Project:	HS20071328	**Date Analyzed:**	8/19/20 23:40

Internal Standard Area and RT Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

File ID:	I:\LCMS01\DATA\20200819\20200819_103	**Lab Code:**	EQ2000350-09
Instrument ID:	E-LCMS-01	**Analysis Lot:**	691702
Analytical Method:	6850	**Signal ID:**	1

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	284,293	2.87
	Upper Limit ==>	426,440	4.87
	Lower Limit ==>	142,147	0.87
Associated Analyses			
Continuing Calibration Verification	EQ2000350-09	215,258	2.87

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

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000735
Project:	HS20071328	**Date Analyzed:**	8/20/20 01:06

Internal Standard Area and RT Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

File ID:	I:\LCMS01\DATA\20200819\20200819_114	**Lab Code:**	EQ2000350-10
Instrument ID:	E-LCMS-01	**Analysis Lot:**	691702
Analytical Method:	6850	**Signal ID:**	1

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	284,293	2.87
	Upper Limit ==>	426,440	4.87
	Lower Limit ==>	142,147	0.87
Associated Analyses			
Continuing Calibration Verification	EQ2000350-10	215,703	2.87

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

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000735
Project:	HS20071328	**Date Analyzed:**	8/20/20 01:38

Internal Standard Area and RT Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

File ID:	I:\LCMS01\DATA\20200819\20200819_118	**Lab Code:**	EQ2000350-11
Instrument ID:	E-LCMS-01	**Analysis Lot:**	691702
Analytical Method:	6850	**Signal ID:**	1

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	284,293	2.87
	Upper Limit ==>	426,440	4.87
	Lower Limit ==>	142,147	0.87
Associated Analyses			
Continuing Calibration Verification	EQ2000350-11	207,196	2.87

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

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000735
Project:	HS20071328	**Date Analyzed:**	8/20/20 10:21

Internal Standard Area and RT Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

File ID:	I:\LCMS01\DATA\20200820\20200820_006	**Lab Code:**	EQ2000352-01
Instrument ID:	E-LCMS-01	**Analysis Lot:**	691880
Analytical Method:	6850	**Signal ID:**	1

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	284,293	2.87
	Upper Limit ==>	426,440	4.87
	Lower Limit ==>	142,147	0.87
Associated Analyses			
Continuing Calibration Verification	EQ2000352-01	181,308	2.87
16WW31-200727	E2000735-002	143,004	2.88
16WW46-200727	E2000735-003	145,047	2.87
16WW46-200727-FD	E2000735-004	144,956	2.87
16WW49-200727	E2000735-005	142,280	2.87
16WW51-200727	E2000735-006	142,732	2.88
16WW51-200727-FD	E2000735-007	148,694	2.88
16WW24-200727	E2000735-010	143,668	2.88
16EW03-200728	E2000735-011	143,204	2.87
16EW04-200728	E2000735-014	144,973	2.87

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

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000735
Project:	HS20071328	**Date Analyzed:**	8/20/20 11:48

Internal Standard Area and RT Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

File ID:	I:\LCMS01\DATA\20200820\20200820_017	**Lab Code:**	EQ2000352-02
Instrument ID:	E-LCMS-01	**Analysis Lot:**	691880
Analytical Method:	6850	**Signal ID:**	1

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	284,293	2.87
	Upper Limit ==>	426,440	4.87
	Lower Limit ==>	142,147	0.87
Associated Analyses			
Continuing Calibration Verification	EQ2000352-02	175,978	2.87
16RW04-200728	E2000735-015	166,494	2.87
16IW03-200728	E2000735-016	175,140	2.88
16SW01-200728	E2000735-017	158,770	2.87
16SW02-200728	E2000735-018	175,766	2.87
16SW03-200728	E2000735-019	173,443	2.87

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

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000735
Project:	HS20071328	**Date Analyzed:**	8/20/20 13:16

Internal Standard Area and RT Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

File ID:	I:\LCMS01\DATA\20200820\20200820_028	**Lab Code:**	EQ2000352-03
Instrument ID:	E-LCMS-01	**Analysis Lot:**	691880
Analytical Method:	6850	**Signal ID:**	1

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	284,293	2.87
	Upper Limit ==>	426,440	4.87
	Lower Limit ==>	142,147	0.87
Associated Analyses			
Continuing Calibration Verification	EQ2000352-03	206,153	2.80
16RW01-200727	E2000735-008	164,153	2.87

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

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000735
Project:	HS20071328	**Date Analyzed:**	8/20/20 14:37

Internal Standard Area and RT Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

File ID:	I:\LCMS01\DATA\20200820\20200820_038	**Lab Code:**	EQ2000352-04
Instrument ID:	E-LCMS-01	**Analysis Lot:**	691880
Analytical Method:	6850	**Signal ID:**	1

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	284,293	2.87
	Upper Limit ==>	426,440	4.87
	Lower Limit ==>	142,147	0.87
Associated Analyses			
Continuing Calibration Verification	EQ2000352-04	185,825	2.87

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

ALS Group Houston

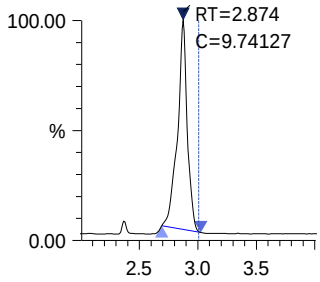
PERCHLORATE7

Date acquired: 8/19/2020 1:09:40 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200819\20200819_023.lcd
Vial: 4 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE7	8/19/2020 1:09:40 PM	302854	9.74127	20200819_023	2.874	25.0000	1.0000	4
Sodium Perchlorate-18O4_IS	PERCHLORATE7	8/19/2020 1:09:40 PM	275008	1.00000	20200819_023	2.873	25.0000	1.0000	4

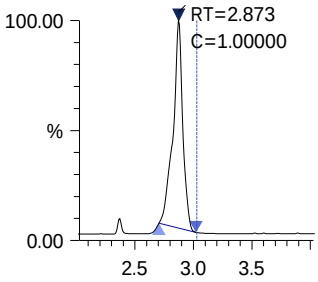
Perchlorate

Conc 9.74127
Area 302854
Q 99.00>83.00 (-) 5.31e4



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 275008
ISTD 107.00>89.00 (-) 4.85e4



ALS Group Houston

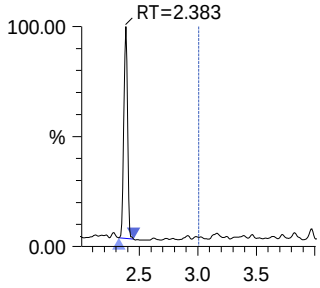
EQ2000327-01

Date acquired: 8/19/2020 2:04:56 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200819\20200819_030.lcd
Vial: 7 | Inj. Volume: 25.0000uL | Tray: 3

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	EQ2000327-01	8/19/2020 2:04:56 PM	----	----	20200819_030	----	25.0000	1.0000	7
Sodium Perchlorate-18O4_IS	EQ2000327-01	8/19/2020 2:04:56 PM	296394	1.00000	20200819_030	2.868	25.0000	1.0000	7

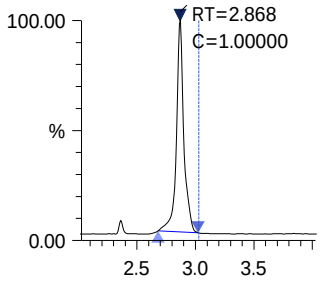
Perchlorate

Conc ----
Area ----
Q 99.00>83.00 (-) 1.78e3



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 296394
ISTD 107.00>89.00 (-) 6.75e4



ALS Group Houston

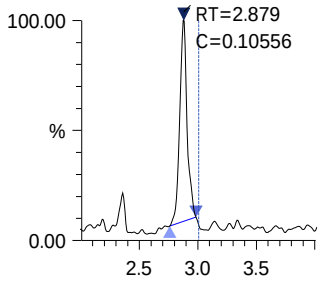
EQ2000327-02

Date acquired: 8/19/2020 2:12:48 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200819\20200819_031.lcd
Vial: 8 | Inj. Volume: 25.0000uL | Tray: 3

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	EQ2000327-02	8/19/2020 2:12:48 PM	3590	0.10556	20200819_031	2.879	25.0000	1.0000	8
Sodium Perchlorate-18O4_IS	EQ2000327-02	8/19/2020 2:12:48 PM	300790	1.00000	20200819_031	2.871	25.0000	1.0000	8

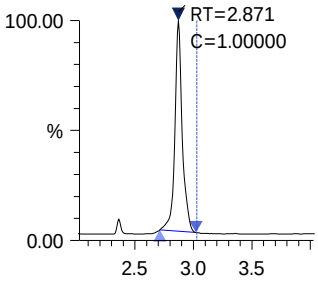
Perchlorate

Conc 0.10556
Area 3590
Q 99.00>83.00 (-) 8.63e2



Sodium Perchlorate-18O4 _IS

Conc 1.00000
Area 300790
ISTD 107.00>89.00 (-) 6.90e4



ALS Group Houston

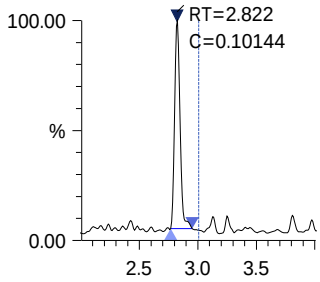
EQ2000327-03

Date acquired: 8/19/2020 2:21:27 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200819\20200819_033.lcd
Vial: 9 | Inj. Volume: 25.0000uL | Tray: 3

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	EQ2000327-03	8/19/2020 2:21:27 PM	3819	0.10144	20200819_033	2.822	25.0000	1.0000	9
Sodium Perchlorate-18O4_IS	EQ2000327-03	8/19/2020 2:21:27 PM	332996	1.00000	20200819_033	2.822	25.0000	1.0000	9

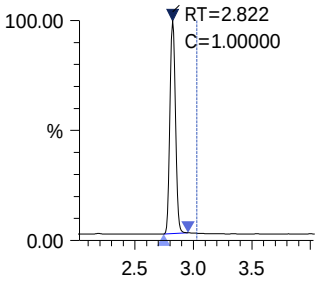
Perchlorate

Conc 0.10144
Area 3819
Q 99.00>83.00 (-) 1.19e3



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 332996
ISTD 107.00>89.00 (-) 1.04e5



ALS Group Houston

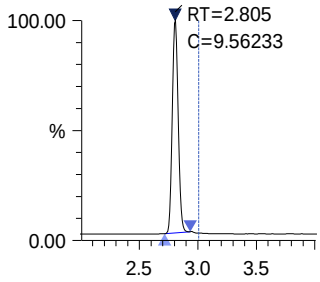
PERCHLORATE7

Date acquired: 8/19/2020 2:29:30 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200819\20200819_034.lcd
Vial: 4 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE7	8/19/2020 2:29:30 PM	280144	9.56233	20200819_034	2.805	25.0000	1.0000	4
Sodium Perchlorate-18O4_IS	PERCHLORATE7	8/19/2020 2:29:30 PM	259146	1.00000	20200819_034	2.803	25.0000	1.0000	4

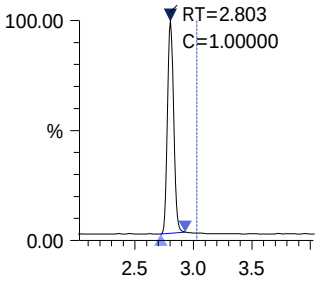
Perchlorate

Conc 9.56233
Area 280144
Q 99.00>83.00 (-) 7.85e4



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 259146
ISTD 107.00>89.00 (-) 7.19e4



ALS Group Houston

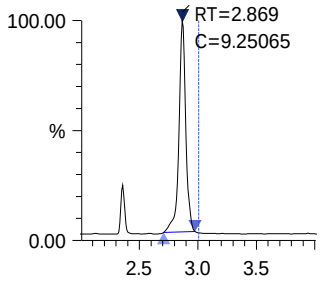
PERCHLORATE7

Date acquired: 8/20/2020 11:48:45 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200820\20200820_017.lcd
Vial: 4 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE7	8/20/2020 11:48:45 AM	184036	9.25065	20200820_017	2.869	25.0000	1.0000	4
Sodium Perchlorate-18O4_IS	PERCHLORATE7	8/20/2020 11:48:45 AM	175978	1.00000	20200820_017	2.868	25.0000	1.0000	4

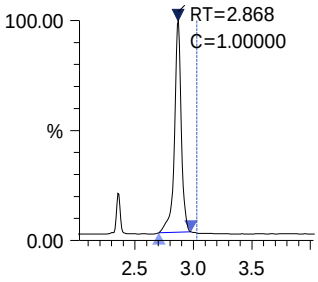
Perchlorate

Conc 9.25065
Area 184036
Q 99.00>83.00 (-) 4.55e4



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 175978
ISTD 107.00>89.00 (-) 4.39e4



ALS Group Houston

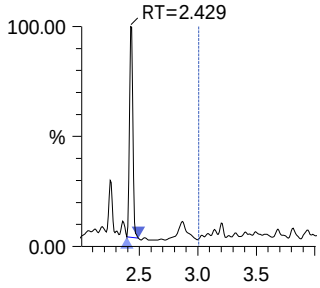
EQ2000339-01

Date acquired: 8/20/2020 12:36:05 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200820\20200820_023.lcd
Vial: 28 | Inj. Volume: 25.0000uL | Tray: 3

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	EQ2000339-01	8/20/2020 12:36:05 PM	----	----	20200820_023	----	25.0000	1.0000	28
Sodium Perchlorate-18O4_IS	EQ2000339-01	8/20/2020 12:36:05 PM	143789	1.00000	20200820_023	2.867	25.0000	1.0000	28

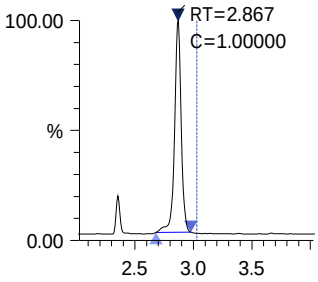
Perchlorate

Conc ----
Area ----
Q 99.00>83.00 (-) 7.23e2



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 143789
ISTD 107.00>89.00 (-) 3.65e4



ALS Group Houston

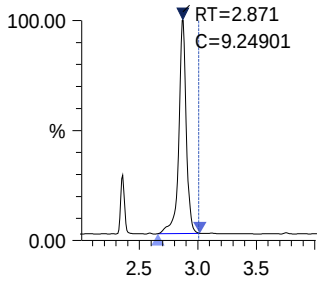
EQ2000339-02

Date acquired: 8/20/2020 12:43:58 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200820\20200820_024.lcd
Vial: 29 | Inj. Volume: 25.0000uL | Tray: 3

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	EQ2000339-02	8/20/2020 12:43:58 PM	149486	9.24901	20200820_024	2.871	25.0000	1.0000	29
Sodium Perchlorate-18O4_IS	EQ2000339-02	8/20/2020 12:43:58 PM	142966	1.00000	20200820_024	2.869	25.0000	1.0000	29

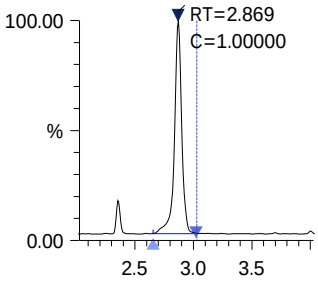
Perchlorate

Conc 9.24901
Area 149486
Q 99.00>83.00 (-) 3.38e4



Sodium Perchlorate-18O4 _IS

Conc 1.00000
Area 142966
ISTD 107.00>89.00 (-) 2.99e4



ALS Group Houston

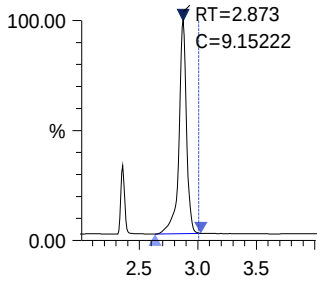
EQ2000339-03

Date acquired: 8/20/2020 12:51:52 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200820\20200820_025.lcd
Vial: 30 | Inj. Volume: 25.0000uL | Tray: 3

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	EQ2000339-03	8/20/2020 12:51:52 PM	149626	9.15222	20200820_025	2.873	25.0000	1.0000	30
Sodium Perchlorate-18O4_IS	EQ2000339-03	8/20/2020 12:51:52 PM	144614	1.00000	20200820_025	2.872	25.0000	1.0000	30

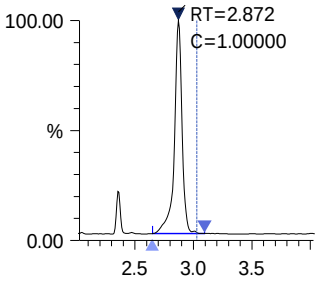
Perchlorate

Conc 9.15222
Area 149626
Q 99.00>83.00 (-) 3.33e4



Sodium Perchlorate-18O4 _IS

Conc 1.00000
Area 144614
ISTD 107.00>89.00 (-) 2.81e4



ALS Group Houston

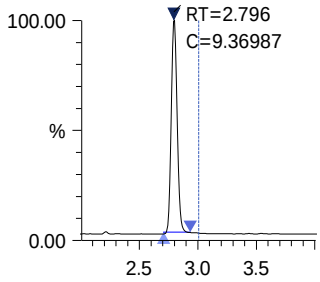
PERCHLORATE7

Date acquired: 8/20/2020 1:16:34 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200820\20200820_028.lcd
Vial: 4 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE7	8/20/2020 1:16:34 PM	218372	9.36987	20200820_028	2.796	25.0000	1.0000	4
Sodium Perchlorate-18O4_IS	PERCHLORATE7	8/20/2020 1:16:34 PM	206153	1.00000	20200820_028	2.795	25.0000	1.0000	4

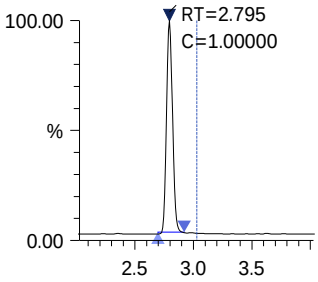
Perchlorate

Conc 9.36987
Area 218372
Q 99.00>83.00 (-) 6.25e4



Sodium Perchlorate-18O4 _IS

Conc 1.00000
Area 206153
ISTD 107.00>89.00 (-) 5.99e4



ALS Group Houston

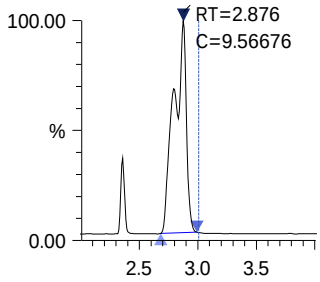
PERCHLORATE7

Date acquired: 8/21/2020 10:18:42 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200821\20200821_006.lcd
Vial: 4 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE7	8/21/2020 10:18:42 AM	205758	9.56676	20200821_006	2.876	25.0000	1.0000	4
Sodium Perchlorate-18O4_IS	PERCHLORATE7	8/21/2020 10:18:42 AM	190247	1.00000	20200821_006	2.874	25.0000	1.0000	4

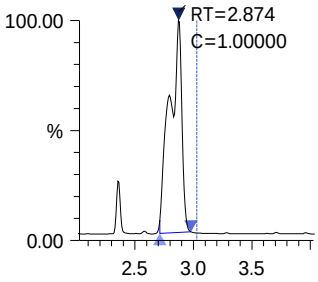
Perchlorate

Conc 9.56676
Area 205758
Q 99.00>83.00 (-) 2.82e4



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 190247
ISTD 107.00>89.00 (-) 2.63e4



ALS Group Houston

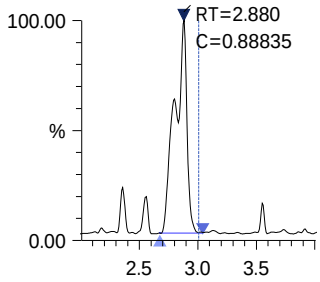
EQ2000339-004

Date acquired: 8/21/2020 10:34:30 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200821\20200821_008.lcd
Vial: 39 | Inj. Volume: 25.0000uL | Tray: 3

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	EQ2000339-004	8/21/2020 10:34:30 AM	18698	0.88835	20200821_008	2.880	25.0000	1.0000	39
Sodium Perchlorate-18O4_IS	EQ2000339-004	8/21/2020 10:34:30 AM	186180	1.00000	20200821_008	2.879	25.0000	1.0000	39

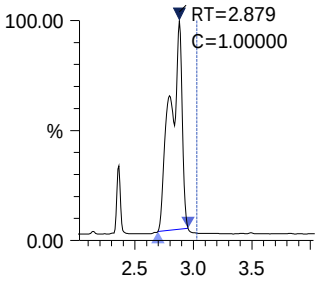
Perchlorate

Conc 0.88835
Area 18698
Q 99.00>83.00 (-) 2.55e3



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 186180
ISTD 107.00>89.00 (-) 2.72e4



ALS Group Houston

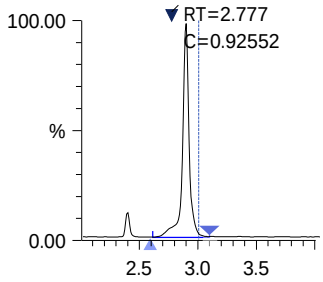
EQ2000339-005

Date acquired: 8/21/2020 10:58:20 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200821\20200821_009.lcd
Vial: 40 | Inj. Volume: 25.0000uL | Tray: 3

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	EQ2000339-005	8/21/2020 10:58:20 AM	22682	0.92552	20200821_009	2.777	25.0000	1.0000	40
Sodium Perchlorate-18O4_IS	EQ2000339-005	8/21/2020 10:58:20 AM	216777	1.00000	20200821_009	2.775	25.0000	1.0000	40

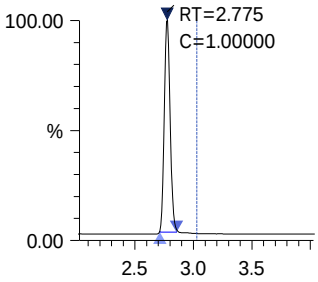
Perchlorate

Conc 0.92552
Area 22682
Q 99.00>83.00 (-) 5.57e3



Sodium Perchlorate-18O4 _IS

Conc 1.00000
Area 216777
ISTD 107.00>89.00 (-) 6.26e4



ALS Group Houston

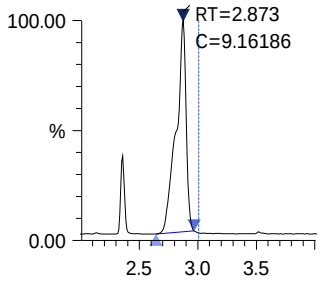
PERCHLORATE7

Date acquired: 8/21/2020 11:06:17 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200821\20200821_010.lcd
Vial: 4 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE7	8/21/2020 11:06:17 AM	192676	9.16186	20200821_010	2.873	25.0000	1.0000	4
Sodium Perchlorate-18O4_IS	PERCHLORATE7	8/21/2020 11:06:17 AM	186024	1.00000	20200821_010	2.872	25.0000	1.0000	4

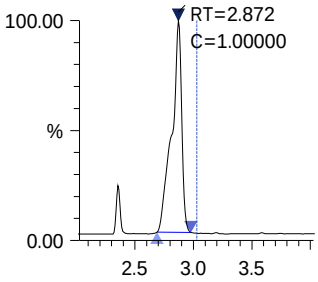
Perchlorate

Conc 9.16186
Area 192676
Q 99.00>83.00 (-) 3.27e4



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 186024
ISTD 107.00>89.00 (-) 3.17e4



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

August 27, 2020

Susan Huang
Aptim Environmental & Infrastucture, Inc.
2500 City West Blvd., Suite 1700
Houston, TX 77042

Work Order: **HS20080738**

Laboratory Results for: **Longhorn Army Ammunition Plant 16 July 2020**

Dear Susan Huang,

ALS Environmental received 3 sample(s) on Aug 18, 2020 for the analysis presented in the following report.

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

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

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

Sincerely,

Generated By: JUMOKE.LAWAL

RJ Modashia
Project Manager

ALS Houston, US Date: 27-Aug-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 July 2020
Work Order: HS20080738

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS20080738-01	16WW58-200817	Groundwater		17-Aug-2020 08:05	18-Aug-2020 09:50	☐
HS20080738-02	16WW57-200817	Groundwater		17-Aug-2020 09:20	18-Aug-2020 09:50	☐
HS20080738-03	Trip Blank-200817	Water	C&G-052219-11	17-Aug-2020 00:00	18-Aug-2020 09:50	☐

ALS Houston, US Date: 27-Aug-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 July 2020
Work Order: HS20080738

CASE NARRATIVE

Work Order Comments

- Analysis of Perchlorate was performed by ALS Houston TX, High Resolution. Laboratory. Final report attached.

  The analysis for TOC was subcontracted to ALS Environmental in Kelso WA. Final report attached.

GC Semivolatiles by Method RSK-175

Batch ID: R367340

Sample ID: 16WW57-200817 (HS20080738-02MS)

- The recovery of the Matrix Spike (MS) associated to this analyte was outside of the established control limits. However, the LCS was within control limits. The recovery of the MS may be due to sample matrix interference.

Sample ID: 16WW57-200817 (HS20080738-02MSD)

- The recovery of the Matrix Spike Duplicate (MSD) associated to this analyte was outside of the established control limits. However, the LCS was within control limits. The failed recovery of the MSD may be due to sample matrix interference.

GCMS Volatiles by Method SW8260

Batch ID: R367092

Sample ID: 16WW57-200817 (HS20080738-02MS)

- MS/MSD failed QC limits for some compounds.

WetChemistry by Method SM2320B

Batch ID: R367090

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

WetChemistry by Method SW9056

Batch ID: R367032

Sample ID: 16WW57-200817 (HS20080738-02 MS/MSD)

- MS/MSD reported at 5X dilution

Sample ID: 16WW57-200817 (HS20080738-02)

- Sample ran at 5X due to high concentration of Chloride

Sample ID: 16WW57-200817 (HS20080738-02MS)

- The MS and/or MSD recovery was outside of the control limits; however, the result in the parent sample is greater than 4x the spike amount. (Sulfate)

ALS Houston, US Date: 27-Aug-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 July 2020
Sample ID: 16WW58-200817
Collection Date: 17-Aug-2020 08:05

ANALYTICAL REPORT
WorkOrder:HS20080738
Lab ID:HS20080738-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	5.0	U	1.5	5.0	5.0	UG/L	5	19-Aug-2020 13:16
1,1-Dichloroethene	**2.9**	J	**1.0**	**2.5**	**5.0**	**UG/L**	5	19-Aug-2020 13:16
1,2-Dichloroethane	2.5	U	1.0	2.5	5.0	UG/L	5	19-Aug-2020 13:16
cis-1,2-Dichloroethene	**110**		**1.0**	**2.5**	**5.0**	**UG/L**	5	19-Aug-2020 13:16
Methylene chloride	5.0	U	2.0	5.0	10	UG/L	5	19-Aug-2020 13:16
Trichloroethene	**3,400**		**10**	**25**	**50**	**UG/L**	50	19-Aug-2020 14:28
Vinyl chloride	2.5	U	1.0	2.5	5.0	UG/L	5	19-Aug-2020 13:16
Surr: 1,2-Dichloroethane-d4	*87.6*			**0**	*81-118*	*%REC*	*5*	*19-Aug-2020 13:16*
Surr: 1,2-Dichloroethane-d4	*90.1*			**0**	*81-118*	*%REC*	*50*	*19-Aug-2020 14:28*
Surr: 4-Bromofluorobenzene	*94.6*			**0**	*85-114*	*%REC*	*5*	*19-Aug-2020 13:16*
Surr: 4-Bromofluorobenzene	*97.0*			**0**	*85-114*	*%REC*	*50*	*19-Aug-2020 14:28*
Surr: Dibromofluoromethane	*92.3*			**0**	*80-119*	*%REC*	*5*	*19-Aug-2020 13:16*
Surr: Dibromofluoromethane	*94.2*			**0**	*80-119*	*%REC*	*50*	*19-Aug-2020 14:28*
Surr: Toluene-d8	*105*			**0**	*89-112*	*%REC*	*5*	*19-Aug-2020 13:16*
Surr: Toluene-d8	*105*			**0**	*89-112*	*%REC*	*50*	*19-Aug-2020 14:28*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PVL
Ethane	0.000250	U	0.000144	0.000250	0.00100	mg/L	1	24-Aug-2020 10:50
Ethene	**0.00171**		**0.000234**	**0.000500**	**0.00100**	**mg/L**	1	24-Aug-2020 10:50
Methane	**0.00969**		**0.000107**	**0.000250**	**0.000500**	**mg/L**	1	24-Aug-2020 10:50
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: TH
Alkalinity, Total (As CaCO3)	**97.8**	a	**5.00**	**5.00**	**5.00**	**mg/L**	1	19-Aug-2020 18:16
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**3.42**		**0.0300**	**0.100**	**0.100**	**mg/L**	1	18-Aug-2020 21:14
Nitrogen, Nitrate (As N)	0.100	U	0.0300	0.100	0.100	mg/L	1	18-Aug-2020 21:14
Sulfate	**348**		**2.00**	**5.00**	**5.00**	**mg/L**	10	18-Aug-2020 14:55
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	27-Aug-2020 17:43
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	27-Aug-2020 14:05

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

ALS Houston, US Date: 27-Aug-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 July 2020
Sample ID: 16WW57-200817
Collection Date: 17-Aug-2020 09:20

ANALYTICAL REPORT
WorkOrder:HS20080738
Lab ID:HS20080738-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	UG/L	1	19-Aug-2020 12:52
1,1-Dichloroethene	**1.5**		**0.20**	**0.50**	**1.0**	**UG/L**	1	19-Aug-2020 12:52
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Aug-2020 12:52
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Aug-2020 12:52
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	19-Aug-2020 12:52
Trichloroethene	**69**		**0.20**	**0.50**	**1.0**	**UG/L**	1	19-Aug-2020 12:52
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	19-Aug-2020 12:52
Surr: 1,2-Dichloroethane-d4	*88.4*			**0**	*81-118*	*%REC*	*1*	*19-Aug-2020 12:52*
Surr: 4-Bromofluorobenzene	*96.3*			**0**	*85-114*	*%REC*	*1*	*19-Aug-2020 12:52*
Surr: Dibromofluoromethane	*92.2*			**0**	*80-119*	*%REC*	*1*	*19-Aug-2020 12:52*
Surr: Toluene-d8	*106*			**0**	*89-112*	*%REC*	*1*	*19-Aug-2020 12:52*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PVL
Ethane	0.000250	U	0.000144	0.000250	0.00100	mg/L	1	24-Aug-2020 10:59
Ethene	0.000500	U	0.000234	0.000500	0.00100	mg/L	1	24-Aug-2020 10:59
Methane	**0.00219**		**0.000107**	**0.000250**	**0.000500**	**mg/L**	1	24-Aug-2020 10:59
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: TH
Alkalinity, Total (As CaCO3)	**138**	a	**5.00**	**5.00**	**5.00**	**mg/L**	1	19-Aug-2020 18:05
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**4.70**		**0.150**	**0.500**	**0.500**	**mg/L**	5	18-Aug-2020 21:32
Nitrogen, Nitrate (As N)	0.500	U	0.150	0.500	0.500	mg/L	5	18-Aug-2020 21:32
Sulfate	**2,610**		**20.0**	**50.0**	**50.0**	**mg/L**	100	18-Aug-2020 23:02
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	27-Aug-2020 17:43
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	27-Aug-2020 14:05

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

ALS Houston, US Date: 27-Aug-20

Client:	Aptim Environmental & Infrastucture, Inc.	**ANALYTICAL REPORT**
Project:	Longhorn Army Ammunition Plant 16 July 2020	WorkOrder:HS20080738
Sample ID:	Trip Blank-200817	Lab ID:HS20080738-03
Collection Date:	17-Aug-2020 00:00	Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	UG/L	1	19-Aug-2020 12:28
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Aug-2020 12:28
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Aug-2020 12:28
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Aug-2020 12:28
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	19-Aug-2020 12:28
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Aug-2020 12:28
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	19-Aug-2020 12:28
Surr: 1,2-Dichloroethane-d4	*87.7*			**0**	*81-118*	*%REC*	*1*	*19-Aug-2020 12:28*
Surr: 4-Bromofluorobenzene	*98.1*			**0**	*85-114*	*%REC*	*1*	*19-Aug-2020 12:28*
Surr: Dibromofluoromethane	*91.7*			**0**	*80-119*	*%REC*	*1*	*19-Aug-2020 12:28*
Surr: Toluene-d8	*107*			**0**	*89-112*	*%REC*	*1*	*19-Aug-2020 12:28*

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

ALS Houston, US Date: 27-Aug-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 July 2020
WorkOrder: HS20080738

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R367032 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Groundwater	
HS20080738-01	16WW58-200817	17 Aug 2020 08:05			18 Aug 2020 21:14	1
HS20080738-01	16WW58-200817	17 Aug 2020 08:05			18 Aug 2020 14:55	10
HS20080738-02	16WW57-200817	17 Aug 2020 09:20			18 Aug 2020 23:02	100
HS20080738-02	16WW57-200817	17 Aug 2020 09:20			18 Aug 2020 21:32	5
Batch ID: R367090 (0)	**Test Name :** ALKALINITY BY SM2320B				**Matrix:** Groundwater	
HS20080738-01	16WW58-200817	17 Aug 2020 08:05			19 Aug 2020 18:16	1
HS20080738-02	16WW57-200817	17 Aug 2020 09:20			19 Aug 2020 18:05	1
Batch ID: R367092 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS20080738-03	Trip Blank-200817	17 Aug 2020 00:00			19 Aug 2020 12:28	1
Batch ID: R367092 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS20080738-01	16WW58-200817	17 Aug 2020 08:05			19 Aug 2020 14:28	50
HS20080738-01	16WW58-200817	17 Aug 2020 08:05			19 Aug 2020 13:16	5
HS20080738-02	16WW57-200817	17 Aug 2020 09:20			19 Aug 2020 12:52	1
Batch ID: R367340 (0)	**Test Name :** DISSOLVED GASES BY RSK-175				**Matrix:** Groundwater	
HS20080738-01	16WW58-200817	17 Aug 2020 08:05			24 Aug 2020 10:50	1
HS20080738-02	16WW57-200817	17 Aug 2020 09:20			24 Aug 2020 10:59	1
Batch ID: R367563 (0)	**Test Name :** SUBCONTRACT ANALYSIS - TOC ANALYSIS				**Matrix:** Groundwater	
HS20080738-01	16WW58-200817	17 Aug 2020 08:05			27 Aug 2020 14:05	1
HS20080738-02	16WW57-200817	17 Aug 2020 09:20			27 Aug 2020 14:05	1
Batch ID: R367591 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** Groundwater	
HS20080738-01	16WW58-200817	17 Aug 2020 08:05			27 Aug 2020 17:43	1
HS20080738-02	16WW57-200817	17 Aug 2020 09:20			27 Aug 2020 17:43	1

ALS Houston, US Date: 27-Aug-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 July 2020
WorkOrder: HS20080738

QC BATCH REPORT

Batch ID: R367340 (0) **Instrument:** FID-4 **Method:** DISSOLVED GASES BY RSK-175

MBLK Sample ID: **MBLK-200824** Units: **mg/L** Analysis Date: **24-Aug-2020 10:12**
Client ID: Run ID: **FID-4_367340** SeqNo: **5712529** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.000250	0.00100								U
Ethene	0.000500	0.00100								U
Methane	0.000250	0.000500								U

LCS Sample ID: **LCS-200824** Units: **mg/L** Analysis Date: **24-Aug-2020 10:25**
Client ID: Run ID: **FID-4_367340** SeqNo: **5712530** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0180	0.00100	0.01804	0	99.9	75 - 125				
Ethene	0.0174	0.00100	0.0168	0	103	75 - 125				
Methane	0.00928	0.000500	0.009647	0	96.2	75 - 125				

LCSD Sample ID: **LCSD-200824** Units: **mg/L** Analysis Date: **24-Aug-2020 10:40**
Client ID: Run ID: **FID-4_367340** SeqNo: **5712531** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0172	0.00100	0.01804	0	95.5	75 - 125	0.01803	4.52	30	
Ethene	0.0163	0.00100	0.0168	0	97.1	75 - 125	0.01738	6.34	30	
Methane	0.00849	0.000500	0.009647	0	88.0	75 - 125	0.009280	8.85	30	

MS Sample ID: **HS20080738-02MS** Units: **mg/L** Analysis Date: **24-Aug-2020 11:08**
Client ID: **16WW57-200817** Run ID: **FID-4_367340** SeqNo: **5712534** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0186	0.00100	0.01804	0	103	75 - 125				
Ethene	0.0184	0.00100	0.0168	0	110	75 - 125				
Methane	0.00889	0.000500	0.009647	0.002186	69.5	75 - 125				S

ALS Houston, US Date: 27-Aug-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 July 2020
WorkOrder: HS20080738

QC BATCH REPORT

Batch ID: **R367340 (0)** **Instrument:** **FID-4** **Method:** **DISSOLVED GASES BY RSK-175**

MSD Sample ID: **HS20080738-02MSD** Units: **mg/L** Analysis Date: **24-Aug-2020 11:20**
Client ID: **16WW57-200817** Run ID: **FID-4_367340** SeqNo: **5712567** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0188	0.00100	0.01804	0	104	75 - 125	0.01863	0.758	30	
Ethene	0.0188	0.00100	0.0168	0	112	75 - 125	0.01841	1.94	30	
Methane	0.00913	0.000500	0.009647	0.002186	72.0	75 - 125	0.008893	2.62	30	S

The following samples were analyzed in this batch: HS20080738-01 HS20080738-02

ALS Houston, US Date: 27-Aug-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 July 2020
WorkOrder: HS20080738

QC BATCH REPORT

Batch ID: R367092 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-200819** Units: **UG/L** Analysis Date: **19-Aug-2020 12:04**
Client ID: Run ID: **VOA6_367092** SeqNo: **5707421** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	1.0	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
Methylene chloride	1.0	2.0								U
Trichloroethene	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*43.99*	*1.0*	*50*	*0*	*88.0*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*47.44*	*1.0*	*50*	*0*	*94.9*	*85 - 114*				
Surr: Dibromofluoromethane	*46.07*	*1.0*	*50*	*0*	*92.1*	*80 - 119*				
Surr: Toluene-d8	*53.28*	*1.0*	*50*	*0*	*107*	*89 - 112*				

LCS Sample ID: **VLCSW-200819** Units: **UG/L** Analysis Date: **19-Aug-2020 11:16**
Client ID: Run ID: **VOA6_367092** SeqNo: **5707420** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	19.93	1.0	20	0	99.6	80 - 119				
1,1-Dichloroethene	20.53	1.0	20	0	103	71 - 131				
1,2-Dichloroethane	20.03	1.0	20	0	100	73 - 128				
cis-1,2-Dichloroethene	20.54	1.0	20	0	103	78 - 123				
Methylene chloride	19.48	2.0	20	0	97.4	74 - 124				
Trichloroethene	19.9	1.0	20	0	99.5	79 - 123				
Vinyl chloride	18.69	1.0	20	0	93.5	58 - 137				
Surr: 1,2-Dichloroethane-d4	*46.51*	*1.0*	*50*	*0*	*93.0*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*46.87*	*1.0*	*50*	*0*	*93.7*	*85 - 114*				
Surr: Dibromofluoromethane	*47.72*	*1.0*	*50*	*0*	*95.4*	*80 - 119*				
Surr: Toluene-d8	*48.49*	*1.0*	*50*	*0*	*97.0*	*89 - 112*				

ALS Houston, US Date: 27-Aug-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 July 2020
WorkOrder: HS20080738

QC BATCH REPORT

Batch ID: R367092 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS20080738-02MS** Units: **UG/L** Analysis Date: **19-Aug-2020 13:40**
Client ID: **16WW57-200817** Run ID: **VOA6_367092** SeqNo: **5707425** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	24.79	1.0	20	0	124	80 - 119				S
1,1-Dichloroethene	27.41	1.0	20	1.527	129	71 - 131				
1,2-Dichloroethane	23.86	1.0	20	0	119	73 - 128				
cis-1,2-Dichloroethene	25.2	1.0	20	0	126	78 - 123				S
Methylene chloride	22.64	2.0	20	0	113	74 - 124				
Trichloroethene	96.79	1.0	20	68.56	141	79 - 123				S
Vinyl chloride	22.82	1.0	20	0	114	58 - 137				
Surr: 1,2-Dichloroethane-d4	*44.85*	*1.0*	*50*	*0*	*89.7*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*47.79*	*1.0*	*50*	*0*	*95.6*	*85 - 114*				
Surr: Dibromofluoromethane	*46.9*	*1.0*	*50*	*0*	*93.8*	*80 - 119*				
Surr: Toluene-d8	*52.45*	*1.0*	*50*	*0*	*105*	*89 - 112*				

MSD Sample ID: **HS20080738-02MSD** Units: **UG/L** Analysis Date: **19-Aug-2020 14:04**
Client ID: **16WW57-200817** Run ID: **VOA6_367092** SeqNo: **5707426** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	23.91	1.0	20	0	120	80 - 119	24.79	3.6	20	S
1,1-Dichloroethene	26.26	1.0	20	1.527	124	71 - 131	27.41	4.27	20	
1,2-Dichloroethane	23.16	1.0	20	0	116	73 - 128	23.86	2.98	20	
cis-1,2-Dichloroethene	23.86	1.0	20	0	119	78 - 123	25.2	5.5	20	
Methylene chloride	22.14	2.0	20	0	111	74 - 124	22.64	2.23	20	
Trichloroethene	90.65	1.0	20	68.56	110	79 - 123	96.79	6.55	20	
Vinyl chloride	21.6	1.0	20	0	108	58 - 137	22.82	5.49	20	
Surr: 1,2-Dichloroethane-d4	*44.24*	*1.0*	*50*	*0*	*88.5*	*81 - 118*	*44.85*	*1.39*	*20*	
Surr: 4-Bromofluorobenzene	*47.89*	*1.0*	*50*	*0*	*95.8*	*85 - 114*	*47.79*	*0.215*	*20*	
Surr: Dibromofluoromethane	*46.05*	*1.0*	*50*	*0*	*92.1*	*80 - 119*	*46.9*	*1.83*	*20*	
Surr: Toluene-d8	*52.62*	*1.0*	*50*	*0*	*105*	*89 - 112*	*52.45*	*0.326*	*20*	

The following samples were analyzed in this batch: HS20080738-01 HS20080738-02 HS20080738-03

ALS Houston, US Date: 27-Aug-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 July 2020
WorkOrder: HS20080738

QC BATCH REPORT

Batch ID: R367032 (0) **Instrument:** ICS-Integrion **Method:** ANIONS BY SW9056A

MBLK Sample ID: **MBLK-081820** Units: **mg/L** Analysis Date: **18-Aug-2020 20:20**
Client ID: Run ID: **ICS-Integrion_367032** SeqNo: **5706036** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	0.100	0.100								U
Nitrogen, Nitrate (As N)	0.100	0.100								U
Sulfate	0.500	0.500								U

LCS Sample ID: **LCS-081820** Units: **mg/L** Analysis Date: **18-Aug-2020 20:38**
Client ID: Run ID: **ICS-Integrion_367032** SeqNo: **5706037** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	4.003	0.100	4	0	100	80 - 120				
Nitrogen, Nitrate (As N)	3.828	0.100	4	0	95.7	80 - 120				
Sulfate	19.7	0.500	20	0	98.5	80 - 120				

MS Sample ID: **HS20080738-02MS** Units: **mg/L** Analysis Date: **18-Aug-2020 21:50**
Client ID: **16WW57-200817** Run ID: **ICS-Integrion_367032** SeqNo: **5706040** PrepDate: DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	14.27	0.500	10	4.702	95.7	80 - 120				
Nitrogen, Nitrate (As N)	11.74	0.500	10	0	117	80 - 120				
Sulfate	2420	2.50	50	2447	-53.1	80 - 120				SEO

MSD Sample ID: **HS20080738-02MSD** Units: **mg/L** Analysis Date: **18-Aug-2020 22:08**
Client ID: **16WW57-200817** Run ID: **ICS-Integrion_367032** SeqNo: **5706041** PrepDate: DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	14.33	0.500	10	4.702	96.3	80 - 120	14.27	0.426	20	
Nitrogen, Nitrate (As N)	11.75	0.500	10	0	117	80 - 120	11.74	0.0639	20	
Sulfate	2403	2.50	50	2447	-87.6	80 - 120	2420	0.715	20	SEO

The following samples were analyzed in this batch: HS20080738-01 HS20080738-02

ALS Houston, US Date: 27-Aug-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 July 2020
WorkOrder: HS20080738

QC BATCH REPORT

Batch ID: R367090 (0) **Instrument: ManTech01** **Method: ALKALINITY BY SM2320B**

MBLK Sample ID: **WBLKW1-200819** Units: **mg/L** Analysis Date: **19-Aug-2020 17:42**
Client ID: Run ID: **ManTech01_367090** SeqNo: **5707395** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	5.00	5.00								U

LCS Sample ID: **LCS1-200819** Units: **mg/L** Analysis Date: **19-Aug-2020 17:51**
Client ID: Run ID: **ManTech01_367090** SeqNo: **5707396** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	1077	5.00	1000	0	108	85 - 115				

LCSD Sample ID: **LCSD1-200819** Units: **mg/L** Analysis Date: **19-Aug-2020 17:59**
Client ID: Run ID: **ManTech01_367090** SeqNo: **5707397** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	1083	5.00	1000	0	108	85 - 115	1077	0.495	20	

DUP Sample ID: **HS20080738-02DUP** Units: **mg/L** Analysis Date: **19-Aug-2020 18:11**
Client ID: **16WW57-200817** Run ID: **ManTech01_367090** SeqNo: **5707399** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	139.4	5.00					138.1	0.944	20	

The following samples were analyzed in this batch: HS20080738-01 HS20080738-02

ALS Houston, US Date: 27-Aug-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 July 2020
WorkOrder: **HS20080738**

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-Aug-20

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	20-030-0	26-Mar-2021
California	2919, 2020-2021	30-Apr-2021
Dept of Defense	ANAB L2231 V010	22-Dec-2021
Florida	E87611-30-07/01/2020	30-Jun-2021
Illinois	2000322020-4	09-May-2021
Kentucky	123043, 2020-2021	30-Apr-2021
Louisiana	03087, 2020-2021	30-Jun-2021
Maryland	343, 2019-2020	30-Sep-2020
North Carolina	624-2020	31-Dec-2020
North Dakota	R-193 2020-2021	30-Apr-2021
Oklahoma	2019-141	31-Aug-2020
Texas	T104704231-20-26	30-Apr-2021

ALS Houston, US Date: 27-Aug-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant 16 July 2020
Work Order: HS20080738

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS20080738-01	16WW58-200817	Login	8/18/2020 12:58:16 PM	PMG	Sub
HS20080738-01	16WW58-200817	Login	8/18/2020 12:58:16 PM	PMG	WET206
HS20080738-01	16WW58-200817	Login	8/18/2020 12:58:16 PM	PMG	VOA157
HS20080738-01	16WW58-200817	Login	8/18/2020 12:58:16 PM	PMG	RSK012
HS20080738-01	16WW58-200817	Login	8/18/2020 12:58:16 PM	PMG	Sub

ALS Houston, US Date: 27-Aug-20

Sample Receipt Checklist

Work Order ID: HS20080738 **Date/Time Received:** **18-Aug-2020 09:50**

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

Completed By: /S/ Paresh M. Giga (eSignature) 18-Aug-2020 13:04 (Date/Time) **Reviewed by:** /S/ RJ Modashia (eSignature) 19-Aug-2020 10:48 (Date/Time)

Matrices: **GW/Water** Carrier name: **FedEx**

	Yes	No	
Shipping container/cooler in good condition?	☑	☐	Not Present ☐
Custody seals intact on shipping container/cooler?	☑	☐	Not Present ☐
Custody seals intact on sample bottles?	☐	☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	☐	☐	Not Present ☑
Chain of custody present?	☑	☐	1 Page(s)
Chain of custody signed when relinquished and received?	☑	☐	COC IDs:None
Samplers name present on COC?	☐	☑	
Chain of custody agrees with sample labels?	☑	☐	
Samples in proper container/bottle?	☑	☐	
Sample containers intact?	☑	☐	
Sufficient sample volume for indicated test?	☑	☐	
All samples received within holding time?	☑	☐	
Container/Temp Blank temperature in compliance?	☑	☐	

Temperature(s)/Thermometer(s):	1.1C U/c	IR31
Cooler(s)/Kit(s):	45351	
Date/Time sample(s) sent to storage:	8/18/2020 13:15	

	Yes	No	
Water - VOA vials have zero headspace?	☑	☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	☐	☐	N/A ☑
pH adjusted?	☐	☐	N/A ☑

pH adjusted by:

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

CHAIN OF CUSTODY

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

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

Project No. 501032

Job: **LHAAP 16 JULY 2020_ALS**

Prepared By: Scott Beesinger

P.O. Number

Field Sample I.D. Time	Sample Matrix	Date /	MS / MSD	No. OF CONTAINERS	VOC by SW 8260B	TOC by SM5310C	MEE by RSK 175	Anions (bromide, sulfate, nitrate) by SW9056 and Alkalinity by SM2320	Bromide by SW9056	Perchlorate by SW6850	Metals (arsenic, chromium, manganese, nickel, thallium) by SW6020				Remarks (Preservatives, etc.)	Lab I.D.#
16WW58-200817	WG	8/17/20/0805		10	X	X	X	X	X	X						
16WW57-200817	WG	8/17/20/0920		10	X	X	X	X	X	X						
16WW57-200817-MS	WG	8/17/20/0920		10	X	X	X	X	X	X						
16WW57-200817-MSD	WG	8/17/20/0920		10	X	X	X	X	X	X						
TRIP BLANK-200817	WG	8/17/20		2	X											

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

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	8/17/20	1430									

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition
J. [illegible]	8/18/20	09:50							

Remarks: Cooler 45351 1:2.31
Temp 1.1°C CFO

HS20080738

Aptim Environmental & Infrastucture, Inc.
Longhorn Army Ammunition Plant 16 July 2020

(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

45351

CUSTODY SEAL

Date: 8/17/20 Time: 1430
Name: Scott Beesinger
Company: BTI/ATL

Seal Broken By: SM
Date: 08/18/20

45351 AUG 18 2020

Must D... ...xt Business Day
Time and Tempature Sensitive!

45351.

ORIGIN ID:SGRA (903) 930-6193
SCOTT BEESINGER
APTIM
1203-B EAST GRAND AVE.
PMB202
MARSHALL, TX 75670
UNITED STATES US

SHIP DATE: 23JUN20
ACTWGT: 1.00 LB MAN
CAD: 3001902/CAFE3211
DIMS: 19x16x13 IN

TO CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099
(281) 530-5656
REF: LHAAP 16-B072394-RJ
RMA:

FedEx Express

FedEx.
TRK# 0221 1891 8877 8358

TUE - 18 AUG 10:30A
PRIORITY OVERNIGHT

AB SGRA

77099
TX-US
IAH

FED: 169785 17Aug2020 CGGA 560C3/77789/05A2

August 27, 2020

Service Request No:E2000759

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

Laboratory Results for: HS20080738

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory August 19, 2020
For your reference, these analyses have been assigned our service request number **E2000759.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current TNI standards, where applicable, and except as noted in the laboratory case narrative provided. All results are intended to be considered in their entirety and ALS Environmental is not responsible for use of less than the complete final report. Results apply only to the items submitted to the laboratory, as received for analysis. In accordance with the current TNI Standard, a statement on the estimated uncertainty of measurement of any quantitative analysis will be supplied upon request.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Corey Grandits
Project Manager

ADDRESS 10450 Stancliff Rd., Suite 210, Houston, TX 77099
PHONE +1 281 530 5656 | FAX +1 281 530 5887
ALS Group USA, Corp.
dba ALS Environmental

Certificate of Analysis

ALS Environmental - Houston HRMS
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

ALS Environmental

Client:	ALS Houston	**Service Request No.:**	E2000759
Project:	HS20080738	**Date Received:**	08/19/20
Sample Matrix:	W		

CASE NARRATIVE

All analyses were performed in adherence to the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier IV. When appropriate to the method, method blank results have been reported with each analytical test.

Sample Receipt

Two samples were received for analysis at ALS Environmental in Houston on 08/19/20.

The samples were received in good condition and are consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

Data Validation Notes and Discussion

Precision and Accuracy:

EQ2000359: Laboratory Control Spike/Duplicate Laboratory Control Spike (LCS/DLCS) samples were analyzed and reported in addition to a MS/MSD for this extraction batch. The MS (EQ2000359-04) and MSD ((EQ2000359-05) were performed on unrelated samples. The LCS and LCSD recovery passed.

DOD Certification is held for the method/matrix/analytes provided in this report.

Lowest practical dilution performed on both E2000759-001/002 due to matrix interference.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.

Use of ALS group USA Corp dba ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.

Client: ALS Environmental - US **Service Request:**E2000759
Project: HS20080738

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
E2000759-001	16WW58-200817	8/17/2020	0805
E2000759-002	16WW57-200817	8/17/2020	0920

Service Request Summary

Folder #: **E2000759**
Client Name: ALS Environmental - US
Project Name: HS20080738
Project Number:

Report To: RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Houston, TX 77099-4338
USA
Phone Number: 281-530-5656
Cell Number:
Fax Number: 281-530-5887
E-mail: rj.modashia@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 08/19/20
Internal Due Date: 9/1/2020
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS20080738
EDD: No EDD Specified

4 250 mL-Plastic Bottle HDPE WM CLEAR Unpreserved
Location: EHRMS-WIC 10D
Pressure Gas:

Lab Samp No.	Client Samp No	Matrix	Collected	HOUSTON CIO4 DOD/6850
E2000759-001	16WW58-200817	Ground Water	08/17/20 0805	**IV**
E2000759-002	16WW57-200817	Ground Water	08/17/20 0920	**IV**

Service Request Summary

Folder #: **E2000759**
Client Name: ALS Environmental - US
Project Name: HS20080738
Project Number:

Report To: RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Houston, TX 77099-4338
USA
Phone Number: 281-530-5656
Cell Number:
Fax Number: 281-530-5887
E-mail: rj.modashia@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 08/19/20
Internal Due Date: 9/1/2020
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS20080738
EDD: No EDD Specified

4 250 mL-Plastic Bottle HDPE WM CLEAR Unpreserved
Location: EHRMS-WIC 10D
Pressure Gas:

Test Comments:

Group	Test/Method	Samples	Comments
Semivoa GCMS	ClO4 DOD/6850	1	Level II due 9/1,level IV 9/8
Semivoa GCMS	ClO4 DOD/6850	1	MS/MSD

Data Qualifiers

Lab Standard

+	Possible Tedlar bag artifact.
A	TIC is a suspected aldol-condensation product
B	Analyte found in the associated method blank as well as in the sample.
BC	Reported results are not blank corrected.
BH	The back section of the tube yielded higher results than the front.
BT	Results indicated possible breakthrough; back section >=10% front section.
C	Result identification confirmed.
D	Compound identified in an analysis at a secondary dilution factor
D	Spike was diluted out
DE	Reported results are corrected for desorption efficiency.
E	Estimated value. Concentration above calibration range
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
H1	Sample analysis performed past holding time. See case narrative.
H2	Initial analysis within holding time. Reanalysis for the required dilution was past holding time.
H3	Sample was received and analyzed past holding time.
H4	Sample was extracted past required extraction holding time, but analyzed within analysis holding time. See case narrative.
I	Internal standard not within the specified limits. See case narrative.
J	Estimated Value. Concentration found below MRL.
K	A deflection in the QC ion may indicate interference with the quantitation of this ion. The concentration of this analyte should be considered as an estimate.
K	Analyte was detected above the method reporting limit prior to normalization.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
L1	Laboratory control sample recovery outside the specified limits; results may be biased high.
L2	Laboratory control sample recovery outside the specified limits; results may be biased low.
L3	Laboratory control sample recovery outside the specified limits.
M	Matrix interference; results may be biased high.
M	The duplicate injection precision not met.
M1	Matrix interference due to coelution with a non-target compound; results may be biased high.
N	Presumptive evidence of a compound for TICs that have been identified based on a mass spectral library search.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.

Data Qualifiers

Lab Standard

P	Indicates chlorodiphenyl ether interference present at the retention time of the target compound.
P	Pesticide/Aroclor target analyte > 40% difference for detected concentrations between GC columns
Q	Indicates as estimated value because the P and P + 2 theoretical abundance ratio does not meet method criteria.
R	Duplicate Precision not met.
R1	Duplicate precision not within the specified limits; however, the results are below the MRL and considered estimated.
S	Surrogate recovery not within specified limits.
S	The reported value was determined by the Method of Standard Additions (MSA).
T	Analyte is a tentatively identified compound, result is estimated.
U	Compound was analyzed for, but was not detected (ND).
V1	The continuing calibration verification standard was outside (biased high) the specified limits for this compound.
V2	The continuing calibration verification standard was outside (biased low) the specified limits for this compound.
W	Result quantified, but the corresponding peak was detected outside the generated retention time window.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
X	See case narrative.
Y	Recovery outside limits
Y	The chromatogram resembles a petroleum product but does not match the calibration standard.
Z	The chromatogram does not resemble a petroleum product.
i	The MRL/MDL has been elevated due to a matrix interference.

ALS Laboratory Group

Acronyms

Cal	Calibration
Conc	CONCentration
Dioxin(s)	Polychlorinated dibenzo-p-dioxin(s)
EDL	Estimated Detection Limit
EMPC	Estimated Maximum Possible Concentration
Flags	Data qualifiers
Furan(s)	Polychlorinated dibenzofuran(s)
g	Grams
ICAL	Initial CALibration
ID	IDentifier
Ions	Masses monitored for the analyte during data acquisition
L	Liter (s)
LCS	Laboratory Control Sample
DLCS	Duplicate Laboratory Control Sample
MB	Method Blank
MCL	Method Calibration Limit
MDL	Method Detection Limit
mL	Milliliters
MS	Matrix Spiked sample
DMS	Duplicate Matrix Spiked sample
NO	Number of peaks meeting all identification criteria
PCDD(s)	Polychlorinated dibenzo-p-dioxin(s)
PCDF(s)	Polychlorinated dibenzofuran(s)
ppb	Parts per billion
ppm	Parts per million
ppq	Parts per quadrillion
ppt	Parts per trillion
QA	Quality Assurance
QC	Quality Control
Ratio	Ratio of areas from monitored ions for an analyte
% Rec.	Percent recovery
RPD	Relative Percent Difference
RRF	Relative Response Factor
RT	Retention Time
SDG	Sample Delivery Group
S/N	Signal-to-noise ratio
TEF	Toxicity Equivalence Factor
TEQ	Toxicity Equivalence Quotient

10450 Stancliff Rd, Houston, TX 77099 | 281-530-5656 | www.alsglobal.com

ALS Environmental

State Certifications, Accreditations, and Licenses

Agency	Number	Expire Date
American Association for Laboratory Accreditation	2897.01 2020	11/30/2021
Arkansas Department of Environmental Quality	20-030-0	3/26/2021
Department of Defense	A2LA 2897.01	11/30/2021
Hawaii Department of Health	2020	4/30/2021
Illinois Environmental Protection Agency	2000322020-4	5/9/2021
Louisiana Department of Health and Hospitals	LA028-2020	12/31/2020
Maine Department of Health and Human Services	2020016	6/5/2022
Minnesota Department of Health	1785988	12/31/2020
Nebraska Department of Health and Human Services	NE-OS-25-13 (2020)	4/30/2021
Nevada Department of Concervation and Natural Resources	TX026932021-1	7/31/2021
New Hampshire Environmental Laboratory Accreditation Program	209420	4/24/2021
New York Department of Health	11707	3/31/2021
Oklahoma Department of Environmental Quality	2019-067	8/31/2020
Tennessee Department of Environment and Concervation	04016-2020	4/30/2021
Texas Commision on Environmental Quality	T104704231-20-26	4/30/2021
United States Department of Agriculture	P330-19-00299	10/10/2022
Washington Department of Health	C819	11/14/2020

Chain of Custody

ALS Environmental - Houston HRMS
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID: 14518**

SUBCONTRACT TO:

ALS Environmental
10450 Stancliff RoadSuite 210
Houston, TX 77084 **Phone:** +1 281 530 5656

CUSTOMER INFORMATION:

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

INVOICE INFORMATION:

Company: ALS Houston
Contact: Accounts Payable
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Reference: HS20080738
TSR: Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS20080738-01**	**16WW58-200817**	**Groundwater**	**17 Aug 2020 08:05**
	SUB_Perch-6850			26 Aug 2020
2.	**HS20080738-02**	**16WW57-200817**	**Groundwater**	**17 Aug 2020 09:20**
	SUB_Perch-6850			26 Aug 2020

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.
HS20080738-02 = MS/MSD

QC Level: DOD IV (DoD Data Package)

Relinquished By: S. Nuzzo Date/Time: 8/19/20 13:20
Received By: Date/Time: 8/19/20 1320
Cooler ID(s): Temperature(s):

ALS Environmental

Cooler Receipt Form

Project Chemist: CG

Client/Project: ALS-H

Thermometer ID: 1125

Date/Time Received: 8/19/20 Initials: CG Date/Time Logged in: 8/19/20 Initials: CG

1. Method of delivery: ○ US Mail ○ Fed Ex ○ UPS ○ DHL ☑ ALS Courier ○ Client
2. Samples received in: ☑ Cooler ○ Box ○ Envelope ○ Other
3. Were custody seals on coolers? ○ Yes ☑ No
   Were they intact? ○ Yes ○ No ☑ N/A
   Were they signed and dated? ○ Yes ○ No ☑ N/A
   If yes, how many and where?
4. Packing Material: ○ Inserts ☑ Baggies ○ Bubble Wrap ○ Gel Packs ☑ Wet Ice ○ Sleeves ○ Other
5. Foreign or Regulated Soil? ○ Yes ○ No Location of Sampling:

Cooler Tracking Number	COC ID	Date Opened	Time Opened	Opened By	Temp. °C	Temp Blank?
–		8/19/20	1320	CG	3.3	☒
						☐
						☐
						☐

6. Were custody papers properly filled out (ink, signed, dated, etc)? ☑ Yes ○ No
7. Did all bottles arrive in good condition (not broken, no signs of leakage)? ☑ Yes ○ No
8. Were all sample labels complete (i.e., sample ID, analysis, preservation, etc)? ☑ Yes ○ No
9. Were appropriate bottles/containers and volumes received for the requested tests? ☑ Yes ○ No
10. Did sample labels and tags agree with custody documents? ☑ Yes ○ No

Notes, Discrepancies, & Resolutions:

Service request Label:

HS-HRMSCoolerReceipt R1.0

ALS Environmental - Houston HRMS

10450 Stancliff Rd., Suite 210
Houston, TX 77099
T: +1 713 266 1599
F: +1 713 266 1599
www.alsglobal.com

SAMPLE ACCEPTANCE POLICY

This policy outlines the criteria samples must meet to be accepted by ALS Environmental – Houston HRMS.

Cooler Custody Seals (desirable, mandatory if specified in SAP):

- ✓ Intact on outside of cooler, signed and dated

Chain-of-Custody (COC) documentation (mandatory):

The following is required on each COC:

- ✓ Sample ID, the location, date and time of collection, collector's name, preservation type, sample type, and any other special remarks concerning the sampleThe COC must be completed in ink.
- ✓ Signature and date of relinquishing party.

In the absence of a COC at sample receipt, the COC will be requested from the client.

Sample Integrity (mandatory):

Samples are inspected upon arrival to ensure that sample integrity was not compromised during transfer to the laboratory.

- ✓ Sample containers must arrive in good condition (not broken or leaking).
- ✓ Samples must be labeled appropriately, including Sample IDs, and requested test using durable labels and indelible ink.
- ✓ The correct type of sample bottle must be used for the method requested.
- ✓ An appropriate sample volume, or weight, must be received.
- ✓ Sample IDs and number of containers must reconcile with the COC.
- ✓ Samples must be received within the method defined holding time.

Temperature Requirement (varies by sample matrix):

- ✓ Aqueous and Non-aqueous samples must be shipped and stored cold, at 0 to 6ºC.
- ✓ Tissue samples must be shipped and stored frozen, at -20 to -10ºC.
- ✓ Air samples are shipped and stored cold, at 0 to 6ºC
- ✓ The sample temperature must be recorded on the COC

All cooler inspections are documented on the Cooler Receipt Form (CRF). A separate CRF is completed for each service request. Any samples not meeting the above criteria are noted on the CRF and the Project Manager notified. The Project Manager must resolve any sample integrity issues with the client prior to proceeding with the analysis. Such resolutions are documented in writing and filed with the project folder. Data associated with samples received outside of this acceptance policy will be qualified on the case narrative of the final report

Preparation Information Benchsheets

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

Preparation Information Benchsheet

Prep Run#: 364168 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
Team: Semivoa GCMS/GRIVERA **Prep Method:** Method **Prep Date/Time:** 8/24/20 09:31

#	Lab Code	Client ID	B#	Method /Test	pH	Cl	Matrix	Amt. Ext.	Sample Description
1	E2000716-001	LH18/24-SP650_080520-BIX	.01	6850/ClO4 DOD			Water	10mL	
2	E2000739-001	LH18/24-SP650_081120_BIX	.01	6850/ClO4 DOD			Ground Water	10mL	
3	E2000740-001	LH18/24-SP140_081120	.01	6850/ClO4 DOD			Ground Water	10mL	
4	E2000741-001	LH18/24-SP650_081120_BIX	.01	6850/ClO4 DOD			Ground Water	10mL	
5	E2000742-001	LHSMW01-200810	.01	6850/ClO4 DOD			Ground Water	10mL	
6	E2000742-002	04WW04-200810	.01	6850/ClO4 DOD			Ground Water	10mL	
7	E2000742-003	04WW08-200810	.01	6850/ClO4 DOD			Ground Water	10mL	
8	E2000742-004	04WW08-200810-FD	.01	6850/ClO4 DOD			Ground Water	10mL	
9	E2000742-005	04WW02-200810	.01	6850/ClO4 DOD			Ground Water	10mL	
10	E2000742-006	04WW06-200810	.01	6850/ClO4 DOD			Ground Water	10mL	
11	E2000742-007	LHSMW02-200810	.01	6850/ClO4 DOD			Ground Water	10mL	
12	E2000742-008	04WW11-200810	.01	6850/ClO4 DOD			Ground Water	10mL	
13	E2000742-009	04WW01-200810	.01	6850/ClO4 DOD			Ground Water	10mL	
14	E2000742-010	04WW05-200811	.01	6850/ClO4 DOD			Ground Water	10mL	
15	E2000742-011	04WW09-200811	.01	6850/ClO4 DOD			Ground Water	10mL	
16	E2000742-012	04WW10-200811	.01	6850/ClO4 DOD			Ground Water	10mL	
17	E2000742-013	04WW07-200811	.01	6850/ClO4 DOD			Ground Water	10mL	
18	E2000742-014	04WW07-200811-FD	.01	6850/ClO4 DOD			Ground Water	10mL	
19	E2000759-001	16WW58-200817	.01	6850/ClO4 DOD			Ground Water	10mL	
20	E2000759-002	16WW57-200817	.01	6850/ClO4 DOD			Ground Water	10mL	
21	EQ2000359-01	MB		6850/ClO4 DOD			Liquid	10mL	
22	EQ2000359-02	LCS		6850/ClO4 DOD			Liquid	10mL	
23	EQ2000359-03	DLCS		6850/ClO4 DOD			Liquid	10mL	
24	EQ2000359-04	04WW10-200811 MS	.01	6850/ClO4 DOD			Liquid	10mL	
25	EQ2000359-05	04WW10-200811 DMS	.01	6850/ClO4 DOD			Liquid	10mL	
26	EQ2000359-06	16WW57-200817 MS	.01	6850/ClO4 DOD			Liquid	10mL	
27	EQ2000359-07	16WW57-200817 DMS	.01	6850/ClO4 DOD			Liquid	10mL	

Spiking Solutions

Name: Sodium Perchlorate 1 ug/mL (IS) (18-O) as CLO4 Inventory ID 202037 Logbook Ref: Sodium Perchlorate Expires On: 05/22/2021

E2000716-001	100.00µL	E2000739-001	100.00µL	E2000740-001	100.00µL	E2000741-001	100.00µL	E2000742-001	100.00µL	E2000742-002	100.00µL
E2000742-003	100.00µL	E2000742-004	100.00µL	E2000742-005	100.00µL	E2000742-006	100.00µL	E2000742-007	100.00µL	E2000742-008	100.00µL
E2000742-009	100.00µL	E2000742-010	100.00µL	E2000742-011	100.00µL	E2000742-012	100.00µL	E2000742-013	100.00µL	E2000742-014	100.00µL
E2000759-001	100.00µL	E2000759-002	100.00µL	EQ2000359-01	100.00µL	EQ2000359-02	100.00µL	EQ2000359-03	100.00µL	EQ2000359-04	100.00µL

Preparation Information Benchsheet

Prep Run#: 364168 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
Team: Semivoa GCMS/GRIVERA **Prep Method:** Method **Prep Date/Time:** 8/24/20 09:31

EQ2000359-05 100.00µL EQ2000359-06 100.00µL EQ2000359-07 100.00µL

Name:	Perchlorate Intermediate Stock1	Inventory ID	209764	Logbook Ref:	Perchlorate Int. Stock1 51820	Expires On:	11/18/2020

EQ2000359-02 1.00µL EQ2000359-03 1.00µL EQ2000359-04 1.00µL EQ2000359-05 1.00µL EQ2000359-06 1.00µL EQ2000359-07 1.00µL

Preparation Steps

Step: Preparation
Started: 8/24/20 09:31
Finished: 8/25/20 17:54
By: GRIVERA
Comments

Comments: _____

Reviewed By: _____ Date: _____

Chain of Custody

Relinquished By: _____ Date: _____ Extracts Examined
Received By: _____ Date: _____ Yes No

Analytical Results

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000759
Project:	HS20080738	**Date Collected:**	8/17/20 0805
Sample Matrix:	Ground Water	**Date Received:**	8/19/20
Sample Name:	16WW58-200817	**Units:**	µg/L
Lab Code:	E2000759-001	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	1.00	0.500	0.250	10	8/24/20	8/26/20 18:29	364168	692775	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000759
Project:	HS20080738	**Date Collected:**	8/17/20 0920
Sample Matrix:	Ground Water	**Date Received:**	8/19/20
Sample Name:	16WW57-200817	**Units:**	µg/L
Lab Code:	E2000759-002	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.454**	J	1.00	0.500	0.250	10	8/24/20	8/26/20 18:36	364168	692775	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000759
Project:	HS20080738	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	µg/L
Lab Code:	EQ2000359-01	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	8/24/20	8/25/20 18:56	364168	692783	

Accuracy & Precision

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000759
Project:	HS20080738	**Date Analyzed:**	8/26/20
Sample Matrix:	Ground Water		

Lab Control Sample Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method:	6850	**Units:**	µg/L
Prep Method:	Method	**Basis:**	NA
		Extraction Lot:	364168

	Lab Control Sample EQ2000359-02			Duplicate Lab Control Sample EQ2000359-03					
Analyte Name	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Perchlorate	0.108	0.100	108	0.100	0.100	100	84 - 119	8	15

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

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

Printed 8/27/20 11:57

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000759
Project:	HS20080738	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2000359-02	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.108**		0.100	0.0500	0.0250	1	8/24/20	8/26/20 15:35	364168	692775	

Printed 8/27/20 11:57

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000759
Project:	HS20080738	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Duplicate Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2000359-03	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.100**		0.100	0.0500	0.0250	1	8/24/20	8/26/20 15:27	364168	692775	

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000759
Project:	HS20080738	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
		Date Analyzed:	8/26/20

Matrix Spike Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Sample Name:	Batch QC	**Units:**	µg/L
Lab Code:	E2000742-012	**Basis:**	NA

Analytical Method: 6850
Prep Method: Method

		Batch QCMS **Matrix Spike** EQ2000359-04					Batch QCDMS **Duplicate Matrix Spike** EQ2000359-05					
Analyte Name	**Sample Result**	**Result**	**Spike Amount**	**% Rec**		**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Perchlorate	0.339	0.459	0.100	120	*	0.428	0.100	89	84 - 119	7	15

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

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

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

Printed 8/27/20 11:57

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000759
Project:	HS20080738	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Batch QC	**Units:**	µg/L
Lab Code:	EQ2000359-04	**Basis:**	NA
Run Type:	Matrix Spike		

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.459**	J	1.00	0.500	0.250	10	8/24/20	8/26/20 15:43	364168	692775	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000759
Project:	HS20080738	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Batch QC	**Units:**	µg/L
Lab Code:	EQ2000359-05	**Basis:**	NA
Run Type:	Duplicate Matrix Spike		

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.428**	J	1.00	0.500	0.250	10	8/24/20	8/26/20 15:51	364168	692775	

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000759
Project:	HS20080738	**Date Collected:**	8/17/20
Sample Matrix:	Ground Water	**Date Received:**	8/19/20
		Date Analyzed:	8/26/20

Matrix Spike Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Sample Name:	16WW57-200817	**Units:**	µg/L
Lab Code:	E2000759-002	**Basis:**	NA

Analytical Method: 6850
Prep Method: Method

		16WW57-200817MS				16WW57-200817DMS					
		Matrix Spike				**Duplicate Matrix Spike**					
		EQ2000359-06				EQ2000359-07					
Analyte Name	**Sample Result**	**Result**	**Spike Amount**	**% Rec**		**Result**	**Spike Amount**	**% Rec**		**% Rec Limits**	**RPD**	**RPD Limit**
Perchlorate	0.454	0.530	0.100	76	#	0.558	0.100	105	#	84 - 119	5	15

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

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

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

Printed 8/27/20 11:57

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000759
Project:	HS20080738	**Date Collected:**	8/17/20 0920
Sample Matrix:	Ground Water	**Date Received:**	8/19/20
Sample Name:	16WW57-200817	**Units:**	µg/L
Lab Code:	EQ2000359-06	**Basis:**	NA
Run Type:	Matrix Spike		

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.530**	J	1.00	0.500	0.250	10	8/24/20	8/26/20 15:59	364168	692775	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000759
Project:	HS20080738	**Date Collected:**	8/17/20 0920
Sample Matrix:	Ground Water	**Date Received:**	8/19/20
Sample Name:	16WW57-200817	**Units:**	µg/L
Lab Code:	EQ2000359-07	**Basis:**	NA
Run Type:	Duplicate Matrix Spike		

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.558**	J	1.00	0.500	0.250	10	8/24/20	8/26/20 16:07	364168	692775	

Printed 8/27/20 11:57

Initial Calibration

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

20200819

1st Review: Kneir
2nd Review: Hvan

Injection Log
LCMS01 -Shimadzu 8050

ICAL Date: 7/19/2020
Cal. Std. xp: 11/18/2020
ICAL ID: **EC2000022**

Mobile Phases **A:** 0.75% Formic Acid/Water 3100807-09 **B:** MeOH 3100802-01

			File Name	Acquisition Method	Dilution	R	Comments	Date/Time
1	PERCHLORATE1		20200819_005	Perchlorate6850b.lcm	1x	☒	3100806-05	8/19/2020 10:42
2	PERCHLORATE2		20200819_006	Perchlorate6850b.lcm	1x	☒	3100806-06	8/19/2020 10:50
3	PERCHLORATE3		20200819_007	Perchlorate6850b.lcm	1x	☒	3100806-07	8/19/2020 10:58
4	PERCHLORATE4		20200819_008	Perchlorate6850b.lcm	1x	☒	3100807-01	8/19/2020 11:06
5	PERCHLORATE5		20200819_009	Perchlorate6850b.lcm	1x	☒	3100807-02	8/19/2020 11:14
6	PERCHLORATE6		20200819_010	Perchlorate6850b.lcm	1x	☒	3100807-03	8/19/2020 11:22
7	PERCHLORATE7		20200819_011	Perchlorate6850b.lcm	1x	☒	3100807-04	8/19/2020 11:30
8	PERCHLORATE8		20200819_012	Perchlorate6850b.lcm	1x	☒	3100807-05	8/19/2020 11:38
9	PERCHLORATE9		20200819_013	Perchlorate6850b.lcm	1x	☒	3100807-06	8/19/2020 11:45
10	PERCHLORATE10		20200819_014	Perchlorate6850b.lcm	1x	☒	3100807-07	8/19/2020 11:53
11	PERCHLORATEICV		20200819_016	Perchlorate6850b.lcm	1x	☒	3100807-08	8/19/2020 12:09
12	LODV		20200819_017	Perchlorate6850b.lcm	1x	☒		8/19/2020 12:17
13	EQ2000337-01		20200819_019	Perchlorate6850b.lcm	1x	☒		8/19/2020 12:38
14	EQ2000337-02		20200819_020	Perchlorate6850b.lcm	1x	☒		8/19/2020 12:46
15	EQ2000337-03		20200819_021	Perchlorate6850b.lcm	1x	☒		8/19/2020 12:53
16	E2000723-001		20200819_022	Perchlorate6850b.lcm	1x	☒		8/19/2020 13:01
17	PERCHLORATE7		20200819_023	Perchlorate6850b.lcm	1x	☒	3100807-04	8/19/2020 13:09
18	E2000680-002X10		20200819_024	Perchlorate6850b.lcm	10x	☒		8/19/2020 13:17
19	E2000680-004X2		20200819_025	Perchlorate6850b.lcm	2x	☒		8/19/2020 13:25
20	E2000680-007X10		20200819_026	Perchlorate6850b.lcm	10x	☒		8/19/2020 13:33
21	E2000680-009X10		20200819_027	Perchlorate6850b.lcm	10x	☒		8/19/2020 13:41
22	E2000680-010X10		20200819_028	Perchlorate6850b.lcm	10x	☒		8/19/2020 13:49
23	E2000680-011X10		20200819_029	Perchlorate6850b.lcm	10x	☒		8/19/2020 13:57
24	EQ2000327-01		20200819_030	Perchlorate6850b.lcm	1x	☒		8/19/2020 14:04
25	EQ2000327-02		20200819_031	Perchlorate6850b.lcm	1x	☒		8/19/2020 14:12
26	EQ2000327-03		20200819_033	Perchlorate6850b.lcm	1x	☒		8/19/2020 14:21
27	PERCHLORATE7		20200819_034	Perchlorate6850b.lcm	1x	☒	3100807-04	8/19/2020 14:29
28	E2000735-001		20200819_035	Perchlorate6850b.lcm	1x	☒		8/19/2020 14:37
29	E2000735-002		20200819_036	Perchlorate6850b.lcm	1x	☒		8/19/2020 14:45
30	E2000735-003		20200819_037	Perchlorate6850b.lcm	1x	☒		8/19/2020 14:53
31	E2000735-004		20200819_038	Perchlorate6850b.lcm	1x	☒		8/19/2020 15:01
32	E2000735-005		20200819_039	Perchlorate6850b.lcm	1x	☒		8/19/2020 15:09
33	E2000735-006		20200819_040	Perchlorate6850b.lcm	1x	☒		8/19/2020 15:16
34	E2000735-007		20200819_041	Perchlorate6850b.lcm	1x	☒		8/19/2020 15:24
35	E2000735-008		20200819_042	Perchlorate6850b.lcm	1x	☒		8/19/2020 15:32
36	E2000735-009		20200819_043	Perchlorate6850b.lcm	1x	☒		8/19/2020 15:44
37	PERCHLORATE7		20200819_044	Perchlorate6850b.lcm	1x	☒	3100807-04	8/19/2020 15:52
38	E2000735-010		20200819_045	Perchlorate6850b.lcm	1x	☒		8/19/2020 16:00
39	E2000735-011		20200819_046	Perchlorate6850b.lcm	1x	☒		8/19/2020 16:08
40	E2000735-013		20200819_047	Perchlorate6850b.lcm	1x	☒		8/19/2020 16:16
41	E2000735-014		20200819_048	Perchlorate6850b.lcm	1x	☒		8/19/2020 16:24
42	E2000735-015		20200819_049	Perchlorate6850b.lcm	1x	☒		8/19/2020 16:32
43	E2000735-016		20200819_050	Perchlorate6850b.lcm	1x	☒		8/19/2020 16:40
44	E2000735-017		20200819_051	Perchlorate6850b.lcm	1x	☒		8/19/2020 16:47
45	E2000735-018		20200819_052	Perchlorate6850b.lcm	1x	☒		8/19/2020 16:55
46	E2000735-019		20200819_053	Perchlorate6850b.lcm	1x	☒		8/19/2020 17:03
47	PERCHLORATE7		20200819_054	Perchlorate6850b.lcm	1x	☒	3100807-04	8/19/2020 17:11
48	EQ2000339-01		20200819_055	Perchlorate6850b.lcm	1x	☒		8/19/2020 17:19
49	EQ2000339-02		20200819_056	Perchlorate6850b.lcm	1x	☒		8/19/2020 17:27
50	EQ2000339-03		20200819_057	Perchlorate6850b.lcm	1x	☒		8/19/2020 17:35
51	E2000712-001		20200819_058	Perchlorate6850b.lcm	1x	☒		8/19/2020 17:43
52	E2000712-002		20200819_059	Perchlorate6850b.lcm	1x	☒		8/19/2020 17:51
53	E2000712-003		20200819_060	Perchlorate6850b.lcm	1x	☒		8/19/2020 17:59
54	IB		20200819_061	Perchlorate6850b.lcm	1x	☒		8/19/2020 18:08
55	IB		20200819_062	Perchlorate6850b.lcm	1x	☒		8/19/2020 18:16
56	IB		20200819_063	Perchlorate6850b.lcm	1x	☒		8/19/2020 18:24
57	IB		20200819_064	Perchlorate6850b.lcm	1x	☒		8/19/2020 18:32
58	PERCHLORATE7		20200819_065	Perchlorate6850b.lcm	1x	☒	3100807-04	8/19/2020 18:40
59	E2000712-004		20200819_066	Perchlorate6850b.lcm	1x	☒		8/19/2020 18:48
60	E2000712-005		20200819_067	Perchlorate6850b.lcm	1x	☒		8/19/2020 18:56
61	E2000712-006		20200819_068	Perchlorate6850b.lcm	1x	☒		8/19/2020 19:04

20200819

1st Review: Kneir
2nd Review: Hvan

Injection Log
LCMS01 -Shimadzu 8050

ICAL Date: 7/19/2020
Cal. Std. xp: 11/18/2020
ICAL ID: **EC2000022**

Mobile Phases **A:** 0.75% Formic Acid/Water 3100807-09 **B:** MeOH 3100802-01

			File Name	Acquisition Method	Dilution	R	Comments	Date/Time
62	E2000712-007		20200819_069	Perchlorate6850b.lcm	1x	☒		8/19/2020 19:12
63	E2000694-012		20200819_070	Perchlorate6850b.lcm	1x	☒		8/19/2020 19:19
64	E2000694-012MS		20200819_071	Perchlorate6850b.lcm	1x	☒		8/19/2020 19:27
65	E2000694-012MSD		20200819_072	Perchlorate6850b.lcm	1x	☒		8/19/2020 19:35
66	E2000711-001		20200819_073	Perchlorate6850b.lcm	1x	☒		8/19/2020 19:43
67	E2000711-002		20200819_074	Perchlorate6850b.lcm	1x	☒		8/19/2020 19:51
68	E2000724-001		20200819_075	Perchlorate6850b.lcm	1x	☒		8/19/2020 19:59
69	PERCHLORATE7		20200819_076	Perchlorate6850b.lcm	1x	☒	3100807-04	8/19/2020 20:07
70	E2000724-002		20200819_077	Perchlorate6850b.lcm	1x	☒		8/19/2020 20:15
71	E2000724-003		20200819_078	Perchlorate6850b.lcm	1x	☒		8/19/2020 20:22
72	E2000724-004		20200819_079	Perchlorate6850b.lcm	1x	☒		8/19/2020 20:30
73	E2000728-001		20200819_080	Perchlorate6850b.lcm	1x	☒		8/19/2020 20:38
74	E2000728-002		20200819_081	Perchlorate6850b.lcm	1x	☒		8/19/2020 20:46
75	E2000729-001		20200819_082	Perchlorate6850b.lcm	1x	☒		8/19/2020 20:54
76	R2006493-001		20200819_083	Perchlorate6850b.lcm	1x	☒		8/19/2020 21:02
77	R2006493-003		20200819_084	Perchlorate6850b.lcm	1x	☒		8/19/2020 21:10
78	R2006493-005		20200819_085	Perchlorate6850b.lcm	1x	☒		8/19/2020 21:18
79	R2006493-007		20200819_086	Perchlorate6850b.lcm	1x	☒		8/19/2020 21:26
80	PERCHLORATE7		20200819_087	Perchlorate6850b.lcm	1x	☒	3100807-04	8/19/2020 21:33
81	R2006493-009		20200819_088	Perchlorate6850b.lcm	1x	☒		8/19/2020 21:41
82	R2006493-011		20200819_089	Perchlorate6850b.lcm	1x	☒		8/19/2020 21:49
83	R2006493-013		20200819_090	Perchlorate6850b.lcm	1x	☒		8/19/2020 21:57
84	R2006493-015		20200819_091	Perchlorate6850b.lcm	1x	☒		8/19/2020 22:05
85	PERCHLORATE7		20200819_092	Perchlorate6850b.lcm	1x	☒	3100807-04	8/19/2020 22:13
86	EQ2000338-01		20200819_093	Perchlorate6850b.lcm	1x	☒		8/19/2020 22:21
87	EQ2000338-02		20200819_094	Perchlorate6850b.lcm	1x	☒		8/19/2020 22:29
88	EQ2000338-03		20200819_095	Perchlorate6850b.lcm	1x	☒		8/19/2020 22:37
89	EQ2000338-04		20200819_096	Perchlorate6850b.lcm	1x	☒		8/19/2020 22:44
90	EQ2000338-05		20200819_097	Perchlorate6850b.lcm	1x	☒		8/19/2020 22:52
91	R2006532-001		20200819_098	Perchlorate6850b.lcm	1x	☒		8/19/2020 23:00
92	R2006532-003		20200819_099	Perchlorate6850b.lcm	1x	☒		8/19/2020 23:08
93	R2006532-005		20200819_100	Perchlorate6850b.lcm	1x	☒		8/19/2020 23:16
94	R2006532-007		20200819_101	Perchlorate6850b.lcm	1x	☒		8/19/2020 23:24
95	R2006532-009		20200819_102	Perchlorate6850b.lcm	1x	☒		8/19/2020 23:32
96	PERCHLORATE7		20200819_103	Perchlorate6850b.lcm	1x	☒	3100807-04	8/19/2020 23:40
97	R2006532-011		20200819_104	Perchlorate6850b.lcm	1x	☒		8/19/2020 23:47
98	R2006555-002		20200819_105	Perchlorate6850b.lcm	1x	☒		8/19/2020 23:55
99	R2006555-004		20200819_106	Perchlorate6850b.lcm	1x	☒		8/20/2020 0:03
100	R2006555-006		20200819_107	Perchlorate6850b.lcm	1x	☒		8/20/2020 0:11
101	R2006555-008		20200819_108	Perchlorate6850b.lcm	1x	☒		8/20/2020 0:19
102	R2006555-010		20200819_109	Perchlorate6850b.lcm	1x	☒		8/20/2020 0:27
103	R2006555-012		20200819_110	Perchlorate6850b.lcm	1x	☒		8/20/2020 0:35
104	R2006617-001		20200819_111	Perchlorate6850b.lcm	1x	☒		8/20/2020 0:43
105	R2006617-003		20200819_112	Perchlorate6850b.lcm	1x	☒		8/20/2020 0:50
106	R2006617-005		20200819_113	Perchlorate6850b.lcm	1x	☒		8/20/2020 0:58
107	PERCHLORATE7		20200819_114	Perchlorate6850b.lcm	1x	☒	3100807-04	8/20/2020 1:06
108	R2006617-007		20200819_115	Perchlorate6850b.lcm	1x	☒		8/20/2020 1:14
109	R2006617-009		20200819_116	Perchlorate6850b.lcm	1x	☒		8/20/2020 1:22
110	R2006617-010		20200819_117	Perchlorate6850b.lcm	1x	☒		8/20/2020 1:30
111	PERCHLORATE7		20200819_118	Perchlorate6850b.lcm	1x	☒	3100807-04	8/20/2020 1:38

Initial Calibration - Detailed Report

Calibration ID: EC2000022 **Instrument ID:** E-LCMS-01
Column Name: 1

#	Lab Code	Sample Name	File Location	Aquisition Date
01	EC2000022-01	PERCHLORATE1	20200819_005	08/19/2020 10:42
02	EC2000022-02	PERCHLORATE2	20200819_006	08/19/2020 10:50
03	EC2000022-03	PERCHLORATE3	20200819_007	08/19/2020 10:58
04	EC2000022-04	PERCHLORATE4	20200819_008	08/19/2020 11:06
05	EC2000022-05	PERCHLORATE5	20200819_009	08/19/2020 11:14
06	EC2000022-06	PERCHLORATE6	20200819_010	08/19/2020 11:22
07	EC2000022-07	PERCHLORATE7	20200819_011	08/19/2020 11:30
08	EC2000022-08	PERCHLORATE8	20200819_012	08/19/2020 11:38
09	EC2000022-09	PERCHLORATE9	20200819_013	08/19/2020 11:45
10	EC2000022-10	PERCHLORATE10	20200819_014	08/19/2020 11:53

Analyte **Curve Fit** **Weighting**

Perchlorate **Average RF** **RSD = 5.952** **Average RF = 0.1131**

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.1000	0.1299	02	0.5000	0.113	03	0.7000	0.1123	04	1.0000	0.1147
05	2.0000	0.1134	06	5.0000	0.1082	07	10.0000	0.1069	08	20.0000	0.1158
09	30.0000	0.1094	10	50.0000	0.107						

Analyte

Perchlorate

#	Amount	Calculated Conc	%D	#	Amount	Calculated Conc	%D	#	Amount	Calculated Conc	%D
01	0.1000	0.115	14.9	02	0.5000	0.500	-0.1	03	0.7000	0.695	-0.7
04	1.0000	1.01	1.5	05	2.0000	2.01	0.3	06	5.0000	4.78	-4.3
07	10.0000	9.46	-5.4	08	20.0000	20.5	2.4	09	30.0000	29.0	-3.2
10	50.0000	47.3	-5.4								

Initial Calibration Verification Summary Report

Calibration ID:	EC2000022	**Instrument ID:**	E-LCMS-01
Datafile ID:	20200819_016	**Column Name:**	1

Analyte	Lab Code	Type	Curve Fit	True Value	Calc Conc	Units	Result	Criteria
Perchlorate	EC2000022-11	T	Average RF	10	9.352	ng/mL	-6.5	<= 15

ALS Group Houston

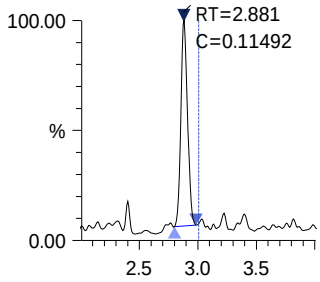
PERCHLORATE1

Date acquired: 8/19/2020 10:42:37 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200819\20200819_005.lcd
Vial: 5 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE1	8/19/2020 10:42:37 AM	3802	0.11492	20200819_005	2.881	25.0000	1.0000	5
Sodium Perchlorate-18O4_IS	PERCHLORATE1	8/19/2020 10:42:37 AM	292622	1.00000	20200819_005	2.877	25.0000	1.0000	5

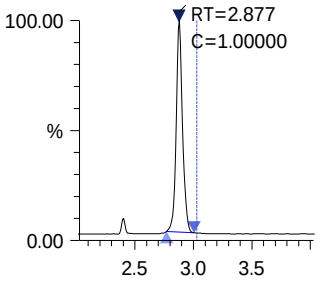
Perchlorate

Conc 0.11492
Area 3802
Q 99.00>83.00 (-) 1.00e3



Sodium Perchlorate-18O4 _IS

Conc 1.00000
Area 292622
ISTD 107.00>89.00 (-) 7.83e4



ALS Group Houston

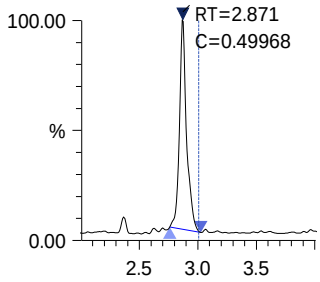
PERCHLORATE2

Date acquired: 8/19/2020 10:50:33 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200819\20200819_006.lcd
Vial: 6 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE2	8/19/2020 10:50:33 AM	18036	0.49968	20200819_006	2.871	25.0000	1.0000	6
Sodium Perchlorate-18O4_IS	PERCHLORATE2	8/19/2020 10:50:33 AM	319274	1.00000	20200819_006	2.870	25.0000	1.0000	6

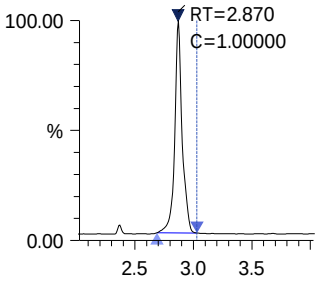
Perchlorate

Conc 0.49968
Area 18036
Q 99.00>83.00 (-) 4.32e3



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 319274
ISTD 107.00>89.00 (-) 7.26e4



ALS Group Houston

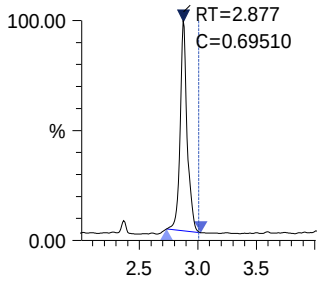
PERCHLORATE3

Date acquired: 8/19/2020 10:58:27 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200819\20200819_007.lcd
Vial: 7 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE3	8/19/2020 10:58:27 AM	24394	0.69510	20200819_007	2.877	25.0000	1.0000	7
Sodium Perchlorate-18O4_IS	PERCHLORATE3	8/19/2020 10:58:27 AM	310422	1.00000	20200819_007	2.874	25.0000	1.0000	7

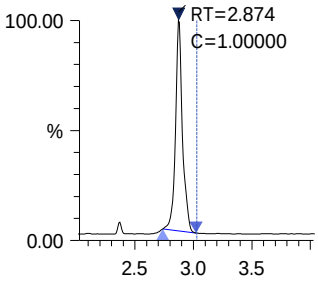
Perchlorate

Conc 0.69510
Area 24394
Q 99.00>83.00 (-) 5.99e3



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 310422
ISTD 107.00>89.00 (-) 7.56e4



ALS Group Houston

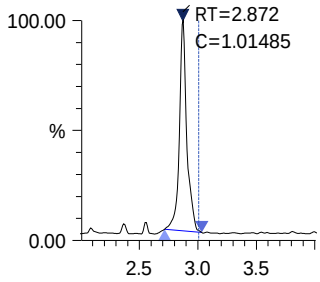
PERCHLORATE4

Date acquired: 8/19/2020 11:06:22 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200819\20200819_008.lcd
Vial: 8 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE4	8/19/2020 11:06:22 AM	33591	1.01485	20200819_008	2.872	25.0000	1.0000	8
Sodium Perchlorate-18O4_IS	PERCHLORATE4	8/19/2020 11:06:22 AM	292786	1.00000	20200819_008	2.872	25.0000	1.0000	8

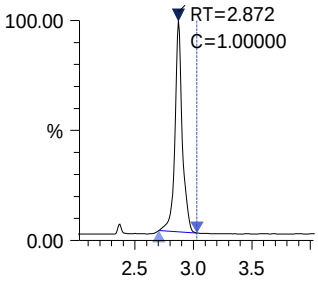
Perchlorate

Conc 1.01485
Area 33591
Q 99.00>83.00 (-) 7.70e3



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 292786
ISTD 107.00>89.00 (-) 6.80e4



ALS Group Houston

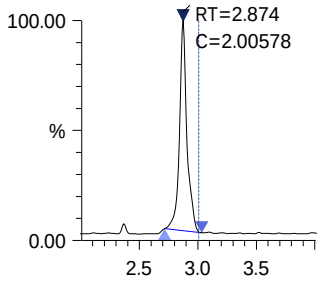
PERCHLORATE5

Date acquired: 8/19/2020 11:14:18 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200819\20200819_009.lcd
Vial: 9 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE5	8/19/2020 11:14:18 AM	65114	2.00578	20200819_009	2.874	25.0000	1.0000	9
Sodium Perchlorate-18O4_IS	PERCHLORATE5	8/19/2020 11:14:18 AM	287158	1.00000	20200819_009	2.873	25.0000	1.0000	9

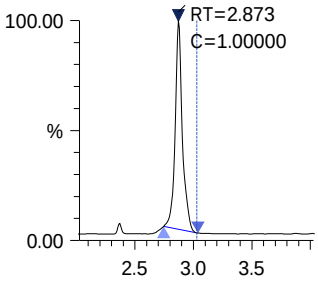
Perchlorate

Conc 2.00578
Area 65114
Q 99.00>83.00 (-) 1.49e4



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 287158
ISTD 107.00>89.00 (-) 6.84e4



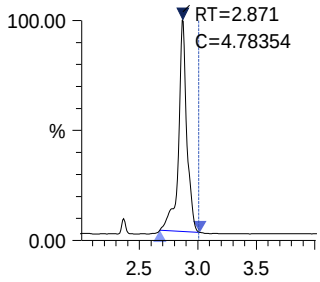
PERCHLORATE6

Date acquired: 8/19/2020 11:22:10 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200819\20200819_010.lcd
Vial: 10 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE6	8/19/2020 11:22:10 AM	167892	4.78354	20200819_010	2.871	25.0000	1.0000	10
Sodium Perchlorate-18O4_IS	PERCHLORATE6	8/19/2020 11:22:10 AM	310462	1.00000	20200819_010	2.870	25.0000	1.0000	10

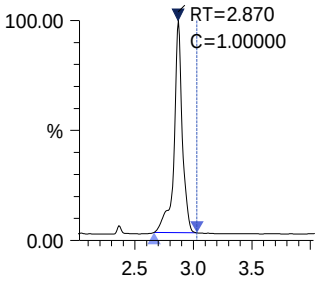
Perchlorate

Conc 4.78354
Area 167892
Q 99.00>83.00 (-) 3.45e4



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 310462
ISTD 107.00>89.00 (-) 6.38e4



ALS Group Houston

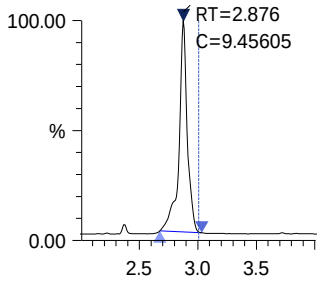
PERCHLORATE7

Date acquired: 8/19/2020 11:30:05 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200819\20200819_011.lcd
Vial: 4 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE7	8/19/2020 11:30:05 AM	309830	9.45605	20200819_011	2.876	25.0000	1.0000	4
Sodium Perchlorate-18O4_IS	PERCHLORATE7	8/19/2020 11:30:05 AM	289828	1.00000	20200819_011	2.875	25.0000	1.0000	4

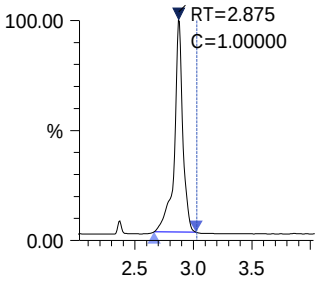
Perchlorate

Conc 9.45605
Area 309830
Q 99.00>83.00 (-) 6.35e4



Sodium Perchlorate-18O4 _IS

Conc 1.00000
Area 289828
ISTD 107.00>89.00 (-) 5.81e4



ALS Group Houston

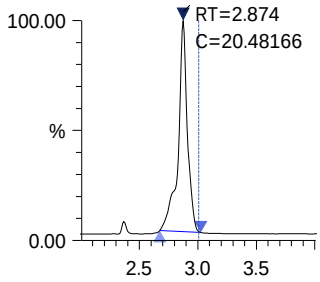
PERCHLORATE8

Date acquired: 8/19/2020 11:38:00 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200819\20200819_012.lcd
Vial: 11 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE8	8/19/2020 11:38:00 AM	587088	20.48166	20200819_012	2.874	25.0000	1.0000	11
Sodium Perchlorate-18O4_IS	PERCHLORATE8	8/19/2020 11:38:00 AM	253551	1.00000	20200819_012	2.873	25.0000	1.0000	11

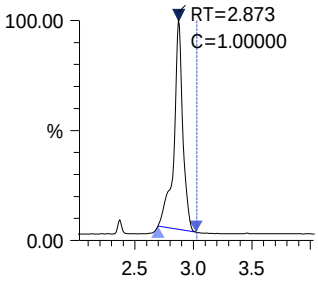
Perchlorate

Conc 20.48166
Area 587088
Q 99.00>83.00 (-) 1.09e5



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 253551
ISTD 107.00>89.00 (-) 4.87e4



ALS Group Houston

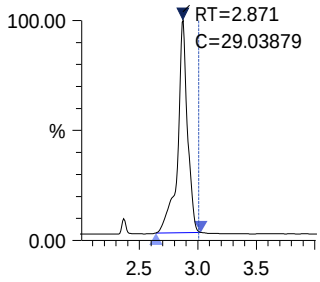
PERCHLORATE9

Date acquired: 8/19/2020 11:45:53 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200819\20200819_013.lcd
Vial: 12 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE9	8/19/2020 11:45:53 AM	849278	29.03879	20200819_013	2.871	25.0000	1.0000	12
Sodium Perchlorate-18O4_IS	PERCHLORATE9	8/19/2020 11:45:53 AM	258702	1.00000	20200819_013	2.870	25.0000	1.0000	12

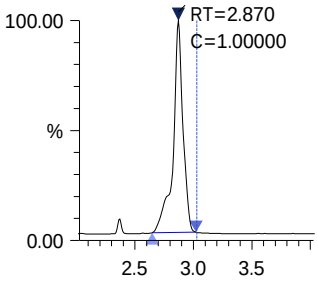
Perchlorate

Conc 29.03879
Area 849278
Q 99.00>83.00 (-) 1.48e5



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 258702
ISTD 107.00>89.00 (-) 4.43e4



ALS Group Houston

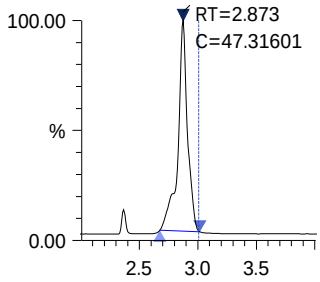
PERCHLORATE10

Date acquired: 8/19/2020 11:53:48 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200819\20200819_014.lcd
Vial: 13 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE10	8/19/2020 11:53:48 AM	1220253	47.31601	20200819_014	2.873	25.0000	1.0000	13
Sodium Perchlorate-18O4_IS	PERCHLORATE10	8/19/2020 11:53:48 AM	228123	1.00000	20200819_014	2.871	25.0000	1.0000	13

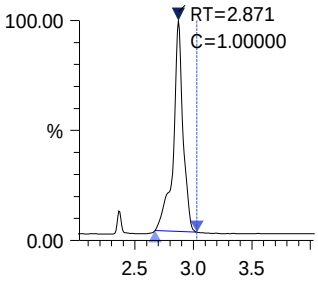
Perchlorate

Conc 47.31601
Area 1220253
Q 99.00>83.00 (-) 2.17e5



Sodium Perchlorate-18O4 _IS

Conc 1.00000
Area 228123
ISTD 107.00>89.00 (-) 3.99e4



ALS Group Houston

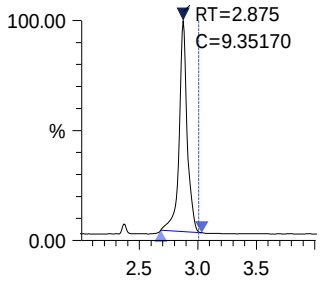
PERCHLORATEICV

Date acquired: 8/19/2020 12:09:35 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200819\20200819_016.lcd
Vial: 14 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATEICV	8/19/2020 12:09:35 PM	294031	9.35170	20200819_016	2.875	25.0000	1.0000	14
Sodium Perchlorate-18O4_IS	PERCHLORATEICV	8/19/2020 12:09:35 PM	278118	1.00000	20200819_016	2.873	25.0000	1.0000	14

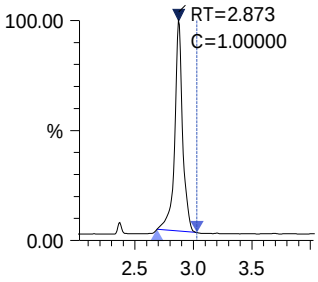
Perchlorate

Conc 9.35170
Area 294031
Q 99.00>83.00 (-) 6.27e4



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 278118
ISTD 107.00>89.00 (-) 5.98e4



20200826

1st Review: Grivera
2nd Review: Hvan

ALS Environmental

Injection Log
LCMS01 -Shimadzu 8050

ICAL Date: 8/26/2020
Cal. Std. xp: 11/18/2020
ICAL ID: **EC2000023**

Mobile Phases **A:** 0.75% Formic Acid/Water 3100807-09 **B:** MeOH 3100802-01

			File Name	Acquisition Method	Dilution	R	Comments	Date/Time
1	PERCHLORATE1		20200826_024	Perchlorate6850b.lcm	1x	☒	3100806-05	8/26/2020 11:55
2	PERCHLORATE2		20200826_025	Perchlorate6850b.lcm	1x	☒	3100806-06	8/26/2020 12:03
3	PERCHLORATE3		20200826_026	Perchlorate6850b.lcm	1x	☒	3100806-07	8/26/2020 12:11
4	PERCHLORATE4		20200826_027	Perchlorate6850b.lcm	1x	☒	3100807-01	8/26/2020 12:19
5	PERCHLORATE5		20200826_028	Perchlorate6850b.lcm	1x	☒	3100807-02	8/26/2020 12:27
6	PERCHLORATE6		20200826_029	Perchlorate6850b.lcm	1x	☒	3100807-03	8/26/2020 12:35
7	PERCHLORATE7		20200826_030	Perchlorate6850b.lcm	1x	☒	3100807-04	8/26/2020 12:42
8	PERCHLORATE8		20200826_031	Perchlorate6850b.lcm	1x	☒	3100807-05	8/26/2020 12:50
9	PERCHLORATE9		20200826_032	Perchlorate6850b.lcm	1x	☒	3100807-06	8/26/2020 12:58
10	PERCHLORATE10		20200826_033	Perchlorate6850b.lcm	1x	☒	3100807-07	8/26/2020 13:06
11	IB		20200826_034	Perchlorate6850b.lcm	1x	☒		8/26/2020 13:14
12	PERCHLORATEICV		20200826_035	Perchlorate6850b.lcm	1x	☒	3100807-08	8/26/2020 14:26
13	IB		20200826_036	Perchlorate6850b.lcm	1x	☒		8/26/2020 14:34
14	LODV		20200826_037	Perchlorate6850b.lcm	1x	☒		8/26/2020 14:42
15	PERCHLORATE7		20200826_038	Perchlorate6850b.lcm	1x	☒	3100807-04	8/26/2020 14:50
16	EQ2000359-01		20200826_039	Perchlorate6850b.lcm	1x	☒		8/26/2020 15:12
17	EQ2000359-02		20200826_040	Perchlorate6850b.lcm	1x	☒		8/26/2020 15:19
18	EQ2000359-03		20200826_041	Perchlorate6850b.lcm	1x	☒		8/26/2020 15:27
19	EQ2000359-02		20200826_042	Perchlorate6850b.lcm	1x	☒		8/26/2020 15:35
20	EQ2000359-04X10		20200826_043	Perchlorate6850b.lcm	10x	☒		8/26/2020 15:43
21	EQ2000359-05X10		20200826_044	Perchlorate6850b.lcm	10x	☒		8/26/2020 15:51
22	EQ2000359-06X10		20200826_045	Perchlorate6850b.lcm	10x	☒		8/26/2020 15:59
23	EQ2000359-07X10		20200826_046	Perchlorate6850b.lcm	10x	☒		8/26/2020 16:07
24	E2000716-001X10		20200826_047	Perchlorate6850b.lcm	10x	☒		8/26/2020 16:15
25	E2000739-001X10		20200826_048	Perchlorate6850b.lcm	10x	☒		8/26/2020 16:23
26	PERCHLORATE7		20200826_049	Perchlorate6850b.lcm	1x	☒	3100807-04	8/26/2020 16:30
27	E2000740-001X200		20200826_050	Perchlorate6850b.lcm	200x	☒		8/26/2020 16:38
28	E2000741-001X10		20200826_051	Perchlorate6850b.lcm	10x	☒		8/26/2020 16:46
29	E2000742-001X2		20200826_052	Perchlorate6850b.lcm	2x	☒		8/26/2020 16:54
30	E2000742-002X2		20200826_053	Perchlorate6850b.lcm	2x	☒		8/26/2020 17:02
31	E2000742-003X10		20200826_054	Perchlorate6850b.lcm	10x	☒		8/26/2020 17:10
32	E2000742-004X10		20200826_055	Perchlorate6850b.lcm	10x	☒		8/26/2020 17:18
33	E2000742-006X10		20200826_056	Perchlorate6850b.lcm	10x	☒		8/26/2020 17:26
34	PERCHLORATE7		20200826_057	Perchlorate6850b.lcm	1x	☒	3100807-04	8/26/2020 17:33
35	E2000742-009X10		20200826_058	Perchlorate6850b.lcm	10x	☒		8/26/2020 17:41
36	E2000742-010X10		20200826_059	Perchlorate6850b.lcm	10x	☒		8/26/2020 17:49
37	E2000742-011X10		20200826_060	Perchlorate6850b.lcm	10x	☒		8/26/2020 17:57
38	E2000742-012X10		20200826_061	Perchlorate6850b.lcm	10x	☒		8/26/2020 18:05
39	E2000742-013X10		20200826_062	Perchlorate6850b.lcm	10x	☒		8/26/2020 18:13
40	E2000742-014X10		20200826_063	Perchlorate6850b.lcm	10x	☒		8/26/2020 18:21
41	E2000759-001X10		20200826_064	Perchlorate6850b.lcm	10x	☒		8/26/2020 18:29
42	E2000759-002X10		20200826_065	Perchlorate6850b.lcm	10x	☒		8/26/2020 18:36
43	PERCHLORATE7		20200826_066	Perchlorate6850b.lcm	1x	☒	3100807-04	8/26/2020 18:44
44	EQ2000369-01		20200826_067	Perchlorate6850b.lcm	1x	☒		8/26/2020 18:52
45	EQ2000369-02		20200826_068	Perchlorate6850b.lcm	1x	☒		8/26/2020 19:00
46	EQ2000369-03		20200826_069	Perchlorate6850b.lcm	1x	☒		8/26/2020 19:08
47	EQ2000369-04		20200826_070	Perchlorate6850b.lcm	1x	☒		8/26/2020 19:16
48	EQ2000369-05		20200826_071	Perchlorate6850b.lcm	1x	☒		8/26/2020 19:24
49	E2000764-001		20200826_072	Perchlorate6850b.lcm	1x	☒		8/26/2020 19:32
50	E2000764-002		20200826_073	Perchlorate6850b.lcm	1x	☒		8/26/2020 19:40
51	E2000764-003		20200826_074	Perchlorate6850b.lcm	1x	☒		8/26/2020 19:47
52	E2000764-004		20200826_075	Perchlorate6850b.lcm	1x	☒		8/26/2020 19:55
53	E2000764-005		20200826_076	Perchlorate6850b.lcm	1x	☒		8/26/2020 20:03
54	PERCHLORATE7		20200826_077	Perchlorate6850b.lcm	1x	☒	3100807-04	8/26/2020 20:11
55	E2000764-006		20200826_078	Perchlorate6850b.lcm	1x	☒		8/26/2020 20:19
56	E2000764-007		20200826_079	Perchlorate6850b.lcm	1x	☒		8/26/2020 20:27
57	E2000764-008		20200826_080	Perchlorate6850b.lcm	1x	☒		8/26/2020 20:35
58	E2000764-009		20200826_081	Perchlorate6850b.lcm	1x	☒		8/26/2020 20:43
59	E2000764-010		20200826_082	Perchlorate6850b.lcm	1x	☒		8/26/2020 20:51
60	E2000764-011		20200826_083	Perchlorate6850b.lcm	1x	☒		8/26/2020 20:58
61	E2000764-012		20200826_084	Perchlorate6850b.lcm	1x	☒		8/26/2020 21:06

20200826

1st Review: Grivera
2nd Review: Hvan

Injection Log
LCMS01 -Shimadzu 8050

ICAL Date: 8/26/2020
Cal. Std. xp: 11/18/2020
ICAL ID: **EC2000023**

Mobile Phases **A:** 0.75% Formic Acid/Water 3100807-09 **B:** MeOH 3100802-01

			File Name	Acquisition Method	Dilution	R	Comments	Date/Time
62	E2000764-013		20200826_085	Perchlorate6850b.lcm	1x	☒		8/26/2020 21:14
63	E2000764-014		20200826_086	Perchlorate6850b.lcm	1x	☒		8/26/2020 21:22
64	E2000764-015		20200826_087	Perchlorate6850b.lcm	1x	☒		8/26/2020 21:30
65	PERCHLORATE7		20200826_088	Perchlorate6850b.lcm	1x	☒	3100807-04	8/26/2020 21:38
66	E2000764-016		20200826_089	Perchlorate6850b.lcm	1x	☒		8/26/2020 21:46
67	E2000764-017		20200826_090	Perchlorate6850b.lcm	1x	☒		8/26/2020 21:54
68	E2000764-018		20200826_091	Perchlorate6850b.lcm	1x	☒		8/26/2020 22:01
69	PERCHLORATE7		20200826_092	Perchlorate6850b.lcm	1x	☒	3100807-04	8/26/2020 22:09
70	EQ2000367-01		20200826_093	Perchlorate6850b.lcm	1x	☒		8/26/2020 22:17
71	EQ2000367-02		20200826_094	Perchlorate6850b.lcm	1x	☒		8/26/2020 22:25
72	EQ2000367-03		20200826_095	Perchlorate6850b.lcm	1x	☒		8/26/2020 22:33
73	EQ2000367-04		20200826_096	Perchlorate6850b.lcm	1x	☒		8/26/2020 22:41
74	EQ2000367-05		20200826_097	Perchlorate6850b.lcm	1x	☒		8/26/2020 22:49
75	R2006746-001		20200826_098	Perchlorate6850b.lcm	1x	☒		8/26/2020 22:57
76	R2006746-002		20200826_099	Perchlorate6850b.lcm	1x	☒		8/26/2020 23:04
77	R2006777-001		20200826_100	Perchlorate6850b.lcm	1x	☒		8/26/2020 23:12
78	R2006777-002		20200826_101	Perchlorate6850b.lcm	1x	☒		8/26/2020 23:20
79	R2006777-003		20200826_102	Perchlorate6850b.lcm	1x	☒		8/26/2020 23:28
80	PERCHLORATE7		20200826_103	Perchlorate6850b.lcm	1x	☒	3100807-04	8/26/2020 23:36
81	R2006777-004		20200826_104	Perchlorate6850b.lcm	1x	☒		8/26/2020 23:44
82	R2006777-005		20200826_105	Perchlorate6850b.lcm	1x	☒		8/26/2020 23:52
83	R2006777-006		20200826_106	Perchlorate6850b.lcm	1x	☒		8/27/2020 0:00
84	R2006777-007		20200826_107	Perchlorate6850b.lcm	1x	☒		8/27/2020 0:08
85	R2006777-008		20200826_108	Perchlorate6850b.lcm	1x	☒		8/27/2020 0:15
86	R2006805-001		20200826_109	Perchlorate6850b.lcm	1x	☒		8/27/2020 0:23
87	R2006805-002		20200826_110	Perchlorate6850b.lcm	1x	☒		8/27/2020 0:31
88	PERCHLORATE7		20200826_111	Perchlorate6850b.lcm	1x	☒	3100807-04	8/27/2020 0:39
89								
90								
91								
92								

Initial Calibration - Detailed Report

Calibration ID: EC2000023 **Instrument ID:** E-LCMS-01
Column Name: 1

#	Lab Code	Sample Name	File Location	Aquisition Date
01	EC2000023-01	PERCHLORATE1	20200826_024	08/26/2020 11:55
02	EC2000023-02	PERCHLORATE2	20200826_025	08/26/2020 12:03
03	EC2000023-03	PERCHLORATE3	20200826_026	08/26/2020 12:11
04	EC2000023-04	PERCHLORATE4	20200826_027	08/26/2020 12:19
05	EC2000023-05	PERCHLORATE5	20200826_028	08/26/2020 12:27
06	EC2000023-06	PERCHLORATE6	20200826_029	08/26/2020 12:35
07	EC2000023-07	PERCHLORATE7	20200826_030	08/26/2020 12:42
08	EC2000023-08	PERCHLORATE8	20200826_031	08/26/2020 12:50
09	EC2000023-09	PERCHLORATE9	20200826_032	08/26/2020 12:58
10	EC2000023-10	PERCHLORATE10	20200826_033	08/26/2020 13:06

Analyte **Curve Fit** **Weighting**

Perchlorate **Average RF** **RSD = 5.546** **Average RF = 0.1085**

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.1000	0.1181	02	0.5000	0.1137	03	0.7000	0.1087	04	1.0000	0.1168
05	2.0000	0.1092	06	5.0000	0.1056	07	10.0000	0.1014	08	20.0000	0.1048
09	30.0000	0.1049	10	50.0000	0.1012						

Analyte

Perchlorate

#	Amount	Calculated Conc	%D	#	Amount	Calculated Conc	%D	#	Amount	Calculated Conc	%D
01	0.1000	0.109	8.9	02	0.5000	0.524	4.8	03	0.7000	0.702	0.2
04	1.0000	1.08	7.7	05	2.0000	2.01	0.7	06	5.0000	4.87	-2.6
07	10.0000	9.35	-6.5	08	20.0000	19.3	-3.3	09	30.0000	29.0	-3.3
10	50.0000	46.7	-6.6								

Initial Calibration Verification Summary Report

Calibration ID:	EC2000023	**Instrument ID:**	E-LCMS-01
Datafile ID:	20200826_035	**Column Name:**	1

Analyte	Lab Code	Type	Curve Fit	True Value	Calc Conc	Units	Result	Criteria
Perchlorate	EC2000023-11	T	Average RF	10	9.690	ng/mL	-3.1	<= 15

ALS Group Houston

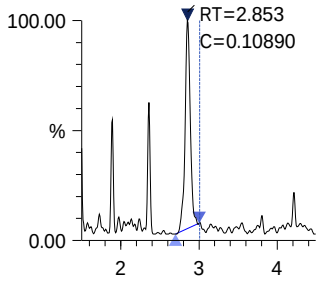
PERCHLORATE1

Date acquired: 8/26/2020 11:55:32 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200826\20200826_024.lcd
Vial: 5 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE1	8/26/2020 11:55:32 AM	2254	0.10890	20200826_024	2.853	25.0000	1.0000	5
Sodium Perchlorate-18O4_IS	PERCHLORATE1	8/26/2020 11:55:32 AM	190859	1.00000	20200826_024	2.852	25.0000	1.0000	5

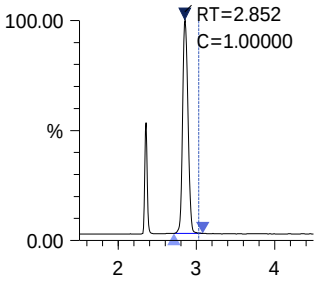
Perchlorate

Conc 0.10890
Area 2254
Q 99.00>83.00 (-) 4.92e2



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 190859
ISTD 107.00>89.00 (-) 3.91e4



ALS Group Houston

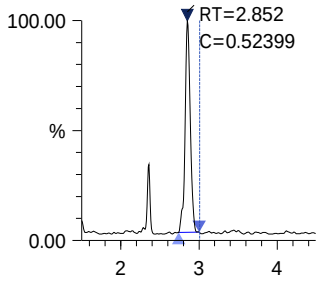
PERCHLORATE2

Date acquired: 8/26/2020 12:03:28 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200826\20200826_025.lcd
Vial: 6 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE2	8/26/2020 12:03:28 PM	11013	0.52399	20200826_025	2.852	25.0000	1.0000	6
Sodium Perchlorate-18O4_IS	PERCHLORATE2	8/26/2020 12:03:28 PM	193789	1.00000	20200826_025	2.850	25.0000	1.0000	6

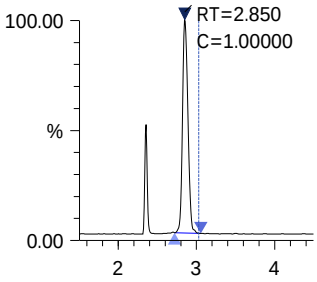
Perchlorate

Conc 0.52399
Area 11013
Q 99.00>83.00 (-) 2.37e3



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 193789
ISTD 107.00>89.00 (-) 3.95e4



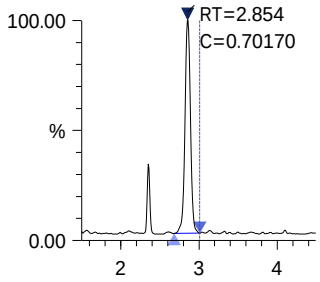
PERCHLORATE3

Date acquired: 8/26/2020 12:11:22 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200826\20200826_026.lcd
Vial: 7 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE3	8/26/2020 12:11:22 PM	15252	0.70170	20200826_026	2.854	25.0000	1.0000	7
Sodium Perchlorate-18O4_IS	PERCHLORATE3	8/26/2020 12:11:22 PM	200410	1.00000	20200826_026	2.849	25.0000	1.0000	7

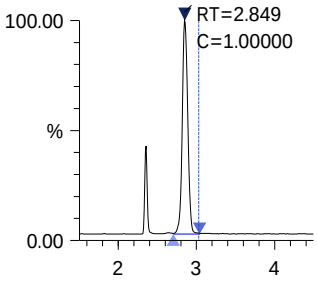
Perchlorate

Conc 0.70170
Area 15252
Q 99.00>83.00 (-) 3.07e3



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 200410
ISTD 107.00>89.00 (-) 4.03e4



ALS Group Houston

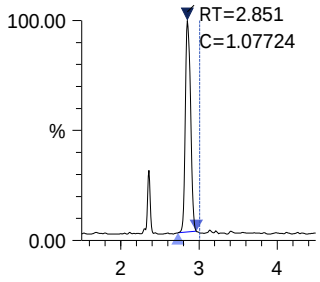
PERCHLORATE4

Date acquired: 8/26/2020 12:19:17 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200826\20200826_027.lcd
Vial: 8 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE4	8/26/2020 12:19:17 PM	21473	1.07724	20200826_027	2.851	25.0000	1.0000	8
Sodium Perchlorate-18O4_IS	PERCHLORATE4	8/26/2020 12:19:17 PM	183791	1.00000	20200826_027	2.851	25.0000	1.0000	8

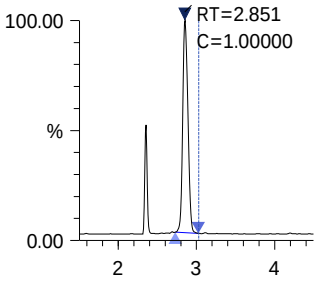
Perchlorate

Conc 1.07724
Area 21473
Q 99.00>83.00 (-) 4.54e3



Sodium Perchlorate-18O4 _IS

Conc 1.00000
Area 183791
ISTD 107.00>89.00 (-) 3.92e4



ALS Group Houston

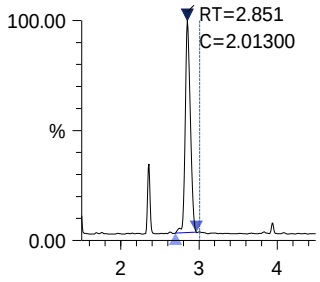
PERCHLORATE5

Date acquired: 8/26/2020 12:27:10 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200826\20200826_028.lcd
Vial: 9 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE5	8/26/2020 12:27:10 PM	40038	2.01300	20200826_028	2.851	25.0000	1.0000	9
Sodium Perchlorate-18O4_IS	PERCHLORATE5	8/26/2020 12:27:10 PM	183386	1.00000	20200826_028	2.849	25.0000	1.0000	9

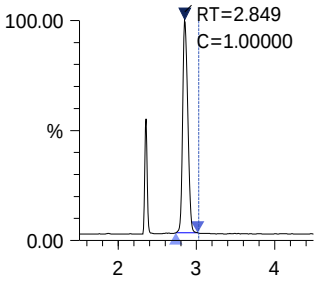
Perchlorate

Conc 2.01300
Area 40038
Q 99.00>83.00 (-) 8.76e3



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 183386
ISTD 107.00>89.00 (-) 3.95e4



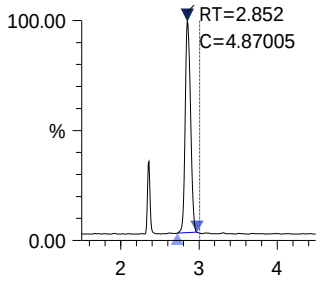
PERCHLORATE6

Date acquired: 8/26/2020 12:35:02 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200826\20200826_029.lcd
Vial: 10 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE6	8/26/2020 12:35:02 PM	98121	4.87005	20200826_029	2.852	25.0000	1.0000	10
Sodium Perchlorate-18O4_IS	PERCHLORATE6	8/26/2020 12:35:02 PM	185768	1.00000	20200826_029	2.850	25.0000	1.0000	10

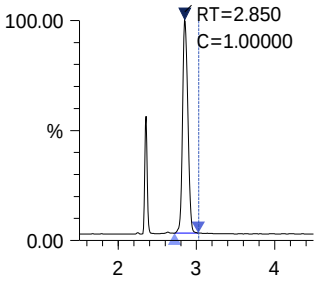
Perchlorate

Conc 4.87005
Area 98121
Q 99.00>83.00 (-) 2.04e4



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 185768
ISTD 107.00>89.00 (-) 3.86e4



ALS Group Houston

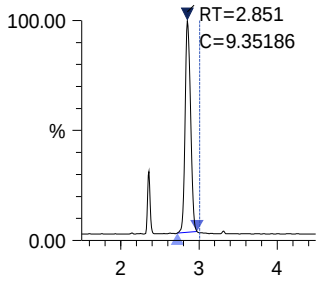
PERCHLORATE7

Date acquired: 8/26/2020 12:42:57 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200826\20200826_030.lcd
Vial: 4 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE7	8/26/2020 12:42:57 PM	174248	9.35186	20200826_030	2.851	25.0000	1.0000	4
Sodium Perchlorate-18O4_IS	PERCHLORATE7	8/26/2020 12:42:57 PM	171796	1.00000	20200826_030	2.850	25.0000	1.0000	4

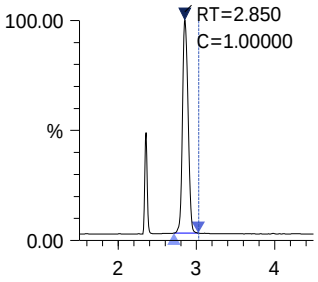
Perchlorate

Conc 9.35186
Area 174248
Q 99.00>83.00 (-) 3.57e4



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 171796
ISTD 107.00>89.00 (-) 3.39e4



ALS Group Houston

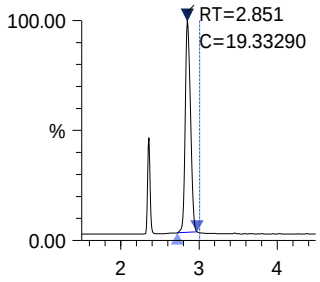
PERCHLORATE8

Date acquired: 8/26/2020 12:50:51 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200826\20200826_031.lcd
Vial: 11 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE8	8/26/2020 12:50:51 PM	337010	19.33290	20200826_031	2.851	25.0000	1.0000	11
Sodium Perchlorate-18O4_IS	PERCHLORATE8	8/26/2020 12:50:51 PM	160727	1.00000	20200826_031	2.850	25.0000	1.0000	11

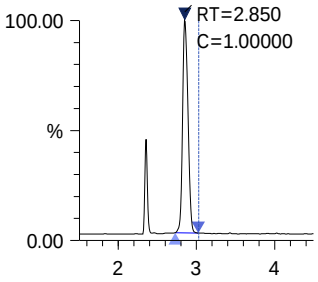
Perchlorate

Conc 19.33290
Area 337010
Q 99.00>83.00 (-) 7.14e4



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 160727
ISTD 107.00>89.00 (-) 3.30e4



ALS Group Houston

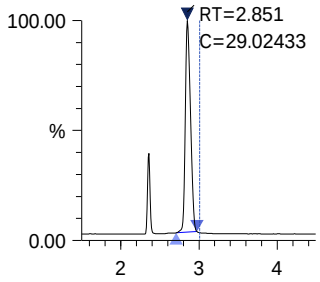
PERCHLORATE9

Date acquired: 8/26/2020 12:58:44 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200826\20200826_032.lcd
Vial: 12 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE9	8/26/2020 12:58:44 PM	466342	29.02433	20200826_032	2.851	25.0000	1.0000	12
Sodium Perchlorate-18O4_IS	PERCHLORATE9	8/26/2020 12:58:44 PM	148144	1.00000	20200826_032	2.849	25.0000	1.0000	12

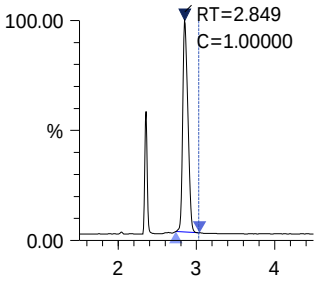
Perchlorate

Conc 29.02433
Area 466342
Q 99.00>83.00 (-) 1.00e5



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 148144
ISTD 107.00>89.00 (-) 3.19e4



ALS Group Houston

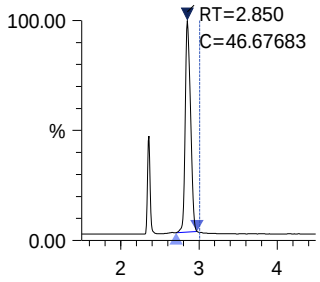
PERCHLORATE10

Date acquired: 8/26/2020 1:06:40 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200826\20200826_033.lcd
Vial: 13 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE10	8/26/2020 1:06:40 PM	694738	46.67683	20200826_033	2.850	25.0000	1.0000	13
Sodium Perchlorate-18O4_IS	PERCHLORATE10	8/26/2020 1:06:40 PM	137234	1.00000	20200826_033	2.849	25.0000	1.0000	13

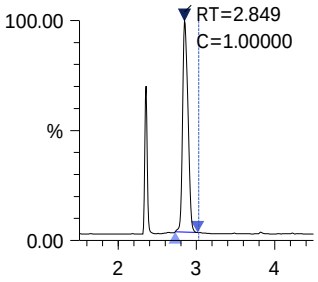
Perchlorate

Conc 46.67683
Area 694738
Q 99.00>83.00 (-) 1.46e5



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 137234
ISTD 107.00>89.00 (-) 2.84e4



ALS Group Houston

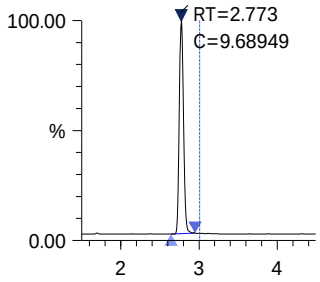
PERCHLORATEICV

Date acquired: 8/26/2020 2:26:45 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200826\20200826_035.lcd
Vial: 14 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATEICV	8/26/2020 2:26:45 PM	257692	9.68949	20200826_035	2.773	25.0000	1.0000	14
Sodium Perchlorate-18O4_IS	PERCHLORATEICV	8/26/2020 2:26:45 PM	245213	1.00000	20200826_035	2.771	25.0000	1.0000	14

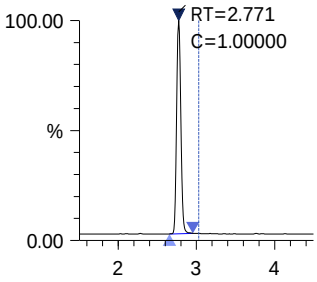
Perchlorate

Conc 9.68949
Area 257692
Q 99.00>83.00 (-) 7.12e4



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 245213
ISTD 107.00>89.00 (-) 6.83e4



Chromatograms and Selected Ion Monitoring

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 320, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

20200825

1st Review: Grivera
2nd Review: Hvan

Injection Log
LCMS01 -Shimadzu 8050

ICAL Date: 7/19/2020
Cal. Std. xp: 11/18/2020
ICAL ID: **EC2000022**

Mobile Phases **A:** 0.75% Formic Acid/Water 3100807-09 **B:** MeOH 3100802-01

			File Name	Acquisition Method	Dilution	R	Comments	Date/Time
1	IB		20200825_017	Perchlorate6850b.lcm	1x	☒		8/25/2020 16:49
2	IB		20200825_018	Perchlorate6850b.lcm	1x	☒		8/25/2020 16:57
3	IB		20200825_019	Perchlorate6850b.lcm	1x	☒		8/25/2020 17:05
4	IB		20200825_020	Perchlorate6850b.lcm	1x	☒		8/25/2020 17:13
5	null		20200825_021	Perchlorate6850b.lcm	1x	☒		8/25/2020 17:20
6	null		20200825_022	Perchlorate6850b.lcm	1x	☒		8/25/2020 17:25
7	null		20200825_023	Perchlorate6850b.lcm	1x	☒		8/25/2020 17:30
8	null		20200825_024	Perchlorate6850b.lcm	1x	☒		8/25/2020 17:34
9	IB		20200825_025	Perchlorate6850b.lcm	1x	☒		8/25/2020 17:40
10	IB		20200825_027	Perchlorate6850b.lcm	1x	☒		8/25/2020 18:22
11	PERCHLORATE7		20200825_028	Perchlorate6850b.lcm	1x	☒	3100807-04	8/25/2020 18:32
12	LODV		20200825_029	Perchlorate6850b.lcm	1x	☒		8/25/2020 18:40
13	PERCHLORATE7		20200825_030	Perchlorate6850b.lcm	1x	☒	3100807-04	8/25/2020 18:48
14	EQ2000359-01		20200825_031	Perchlorate6850b.lcm	1x	☒		8/25/2020 18:56
15	EQ2000359-02		20200825_032	Perchlorate6850b.lcm	1x	☒		8/25/2020 19:04
16	EQ2000359-03		20200825_033	Perchlorate6850b.lcm	1x	☒		8/25/2020 19:12
17	EQ2000359-04		20200825_034	Perchlorate6850b.lcm	1x	☒		8/25/2020 19:19
18	EQ2000359-05		20200825_035	Perchlorate6850b.lcm	1x	☒		8/25/2020 19:27
19	EQ2000359-06		20200825_036	Perchlorate6850b.lcm	1x	☒		8/25/2020 19:35
20	EQ2000359-07		20200825_037	Perchlorate6850b.lcm	1x	☒		8/25/2020 19:43
21	E2000716-001		20200825_038	Perchlorate6850b.lcm	1x	☒		8/25/2020 19:51
22	E2000739-001		20200825_039	Perchlorate6850b.lcm	1x	☒		8/25/2020 19:59
23	E2000740-001		20200825_040	Perchlorate6850b.lcm	1x	☒		8/25/2020 20:07
24	PERCHLORATE7		20200825_041	Perchlorate6850b.lcm	1x	☒	3100807-04	8/25/2020 20:15
25	E2000741-001		20200825_042	Perchlorate6850b.lcm	1x	☒		8/25/2020 20:22
26	E2000742-001		20200825_043	Perchlorate6850b.lcm	1x	☒		8/25/2020 20:30
27	E2000742-002		20200825_044	Perchlorate6850b.lcm	1x	☒		8/25/2020 20:38
28	E2000742-003		20200825_045	Perchlorate6850b.lcm	1x	☒		8/25/2020 20:46
29	E2000742-004		20200825_046	Perchlorate6850b.lcm	1x	☒		8/25/2020 20:54
30	E2000742-005		20200825_047	Perchlorate6850b.lcm	1x	☒		8/25/2020 21:02
31	E2000742-006		20200825_048	Perchlorate6850b.lcm	1x	☒		8/25/2020 21:10
32	E2000742-007		20200825_049	Perchlorate6850b.lcm	1x	☒		8/25/2020 21:18
33	E2000742-008		20200825_050	Perchlorate6850b.lcm	1x	☒		8/25/2020 21:26
34	E2000742-009		20200825_051	Perchlorate6850b.lcm	1x	☒		8/25/2020 21:33
35	PERCHLORATE7		20200825_052	Perchlorate6850b.lcm	1x	☒	3100807-04	8/25/2020 21:41
36	E2000742-010		20200825_053	Perchlorate6850b.lcm	1x	☒		8/25/2020 21:49
37	E2000742-011		20200825_054	Perchlorate6850b.lcm	1x	☒		8/25/2020 21:57
38	E2000742-012		20200825_055	Perchlorate6850b.lcm	1x	☒		8/25/2020 22:05
39	E2000742-013		20200825_056	Perchlorate6850b.lcm	1x	☒		8/25/2020 22:13
40	E2000742-014		20200825_057	Perchlorate6850b.lcm	1x	☒		8/25/2020 22:21
41	E2000759-001		20200825_058	Perchlorate6850b.lcm	1x	☒		8/25/2020 22:29
42	E2000759-002		20200825_059	Perchlorate6850b.lcm	1x	☒		8/25/2020 22:36
43	PERCHLORATE7		20200825_060	Perchlorate6850b.lcm	1x	☒	3100807-04	8/25/2020 22:44
44								
45								
46								
47								
48								

20200826

1st Review: Grivera
2nd Review: Hvan

ALS Environmental

Injection Log
LCMS01 -Shimadzu 8050

ICAL Date: 8/26/2020
Cal. Std. xp: 11/18/2020
ICAL ID: **EC2000023**

Mobile Phases **A:** 0.75% Formic Acid/Water 3100807-09 **B:** MeOH 3100802-01

		File Name	Acquisition Method	Dilution	R	Comments	Date/Time
1	PERCHLORATE1	20200826_024	Perchlorate6850b.lcm	1x	☒	3100806-05	8/26/2020 11:55
2	PERCHLORATE2	20200826_025	Perchlorate6850b.lcm	1x	☒	3100806-06	8/26/2020 12:03
3	PERCHLORATE3	20200826_026	Perchlorate6850b.lcm	1x	☒	3100806-07	8/26/2020 12:11
4	PERCHLORATE4	20200826_027	Perchlorate6850b.lcm	1x	☒	3100807-01	8/26/2020 12:19
5	PERCHLORATE5	20200826_028	Perchlorate6850b.lcm	1x	☒	3100807-02	8/26/2020 12:27
6	PERCHLORATE6	20200826_029	Perchlorate6850b.lcm	1x	☒	3100807-03	8/26/2020 12:35
7	PERCHLORATE7	20200826_030	Perchlorate6850b.lcm	1x	☒	3100807-04	8/26/2020 12:42
8	PERCHLORATE8	20200826_031	Perchlorate6850b.lcm	1x	☒	3100807-05	8/26/2020 12:50
9	PERCHLORATE9	20200826_032	Perchlorate6850b.lcm	1x	☒	3100807-06	8/26/2020 12:58
10	PERCHLORATE10	20200826_033	Perchlorate6850b.lcm	1x	☒	3100807-07	8/26/2020 13:06
11	IB	20200826_034	Perchlorate6850b.lcm	1x	☒		8/26/2020 13:14
12	PERCHLORATEICV	20200826_035	Perchlorate6850b.lcm	1x	☒	3100807-08	8/26/2020 14:26
13	IB	20200826_036	Perchlorate6850b.lcm	1x	☒		8/26/2020 14:34
14	LODV	20200826_037	Perchlorate6850b.lcm	1x	☒		8/26/2020 14:42
15	PERCHLORATE7	20200826_038	Perchlorate6850b.lcm	1x	☒	3100807-04	8/26/2020 14:50
16	EQ2000359-01	20200826_039	Perchlorate6850b.lcm	1x	☒		8/26/2020 15:12
17	EQ2000359-02	20200826_040	Perchlorate6850b.lcm	1x	☒		8/26/2020 15:19
18	EQ2000359-03	20200826_041	Perchlorate6850b.lcm	1x	☒		8/26/2020 15:27
19	EQ2000359-02	20200826_042	Perchlorate6850b.lcm	1x	☒		8/26/2020 15:35
20	EQ2000359-04X10	20200826_043	Perchlorate6850b.lcm	10x	☒		8/26/2020 15:43
21	EQ2000359-05X10	20200826_044	Perchlorate6850b.lcm	10x	☒		8/26/2020 15:51
22	EQ2000359-06X10	20200826_045	Perchlorate6850b.lcm	10x	☒		8/26/2020 15:59
23	EQ2000359-07X10	20200826_046	Perchlorate6850b.lcm	10x	☒		8/26/2020 16:07
24	E2000716-001X10	20200826_047	Perchlorate6850b.lcm	10x	☒		8/26/2020 16:15
25	E2000739-001X10	20200826_048	Perchlorate6850b.lcm	10x	☒		8/26/2020 16:23
26	PERCHLORATE7	20200826_049	Perchlorate6850b.lcm	1x	☒	3100807-04	8/26/2020 16:30
27	E2000740-001X200	20200826_050	Perchlorate6850b.lcm	200x	☒		8/26/2020 16:38
28	E2000741-001X10	20200826_051	Perchlorate6850b.lcm	10x	☒		8/26/2020 16:46
29	E2000742-001X2	20200826_052	Perchlorate6850b.lcm	2x	☒		8/26/2020 16:54
30	E2000742-002X2	20200826_053	Perchlorate6850b.lcm	2x	☒		8/26/2020 17:02
31	E2000742-003X10	20200826_054	Perchlorate6850b.lcm	10x	☒		8/26/2020 17:10
32	E2000742-004X10	20200826_055	Perchlorate6850b.lcm	10x	☒		8/26/2020 17:18
33	E2000742-006X10	20200826_056	Perchlorate6850b.lcm	10x	☒		8/26/2020 17:26
34	PERCHLORATE7	20200826_057	Perchlorate6850b.lcm	1x	☒	3100807-04	8/26/2020 17:33
35	E2000742-009X10	20200826_058	Perchlorate6850b.lcm	10x	☒		8/26/2020 17:41
36	E2000742-010X10	20200826_059	Perchlorate6850b.lcm	10x	☒		8/26/2020 17:49
37	E2000742-011X10	20200826_060	Perchlorate6850b.lcm	10x	☒		8/26/2020 17:57
38	E2000742-012X10	20200826_061	Perchlorate6850b.lcm	10x	☒		8/26/2020 18:05
39	E2000742-013X10	20200826_062	Perchlorate6850b.lcm	10x	☒		8/26/2020 18:13
40	E2000742-014X10	20200826_063	Perchlorate6850b.lcm	10x	☒		8/26/2020 18:21
41	E2000759-001X10	20200826_064	Perchlorate6850b.lcm	10x	☒		8/26/2020 18:29
42	E2000759-002X10	20200826_065	Perchlorate6850b.lcm	10x	☒		8/26/2020 18:36
43	PERCHLORATE7	20200826_066	Perchlorate6850b.lcm	1x	☒	3100807-04	8/26/2020 18:44
44	EQ2000369-01	20200826_067	Perchlorate6850b.lcm	1x	☒		8/26/2020 18:52
45	EQ2000369-02	20200826_068	Perchlorate6850b.lcm	1x	☒		8/26/2020 19:00
46	EQ2000369-03	20200826_069	Perchlorate6850b.lcm	1x	☒		8/26/2020 19:08
47	EQ2000369-04	20200826_070	Perchlorate6850b.lcm	1x	☒		8/26/2020 19:16
48	EQ2000369-05	20200826_071	Perchlorate6850b.lcm	1x	☒		8/26/2020 19:24
49	E2000764-001	20200826_072	Perchlorate6850b.lcm	1x	☒		8/26/2020 19:32
50	E2000764-002	20200826_073	Perchlorate6850b.lcm	1x	☒		8/26/2020 19:40
51	E2000764-003	20200826_074	Perchlorate6850b.lcm	1x	☒		8/26/2020 19:47
52	E2000764-004	20200826_075	Perchlorate6850b.lcm	1x	☒		8/26/2020 19:55
53	E2000764-005	20200826_076	Perchlorate6850b.lcm	1x	☒		8/26/2020 20:03
54	PERCHLORATE7	20200826_077	Perchlorate6850b.lcm	1x	☒	3100807-04	8/26/2020 20:11
55	E2000764-006	20200826_078	Perchlorate6850b.lcm	1x	☒		8/26/2020 20:19
56	E2000764-007	20200826_079	Perchlorate6850b.lcm	1x	☒		8/26/2020 20:27
57	E2000764-008	20200826_080	Perchlorate6850b.lcm	1x	☒		8/26/2020 20:35
58	E2000764-009	20200826_081	Perchlorate6850b.lcm	1x	☒		8/26/2020 20:43
59	E2000764-010	20200826_082	Perchlorate6850b.lcm	1x	☒		8/26/2020 20:51
60	E2000764-011	20200826_083	Perchlorate6850b.lcm	1x	☒		8/26/2020 20:58
61	E2000764-012	20200826_084	Perchlorate6850b.lcm	1x	☒		8/26/2020 21:06

20200826

1st Review: Grivera
2nd Review: Hvan

Injection Log
LCMS01 -Shimadzu 8050

ICAL Date: 8/26/2020
Cal. Std. xp: 11/18/2020
ICAL ID: **EC2000023**

Mobile Phases **A:** 0.75% Formic Acid/Water 3100807-09 **B:** MeOH 3100802-01

			File Name	Acquisition Method	Dilution	R	Comments	Date/Time
62	E2000764-013		20200826_085	Perchlorate6850b.lcm	1x	☒		8/26/2020 21:14
63	E2000764-014		20200826_086	Perchlorate6850b.lcm	1x	☒		8/26/2020 21:22
64	E2000764-015		20200826_087	Perchlorate6850b.lcm	1x	☒		8/26/2020 21:30
65	PERCHLORATE7		20200826_088	Perchlorate6850b.lcm	1x	☒	3100807-04	8/26/2020 21:38
66	E2000764-016		20200826_089	Perchlorate6850b.lcm	1x	☒		8/26/2020 21:46
67	E2000764-017		20200826_090	Perchlorate6850b.lcm	1x	☒		8/26/2020 21:54
68	E2000764-018		20200826_091	Perchlorate6850b.lcm	1x	☒		8/26/2020 22:01
69	PERCHLORATE7		20200826_092	Perchlorate6850b.lcm	1x	☒	3100807-04	8/26/2020 22:09
70	EQ2000367-01		20200826_093	Perchlorate6850b.lcm	1x	☒		8/26/2020 22:17
71	EQ2000367-02		20200826_094	Perchlorate6850b.lcm	1x	☒		8/26/2020 22:25
72	EQ2000367-03		20200826_095	Perchlorate6850b.lcm	1x	☒		8/26/2020 22:33
73	EQ2000367-04		20200826_096	Perchlorate6850b.lcm	1x	☒		8/26/2020 22:41
74	EQ2000367-05		20200826_097	Perchlorate6850b.lcm	1x	☒		8/26/2020 22:49
75	R2006746-001		20200826_098	Perchlorate6850b.lcm	1x	☒		8/26/2020 22:57
76	R2006746-002		20200826_099	Perchlorate6850b.lcm	1x	☒		8/26/2020 23:04
77	R2006777-001		20200826_100	Perchlorate6850b.lcm	1x	☒		8/26/2020 23:12
78	R2006777-002		20200826_101	Perchlorate6850b.lcm	1x	☒		8/26/2020 23:20
79	R2006777-003		20200826_102	Perchlorate6850b.lcm	1x	☒		8/26/2020 23:28
80	PERCHLORATE7		20200826_103	Perchlorate6850b.lcm	1x	☒	3100807-04	8/26/2020 23:36
81	R2006777-004		20200826_104	Perchlorate6850b.lcm	1x	☒		8/26/2020 23:44
82	R2006777-005		20200826_105	Perchlorate6850b.lcm	1x	☒		8/26/2020 23:52
83	R2006777-006		20200826_106	Perchlorate6850b.lcm	1x	☒		8/27/2020 0:00
84	R2006777-007		20200826_107	Perchlorate6850b.lcm	1x	☒		8/27/2020 0:08
85	R2006777-008		20200826_108	Perchlorate6850b.lcm	1x	☒		8/27/2020 0:15
86	R2006805-001		20200826_109	Perchlorate6850b.lcm	1x	☒		8/27/2020 0:23
87	R2006805-002		20200826_110	Perchlorate6850b.lcm	1x	☒		8/27/2020 0:31
88	PERCHLORATE7		20200826_111	Perchlorate6850b.lcm	1x	☒	3100807-04	8/27/2020 0:39
89								
90								
91								
92								

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000759
Project:	HS20080738	**Date Analyzed:**	8/26/20

Continuing Calibration Verification Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method:	6850	**Calibration Date:**	8/26/20
File ID:	I:\LCMS01\DATA\20200826\20200826_038	**Calibration ID:**	EC2000023
		Analysis Lot:	692775
		Units:	ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Perchlorate	10.0	8.96	0.1085	0.09719	-10.4	NA	± 15 %	Average RF

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000759
Project:	HS20080738	**Date Analyzed:**	8/26/20

Continuing Calibration Verification Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method:	6850	**Calibration Date:**	8/26/20
File ID:	I:\LCMS01\DATA\20200826\20200826_049	**Calibration ID:**	EC2000023
		Analysis Lot:	692775
		Units:	ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Perchlorate	10.0	9.65	0.1085	0.1047	-3.5	NA	± 15 %	Average RF

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000759
Project:	HS20080738	**Date Analyzed:**	8/26/20

Continuing Calibration Verification Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method:	6850	**Calibration Date:**	8/26/20
File ID:	I:\LCMS01\DATA\20200826\20200826_057	**Calibration ID:**	EC2000023
		Analysis Lot:	692775
		Units:	ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Perchlorate	10.0	9.59	0.1085	0.1040	-4.1	NA	± 15 %	Average RF

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000759
Project:	HS20080738	**Date Analyzed:**	8/26/20

Continuing Calibration Verification Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method:	6850	**Calibration Date:**	8/26/20
File ID:	I:\LCMS01\DATA\20200826\20200826_066	**Calibration ID:**	EC2000023
		Analysis Lot:	692775
		Units:	ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Perchlorate	10.0	9.71	0.1085	0.1053	-2.9	NA	± 15 %	Average RF

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000759
Project:	HS20080738	**Date Analyzed:**	8/25/20

Continuing Calibration Verification Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method:	6850	**Calibration Date:**	8/19/20
File ID:	I:\LCMS01\DATA\20200825\20200825_030	**Calibration ID:**	EC2000022
		Analysis Lot:	692783
		Units:	ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Perchlorate	10.0	9.23	0.1131	0.1043	-7.7	NA	± 15 %	Average RF

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000759
Project:	HS20080738	**Date Analyzed:**	8/25/20

Continuing Calibration Verification Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method:	6850	**Calibration Date:**	8/19/20
File ID:	I:\LCMS01\DATA\20200825\20200825_041	**Calibration ID:**	EC2000022
		Analysis Lot:	692783
		Units:	ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Perchlorate	10.0	9.78	0.1131	0.1105	-2.2	NA	± 15 %	Average RF

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS20080738

Service Request: E2000759
Date Analyzed: 8/25/20

Continuing Calibration Verification Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
File ID: I:\LCMS01\DATA\20200825\20200825_052

Calibration Date: 8/19/20
Calibration ID: EC2000022
Analysis Lot: 692783
Units: ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Perchlorate	10.0	9.00	0.1131	0.1018	-10.0	NA	± 15 %	Average RF

Printed 8/27/20 11:57

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000759
Project:	HS20080738	**Date Analyzed:**	8/26/20 14:50

Internal Standard Area and RT Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

File ID:	I:\LCMS01\DATA\20200826\20200826_038	**Lab Code:**	EQ2000370-01
Instrument ID:	E-LCMS-01	**Analysis Lot:**	692775
Analytical Method:	6850	**Signal ID:**	1

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	175,590	2.85
	Upper Limit ==>	263,385	4.85
	Lower Limit ==>	87,795	0.85
Associated Analyses			
Continuing Calibration Verification	EQ2000370-01	168,655	2.85
Duplicate Lab Control Sample	EQ2000359-03	222,420	2.86
Lab Control Sample	EQ2000359-02	218,301	2.86
Batch QCMS	EQ2000359-04	136,805	2.85
Batch QCDMS	EQ2000359-05	144,861	2.85
16WW57-200817MS	EQ2000359-06	127,802	2.85
16WW57-200817DMS	EQ2000359-07	144,838	2.85

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

Printed 8/27/20 11:57

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000759
Project:	HS20080738	**Date Analyzed:**	8/26/20 16:30

Internal Standard Area and RT Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

File ID:	I:\LCMS01\DATA\20200826\20200826_049	**Lab Code:**	EQ2000370-02
Instrument ID:	E-LCMS-01	**Analysis Lot:**	692775
Analytical Method:	6850	**Signal ID:**	1

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	175,590	2.85
	Upper Limit ==>	263,385	4.85
	Lower Limit ==>	87,795	0.85
Associated Analyses			
Continuing Calibration Verification	EQ2000370-02	159,403	2.86

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

Printed 8/27/20 11:57

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000759
Project:	HS20080738	**Date Analyzed:**	8/26/20 17:33

Internal Standard Area and RT Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

File ID:	I:\LCMS01\DATA\20200826\20200826_057	**Lab Code:**	EQ2000370-03
Instrument ID:	E-LCMS-01	**Analysis Lot:**	692775
Analytical Method:	6850	**Signal ID:**	1

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	175,590	2.85
	Upper Limit ==>	263,385	4.85
	Lower Limit ==>	87,795	0.85
Associated Analyses			
Continuing Calibration Verification	EQ2000370-03	153,993	2.86
Batch QC	E2000742-012	141,019	2.85
16WW58-200817	E2000759-001	148,816	2.85
16WW57-200817	E2000759-002	131,720	2.85

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

Printed 8/27/20 11:57

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000759
Project:	HS20080738	**Date Analyzed:**	8/26/20 18:44

Internal Standard Area and RT Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

File ID:	I:\LCMS01\DATA\20200826\20200826_066	**Lab Code:**	EQ2000370-04
Instrument ID:	E-LCMS-01	**Analysis Lot:**	692775
Analytical Method:	6850	**Signal ID:**	1

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	175,590	2.85
	Upper Limit ==>	263,385	4.85
	Lower Limit ==>	87,795	0.85
Associated Analyses			
Continuing Calibration Verification	EQ2000370-04	147,883	2.86

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

Printed 8/27/20 11:57

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000759
Project:	HS20080738	**Date Analyzed:**	8/25/20 18:48

Internal Standard Area and RT Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

File ID:	I:\LCMS01\DATA\20200825\20200825_030	**Lab Code:**	EQ2000371-01
Instrument ID:	E-LCMS-01	**Analysis Lot:**	692783
Analytical Method:	6850	**Signal ID:**	1

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	284,293	2.87
	Upper Limit ==>	426,440	4.87
	Lower Limit ==>	142,147	0.87
Associated Analyses			
Continuing Calibration Verification	EQ2000371-01	185,913	2.86
Method Blank	EQ2000359-01	246,634	2.86

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

Printed 8/27/20 11:57

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000759
Project:	HS20080738	**Date Analyzed:**	8/25/20 20:15

Internal Standard Area and RT Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

File ID:	I:\LCMS01\DATA\20200825\20200825_041	**Lab Code:**	EQ2000371-02
Instrument ID:	E-LCMS-01	**Analysis Lot:**	692783
Analytical Method:	6850	**Signal ID:**	1

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	284,293	2.87
	Upper Limit ==>	426,440	4.87
	Lower Limit ==>	142,147	0.87
Associated Analyses			
Continuing Calibration Verification	EQ2000371-02	148,398	2.85

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

Printed 8/27/20 11:57

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000759
Project:	HS20080738	**Date Analyzed:**	8/25/20 21:41

Internal Standard Area and RT Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

File ID:	I:\LCMS01\DATA\20200825\20200825_052	**Lab Code:**	EQ2000371-03
Instrument ID:	E-LCMS-01	**Analysis Lot:**	692783
Analytical Method:	6850	**Signal ID:**	1

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	284,293	2.87
	Upper Limit ==>	426,440	4.87
	Lower Limit ==>	142,147	0.87
Associated Analyses			
Continuing Calibration Verification	EQ2000371-03	176,558	2.85

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

Printed 8/27/20 11:57

ALS Group Houston

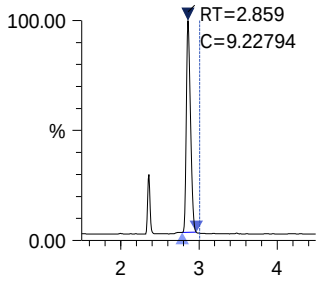
PERCHLORATE7

Date acquired: 8/25/2020 6:48:17 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200825\20200825_030.lcd
Vial: 4 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE7	8/25/2020 6:48:17 PM	193948	9.22794	20200825_030	2.859	25.0000	1.0000	4
Sodium Perchlorate-18O4_IS	PERCHLORATE7	8/25/2020 6:48:17 PM	185913	1.00000	20200825_030	2.859	25.0000	1.0000	4

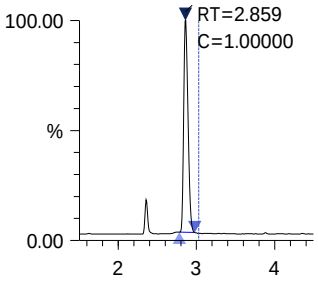
Perchlorate

Conc 9.22794
Area 193948
Q 99.00>83.00 (-) 5.19e4



Sodium Perchlorate-18O4 _IS

Conc 1.00000
Area 185913
ISTD 107.00>89.00 (-) 4.80e4



ALS Group Houston

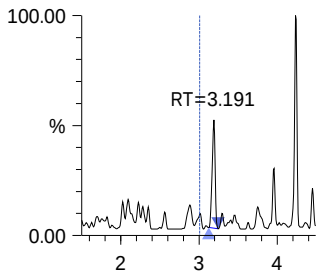
EQ2000359-01

Date acquired: 8/25/2020 6:56:11 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200825\20200825_031.lcd
Vial: 1 | Inj. Volume: 25.0000uL | Tray: 5

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	EQ2000359-01	8/25/2020 6:56:11 PM	----	----	20200825_031	----	25.0000	1.0000	1
Sodium Perchlorate-18O4_IS	EQ2000359-01	8/25/2020 6:56:11 PM	246634	1.00000	20200825_031	2.856	25.0000	1.0000	1

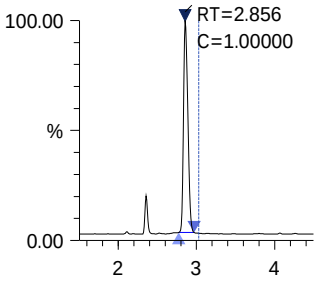
Perchlorate

Conc ----
Area ----
Q 99.00>83.00 (-) 5.44e2



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 246634
ISTD 107.00>89.00 (-) 6.33e4



ALS Group Houston

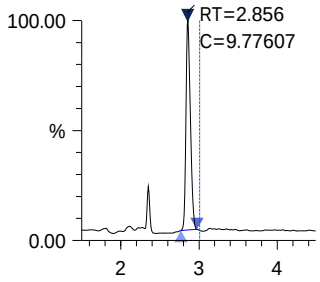
PERCHLORATE7

Date acquired: 8/25/2020 8:15:05 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200825\20200825_041.lcd
Vial: 4 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE7	8/25/2020 8:15:05 PM	164008	9.77607	20200825_041	2.856	25.0000	1.0000	4
Sodium Perchlorate-18O4_IS	PERCHLORATE7	8/25/2020 8:15:05 PM	148398	1.00000	20200825_041	2.853	25.0000	1.0000	4

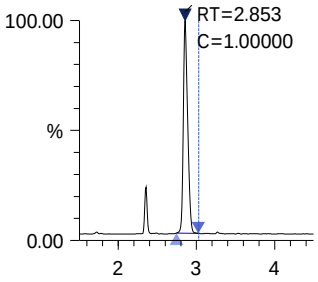
Perchlorate

Conc 9.77607
Area 164008
Q 99.00>83.00 (-) 4.18e4



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 148398
ISTD 107.00>89.00 (-) 3.81e4



ALS Group Houston

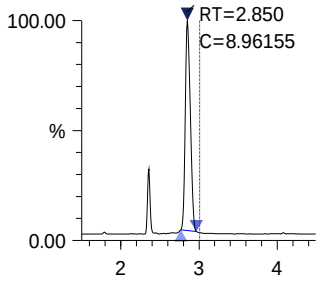
PERCHLORATE7

Date acquired: 8/26/2020 2:50:21 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200826\20200826_038.lcd
Vial: 4 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE7	8/26/2020 2:50:21 PM	163923	8.96155	20200826_038	2.850	25.0000	1.0000	4
Sodium Perchlorate-18O4_IS	PERCHLORATE7	8/26/2020 2:50:21 PM	168655	1.00000	20200826_038	2.849	25.0000	1.0000	4

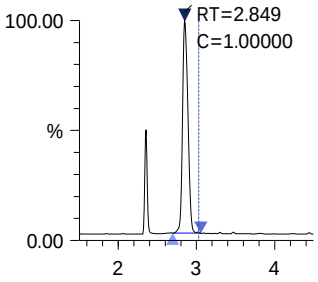
Perchlorate

Conc 8.96155
Area 163923
Q 99.00>83.00 (-) 3.65e4



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 168655
ISTD 107.00>89.00 (-) 3.46e4



ALS Group Houston

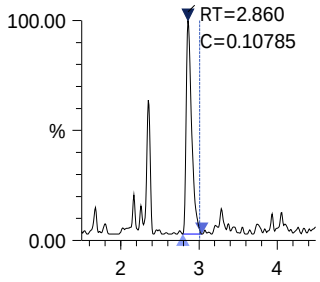
EQ2000359-02

Date acquired: 8/26/2020 3:35:46 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200826\20200826_042.lcd
Vial: 2 | Inj. Volume: 25.0000uL | Tray: 5

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	EQ2000359-02	8/26/2020 3:35:46 PM	2554	0.10785	20200826_042	2.860	25.0000	1.0000	2
Sodium Perchlorate-18O4_IS	EQ2000359-02	8/26/2020 3:35:46 PM	218301	1.00000	20200826_042	2.861	25.0000	1.0000	2

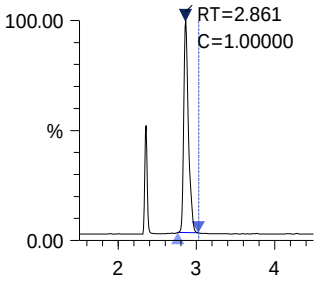
Perchlorate

Conc 0.10785
Area 2554
Q 99.00>83.00 (-) 5.15e2



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 218301
ISTD 107.00>89.00 (-) 5.16e4



ALS Group Houston

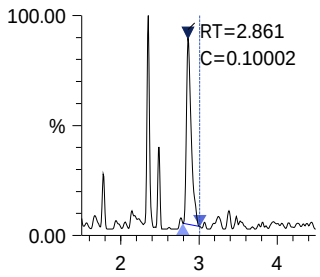
EQ2000359-03

Date acquired: 8/26/2020 3:27:52 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200826\20200826_041.lcd
Vial: 3 | Inj. Volume: 25.0000uL | Tray: 5

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	EQ2000359-03	8/26/2020 3:27:52 PM	2413	0.10002	20200826_041	2.861	25.0000	1.0000	3
Sodium Perchlorate-18O4_IS	EQ2000359-03	8/26/2020 3:27:52 PM	222420	1.00000	20200826_041	2.861	25.0000	1.0000	3

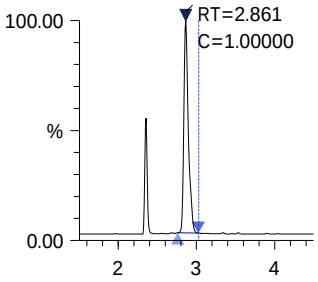
Perchlorate

Conc 0.10002
Area 2413
Q 99.00>83.00 (-) 6.41e2



Sodium Perchlorate-18O4 _IS

Conc 1.00000
Area 222420
ISTD 107.00>89.00 (-) 5.49e4



ALS Group Houston

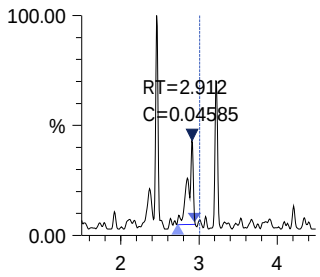
EQ2000359-04X10

Date acquired: 8/26/2020 3:43:38 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200826\20200826_043.lcd
Vial: 4 | Inj. Volume: 25.0000uL | Tray: 5

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	EQ2000359-04X10	8/26/2020 3:43:38 PM	680	0.04585	20200826_043	2.912	25.0000	1.0000	4
Sodium Perchlorate-18O4_IS	EQ2000359-04X10	8/26/2020 3:43:38 PM	136805	1.00000	20200826_043	2.846	25.0000	1.0000	4

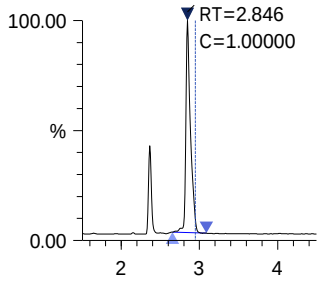
Perchlorate

Conc 0.04585
Area 680
Q 99.00>83.00 (-) 4.91e2



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 136805
ISTD 107.00>89.00 (-) 3.30e4



ALS Group Houston

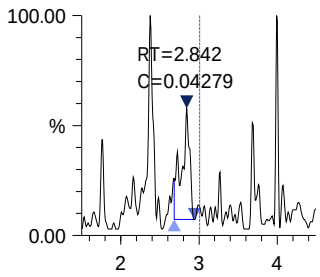
EQ2000359-05X10

Date acquired: 8/26/2020 3:51:31 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200826\20200826_044.lcd
Vial: 5 | Inj. Volume: 25.0000uL | Tray: 5

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	EQ2000359-05X10	8/26/2020 3:51:31 PM	672	0.04279	20200826_044	2.842	25.0000	1.0000	5
Sodium Perchlorate-18O4_IS	EQ2000359-05X10	8/26/2020 3:51:31 PM	144861	1.00000	20200826_044	2.847	25.0000	1.0000	5

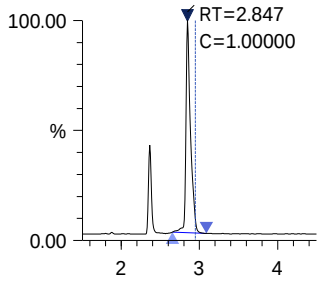
Perchlorate

Conc 0.04279
Area 672
Q 99.00>83.00 (-) 1.77e2



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 144861
ISTD 107.00>89.00 (-) 3.54e4



ALS Group Houston

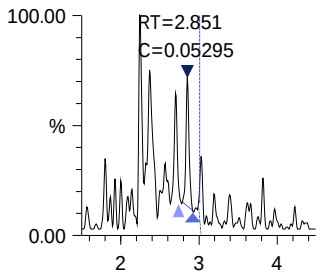
EQ2000359-06X10

Date acquired: 8/26/2020 3:59:24 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200826\20200826_045.lcd
Vial: 6 | Inj. Volume: 25.0000uL | Tray: 5

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	EQ2000359-06X10	8/26/2020 3:59:24 PM	734	0.05295	20200826_045	2.851	25.0000	1.0000	6
Sodium Perchlorate-18O4_IS	EQ2000359-06X10	8/26/2020 3:59:24 PM	127802	1.00000	20200826_045	2.850	25.0000	1.0000	6

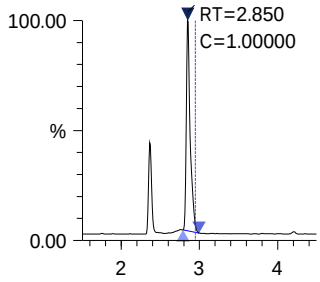
Perchlorate

Conc 0.05295
Area 734
Q 99.00>83.00 (-) 2.12e2



Sodium Perchlorate-18O4 _IS

Conc 1.00000
Area 127802
ISTD 107.00>89.00 (-) 3.69e4



ALS Group Houston

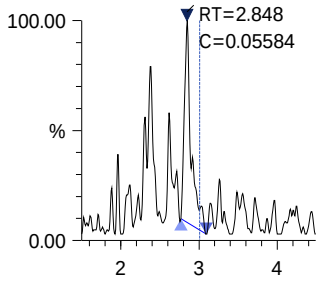
EQ2000359-07X10

Date acquired: 8/26/2020 4:07:16 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200826\20200826_046.lcd
Vial: 7 | Inj. Volume: 25.0000uL | Tray: 5

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	EQ2000359-07X10	8/26/2020 4:07:16 PM	878	0.05584	20200826_046	2.848	25.0000	1.0000	7
Sodium Perchlorate-18O4_IS	EQ2000359-07X10	8/26/2020 4:07:16 PM	144838	1.00000	20200826_046	2.851	25.0000	1.0000	7

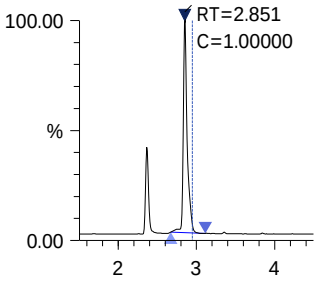
Perchlorate

Conc 0.05584
Area 878
Q 99.00>83.00 (-) 1.53e2



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 144838
ISTD 107.00>89.00 (-) 4.13e4



ALS Group Houston

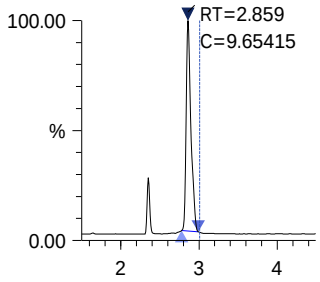
PERCHLORATE7

Date acquired: 8/26/2020 4:30:55 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200826\20200826_049.lcd
Vial: 4 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE7	8/26/2020 4:30:55 PM	166904	9.65415	20200826_049	2.859	25.0000	1.0000	4
Sodium Perchlorate-18O4_IS	PERCHLORATE7	8/26/2020 4:30:55 PM	159403	1.00000	20200826_049	2.858	25.0000	1.0000	4

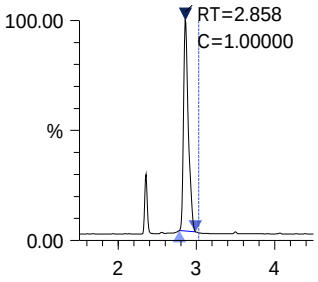
Perchlorate

Conc 9.65415
Area 166904
Q 99.00>83.00 (-) 3.94e4



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 159403
ISTD 107.00>89.00 (-) 3.71e4



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

August 26, 2020

Analytical Report for Service Request No: K2007110

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

RE: ALS Houston DOD TOC

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory August 19, 2020
For your reference, these analyses have been assigned our service request number **K2007110.**

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

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
Qualifiers
State Certifications, Accreditations, And Licenses
Case Narrative
Chain of Custody
General Chemistry
Raw Data
    General Chemistry

Acronyms

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

Inorganic Data Qualifiers

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

Metals Data Qualifiers

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

Organic Data Qualifiers

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

Additional Petroleum Hydrocarbon Specific Qualifiers

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

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

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

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

Case Narrative

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

1317 South 13th Ave, Kelso, WA 98626 | 1-360-577-7222 | www.alsglobal.com

ALS Environmental

Client: ALS Environmental - US
Project: ALS Houston DOD TOC
Sample Matrix: Ground Water

Service Request: K2007110
Date Received: 08/19/2020

CASE NARRATIVE

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

Sample Receipt:

Two ground water samples were received for analysis at ALS Environmental on 08/19/2020. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The samples were stored at minimum in accordance with the analytical method requirements.

General Chemistry:

No significant anomalies were noted with this analysis.

Approved by Kelley Lovejoy Date 08/26/2020

Chain of Custody

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

K2007110

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID:** **14517**

SUBCONTRACT TO:

ALS Environmental Kelso
1317 S. 13th Avenue
Kelso, WA 98626 **Phone:** +1 360 501 3312

CUSTOMER INFORMATION:

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

INVOICE INFORMATION:

Company: ALS Houston
Contact: Accounts Payable
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Reference: HS20080738
TSR: Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS20080738-01**	**16WW58-200817**	**Groundwater**	**17 Aug 2020 08:05**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			26 Aug 2020
2.	**HS20080738-02**	**16WW57-200817**	**Groundwater**	**17 Aug 2020 09:20**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			26 Aug 2020

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.
HS20080738-02 = MS/MSD

QC Level: DOD IV (DoD Data Package)

Relinquished By: _____ Date/Time: 8/18/2020 1800
Received By: ALS Kelso Date/Time: 8/19/20 0950
Cooler ID(s): _____ Temperature(s): _____

PM KL

Cooler Receipt and Preservation Form

Client ALS- Houston Service Request K20 07110

Received: 8/19/20 Opened: 8/19/20 By: Km Unloaded: 8/19/20 By: Km

1. Samples were received via? *USPS* *Fed Ex* *UPS* *DHL* *PDX* *Courier* *Hand Delivered*
2. Samples were received in: (circle) *Cooler* *Box* *Envelope* *Other* _____ *NA*
3. Were custody seals on coolers? NA Y N If yes, how many and where? 2 Front
   If present, were custody seals intact? Y N If present, were they signed and dated? Y N
4. Was a Temperature Blank present in cooler? NA Y N If yes, notate the temperature in the appropriate column below:
   If no, take the temperature of a representative sample bottle contained within the cooler; notate in the column "Sample Temp":
5. Were samples received within the method specified temperature ranges? NA Y N
   If no, were they received on ice and same day as collected? If not, notate the cooler # below and notify the PM. NA Y N

If applicable, tissue samples were received: *Frozen* *Partially Thawed* *Thawed*

Temp Blank	Sample Temp	IR Gun	Cooler #/COC ID / NA	Out of temp indicate with "X"	PM Notified If out of temp	Tracking Number NA	Filed
1.7	N/A	IR02	14517	N/A	N/A	1891 8879 5111	

6. Packing material: *Inserts* *Baggies* *Bubble Wrap* *Gel Packs* *Wet Ice* *Dry Ice* *Sleeves* _____
7. Were custody papers properly filled out (ink, signed, etc.)? NA Y N
8. Were samples received in good condition (unbroken) NA Y N
9. Were all sample labels complete (ie, analysis, preservation, etc.)? NA Y N
10. Did all sample labels and tags agree with custody papers? NA Y N
11. Were appropriate bottles/containers and volumes received for the tests indicated? NA Y N
12. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* NA Y N
13. Were VOA vials received without headspace? *Indicate in the table below.* NA Y N
14. Was C12/Res negative? NA Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count Bottle Type	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:**	K2007110
Project:	ALS Houston DOD TOC	**Date Collected:**	08/17/20
Sample Matrix:	Ground Water	**Date Received:**	08/19/20
Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA

Carbon, Total Organic

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
16WW58-200817	K2007110-001	**4.56**	0.50	0.20	0.07	1	08/20/20 10:28	
16WW57-200817	K2007110-002	**13.2**	0.50	0.20	0.07	1	08/20/20 10:28	
Method Blank	K2007110-MB	ND U	0.50	0.20	0.07	1	08/20/20 10:28	

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K2007110
Project	ALS Houston DOD TOC	**Date Collected:**	08/17/20
Sample Matrix:	Ground Water	**Date Received:**	08/19/20
		Date Analyzed:	08/20/20

Replicate Sample Summary
General Chemistry Parameters

Sample Name:	16WW57-200817	**Units:**	mg/L
Lab Code:	K2007110-002	**Basis:**	NA

Analyte Name	Analysis Method	LOQ	LOD	MDL	Sample Result	Duplicate Sample K2007110-002DUP Result	Average	RPD	RPD Limit
Carbon, Total Organic	SM 5310 C	0.50	0.20	0.07	13.2	13.1	13.1	<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:**	K2007110
Project:	ALS Houston DOD TOC	**Date Collected:**	08/17/20
Sample Matrix:	Ground Water	**Date Received:**	08/19/20
		Date Analyzed:	08/20/20
		Date Extracted:	NA

Matrix Spike Summary
Carbon, Total Organic

Sample Name:	16WW57-200817	**Units:**	mg/L
Lab Code:	K2007110-002	**Basis:**	NA
Analysis Method:	SM 5310 C		
Prep Method:	None		

Matrix Spike
K2007110-002MS

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Carbon, Total Organic	13.2	34.8	25.0	87	83-117

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

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

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

Matrix Spike and Matrix Spike Duplicate Data is presented for information purposes only. The matrix may or may not be relevant to samples reported in this report. The laboratory evaluates system performance based on the LCS and LCSD control limits.

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K2007110
Project:	ALS Houston DOD TOC	**Date Analyzed:**	08/20/20
Sample Matrix:	Ground Water	**Date Extracted:**	NA

Lab Control Sample Summary
Carbon, Total Organic

Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA
		Analysis Lot:	692111

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K2007110-LCS	23.2	25.0	93	83-117

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US **Service Request:** K2007110
Project: ALS Houston DOD TOC

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	692111	KQ2011928-09	08/20/20 10:28	25.0	24.4	98	90-110
CCV2	692111	KQ2011928-10	08/20/20 10:28	25.0	24.6	98	90-110
CCV3	692111	KQ2011928-11	08/20/20 10:28	25.0	23.9	96	90-110
CCV4	692111	KQ2011928-12	08/20/20 10:28	25.0	23.4	94	90-110

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: ALS Houston DOD TOC

Service Request:K2007110

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	692111	KQ2011928-05	08/20/20 10:28	0.50	0.20	0.07	ND	U
CCB2	692111	KQ2011928-06	08/20/20 10:28	0.50	0.20	0.07	ND	U
CCB3	692111	KQ2011928-07	08/20/20 10:28	0.50	0.20	0.07	ND	U
CCB4	692111	KQ2011928-08	08/20/20 10:28	0.50	0.20	0.07	ND	U

Raw Data

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

General Chemistry

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

Work Request # 6746 6805 6806 6883 7004 7063 7110 7111 6929

Tier: IV I I II IV II IV IV II

Date Analyzed: 8-20-20 7018 IV 7063 II

Analyst: MK Run # 692111 692113

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:
7018-3 needs reanalysis. High RPD 16% due to carryover. LCS/DLCS was run

Final Approved by: [signature] Date: 8/26/20

DQREPORT

Analytical Results Summary

Instrument Name: K-TOC-01 **Analyst:** MKANALY **Analysis Lot:** 692111 **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
K2006746-001	Carbon, Total Organic	N/A		Water	1.50 mg/L	10 mL	1.50 mg/L	1	0.07	0.50			8/20/20 10:28:00	N	IV
K2006746-002	Carbon, Total Organic	N/A		Water	2.29 mg/L	10 mL	2.29 mg/L	1	0.07	0.50			8/20/20 10:28:00	N	IV
K2006805-001	Carbon, Total Organic	N/A		Water	39.91 mg/L	10 mL	39.9 mg/L	1	0.07	0.50			8/20/20 10:28:00	N	I
K2006806-001	Carbon, Total Organic	N/A		Water	5.63 mg/L	10 mL	5.63 mg/L	1	0.07	0.50			8/20/20 10:28:00	N	I
K2006806-002	Carbon, Total Organic	N/A		Water	30.77 mg/L	10 mL	30.8 mg/L	1	0.07	0.50			8/20/20 10:28:00	N	I
K2006806-003	Carbon, Total Organic	N/A		Water	1.02 mg/L	10 mL	1.02 mg/L	1	0.07	0.50			8/20/20 10:28:00	N	I
K2006883-001	Carbon, Total Organic	N/A		Water	0.43 mg/L	10 mL	0.43 mg/L J	1	0.07	0.50			8/20/20 10:28:00	N	II
K2006883-002	Carbon, Total Organic	N/A		Water	0.53 mg/L	10 mL	0.53 mg/L	1	0.07	0.50			8/20/20 10:28:00	N	II
K2006883-003	Carbon, Total Organic	N/A		Water	0.70 mg/L	10 mL	0.70 mg/L	1	0.07	0.50			8/20/20 10:28:00	N	II
K2006883-004	Carbon, Total Organic	N/A		Water	0.62 mg/L	10 mL	0.62 mg/L	1	0.07	0.50			8/20/20 10:28:00	N	II
K2006883-005	Carbon, Total Organic	N/A		Water	0.64 mg/L	10 mL	0.64 mg/L	1	0.07	0.50			8/20/20 10:28:00	N	II
K2006883-006	Carbon, Total Organic	N/A		Water	0.31 mg/L	10 mL	0.31 mg/L J	1	0.07	0.50			8/20/20 10:28:00	N	II
K2006886-001	Carbon, Total Organic	N/A		Reagent Water	-0.10 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			8/20/20 10:28:00	N	I
K2006886-002	Carbon, Total Organic	N/A		Reagent Water	-0.10 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			8/20/20 10:28:00	N	I
K2007004-001	Carbon, Total Organic	N/A		Water	2.11 mg/L	10 mL	2.11 mg/L	1	0.07	0.50			8/20/20 10:28:00	N	IV
K2007063-001	Carbon, Total Organic	N/A		Water	4.20 mg/L	10 mL	4.20 mg/L	1	0.07	0.50			8/20/20 10:28:00	N	II
K2007063-003	Carbon, Total Organic	N/A		Water	3.18 mg/L	10 mL	3.18 mg/L	1	0.07	0.50			8/20/20 10:28:00	N	II
K2007110-001	Carbon, Total Organic	N/A		Ground Water	4.56 mg/L	10 mL	4.56 mg/L	1	0.07	0.50			8/20/20 10:28:00	N	IV
K2007110-002	Carbon, Total Organic	N/A		Ground Water	13.18 mg/L	10 mL	13.2 mg/L	1	0.07	0.50			8/20/20 10:28:00	Y	IV
K2007111-001	Carbon, Total Organic	N/A		Water	2.49 mg/L	10 mL	2.49 mg/L	1	0.07	0.50			8/20/20 10:28:00	N	II
KQ2011928-01	Carbon, Total Organic	DUP	K2007110-002	Ground Water	13.08 mg/L	10 mL	13.1 mg/L	1	0.07	0.50		<1	8/20/20 10:28:00	N	IV
KQ2011928-02	Carbon, Total Organic	MS	K2007110-002	Ground Water	34.82 mg/L	10 mL	34.8 mg/L	1	0.07	0.50	87		8/20/20 10:28:00	N	IV
KQ2011928-03	Carbon, Total Organic	LCS		Water	23.20 mg/L	10 mL	23.2 mg/L	1	0.07	0.50	93		8/20/20 10:28:00	N	IV
KQ2011928-04	Carbon, Total Organic	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			8/20/20 10:28:00	N	IV
KQ2011928-05	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			8/20/20 10:28:00	N	IV
KQ2011928-06	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			8/20/20 10:28:00	N	IV
KQ2011928-07	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			8/20/20 10:28:00	N	IV
KQ2011928-08	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			8/20/20 10:28:00	N	IV
KQ2011928-09	Carbon, Total Organic	CCV		Water	24.42 mg/L	10 mL	24.4 mg/L	1					8/20/20 10:28:00	N	IV
KQ2011928-10	Carbon, Total Organic	CCV		Water	24.55 mg/L	10 mL	24.6 mg/L	1					8/20/20 10:28:00	N	IV
KQ2011928-11	Carbon, Total Organic	CCV		Water	23.92 mg/L	10 mL	23.9 mg/L	1					8/20/20 10:28:00	N	IV
KQ2011928-12	Carbon, Total Organic	CCV		Water	23.44 mg/L	10 mL	23.4 mg/L	1					8/20/20 10:28:00	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-01 **Analyst:** MKANALY **Analysis Lot:** 692113 **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
K2006883-007	Carbon, Total Organic	N/A		Water	0.83 mg/L	10 mL	0.83 mg/L	1	0.07	0.50			8/20/20 10:28:00	N	II
K2006883-008	Carbon, Total Organic	N/A		Water	0.40 mg/L	10 mL	0.40 mg/L J	1	0.07	0.50			8/20/20 10:28:00	N	II
K2006929-001	Carbon, Total Organic	N/A		Water	7.61 mg/L	10 mL	7.61 mg/L	1	0.07	0.50			8/20/20 10:28:00	N	II
K2007018-001	Carbon, Total Organic	N/A		Ground Water	2.31 mg/L	10 mL	2.31 mg/L	1	0.07	0.50			8/20/20 10:28:00	N	IV
K2007018-002	Carbon, Total Organic	N/A		Ground Water	468.90 mg/L	10 mL	4690 mg/L	10	0.7	5.0			8/20/20 10:28:00	N	IV
K2007018-003	Carbon, Total Organic	N/A		Ground Water	3.81 mg/L	10 mL	3.81 mg/L	1	0.07	0.50			8/20/20 10:28:00	Y	IV
K2007018-004	Carbon, Total Organic	N/A		Ground Water	23.77 mg/L	10 mL	23.8 mg/L	1	0.07	0.50			8/20/20 10:28:00	N	IV
K2007018-005	Carbon, Total Organic	N/A		Ground Water	24.16 mg/L	10 mL	24.2 mg/L	1	0.07	0.50			8/20/20 10:28:00	N	IV
K2007063-002	Carbon, Dissolved Organic (DOC)	N/A		Water	5.79 mg/L	10 mL	5.79 mg/L	1	0.07	0.50			8/20/20 10:28:00	N	II
K2007063-004	Carbon, Dissolved Organic (DOC)	N/A		Water	4.00 mg/L	10 mL	4.00 mg/L	1	0.07	0.50			8/20/20 10:28:00	N	II
KQ2011930-01	Carbon, Total Organic	DUP	K2007018-003	Ground Water	4.48 mg/L	10 mL	4.48 mg/L	1	0.07	0.50		16*	8/20/20 10:28:00	N	IV
KQ2011930-02	Carbon, Total Organic	MS	K2007018-003	Ground Water	29.16 mg/L	10 mL	29.2 mg/L	1	0.07	0.50	101		8/20/20 10:28:00	N	IV
KQ2011930-03	Carbon, Dissolved Organic (DOC)	MB		Water	-0.10 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			8/20/20 10:28:00	N	II
KQ2011930-03	Carbon, Total Organic	MB		Water	-0.10 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			8/20/20 10:28:00	N	II
KQ2011930-04	Carbon, Dissolved Organic (DOC)	LCS		Water	22.99 mg/L	10 mL	23.0 mg/L	1	0.07	0.50	92		8/20/20 10:28:00	N	II
KQ2011930-04	Carbon, Total Organic	LCS		Water	22.99 mg/L	10 mL	23.0 mg/L	1	0.07	0.50	92		8/20/20 10:28:00	N	II
KQ2011930-05	Carbon, Dissolved Organic (DOC)	DLCS		Water	22.76 mg/L	10 mL	22.8 mg/L	1	0.07	0.50	91	1	8/20/20 10:28:00	N	II
KQ2011930-05	Carbon, Total Organic	DLCS		Water	22.76 mg/L	10 mL	22.8 mg/L	1	0.07	0.50	91	1	8/20/20 10:28:00	N	II
KQ2011930-06	Carbon, Dissolved Organic (DOC)	CCV		Water	23.92 mg/L	10 mL	23.9 mg/L	1					8/20/20 10:28:00	N	II
KQ2011930-06	Carbon, Total Organic	CCV		Water	23.92 mg/L	10 mL	23.9 mg/L	1					8/20/20 10:28:00	N	II
KQ2011930-07	Carbon, Dissolved Organic (DOC)	CCV		Water	23.43 mg/L	10 mL	23.4 mg/L	1					8/20/20 10:28:00	N	II
KQ2011930-07	Carbon, Total Organic	CCV		Water	23.43 mg/L	10 mL	23.4 mg/L	1					8/20/20 10:28:00	N	II
KQ2011930-08	Carbon, Dissolved Organic (DOC)	CCV		Water	23.03 mg/L	10 mL	23.0 mg/L	1					8/20/20 10:28:00	N	II
KQ2011930-08	Carbon, Total Organic	CCV		Water	23.03 mg/L	10 mL	23.0 mg/L	1					8/20/20 10:28:00	N	II
KQ2011930-09	Carbon, Dissolved Organic (DOC)	CCB		Water	-0.10 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			8/20/20 10:28:00	N	II
KQ2011930-09	Carbon, Total Organic	CCB		Water	-0.10 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			8/20/20 10:28:00	N	II
KQ2011930-10	Carbon, Dissolved Organic (DOC)	CCB		Water	-0.10 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			8/20/20 10:28:00	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-01 **Analyst:** MKANALY **Analysis Lot:** 692113 **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
KQ2011930-10	Carbon, Total Organic	CCB		Water	-0.10 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			8/20/20 10:28:00	N	II
KQ2011930-11	Carbon, Dissolved Organic (DOC)	CCB		Water	-0.10 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			8/20/20 10:28:00	N	II
KQ2011930-11	Carbon, Total Organic	CCB		Water	-0.10 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			8/20/20 10:28:00	N	II
KQ2011930-12	Carbon, Dissolved Organic (DOC)	CCV		Water	23.98 mg/L	10 mL	24.0 mg/L	1					8/20/20 10:28:00	N	II
KQ2011930-12	Carbon, Total Organic	CCV		Water	23.98 mg/L	10 mL	24.0 mg/L	1					8/20/20 10:28:00	N	II
KQ2011930-13	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			8/20/20 10:28:00	N	II
KQ2011930-13	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			8/20/20 10:28:00	N	II

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

ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
CBA	RB	1			0.0000	0	<0.5	
2	CCV	1	24.512	0.0969	24.4150	24.415	24.4	
3	CCB	1	0.000	0.0969	-0.0969	-0.0969	<0.5	
4	MB1	1	0.000	0.0969	-0.0969	-0.0969	<0.5	
5	LCS	1	23.302	0.0969	23.2052	23.2052	23.2	
6	ics	1	0.279	0.0969	0.1824	0.1824	<0.5	
7	6886-001	1	0.000	0.0969	-0.0969	-0.0969	<0.5	
8	6886-002	1	0.000	0.0969	-0.0969	-0.0969	<0.5	
9	6746-001	1	1.597	0.0969	1.5001	1.5001	1.50	
10	6746-002	1	2.390	0.0969	2.2928	2.2928	2.29	
11	7004-001	1	2.203	0.0969	2.1060	2.106	2.1	
12	6806-001	1	5.729	0.0969	5.6325	5.6325	5.63	
13	6806-002	1	30.872	0.0969	30.7746	30.7746	30.77	
14	ccv	1	24.532	0.0969	24.4354	24.4354	24.44	
15	ccb	1	0.000	0.0969	-0.0969	-0.0969	<0.5	
16	6806-003	1	1.114	0.0969	1.0175	1.0175	1.0	
17	6805-001	1	40.009	0.0969	39.9118	39.9118	39.91	
18	7110-001	1	4.656	0.0969	4.5594	4.5594	4.6	
19	7110-002	1	13.277	0.0969	13.1801	13.1801	13.2	
20	7110-002d	1	13.179	0.0969	13.0824	13.0824	13.08	
21	7110-002ms	1	34.913	0.0969	34.8164	34.8164	34.82	
22	7111-001	1	2.591	0.0969	2.4943	2.4943	2.5	
23	7063-001	1	4.299	0.0969	4.2020	4.202	4.2	
24	7063-003	1	3.274	0.0969	3.1774	3.1774	3.18	
25	6883-001	1	0.523	0.0969	0.4261	0.4261	<0.5	

date time

Analyzed By:	Date Analyzed
Reviewed By:	Date Reviewed

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	ccv	1	24.012	0.0969	23.9155	23.9155	23.92	
27	ccb	1	0.000	0.0969	-0.0969	-0.0969	<0.5	
28	mb	1	0.000	0.0969	-0.0969	-0.0969	<0.5	
29	lcs	1	23.091	0.0969	22.9945	22.9945	23.0	
30	lcs	1	22.861	0.0969	22.7638	22.7638	22.8	
31	6883-002	1	0.6280	0.0969	0.5311	0.5311	0.5	
32	6883-003	1	0.7920	0.0969	0.6951	0.6951	0.7	
33	6883-004	1	0.7126	0.0969	0.6157	0.6157	0.6	
34	6883-005	1	0.7328	0.0969	0.6359	0.6359	0.6	
35	6883-006	1	0.4024	0.0969	0.3055	0.3055	<0.5	
36	6883-007	1	0.9261	0.0969	0.8292	0.8292	0.8	
37	6883-008	1	0.4861	0.0969	0.3892	0.3892	<0.5	
38	ccv	1	23.5262	0.0969	23.4293	23.4293	23.4	
39	ccb	1	0.0000	0.0969	-0.0969	-0.0969	<0.5	
40	6929-1	10	0.5872	0.0969	0.4903	4.903	4.9	NR
41	7018-001	1	2.4033	0.0969	2.3064	2.3064	2.3	
42	7018-002	1	97.1119	0.0969	97.0150	97.015	97.0	NR
43	7018-003	1	7.3687	0.0969	7.2718	7.2718	nr	NR
44	7018-3d	1	4.5730	0.0969	4.4761	4.4761	4.5	
45	7018-003ms	1	29.2565	0.0969	29.1596	29.1596	29.2	
46	7018-004	1	23.8707	0.0969	23.7738	23.7738	23.8	
47	7018-005	1	24.2526	0.0969	24.1557	24.1557	24.2	
48	7063-002	1	5.8856	0.0969	5.7887	5.7887	5.8	
49	7063-004	1	4.1003	0.0969	4.0034	4.0034	4.0	
50	ccv	1	23.1219	0.0969	23.0250	23.025	23.0	

Analyzed By:	Date Analyzed
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	
51	ccb	1	0.5558	0.0969	0.4589	0.4589	<0.5	
52	mb	1	0.4627	0.0969	0.3658	0.3658	<0.5	
53	lcs	1	25.5496	0.0969	25.4527	25.4527	25.5	
54	dlcs	1	25.7292	0.0969	25.6323	25.6323	25.6	
55	6929-001	1	7.7110	0.0969	7.6141	7.6141	7.6	
56	7018-002	10	46.9853	0.0969	46.8884	468.884	468.9	
57	7018-003	1	3.9045	0.0969	3.8076	3.8076	3.8	
58	ccv	1	24.0763	0.0969	23.9794	23.9794	24.0	
59	ccb	1	0.0969	0.0969	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:	Date Analyzed
Reviewed By:	Date Reviewed

Schedule: 082020

Version: 10
Instrument: Fusion1
Last Saved by: Fusion1 (Fusion1)
Last Saved on: 2020/08/21 10:28 - Friday

Position	Sample Type	Sample ID	Method ID (Calibration ID)	Reps	Use	State
(Clean)	Clean	Clean		1	True	Done
(Clean)	Clean	Clean		1	True	Done
(Clean)	Clean	Clean		1	True	Done
(Blank)	Blank	Reagent/Acid Blank		1	True	Done
D	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Done
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Done
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Done
1	Sample	MB1	CAS_salt_010711 (CAS_salt_010711)	1	True	Done
C	Check Standard	[TOC] LCS [24.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Done
2	Sample	ICS	CAS_salt_010711 (CAS_salt_010711)	1	True	Done
3	Sample	K2006886-001	CAS_salt_010711 (CAS_salt_010711)	2	True	Done
4	Sample	K2006886-002	CAS_salt_010711 (CAS_salt_010711)	2	True	Done
5	Sample	K2006746-001	CAS_salt_010711 (CAS_salt_010711)	2	True	Done
6	Sample	K2006746-002	CAS_salt_010711 (CAS_salt_010711)	2	True	Done
7	Sample	K2007004-001	CAS_salt_010711 (CAS_salt_010711)	2	True	Done
8	Sample	K2006806-001	CAS_salt_010711 (CAS_salt_010711)	2	True	Done
9	Sample	K2006806-002	CAS_salt_010711 (CAS_salt_010711)	2	True	Done
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Done
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Done
10	Sample	K2006806-003	CAS_salt_010711 (CAS_salt_010711)	2	True	Done
11	Sample	K2006805-001	CAS_salt_010711 (CAS_salt_010711)	2	True	Done
12	Sample	K2007110-001	CAS_salt_010711 (CAS_salt_010711)	2	True	Done
13	Sample	K2007110-002	CAS_salt_010711 (CAS_salt_010711)	2	True	Done
14	Sample	K2007110-002D	CAS_salt_010711 (CAS_salt_010711)	2	True	Done
15	Sample	K2007110-002MS	CAS_salt_010711 (CAS_salt_010711)	2	True	Done
16	Sample	K2007111-001	CAS_salt_010711 (CAS_salt_010711)	2	True	Done
17	Sample	K2007063-001	CAS_salt_010711 (CAS_salt_010711)	2	True	Done
18	Sample	K2007063-003	CAS_salt_010711 (CAS_salt_010711)	2	True	Done
19	Sample	K2006883-001	CAS_salt_010711 (CAS_salt_010711)	2	True	Done
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Done
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Done
20	Sample	MB2	CAS_salt_010711 (CAS_salt_010711)	1	True	Done
C	Check Standard	[TOC] LCS [24.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Done
C	Check Standard	[TOC] LCS [25.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Done
22	Sample	K2006883-002	CAS_salt_010711 (CAS_salt_010711)	2	True	Done
23	Sample	K2006883-003	CAS_salt_010711 (CAS_salt_010711)	2	True	Done
24	Sample	K2006883-004	CAS_salt_010711 (CAS_salt_010711)	2	True	Done
25	Sample	K2006883-005	CAS_salt_010711 (CAS_salt_010711)	2	True	Done
26	Sample	K2006883-006	CAS_salt_010711 (CAS_salt_010711)	2	True	Done
27	Sample	K2006883-007	CAS_salt_010711 (CAS_salt_010711)	2	True	Done
28	Sample	K2006883-008	CAS_salt_010711 (CAS_salt_010711)	2	True	Done
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Done
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Done
29	Sample	K2006929-001 10X	CAS_salt_010711 (CAS_salt_010711)	2	True	Done
30	Sample	K2007018-001	CAS_salt_010711 (CAS_salt_010711)	2	True	Done
31	Sample	K2007018-002	CAS_salt_010711 (CAS_salt_010711)	2	True	Done
32	Sample	K2007018-003	CAS_salt_010711 (CAS_salt_010711)	2	True	Done
33	Sample	K2007018-003D	CAS_salt_010711 (CAS_salt_010711)	2	True	Done
34	Sample	K2007018-003MS	CAS_salt_010711 (CAS_salt_010711)	2	True	Done
35	Sample	K2007018-004	CAS_salt_010711 (CAS_salt_010711)	2	True	Done
36	Sample	K2007018-005	CAS_salt_010711 (CAS_salt_010711)	2	True	Done
37	Sample	K2007063-002	CAS_salt_010711 (CAS_salt_010711)	2	True	Done
38	Sample	K2007063-004	CAS_salt_010711 (CAS_salt_010711)	2	True	Done
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Running

Schedule: 082020

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	Pending
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
C	Check Standard	[TOC] LCS [25.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
40	Sample	K2006929-001	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
41	Sample	K2007018-002 10X	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
42	Sample	K2007018-003	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
3	Sample		CAS_salt_010711 (CAS_salt_010711)	1	False	Ready
					False	

Fusion Report - 082020
Thursday, August 20, 2020 11:36 AM

(View - Reps, Unused Reps, Meta-Data, Signature, History)
Printed on 2020/08/24 09:32 - Monday

Report Summary Information

Company Location:	Gen Chem Lab		
Schedule Name:	082020	Engine Version:	1.1.5.1
Instrument Name:	Fusion1	Firmware Version:	1.2.0696
Report Version:	1 of 1	Connection:	RS232 COM1
Report Creation by Operators (schedule version):	Fusion1 (Fusion1) (v1) Fusion1 (Fusion1) (v2) Fusion1 (Fusion1) (v3) Fusion1 (Fusion1) (v5) Fusion1 (Fusion1) (v6) Fusion1 (Fusion1) (v7) Fusion1 (Fusion1) (v8) Fusion1 (Fusion1) (v9) Fusion1 (Fusion1) (v10)		
Comment:			

Report Results

Sample Type: Clean — From Schedule Version 1

	Pos	Analysis Type	Sample ID	Start Time
◆	(clean)		Clean	2020/08/20 11:36

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	13.60	26.95	13.35	49.69	05:30
2	TC Clean	16.57	29.67	13.10	49.70	07:16
3	TC Clean	2.40	15.39	12.99	49.88	07:03
4	TC Clean	0.99	14.20	13.21	49.75	07:03

Sample Type: Clean — From Schedule Version 1

	Pos	Analysis Type	Sample ID	Start Time
◆	(clean)		Clean	2020/08/20 12:08

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	-0.23	12.89	13.11	49.83	08:00

2	TC Clean	4.24	17.20	12.97	49.91	07:18
3	TC Clean	0.78	13.76	12.98	49.71	07:04
4	TC Clean	0.36	13.36	13.00	49.73	07:02

Sample Type: Clean

From Schedule Version 1

	Pos	Analysis Type	Sample ID	Start Time
◈	(clean)		Clean	2020/08/20 12:42

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	-0.05	12.76	12.80	49.67	05:19
2	TC Clean	3.48	16.54	13.07	49.72	07:15
3	TC Clean	0.78	13.80	13.02	49.73	06:58
4	TC Clean	0.47	13.41	12.94	49.84	07:01

Sample Type: Blank (Creating v1436)

From Schedule Version 1

	Pos	Analysis Type	Sample ID	Start Time
◈	(blank)		Reagent/Acid Blank	2020/08/20 13:13

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	-0.18	12.77	12.95	49.84	08:00
2	TC Clean	4.11	16.89	12.78	49.87	07:15
3	TC Clean	0.70	13.73	13.04	49.78	07:00
4	TC Clean	0.39	13.32	12.93	49.71	07:03
5	Reagent Blank	4.21	17.15	12.94	49.86	08:12
6	Acid Blank	0.23	13.15	12.92	49.87	08:00

Sample Type: Sample

From Schedule Version 1

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	D	TOC	RB	0.0418 ppm	0.0000 ppm	0.0000%	2020/08/20 14:05

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0418	0.4184	9.48	22.67	13.19	49.96	10:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.1835 (IC) (v1436)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

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)	24.5119 ppm (PASS)	0.0000 ppm	0%	2020/08/20 14:20

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.5119	245.1193	181.84	194.84	13.00	49.89	10:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)	50 ppmC

Sample Type: Check Standard --> CCB — From Schedule Version 3

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2020/08/20 14:35

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	9.09	21.89	12.80	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 (v38)	0 ppmC

Sample Type: Sample — From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	1	TOC	MB1	0.0000 ppm	0.0000 ppm	0.0000%	2020/08/20 14:49

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.57	21.49	12.92	49.94	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.1835 (IC) (v1436)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

Sample Type: Check Standard --> LCS — From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	C	TOC	25.0000	1:1	[TOC] LCS [24.0 ppm]	0 / infinity (NA / NA)	23.3021 ppm (PASS)	0.0000 ppm	0%	2020/08/20 15:04

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	23.3021	233.0207	173.35	186.31	12.96	49.90	10:29

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)	25 ppmC

Sample Type: Sample — From Schedule Version 6

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	2	TOC	ICS	0.2793 ppm	0.0000 ppm	0.0000%	2020/08/20 15:19

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.2793	2.7933	11.14	24.06	12.92	49.94	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.1835 (IC) (v1436)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	3	TOC	K2006886-001	0.0000 ppm	0.0000 ppm	0.0000%	2020/08/20 15:33

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.49	21.38	12.88	49.91	10:29
2	TOC	0.0000	0.0000	8.61	21.52	12.91	49.91	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.1835 (IC) (v1436)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

Sample Type: Sample — From Schedule Version 7

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	4	TOC	K2006886-002	0.0000 ppm	0.0000 ppm	0.0000%	2020/08/20 16:01

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.36	21.30	12.95	49.93	10:31
2	TOC	0.0000	0.0000	8.06	21.04	12.98	49.92	10:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.1835 (IC) (v1436)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

Sample Type: Sample

From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	5	TOC	K2006746-001	1.5970 ppm	0.0385 ppm	2.4100%	2020/08/20 16:29

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.5697	15.6974	20.19	33.24	13.04	49.93	10:25
2	TOC	1.6242	16.2420	20.58	33.48	12.90	49.88	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.1835 (IC) (v1436)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	6	TOC	K2006746-002	2.3897 ppm	0.0540 ppm	2.2600%	2020/08/20 16:57

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.3515	23.5152	25.68	38.58	12.90	49.96	10:31
2	TOC	2.4279	24.2793	26.21	39.04	12.83	49.95	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.1835 (IC) (v1436)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	7	TOC	K2007004-001	2.2029 ppm	0.0211 ppm	0.9600%	2020/08/20 17:25

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.1880	21.8801	24.53	37.65	13.11	49.95	10:30
2	TOC	2.2178	22.1780	24.74	37.46	12.72	49.96	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.1835 (IC) (v1436)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	8	TOC	K2006806-001	5.7294 ppm	0.0040 ppm	0.0700%	2020/08/20 17:53

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	5.7322	57.3221	49.39	62.24	12.85	49.95	10:27
2	TOC	5.7265	57.2651	49.35	62.31	12.96	49.98	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.1835 (IC) (v1436)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	9	TOC	K2006806-002	30.8715 ppm	0.0903 ppm	0.2900%	2020/08/20 18:21

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	30.8077	308.0767	225.29	238.33	13.03	50.06	10:26
2	TOC	30.9354	309.3540	226.19	239.30	13.11	50.16	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.1835 (IC) (v1436)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

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)	24.5323 ppm (PASS)	0.0000 ppm	0%	2020/08/20 18:49

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.5323	245.3232	181.98	194.98	13.00	50.10	10:34

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)	50 ppmC

Sample Type: Check Standard --> CCB From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2020/08/20 19:04

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	9.80	22.74	12.94	50.07	10:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)	0 ppmC

Sample Type: Sample From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	10	TOC	K2006806-003	1.1144 ppm	0.0101 ppm	0.9000%	2020/08/20 19:19

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.1216	11.2155	17.05	30.13	13.08	50.21	10:25
2	TOC	1.1073	11.0730	16.95	29.91	12.96	50.12	10:26

Dilution	Blank Contribution	Method	Calibration

1:10	(TC) 9.1835 (IC) (v1436)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	11	TOC	K2006805-001	40.0087 ppm	0.4426 ppm	1.1100%	2020/08/20 19:47

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	40.3217	403.2167	292.03	305.07	13.04	50.08	10:29
2	TOC	39.6957	396.9571	287.64	300.54	12.89	50.22	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.1835 (IC) (v1436)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	12	TOC	K2007110-001	4.6563 ppm	0.1970 ppm	4.2300%	2020/08/20 20:15

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.7956	47.9563	42.82	55.78	12.96	50.04	10:24
2	TOC	4.5171	45.1707	40.87	53.90	13.03	49.95	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.1835 (IC) (v1436)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	13	TOC	K2007110-002	13.2770 ppm	0.1438 ppm	1.0800%	2020/08/20 20:43

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	13.1753	131.7531	101.61	114.52	12.92	49.87	10:27
2	TOC	13.3787	133.7873	103.03	115.88	12.84	49.94	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.1835 (IC) (v1436)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	14	TOC	K2007110-002D	13.1793 ppm	0.1365 ppm	1.0400%	2020/08/20 21:11

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	13.2758	132.7581	102.31	115.16	12.85	49.88	10:29
2	TOC	13.0828	130.8279	100.96	113.87	12.91	49.95	10:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.1835 (IC) (v1436)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	15	TOC	K2007110-002MS	34.9133 ppm	0.5447 ppm	1.5600%	2020/08/20 21:39

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	35.2984	352.9845	256.80	269.65	12.85	49.87	10:31
2	TOC	34.5281	345.2808	251.39	264.23	12.84	49.83	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.1835 (IC) (v1436)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	16	TOC	K2007111-001	2.5912 ppm	0.0951 ppm	3.6700%	2020/08/20 22:07

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.6584	26.5844	27.83	40.81	12.98	49.91	10:28
2	TOC	2.5240	25.2401	26.89	39.81	12.92	49.87	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.1835 (IC) (v1436)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	17	TOC	K2007063-001	4.2989 ppm	0.0922 ppm	2.1500%	2020/08/20 22:35

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.2337	42.3367	38.88	51.93	13.05	49.81	10:28
2	TOC	4.3641	43.6411	39.80	52.62	12.83	49.90	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.1835 (IC) (v1436)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	18	TOC	K2007063-003	3.2743 ppm	0.0023 ppm	0.0700%	2020/08/20 23:03

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.2760	32.7599	32.16	45.10	12.93	49.84	10:27
2	TOC	3.2727	32.7271	32.14	44.98	12.83	50.00	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.1835 (IC) (v1436)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	19	TOC	K2006883-001	0.5230 ppm	0.0016 ppm	0.3100%	2020/08/20 23:31

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5218	5.2182	12.84	25.81	12.97	49.86	10:25
2	TOC	0.5241	5.2410	12.86	25.94	13.08	49.84	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.1835 (IC)	CAS_salt_010711	CAS_salt_010711

(v1436) (v4) (v38)

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)	24.0124 ppm (PASS)	0.0000 ppm	0%	2020/08/20 23:59

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.0124	240.1242	178.33	191.21	12.88	49.93	10:33

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)	50 ppmC

Sample Type: Check Standard --> CCB

From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2020/08/21 00:14

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	8.90	21.92	13.02	49.86	10:33

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)	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%	2020/08/21 00:29

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.11	21.07	12.96	49.94	10:33

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.1835 (IC) (v1436)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

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)	23.0914 ppm (PASS)	0.0000 ppm	0%	2020/08/21 00:43

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	23.0914	230.9137	171.87	184.62	12.74	49.91	10:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)	25 ppmC

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)	22.8607 ppm (PASS)	0.0000 ppm	0%	2020/08/21 00:58

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	22.8607	228.6071	170.26	183.33	13.08	49.92	10:28

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)	25 ppmC

Sample Type: Sample From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	22	TOC	K2006883-002	0.6280 ppm	0.0527 ppm	8.4000%	2020/08/21 01:12

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.6652	6.6523	13.85	26.73	12.88	49.95	10:27
2	TOC	0.5907	5.9068	13.33	26.21	12.88	49.85	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.1835 (IC) (v1436)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	23	TOC	K2006883-003	0.7920 ppm	0.0757 ppm	9.5600%	2020/08/21 01:40

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.7385	7.3851	14.36	27.23	12.87	49.98	10:27
2	TOC	0.8456	8.4556	15.11	28.10	12.99	49.91	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.1835 (IC) (v1436)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	24	TOC	K2006883-004	0.7126 ppm	0.0096 ppm	1.3400%	2020/08/21 02:08

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.7059	7.0586	14.13	27.31	13.18	50.04	10:30
2	TOC	0.7194	7.1940	14.23	27.30	13.07	49.97	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.1835 (IC) (v1436)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	25	TOC	K2006883-005	0.7328 ppm	0.0488 ppm	6.6600%	2020/08/21 02:36

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.7673	7.6730	14.57	27.51	12.95	49.88	10:27
2	TOC	0.6983	6.9830	14.08	27.23	13.15	49.99	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.1835 (IC) (v1436)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	26	TOC	K2006883-006	0.4024 ppm	0.0026 ppm	0.6500%	2020/08/21 03:05

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.4005	4.0051	11.99	25.13	13.14	49.91	10:26
2	TOC	0.4042	4.0421	12.02	25.07	13.06	50.04	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.1835 (IC) (v1436)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	27	TOC	K2006883-007	0.9261 ppm	0.0369 ppm	3.9800%	2020/08/21 03:33

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.9000	9.0002	15.50	28.52	13.02	49.93	10:30
2	TOC	0.9522	9.5220	15.86	28.80	12.93	50.02	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.1835 (IC) (v1436)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	28	TOC	K2006883-008	0.4861 ppm	0.0084 ppm	1.7200%	2020/08/21 04:01

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.4802	4.8020	12.55	25.76	13.20	49.95	10:26

2	TOC	0.4920	4.9203	12.64	25.80	13.16	49.93	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.1835 (IC) (v1436)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

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)	23.5262 ppm (PASS)	0.0000 ppm	0%	2020/08/21 04:29

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.5262	235.2616	174.92	187.91	12.99	49.99	10:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)	50 ppmC

Sample Type: Check Standard --> CCB — From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2020/08/21 04:43

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	8.96	21.91	12.95	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 (v38)	0 ppmC

Sample Type: Sample — From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	29	TOC	K2006929-001 10X	0.5872 ppm	0.0408 ppm	6.9500%	2020/08/21 04:58

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5583	5.5832	13.10	26.27	13.17	49.99	10:25
2	TOC	0.6161	6.1605	13.50	26.43	12.93	49.92	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.1835 (IC) (v1436)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

		Analysis			Std. Dev.		

	Pos	Type	Sample ID	Result (ppmC)	(ppmC)	RSD	Start Time
◈	30	TOC	K2007018-001	2.4033 ppm	0.0459 ppm	1.9100%	2020/08/21 05:26

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.3709	23.7090	25.82	38.92	13.11	49.99	10:24
2	TOC	2.4358	24.3577	26.27	39.20	12.93	49.95	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.1835 (IC) (v1436)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	31	TOC	K2007018-002	97.1119 ppm	1.3734 ppm	1.4100%	2020/08/21 05:54

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	98.0830	980.8304	697.22	710.23	13.01	50.00	10:27
2	TOC	96.1407	961.4072	683.59	697.36	13.77	49.92	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.1835 (IC) (v1436)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	32	TOC	K2007018-003	7.3687 ppm	2.6382 ppm	35.8000%	2020/08/21 06:22

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	9.2342	92.3422	73.96	87.68	13.72	50.00	10:28
2	TOC	5.5033	55.0327	47.79	60.91	13.13	50.06	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.1835 (IC) (v1436)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	33	TOC	K2007018-003D	4.5753 ppm	0.3918 ppm	8.5600%	2020/08/21 06:50

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.8524	48.5236	43.22	56.16	12.93	49.97	10:29
2	TOC	4.2983	42.9825	39.33	52.30	12.97	50.10	10:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.1835 (IC) (v1436)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	34	TOC	K2007018-003MS	29.2565 ppm	0.1532 ppm	0.5200%	2020/08/21 07:18

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	29.3649	293.6487	215.17	228.41	13.24	49.95	10:29
2	TOC	29.1482	291.4819	213.65	226.91	13.26	50.02	10:27

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	35	TOC	K2007018-004	23.8707 ppm	0.5947 ppm	2.4900%	2020/08/21 07:46

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	23.4501	234.5011	173.68	186.59	12.90	50.07	10:30
2	TOC	24.2912	242.9119	179.58	192.65	13.07	49.97	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.1835 (IC) (v1436)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	36	TOC	K2007018-005	24.2526 ppm	0.0925 ppm	0.3800%	2020/08/21 08:15

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	24.1871	241.8713	178.85	191.97	13.11	50.02	10:25
2	TOC	24.3180	243.1799	179.77	192.98	13.21	50.07	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.1835 (IC) (v1436)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

Sample Type: Sample From Schedule Version 9

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	37	TOC	K2007063-002	5.8856 ppm	0.7693 ppm	13.0700%	2020/08/21 08:43

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	6.4296	64.2959	54.29	67.26	12.98	49.96	10:29
2	TOC	5.3416	53.4161	46.65	59.71	13.06	50.05	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.1835 (IC) (v1436)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	38	TOC	K2007063-004	4.1003 ppm	0.0134 ppm	0.3300%	2020/08/21 09:11

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.1098	41.0979	38.01	51.09	13.08	50.10	10:27
2	TOC	4.0908	40.9083	37.88	50.85	12.97	49.98	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.1835 (IC) (v1436)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

Sample Type: Check Standard --> CCV 25 ppm

From Schedule Version 10

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	23.1219 ppm (PASS)	0.0000 ppm	0%	2020/08/21 10:28

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.1219	231.2188	172.09	185.09	13.01	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 (v38)	50 ppmC

Sample Type: Check Standard --> CCB

From Schedule Version 10

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.5558 ppm (PASS)	0.0000 ppm	0%	2020/08/21 10:42

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.5558	5.5582	13.79	26.93	13.14	50.01	10:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)	0 ppmC

Sample Type: Sample

From Schedule Version 10

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	39	TOC	MB3	0.4627 ppm	0.0000 ppm	0.0000%	2020/08/21 10:57

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.4627	4.6266	12.43	25.52	13.09	50.12	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.1835 (IC) (v1436)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

Sample Type: Check Standard --> LCS

From Schedule Version 10

	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)	25.5496 ppm (PASS)	0.0000 ppm	0%	2020/08/21 11:11

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	25.5496	255.4959	189.12	202.09	12.97	50.03	10:29

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)	25 ppmC

Sample Type: Check Standard --> LCS

From Schedule Version 10

	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)	25.7292 ppm (PASS)	0.0000 ppm	0%	2020/08/21 11:26

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	25.7292	257.2921	190.38	203.40	13.02	49.96	10:29

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)	25 ppmC

Sample Type: Sample

From Schedule Version 10

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	40	TOC	K2006929-001	7.7110 ppm	0.0183 ppm	0.2400%	2020/08/21 11:41

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	7.7240	77.2400	63.37	76.45	13.09	50.07	10:26
2	TOC	7.6980	76.9805	63.18	76.02	12.83	50.03	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.1835 (IC) (v1436)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	41	TOC	K2007018-002 10X	46.9853 ppm	0.2265 ppm	0.4800%	2020/08/21 12:09

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	46.8252	468.2518	337.65	350.55	12.90	49.97	10:26
2	TOC	47.1455	471.4550	339.90	353.06	13.16	50.07	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.1835 (IC) (v1436)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	42	TOC	K2007018-003	3.9045 ppm	0.3744 ppm	9.5900%	2020/08/21 12:37

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.1692	41.6924	38.43	51.54	13.11	49.94	10:27
2	TOC	3.6398	36.3979	34.72	47.72	13.01	49.97	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.1835 (IC) (v1436)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 10

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.0763 ppm (PASS)	0.0000 ppm	0%	2020/08/21 13:05

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.0763	240.7628	178.78	191.91	13.12	50.05	10:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)	50 ppmC

Sample Type: Check Standard --> CCB From Schedule Version 10

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0969 ppm (PASS)	0.0000 ppm	0%	2020/08/21 13:19

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0969	0.9693	10.57	23.46	12.88	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 (v38)	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
v1435	1.3927	0.5240	0.0000	0.0000	0.0000	2020/08/17 12:16	Fusion1 (Fusion1)

v1436	1.4033	0.2300	0.0000	0.0000	0.0000	2020/08/20 14:05	Fusion1 (Fusion1)

Calibrations

Name: CAS_salt_010711 (TOC)

Version: v38

Ver Creation: 2020/06/13 16:40

Comment:

Operator: Fusion1 (Fusion1)

Basic Analysis Type: TOC

Calibration curve formula: TOC: y = 7.015x + 9.892

r^2 value: TOC: r^2 = 0.99974

Basic Analysis Type: TOC

Sample ID	Y Raw Value	X Expected	Message	End Time
DI Water	9.5750	0.0000		2020/06/13 15:13
0.500 ppm	12.9010	0.5000		2020/06/13 15:28
1.0 ppm	15.6320	1.0000		2020/06/13 15:42
5.0 ppm	43.2510	5.0000		2020/06/13 15:56
10 ppm	82.4040	10.0000		2020/06/13 16:11
25 ppm	188.6880	25.0000		2020/06/13 16:25
50 ppm	358.6500	50.0000		2020/06/13 16:39

Methods

Name: CAS_salt_010711 (TOC)

Version: v4

Ver Creation: 2019/02/21 17:57

Comment:

Operator: Fusion1 (Fusion1)

Parameter	Value
SampleVolume	10.0 mL
Dilution	1:10
AcidVolume	0.5 ml
ReagentVolume	2.0 ml
UVReactorPrerinse	Off
UVReactorPrerinseVolume	5.0
NumberOfUVReactorPrerinses	1
ICSpargeTime	1.00 mins
DetectorSweepFlow	500 ml/min
PreSpargeTime	2.00 mins
SystemFlow	500 ml/min

Advanced Parameter	Value
NeedleRinseVolume	5.0 ml
VialPrimeVolume	2.0 ml
ICSamplePrimeVolume	2.0 ml
ICSpargeRinseVolume	12.0 ml
BaselineStabilizeTime	0.70 min
DetectorPressureFlow	150 ml/min
SyringeSpeedWaste	10
SyringeSpeedAcid	7
SyringeSpeedReagent	7
SyringeSpeedDIWater	7
NDIRPressurization	60 psig
SyringeSpeedSampleDispense	5
SyringeSpeedSampleAspirate	4
SyringeSpeedUVDispense	5
SyringeSpeedUVAspirate	5

SyringeSpeedICDispense	5
SyringeSpeedICAspirate	5
NDIRPressureStabilize	1.75 min
SampleMixing	Off
SampleMixingCycles	1
SampleMixingVolume	10.0
LowLevelFilterNDIR	Off

Acceptance / Approval

Electronic Signatures

Report Version	User Name	Acceptance	Reason	Date

Report History

Report History

Report Version	User Name	System Reason	User Reason	Date
1	Fusion1 (Fusion1)	Schedule completed	Schedule completed	2020/08/21 13:34

0.556				OBSERVATIONS	9	ABOVE
0.463				STD Deviation	0.22197	ABOVE
0.097	0.097	######	######	AVERAGE	0.12393	0.0969
0.000				UCL	0.34590	0
0.000				LCL	-0.09803	0
0.000						0
0.000						0
0.000				OBSERVATIONS	1	0
0.000				STD Deviation	~~#DIV/0!~~	0
				AVERAGE	0.09690	0
				UCL	#DIV/0!	0
				LCL	#DIV/0!	0
						0
						0
				OBSERVATIONS	0	0
				STD Deviation	#DIV/0!	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
						0

ALS Environmental

StarLIMS Run: 692111/392113

Analysis: DOC/TOC

Method: SM 5310 C, 9060A, 415.1, 9060

CCV: 19-GEN-8-15-C 50 ppm LCS: 19-GEN-8-31I 25.0 ppm

ICAL Date: 6/16/2020

ICAL ID: 19-GEN-8-22-G

ICS ID: 19-GEN-8-35-J

ICS TV: 25.0 ppm ICS % R < 1

Spike ID: 19-GEN-8-15-B 0.05 ml of 5000 ppm stock ---> 10.0 ml = 25.0 ppm x dilution factor

Sodium Persulfate: 19-GEN-08-38-B

21 % H3PO4: 19-GEN-08-38-A

Equipment ID: K-TOC-03

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

FILTER ID: 16967789

Analyzed By:	MK	Date Analyzed:	8/20/20
Reviewed By:	JC	Date Reviewed:	8/26/20

microbialinsights

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

ilac-MRA

ANAB
ANSI National Accreditation Board
ACCREDITED
ISO/IEC 17025
TESTING LABORATORY

Client: Susan Huang
APTIM
4005 Port Chicago Hwy
Concord, CA 94520

Phone: 925-288-2099

Fax:

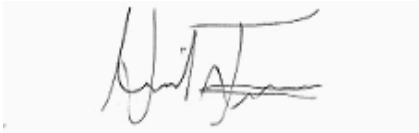
Identifier: 037RJ **Date Rec:** 10/09/2020 **Report Date:** 10/29/2020

Client Project #: 501032 **Client Project Name:** LHAAP 16 October 2020

Purchase Order #: 204818

Test results provided for: CENSUS

Reviewed By:



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

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

MICROBIAL INSIGHTS, INC.

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

CENSUS

Client: **APTIM**
Project: LHAAP 16 October 2020

MI Project Number: **037RJ**
Date Received: 10/09/2020

Sample Information

Client Sample ID:		**16WW58-201008**	**16WW57-201008**	**16WW16-201008**	**16WW36-201013**	**16WW35-201013**
Sample Date:		10/08/2020	10/08/2020	10/08/2020	10/13/2020	10/13/2020
Units:		cells/mL	cells/mL	cells/mL	cells/mL	cells/mL
Analyst/Reviewer:		HT/HT	HT/HT	HT/HT	HT/HT	HT/HT
Dechlorinating Bacteria						
Dehalococcoides	*DHC*	**1.03E+01**	**2.60E+00**	**5.00E-01 (J)**	**1.68E+03**	**7.62E+01**

Legend:
NA = Not Analyzed NS = Not Sampled J = Estimated gene copies below PQL but above LQL I = Inhibited
< = Result not detected

MICROBIAL INSIGHTS, INC.

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

CENSUS

Client: **APTIM**
Project: LHAAP 16 October 2020

MI Project Number: **037RJ**
Date Received: 10/09/2020

Sample Information

Client Sample ID:		**16IW09-201013**	**16WW55-201013**	**16IW03-201013**	**16IW10-201013**	**16WW25-201014**
Sample Date:		10/13/2020	10/13/2020	10/13/2020	10/13/2020	10/14/2020
Units:		cells/mL	cells/mL	cells/mL	cells/mL	cells/mL
Analyst/Reviewer:		HT/HT	HT/HT	HT/HT	HT/HT	HT/HT
Dechlorinating Bacteria						
Dehalococcoides	*DHC*	<7.20E+00	<5.00E-01	**6.34E+02**	**5.95E+04**	**3.50E+00**

Legend:
NA = Not Analyzed NS = Not Sampled J = Estimated gene copies below PQL but above LQL I = Inhibited
< = Result not detected

MICROBIAL INSIGHTS, INC.

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

CENSUS

Client: **APTIM**
Project: LHAAP 16 October 2020

MI Project Number: **037RJ**
Date Received: 10/09/2020

Sample Information

Client Sample ID:		**16WW26-201014**	**16WW29-201014**	**16WW22-201014**	**16WW41-201014**	**16EW01-201020**
Sample Date:		10/14/2020	10/14/2020	10/14/2020	10/14/2020	10/20/2020
Units:		cells/mL	cells/mL	cells/mL	cells/mL	cells/mL
Analyst/Reviewer:		HT/HT	HT/HT	HT/HT	HT/HT	HT/HT
Dechlorinating Bacteria						
Dehalococcoides	*DHC*	**2.19E+01**	**3.22E+01**	**1.11E+01**	**3.00E-01 (J)**	**4.00E-01 (J)**

Legend:
NA = Not Analyzed NS = Not Sampled J = Estimated gene copies below PQL but above LQL I = Inhibited
< = Result not detected

MICROBIAL INSIGHTS, INC.

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

CENSUS

Client: **APTIM**
Project: LHAAP 16 October 2020

MI Project Number: **037RJ**
Date Received: 10/09/2020

Sample Information

Client Sample ID:		**16WW48-201020**	**16WW56-201021**	**16IW20-201021**	**16EW02-201021**
Sample Date:		10/20/2020	10/21/2020	10/21/2020	10/21/2020
Units:		cells/mL	cells/mL	cells/mL	cells/mL
Analyst/Reviewer:		HT/HT	HT/HT	HT/HT	HT/HT
Dechlorinating Bacteria					
Dehalococcoides	*DHC*	**1.90E+00**	**4.15E+01**	**5.54E+04**	**4.06E+02**

Legend:
NA = Not Analyzed NS = Not Sampled J = Estimated gene copies below PQL but above LQL I = Inhibited
< = Result not detected

Quality Assurance/Quality Control Data

Samples Received 10/9/2020

Component	Date Prepared	Date Analyzed	Arrival Temperature	Positive Control	Extraction Blank	Negative Control
DHC	10/09/2020	10/29/2020	0 °C	103%	non-detect	non-detect

Samples Received 10/14/2020

Component	Date Prepared	Date Analyzed	Arrival Temperature	Positive Control	Extraction Blank	Negative Control
DHC	10/14/2020	10/29/2020	2 °C	104%	non-detect	non-detect

Samples Received 10/15/2020

Component	Date Prepared	Date Analyzed	Arrival Temperature	Positive Control	Extraction Blank	Negative Control
DHC	10/15/2020	10/29/2020	1 °C	105%	non-detect	non-detect

Samples Received 10/21/2020

Component	Date Prepared	Date Analyzed	Arrival Temperature	Positive Control	Extraction Blank	Negative Control
DHC	10/21/2020	10/29/2020	0 °C	104%	non-detect	non-detect

Samples Received 10/22/2020

Component	Date Prepared	Date Analyzed	Arrival Temperature	Positive Control	Extraction Blank	Negative Control
DHC	10/22/2020	10/29/2020	0 °C	104%	non-detect	non-detect

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

October 26, 2020

Susan Huang
Aptim Environmental & Infrastucture, Inc.
2500 City West Blvd., Suite 1700
Houston, TX 77042

Work Order: **HS20100455**

Laboratory Results for: **LHAAP 16**

Dear Susan Huang,

ALS Environmental received 6 sample(s) on Oct 09, 2020 for the analysis presented in the following report.

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

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

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

Sincerely,

Generated By: JUMOKE.LAWAL

RJ Modashia
Project Manager

ALS Houston, US Date: 26-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16
Work Order: HS20100455

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS20100455-01	16WW58-201008	Groundwater		08-Oct-2020 07:50	09-Oct-2020 09:45	☐
HS20100455-02	16WW57-201008	Groundwater		08-Oct-2020 07:50	09-Oct-2020 09:45	☐
HS20100455-03	16WW23-201008	Groundwater		08-Oct-2020 09:45	09-Oct-2020 09:45	☐
HS20100455-04	16WW24-201008	Groundwater		08-Oct-2020 10:30	09-Oct-2020 09:45	☐
HS20100455-05	16WW16-201008	Groundwater		08-Oct-2020 11:15	09-Oct-2020 09:45	☐
HS20100455-06	Trip blank-201008	Water		09-Oct-2020 00:00	09-Oct-2020 09:45	☐

ALS Houston, US Date: 26-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16
Work Order: HS20100455

CASE NARRATIVE

Work Order Comments

- Analysis of Perchlorate was performed by ALS Houston TX, High Resolution. Laboratory. Final report attached.

  The analysis for TOC was subcontracted to ALS Environmental in Kelso WA. Final report attached.

GC Semivolatiles by Method RSK-175

Batch ID: R370661

Sample ID: 16WW58-201008 (HS20100455-01DUP)

- The RPD between the sample and its duplicate was outside the control limit. Ethene

GCMS Volatiles by Method SW8260

Batch ID: R370739

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

WetChemistry by Method SM2320B

Batch ID: R370437

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

WetChemistry by Method SW9056

Batch ID: R370227

Sample ID: 16WW16-201008 (HS20100455-05)

- Sample ran at 10X due to matrix

Sample ID: 16WW57-201008 (HS20100455-02)

- Sample ran at 10X due to high concentration of Sulfate

Sample ID: 16WW58-201008 (HS20100455-01)

- Sample ran at 10X due to matrix

Sample ID: HS20100362-01MS

- MS and MSD are for an unrelated sample (Nitrogen, Nitrate (As N),

Batch ID: R371285

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

ALS Houston, US Date: 26-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16
Sample ID: 16WW58-201008
Collection Date: 08-Oct-2020 07:50

ANALYTICAL REPORT
WorkOrder:HS20100455
Lab ID:HS20100455-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	2.5	U	1.5	2.5	5.0	UG/L	5	16-Oct-2020 19:47
1,1-Dichloroethene	**3.3**	J	**1.0**	**2.5**	**5.0**	**UG/L**	5	16-Oct-2020 19:47
1,2-Dichloroethane	2.5	U	1.0	2.5	5.0	UG/L	5	16-Oct-2020 19:47
cis-1,2-Dichloroethene	**140**		**1.0**	**2.5**	**5.0**	**UG/L**	5	16-Oct-2020 19:47
Methylene chloride	**5.7**	J	**2.0**	**5.0**	**10**	**UG/L**	5	16-Oct-2020 19:47
Trichloroethene	**4,400**		**10**	**25**	**50**	**UG/L**	50	16-Oct-2020 21:23
Vinyl chloride	2.5	U	1.0	2.5	5.0	UG/L	5	16-Oct-2020 19:47
Surr: 1,2-Dichloroethane-d4	*85.7*			**0**	*81-118*	*%REC*	*5*	*16-Oct-2020 19:47*
Surr: 1,2-Dichloroethane-d4	*87.2*			**0**	*81-118*	*%REC*	*50*	*16-Oct-2020 21:23*
Surr: 4-Bromofluorobenzene	*102*			**0**	*85-114*	*%REC*	*5*	*16-Oct-2020 19:47*
Surr: 4-Bromofluorobenzene	*100*			**0**	*85-114*	*%REC*	*50*	*16-Oct-2020 21:23*
Surr: Dibromofluoromethane	*90.7*			**0**	*80-119*	*%REC*	*50*	*16-Oct-2020 21:23*
Surr: Dibromofluoromethane	*87.8*			**0**	*80-119*	*%REC*	*5*	*16-Oct-2020 19:47*
Surr: Toluene-d8	*100*			**0**	*89-112*	*%REC*	*5*	*16-Oct-2020 19:47*
Surr: Toluene-d8	*95.1*			**0**	*89-112*	*%REC*	*50*	*16-Oct-2020 21:23*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PVL
Ethane	0.000250	U	0.000144	0.000250	0.00100	mg/L	1	15-Oct-2020 10:01
Ethene	**0.000645**	J	**0.000234**	**0.000500**	**0.00100**	**mg/L**	1	15-Oct-2020 10:01
Methane	**0.00659**		**0.000107**	**0.000250**	**0.000500**	**mg/L**	1	15-Oct-2020 10:01
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: TH
Alkalinity, Total (As CaCO3)	**41.9**	a	**5.00**	**5.00**	**5.00**	**mg/L**	1	13-Oct-2020 21:40
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KVL
Bromide	**4.33**		**0.150**	**0.500**	**0.500**	**mg/L**	5	09-Oct-2020 19:57
Nitrogen, Nitrate (As N)	0.500	U	0.150	0.500	0.500	mg/L	5	09-Oct-2020 19:57
Sulfate	**383**		**4.00**	**10.0**	**10.0**	**mg/L**	20	23-Oct-2020 17:47
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	22-Oct-2020 13:19
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	19-Oct-2020 09:23

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

ALS Houston, US Date: 26-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16
Sample ID: 16WW57-201008
Collection Date: 08-Oct-2020 07:50

ANALYTICAL REPORT
WorkOrder:HS20100455
Lab ID:HS20100455-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	16-Oct-2020 18:35
1,1-Dichloroethene	**1.3**		**0.20**	**0.50**	**1.0**	**UG/L**	1	16-Oct-2020 18:35
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Oct-2020 18:35
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	16-Oct-2020 18:35
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	16-Oct-2020 18:35
Trichloroethene	**72**		**0.20**	**0.50**	**1.0**	**UG/L**	1	16-Oct-2020 18:35
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	16-Oct-2020 18:35
Surr: 1,2-Dichloroethane-d4	*92.0*			**0**	*81-118*	*%REC*	*1*	*16-Oct-2020 18:35*
Surr: 4-Bromofluorobenzene	*107*			**0**	*85-114*	*%REC*	*1*	*16-Oct-2020 18:35*
Surr: Dibromofluoromethane	*89.7*			**0**	*80-119*	*%REC*	*1*	*16-Oct-2020 18:35*
Surr: Toluene-d8	*107*			**0**	*89-112*	*%REC*	*1*	*16-Oct-2020 18:35*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PVL
Ethane	0.000250	U	0.000144	0.000250	0.00100	mg/L	1	15-Oct-2020 10:14
Ethene	**0.00125**		**0.000234**	**0.000500**	**0.00100**	**mg/L**	1	15-Oct-2020 10:14
Methane	**0.00299**		**0.000107**	**0.000250**	**0.000500**	**mg/L**	1	15-Oct-2020 10:14
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: TH
Alkalinity, Total (As CaCO3)	**77.6**	a	**5.00**	**5.00**	**5.00**	**mg/L**	1	13-Oct-2020 21:45
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KVL
Bromide	**5.69**		**0.300**	**1.00**	**1.00**	**mg/L**	10	09-Oct-2020 19:39
Nitrogen, Nitrate (As N)	1.00	U	0.300	1.00	1.00	mg/L	10	09-Oct-2020 19:39
Sulfate	**2,440**		**20.0**	**50.0**	**50.0**	**mg/L**	100	23-Oct-2020 18:23
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	22-Oct-2020 13:19
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	19-Oct-2020 09:23

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

ALS Houston, US Date: 26-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16
Sample ID: 16WW23-201008
Collection Date: 08-Oct-2020 09:45

ANALYTICAL REPORT
WorkOrder:HS20100455
Lab ID:HS20100455-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	UG/L	1	16-Oct-2020 18:59
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	16-Oct-2020 18:59
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Oct-2020 18:59
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	16-Oct-2020 18:59
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	16-Oct-2020 18:59
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	16-Oct-2020 18:59
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	16-Oct-2020 18:59
Surr: 1,2-Dichloroethane-d4	*85.5*			**0**	*81-118*	*%REC*	*1*	*16-Oct-2020 18:59*
Surr: 4-Bromofluorobenzene	*102*			**0**	*85-114*	*%REC*	*1*	*16-Oct-2020 18:59*
Surr: Dibromofluoromethane	*88.0*			**0**	*80-119*	*%REC*	*1*	*16-Oct-2020 18:59*
Surr: Toluene-d8	*98.5*			**0**	*89-112*	*%REC*	*1*	*16-Oct-2020 18:59*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	22-Oct-2020 13:19

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

ALS Houston, US Date: 26-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16
Sample ID: 16WW24-201008
Collection Date: 08-Oct-2020 10:30

ANALYTICAL REPORT
WorkOrder:HS20100455
Lab ID:HS20100455-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	UG/L	1	16-Oct-2020 19:23
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	16-Oct-2020 19:23
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Oct-2020 19:23
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	16-Oct-2020 19:23
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	16-Oct-2020 19:23
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	16-Oct-2020 19:23
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	16-Oct-2020 19:23
Surr: 1,2-Dichloroethane-d4	*89.1*			**0**	*81-118*	*%REC*	*1*	*16-Oct-2020 19:23*
Surr: 4-Bromofluorobenzene	*102*			**0**	*85-114*	*%REC*	*1*	*16-Oct-2020 19:23*
Surr: Dibromofluoromethane	*90.4*			**0**	*80-119*	*%REC*	*1*	*16-Oct-2020 19:23*
Surr: Toluene-d8	*98.2*			**0**	*89-112*	*%REC*	*1*	*16-Oct-2020 19:23*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	22-Oct-2020 13:19

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

ALS Houston, US Date: 26-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16
Sample ID: 16WW16-201008
Collection Date: 08-Oct-2020 11:15

ANALYTICAL REPORT
WorkOrder:HS20100455
Lab ID:HS20100455-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	12	U	7.5	12	25	UG/L	25	16-Oct-2020 20:11
1,1-Dichloroethene	**59**		**5.0**	**12**	**25**	**UG/L**	25	16-Oct-2020 20:11
1,2-Dichloroethane	**33**		**5.0**	**12**	**25**	**UG/L**	25	16-Oct-2020 20:11
cis-1,2-Dichloroethene	**17,000**		**100**	**250**	**500**	**UG/L**	500	16-Oct-2020 21:48
Methylene chloride	**44**	J	**10**	**25**	**50**	**UG/L**	25	16-Oct-2020 20:11
Trichloroethene	**32,000**		**100**	**250**	**500**	**UG/L**	500	16-Oct-2020 21:48
Vinyl chloride	**470**		**5.0**	**12**	**25**	**UG/L**	25	16-Oct-2020 20:11
Surr: 1,2-Dichloroethane-d4	*87.9*			**0**	*81-118*	*%REC*	*25*	*16-Oct-2020 20:11*
Surr: 1,2-Dichloroethane-d4	*85.2*			**0**	*81-118*	*%REC*	*500*	*16-Oct-2020 21:48*
Surr: 4-Bromofluorobenzene	*102*			**0**	*85-114*	*%REC*	*25*	*16-Oct-2020 20:11*
Surr: 4-Bromofluorobenzene	*102*			**0**	*85-114*	*%REC*	*500*	*16-Oct-2020 21:48*
Surr: Dibromofluoromethane	*90.5*			**0**	*80-119*	*%REC*	*25*	*16-Oct-2020 20:11*
Surr: Dibromofluoromethane	*88.1*			**0**	*80-119*	*%REC*	*500*	*16-Oct-2020 21:48*
Surr: Toluene-d8	*101*			**0**	*89-112*	*%REC*	*500*	*16-Oct-2020 21:48*
Surr: Toluene-d8	*99.0*			**0**	*89-112*	*%REC*	*25*	*16-Oct-2020 20:11*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PVL
Ethane	**0.00564**		**0.000144**	**0.000250**	**0.00100**	**mg/L**	1	15-Oct-2020 10:25
Ethene	**0.0116**		**0.000234**	**0.000500**	**0.00100**	**mg/L**	1	15-Oct-2020 10:25
Methane	**0.907**		**0.0107**	**0.0250**	**0.0500**	**mg/L**	100	15-Oct-2020 14:28
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: TH
Alkalinity, Total (As CaCO3)	**391**	a	**5.00**	**5.00**	**5.00**	**mg/L**	1	13-Oct-2020 21:52
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KVL
Bromide	**6.75**		**0.150**	**0.500**	**0.500**	**mg/L**	5	10-Oct-2020 01:04
Nitrogen, Nitrate (As N)	0.500	U	0.150	0.500	0.500	mg/L	5	10-Oct-2020 01:04
Sulfate	**491**		**4.00**	**10.0**	**10.0**	**mg/L**	20	23-Oct-2020 18:41
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	22-Oct-2020 13:19
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	19-Oct-2020 09:23

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

ALS Houston, US Date: 26-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.

ANALYTICAL REPORT

Project: LHAAP 16 WorkOrder:HS20100455

Sample ID: Trip blank-201008 Lab ID:HS20100455-06

Collection Date: 09-Oct-2020 00:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	16-Oct-2020 18:11
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	16-Oct-2020 18:11
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Oct-2020 18:11
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	16-Oct-2020 18:11
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	16-Oct-2020 18:11
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	16-Oct-2020 18:11
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	16-Oct-2020 18:11
Surr: 1,2-Dichloroethane-d4	*86.9*			**0**	*81-118*	*%REC*	*1*	*16-Oct-2020 18:11*
Surr: 4-Bromofluorobenzene	*94.1*			**0**	*85-114*	*%REC*	*1*	*16-Oct-2020 18:11*
Surr: Dibromofluoromethane	*88.5*			**0**	*80-119*	*%REC*	*1*	*16-Oct-2020 18:11*
Surr: Toluene-d8	*103*			**0**	*89-112*	*%REC*	*1*	*16-Oct-2020 18:11*

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

ALS Houston, US Date: 26-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16
WorkOrder: HS20100455

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R370227 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Groundwater	
HS20100455-01	16WW58-201008	08 Oct 2020 07:50			09 Oct 2020 19:57	5
HS20100455-02	16WW57-201008	08 Oct 2020 07:50			09 Oct 2020 19:39	10
HS20100455-05	16WW16-201008	08 Oct 2020 11:15			10 Oct 2020 01:04	5
Batch ID: R370437 (0)	**Test Name :** ALKALINITY BY SM2320B				**Matrix:** Groundwater	
HS20100455-01	16WW58-201008	08 Oct 2020 07:50			13 Oct 2020 21:40	1
HS20100455-02	16WW57-201008	08 Oct 2020 07:50			13 Oct 2020 21:45	1
HS20100455-05	16WW16-201008	08 Oct 2020 11:15			13 Oct 2020 21:52	1
Batch ID: R370661 (0)	**Test Name :** DISSOLVED GASES BY RSK-175				**Matrix:** Groundwater	
HS20100455-01	16WW58-201008	08 Oct 2020 07:50			15 Oct 2020 10:01	1
HS20100455-02	16WW57-201008	08 Oct 2020 07:50			15 Oct 2020 10:14	1
HS20100455-05	16WW16-201008	08 Oct 2020 11:15			15 Oct 2020 14:28	100
HS20100455-05	16WW16-201008	08 Oct 2020 11:15			15 Oct 2020 10:25	1
Batch ID: R370739 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS20100455-06	Trip blank-201008	09 Oct 2020 00:00			16 Oct 2020 18:11	1
Batch ID: R370739 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS20100455-01	16WW58-201008	08 Oct 2020 07:50			16 Oct 2020 21:23	50
HS20100455-01	16WW58-201008	08 Oct 2020 07:50			16 Oct 2020 19:47	5
HS20100455-02	16WW57-201008	08 Oct 2020 07:50			16 Oct 2020 18:35	1
HS20100455-03	16WW23-201008	08 Oct 2020 09:45			16 Oct 2020 18:59	1
HS20100455-04	16WW24-201008	08 Oct 2020 10:30			16 Oct 2020 19:23	1
HS20100455-05	16WW16-201008	08 Oct 2020 11:15			16 Oct 2020 21:48	500
HS20100455-05	16WW16-201008	08 Oct 2020 11:15			16 Oct 2020 20:11	25
Batch ID: R370759 (0)	**Test Name :** SUBCONTRACT ANALYSIS - TOC ANALYSIS				**Matrix:** Groundwater	
HS20100455-01	16WW58-201008	08 Oct 2020 07:50			19 Oct 2020 09:23	1
HS20100455-02	16WW57-201008	08 Oct 2020 07:50			19 Oct 2020 09:23	1
HS20100455-05	16WW16-201008	08 Oct 2020 11:15			19 Oct 2020 09:23	1
Batch ID: R371062 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** Groundwater	
HS20100455-01	16WW58-201008	08 Oct 2020 07:50			22 Oct 2020 13:19	1
HS20100455-02	16WW57-201008	08 Oct 2020 07:50			22 Oct 2020 13:19	1
HS20100455-03	16WW23-201008	08 Oct 2020 09:45			22 Oct 2020 13:19	1
HS20100455-04	16WW24-201008	08 Oct 2020 10:30			22 Oct 2020 13:19	1
HS20100455-05	16WW16-201008	08 Oct 2020 11:15			22 Oct 2020 13:19	1
Batch ID: R371285 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Groundwater	
HS20100455-01	16WW58-201008	08 Oct 2020 07:50			23 Oct 2020 17:47	20
HS20100455-02	16WW57-201008	08 Oct 2020 07:50			23 Oct 2020 18:23	100
HS20100455-05	16WW16-201008	08 Oct 2020 11:15			23 Oct 2020 18:41	20

ALS Houston, US Date: 26-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16
WorkOrder: HS20100455

QC BATCH REPORT

Batch ID: R370661 (0) **Instrument:** FID-4 **Method:** DISSOLVED GASES BY RSK-175

MBLK Sample ID: **MBLK-201015** Units: **mg/L** Analysis Date: **15-Oct-2020 09:35**
Client ID: Run ID: **FID-4_370661** SeqNo: **5785474** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.000250	0.00100								U
Ethene	0.000500	0.00100								U
Methane	0.000250	0.000500								U

LCS Sample ID: **LCS-201015** Units: **mg/L** Analysis Date: **15-Oct-2020 09:43**
Client ID: Run ID: **FID-4_370661** SeqNo: **5785475** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0169	0.00100	0.01804	0	93.5	75 - 125				
Ethene	0.0165	0.00100	0.0168	0	98.4	75 - 125				
Methane	0.00978	0.000500	0.009647	0	101	75 - 125				

LCSD Sample ID: **LCSD-201015** Units: **mg/L** Analysis Date: **15-Oct-2020 09:51**
Client ID: Run ID: **FID-4_370661** SeqNo: **5785476** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0151	0.00100	0.01804	0	83.8	75 - 125	0.01688	10.9	30	
Ethene	0.0143	0.00100	0.0168	0	85.2	75 - 125	0.01653	14.4	30	
Methane	0.00778	0.000500	0.009647	0	80.7	75 - 125	0.009778	22.7	30	

DUP Sample ID: **HS20100455-01DUP** Units: **mg/L** Analysis Date: **15-Oct-2020 14:06**
Client ID: **16WW58-201008** Run ID: **FID-4_370661** SeqNo: **5785497** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.000250	0.00100					0	0	30	U
Ethene	0.00142	0.00100					0.0006453	75.2	30	R
Methane	0.00762	0.000500					0.006594	14.4	30	

The following samples were analyzed in this batch: HS20100455-01 HS20100455-02 HS20100455-05

ALS Houston, US Date: 26-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16
WorkOrder: HS20100455

QC BATCH REPORT

Batch ID: R370739 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-201016** Units: **UG/L** Analysis Date: **16-Oct-2020 16:11**
Client ID: Run ID: **VOA6_370739** SeqNo: **5787499** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	0.50	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
Methylene chloride	1.0	2.0								U
Trichloroethene	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*44.61*	*1.0*	*50*	*0*	*89.2*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*49.42*	*1.0*	*50*	*0*	*98.8*	*85 - 114*				
Surr: Dibromofluoromethane	*44.27*	*1.0*	*50*	*0*	*88.5*	*80 - 119*				
Surr: Toluene-d8	*50.71*	*1.0*	*50*	*0*	*101*	*89 - 112*				

LCS Sample ID: **VLCSW-201016** Units: **UG/L** Analysis Date: **16-Oct-2020 15:23**
Client ID: Run ID: **VOA6_370739** SeqNo: **5787498** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	19.42	1.0	20	0	97.1	80 - 119				
1,1-Dichloroethene	18.89	1.0	20	0	94.5	71 - 131				
1,2-Dichloroethane	19.21	1.0	20	0	96.1	73 - 128				
cis-1,2-Dichloroethene	20.17	1.0	20	0	101	78 - 123				
Methylene chloride	24.3	2.0	20	0	121	74 - 124				
Trichloroethene	19.03	1.0	20	0	95.1	79 - 123				
Vinyl chloride	18.53	1.0	20	0	92.6	58 - 137				
Surr: 1,2-Dichloroethane-d4	*46.76*	*1.0*	*50*	*0*	*93.5*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.89*	*1.0*	*50*	*0*	*102*	*85 - 114*				
Surr: Dibromofluoromethane	*48.62*	*1.0*	*50*	*0*	*97.2*	*80 - 119*				
Surr: Toluene-d8	*49.49*	*1.0*	*50*	*0*	*99.0*	*89 - 112*				

ALS Houston, US Date: 26-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16
WorkOrder: HS20100455

QC BATCH REPORT

Batch ID: R370739 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS20100455-03MS** Units: **UG/L** Analysis Date: **16-Oct-2020 20:35**
Client ID: **16WW23-201008** Run ID: **VOA6_370739** SeqNo: **5787510** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	22.91	1.0	20	0	115	80 - 119				
1,1-Dichloroethene	22.76	1.0	20	0	114	71 - 131				
1,2-Dichloroethane	21.07	1.0	20	0	105	73 - 128				
cis-1,2-Dichloroethene	22.26	1.0	20	0	111	78 - 123				
Methylene chloride	22.43	2.0	20	0	112	74 - 124				
Trichloroethene	24.05	1.0	20	0	120	79 - 123				
Vinyl chloride	21.77	1.0	20	0	109	58 - 137				
Surr: 1,2-Dichloroethane-d4	*43.91*	*1.0*	*50*	*0*	*87.8*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*51.37*	*1.0*	*50*	*0*	*103*	*85 - 114*				
Surr: Dibromofluoromethane	*45.88*	*1.0*	*50*	*0*	*91.8*	*80 - 119*				
Surr: Toluene-d8	*54.04*	*1.0*	*50*	*0*	*108*	*89 - 112*				

MSD Sample ID: **HS20100455-03MSD** Units: **UG/L** Analysis Date: **16-Oct-2020 20:59**
Client ID: **16WW23-201008** Run ID: **VOA6_370739** SeqNo: **5787511** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	20.14	1.0	20	0	101	80 - 119	22.91	12.8	20	
1,1-Dichloroethene	21.57	1.0	20	0	108	71 - 131	22.76	5.4	20	
1,2-Dichloroethane	20.02	1.0	20	0	100	73 - 128	21.07	5.1	20	
cis-1,2-Dichloroethene	20.08	1.0	20	0	100	78 - 123	22.26	10.3	20	
Methylene chloride	20.81	2.0	20	0	104	74 - 124	22.43	7.49	20	
Trichloroethene	22.1	1.0	20	0	111	79 - 123	24.05	8.42	20	
Vinyl chloride	20.66	1.0	20	0	103	58 - 137	21.77	5.22	20	
Surr: 1,2-Dichloroethane-d4	*42.7*	*1.0*	*50*	*0*	*85.4*	*81 - 118*	*43.91*	*2.78*	*20*	
Surr: 4-Bromofluorobenzene	*50.15*	*1.0*	*50*	*0*	*100*	*85 - 114*	*51.37*	*2.41*	*20*	
Surr: Dibromofluoromethane	*43.92*	*1.0*	*50*	*0*	*87.8*	*80 - 119*	*45.88*	*4.35*	*20*	
Surr: Toluene-d8	*47.49*	*1.0*	*50*	*0*	*95.0*	*89 - 112*	*54.04*	*12.9*	*20*	

The following samples were analyzed in this batch: HS20100455-01 HS20100455-02 HS20100455-03 HS20100455-04 HS20100455-05 HS20100455-06

ALS Houston, US Date: 26-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16
WorkOrder: HS20100455

QC BATCH REPORT

Batch ID: R370227 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY SW9056A**

MBLK Sample ID: **MBLK-10.08.20** Units: **mg/L** Analysis Date: **08-Oct-2020 19:37**
Client ID: Run ID: **ICS-Integrion_370227** SeqNo: **5774420** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	0.100	0.100								U
Nitrogen, Nitrate (As N)	0.100	0.100								U

LCS Sample ID: **LCS** Units: **mg/L** Analysis Date: **08-Oct-2020 19:55**
Client ID: Run ID: **ICS-Integrion_370227** SeqNo: **5774421** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.989	0.100	4	0	99.7	80 - 120				
Nitrogen, Nitrate (As N)	3.906	0.100	4	0	97.6	80 - 120				

LCSD Sample ID: **LCSD** Units: **mg/L** Analysis Date: **10-Oct-2020 04:22**
Client ID: Run ID: **ICS-Integrion_370227** SeqNo: **5788647** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.861	0.100	4	0	96.5	80 - 120	3.989	3.28	20	
Nitrogen, Nitrate (As N)	3.983	0.100	4	0	99.6	80 - 120	3.906	1.96	20	

MS Sample ID: **HS20100362-01MS** Units: **mg/L** Analysis Date: **09-Oct-2020 09:26**
Client ID: Run ID: **ICS-Integrion_370227** SeqNo: **5788637** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	2.264	0.100	2	0.308	97.8	80 - 120				
Nitrogen, Nitrate (As N)	2.873	0.100	2	0	144	80 - 120				S

MSD Sample ID: **HS20100362-01MSD** Units: **mg/L** Analysis Date: **09-Oct-2020 09:44**
Client ID: Run ID: **ICS-Integrion_370227** SeqNo: **5788638** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	2.264	0.100	2	0.308	97.8	80 - 120	2.264	0.00883	20	
Nitrogen, Nitrate (As N)	2.871	0.100	2	0	144	80 - 120	2.873	0.0696	20	S

The following samples were analyzed in this batch: HS20100455-01 HS20100455-02 HS20100455-05

ALS Houston, US Date: 26-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16
WorkOrder: HS20100455

QC BATCH REPORT

Batch ID: R370437 (0) **Instrument:** ManTech01 **Method:** ALKALINITY BY SM2320B

MBLK Sample ID: **WBLKW2-201013** Units: **mg/L** Analysis Date: **13-Oct-2020 19:34**
Client ID: Run ID: **ManTech01_370437** SeqNo: **5779994** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	5.00	5.00								U

LCS Sample ID: **LCS2-201013** Units: **mg/L** Analysis Date: **13-Oct-2020 19:43**
Client ID: Run ID: **ManTech01_370437** SeqNo: **5779995** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	1028	5.00	1000	0	103	85 - 115				

LCSD Sample ID: **LCSD2-201013** Units: **mg/L** Analysis Date: **13-Oct-2020 19:52**
Client ID: Run ID: **ManTech01_370437** SeqNo: **5779996** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	1025	5.00	1000	0	103	85 - 115	1028	0.267	20	

DUP Sample ID: **HS20100284-07DUP** Units: **mg/L** Analysis Date: **13-Oct-2020 20:06**
Client ID: Run ID: **ManTech01_370437** SeqNo: **5779998** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	249.2	5.00					248.5	0.249	20	

The following samples were analyzed in this batch: HS20100455-01 HS20100455-02 HS20100455-05

ALS Houston, US Date: 26-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16
WorkOrder: HS20100455

QC BATCH REPORT

Batch ID: R371285 (0) **Instrument:** ICS-Integrion **Method:** ANIONS BY SW9056A

MBLK Sample ID: **MBLK-102320** Units: **mg/L** Analysis Date: **23-Oct-2020 19:53**
Client ID: Run ID: **ICS-Integrion_371285** SeqNo: **5799757** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	0.500	0.500								U

LCS Sample ID: **LCS-102320** Units: **mg/L** Analysis Date: **23-Oct-2020 20:11**
Client ID: Run ID: **ICS-Integrion_371285** SeqNo: **5799758** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	18.24	0.500	20	0	91.2	80 - 120				

MS Sample ID: **HS20100361-02MS** Units: **mg/L** Analysis Date: **23-Oct-2020 14:28**
Client ID: Run ID: **ICS-Integrion_371285** SeqNo: **5799743** PrepDate: DF: **100**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	3309	50.0	1000	2487	82.2	80 - 120				

MSD Sample ID: **HS20100361-02MSD** Units: **mg/L** Analysis Date: **23-Oct-2020 14:46**
Client ID: Run ID: **ICS-Integrion_371285** SeqNo: **5799744** PrepDate: DF: **100**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	3340	50.0	1000	2487	85.4	80 - 120	3309	0.952	20	

The following samples were analyzed in this batch: HS20100455-01 HS20100455-02 HS20100455-05

ALS Houston, US Date: 26-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16
WorkOrder: **HS20100455**

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: 26-Oct-20

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	20-030-0	26-Mar-2021
California	2919, 2020-2021	30-Apr-2021
Dept of Defense	PJLA L20-507	22-Dec-2021
Florida	E87611-30-07/01/2020	30-Jun-2021
Illinois	2000322020-4	09-May-2021
Kansas	E-10352 2020-2021	31-Jul-2021
Kentucky	123043, 2020-2021	30-Apr-2021
Louisiana	03087, 2020-2021	30-Jun-2021
North Carolina	624-2020	31-Dec-2020
North Dakota	R-193 2020-2021	30-Apr-2021
Texas	T104704231-20-26	30-Apr-2021

ALS Houston, US Date: 26-Oct-20

Sample Receipt Checklist

Work Order ID: HS20100455 **Date/Time Received:** **09-Oct-2020 09:45**

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

Completed By: /S/ Jared R. Makan (eSignature) 09-Oct-2020 13:01 (Date/Time) **Reviewed by:** /S/ RJ Modashia (eSignature) 09-Oct-2020 16:30 (Date/Time)

Matrices: **Water** Carrier name: **FedEx Priority Overnight**

	Yes	No	Not Present
Shipping container/cooler in good condition?	☑	☐	☐
Custody seals intact on shipping container/cooler?	☑	☐	☐
Custody seals intact on sample bottles?	☐	☐	☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	☐	☐	☑
Chain of custody present?	☑	☐	1 Page(s)
Chain of custody signed when relinquished and received?	☑	☐	
Samplers name present on COC?	☑	☐	
Chain of custody agrees with sample labels?	☐	☑	
Samples in proper container/bottle?	☑	☐	
Sample containers intact?	☑	☐	
Sufficient sample volume for indicated test?	☑	☐	
All samples received within holding time?	☑	☐	
Container/Temp Blank temperature in compliance?	☑	☐	

Temperature(s)/Thermometer(s): 2.1°C/2.1°C/ UC/C IR31

Cooler(s)/Kit(s): 45957

Date/Time sample(s) sent to storage: 10/09/2020 13:10

	Yes	No	
Water - VOA vials have zero headspace?	☑	☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	☐	☐	N/A ☑
pH adjusted?	☐	☐	N/A ☑

pH adjusted by:

Login Notes: Trip Blank received, not listed on COC. placed on hold.

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

CHAIN OF CUSTODY

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

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

Project No. 501032

Job: **LHAAP 16 October 2020**

Prepared By: Scott Beesinger

P.O. Number

Field Sample I.D. Time	Sample Matrix	Date /	MS / MSD	No. OF CONTAINERS	VOC by SW 8260B	TOC by SM5310C	MEE by RSK 175	Anions (bromide, sulfate, nitrate) by SW9056 and Alkalinity by SM2320	Bromide by SW9056	Perchlorate by SW6850	Metals (arsenic, chromium, manganese, nickel, thallium) by SW6020				Remarks (Preservatives, etc.)	Lab I.D.#
16ww58-201008	WG	10/8/20/0750		10	X	X	X	X	X	X						
16ww57-201008	WG	10/8/20/0840		10	X	X	X	X	X	X						
16ww23-201008	WG	10/8/20/0945		4	X					X						
16ww24-201008	WG	10/8/20/1030		4	X					X						
16ww16-201008	WG	10/8/20/1115		10	X	X	X	X	X	X						

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

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	10/8/20	1430									

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition
JM	oct/09/20	9:45					2.1		45957

Remarks: #R31 C/F-0

HS20100455

Aptim Environmental & Infrastucture, Inc.
Longhorn Army Ammunition Plant LHAAP 16

(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

U5957

CUSTODY SEAL

Date: 10/8/20 Time: 1430
Name: Scott Beesinger
Company: BHATS

Seal Broken By: SM
Date: 10/09/20

U5953

Must Deliver Next Bus. Time and Temperature Sen. e!

U5957

ORIGIN ID:SGRA (903) 930-6193
SCOTT BEESINGER
APTIM
1203-B EAST GRAND AVE.
PMB202
MARSHALL, TX 75670
UNITED STATES US

SHIP DATE: 23JUN20
ACTWGT: 1.00 LB MAN
CAD: 3001[illegible]/CAFE3211
DIMS: 19x1[illegible]x13 IN

TO CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099
(281) 530-5656
REF: LHAAP 16 – BO72394 – RJ
RMA:

FedEx Express

FedEx
TRK# 0221 1891 8877 8299

FRI - 09 OCT AA
PRIORITY OVERNIGHT

AB SGRA

77099
TX-US
IAH

FID: 162785 B00ct2020 GGGA 5600/A27E/05A7

October 22, 2020

Service Request No:E2000971

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

Laboratory Results for: HS20100455

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory October 09, 2020
For your reference, these analyses have been assigned our service request number **E2000971.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current TNI standards, where applicable, and except as noted in the laboratory case narrative provided. All results are intended to be considered in their entirety and ALS Environmental is not responsible for use of less than the complete final report. Results apply only to the items submitted to the laboratory, as received for analysis. In accordance with the current TNI Standard, a statement on the estimated uncertainty of measurement of any quantitative analysis will be supplied upon request.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Corey Grandits
Project Manager

ADDRESS 10450 Stancliff Rd., Suite 210, Houston, TX 77099
PHONE +1 281 530 5656 | FAX +1 281 530 5887
ALS Group USA, Corp.
dba ALS Environmental

Certificate of Analysis

ALS Environmental - Houston HRMS
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

ALS Environmental

Client:	ALS Houston	**Service Request No.:**	E2000971
Project:	HS20100455	**Date Received:**	10/09/20
Sample Matrix:	W		

CASE NARRATIVE

All analyses were performed in adherence to the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier II. When appropriate to the method, method blank results have been reported with each analytical test.

Sample Receipt

Five samples were received for analysis at ALS Environmental in Houston on 10/09/20.

The samples were received in good condition and are consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

Data Validation Notes and Discussion

Precision and Accuracy:

EQ2000512: Laboratory Control Spike/Duplicate Laboratory Control Spike (LCS/DLCS) samples were analyzed and reported in lieu of a MS/MSD for this extraction batch. The LCS and DLCS recoveries are within QC limits.

DoD Certification is held for the method/matrix/analytes provided in this report.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.

Use of ALS group USA Corp dba ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.

Client: ALS Environmental - US **Service Request:**E2000971
Project: HS20100455

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
E2000971-001	16WW58-201008	10/8/2020	0750
E2000971-002	16WW57-201008	10/8/2020	0750
E2000971-003	16WW23-201008	10/8/2020	0945
E2000971-004	50WW24-201008	10/8/2020	1030
E2000971-005	16WW16-201008	10/8/2020	1115

Service Request Summary

Folder #: **E2000971**
Client Name: ALS Environmental - US
Project Name: HS20100455
Project Number:

Report To: RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Houston, TX 77099-4338
USA
Phone Number: 281-530-5656
Cell Number:
Fax Number: 281-530-5887
E-mail: rj.modashia@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 10/09/20
Internal Due Date: 10/23/2020
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS20100455
EDD: No EDD Specified

5 250 mL-Plastic Bottle HDPE WM CLEAR Unpreserved
Location: EHRMS-WIC 7E
Pressure Gas:

Lab Samp No.	Client Samp No	Matrix	Collected	HOUSTON CIO4 DOD/6850
E2000971-001	16WW58-201008	Ground Water	10/08/20 0750	**IV**
E2000971-002	16WW57-201008	Ground Water	10/08/20 0750	**IV**
E2000971-003	16WW23-201008	Ground Water	10/08/20 0945	**IV**
E2000971-004	50WW24-201008	Ground Water	10/08/20 1030	**IV**
E2000971-005	16WW16-201008	Ground Water	10/08/20 1115	**IV**

Service Request Summary

Folder #:	**E2000971**	Project Chemist:	Corey Grandits
Client Name:	ALS Environmental - US	Originating Lab:	HOUSTON
Project Name:	HS20100455	Logged By:	CGRANDITS
Project Number:		Date Received:	10/09/20
		Internal Due Date:	10/23/2020
Report To:	RJ Modashia ALS Laboratory Group 10450 Stancliff Road Houston, TX 77099-4338 USA	QAP:	LAB QAP
		Qualifier Set:	Lab Standard
		Formset:	Lab Standard
		Merged?:	Y
Phone Number:	281-530-5656	Report to MDL?:	Y
Cell Number:		P.O. Number:	HS20100455
Fax Number:	281-530-5887	EDD:	No EDD Specified
E-mail:	rj.modashia@alsglobal.com		

5 250 mL-Plastic Bottle HDPE WM CLEAR Unpreserved

Location: EHRMS-WIC 7E

Pressure Gas:

Test Comments:

Group	Test/Method	Samples	Comments
Semivoa GCMS	ClO4 DOD/6850	5	Level II due 10/23,level IV 10/30

Data Qualifiers

Lab Standard

+	Possible Tedlar bag artifact.
A	TIC is a suspected aldol-condensation product
B	Analyte found in the associated method blank as well as in the sample.
BC	Reported results are not blank corrected.
BH	The back section of the tube yielded higher results than the front.
BT	Results indicated possible breakthrough; back section >=10% front section.
C	Result identification confirmed.
D	Compound identified in an analysis at a secondary dilution factor
D	Spike was diluted out
DE	Reported results are corrected for desorption efficiency.
E	Estimated value. Concentration above calibration range
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
H1	Sample analysis performed past holding time. See case narrative.
H2	Initial analysis within holding time. Reanalysis for the required dilution was past holding time.
H3	Sample was received and analyzed past holding time.
H4	Sample was extracted past required extraction holding time, but analyzed within analysis holding time. See case narrative.
I	Internal standard not within the specified limits. See case narrative.
J	Estimated Value. Concentration found below MRL.
K	A deflection in the QC ion may indicate interference with the quantitation of this ion. The concentration of this analyte should be considered as an estimate.
K	Analyte was detected above the method reporting limit prior to normalization.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
L1	Laboratory control sample recovery outside the specified limits; results may be biased high.
L2	Laboratory control sample recovery outside the specified limits; results may be biased low.
L3	Laboratory control sample recovery outside the specified limits.
M	Matrix interference; results may be biased high.
M	The duplicate injection precision not met.
M1	Matrix interference due to coelution with a non-target compound; results may be biased high.
N	Presumptive evidence of a compound for TICs that have been identified based on a mass spectral library search.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.

Data Qualifiers

Lab Standard

P	Indicates chlorodiphenyl ether interference present at the retention time of the target compound.
P	Pesticide/Aroclor target analyte > 40% difference for detected concentrations between GC columns
Q	Indicates as estimated value because the P and P + 2 theoretical abundance ratio does not meet method criteria.
R	Duplicate Precision not met.
R1	Duplicate precision not within the specified limits; however, the results are below the MRL and considered estimated.
S	Surrogate recovery not within specified limits.
S	The reported value was determined by the Method of Standard Additions (MSA).
T	Analyte is a tentatively identified compound, result is estimated.
U	Compound was analyzed for, but was not detected (ND).
V1	The continuing calibration verification standard was outside (biased high) the specified limits for this compound.
V2	The continuing calibration verification standard was outside (biased low) the specified limits for this compound.
W	Result quantified, but the corresponding peak was detected outside the generated retention time window.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
X	See case narrative.
Y	Recovery outside limits
Y	The chromatogram resembles a petroleum product but does not match the calibration standard.
Z	The chromatogram does not resemble a petroleum product.
i	The MRL/MDL has been elevated due to a matrix interference.

ALS Laboratory Group

Acronyms

Cal	Calibration
Conc	CONCentration
Dioxin(s)	Polychlorinated dibenzo-p-dioxin(s)
EDL	Estimated Detection Limit
EMPC	Estimated Maximum Possible Concentration
Flags	Data qualifiers
Furan(s)	Polychlorinated dibenzofuran(s)
g	Grams
ICAL	Initial CALibration
ID	IDentifier
Ions	Masses monitored for the analyte during data acquisition
L	Liter (s)
LCS	Laboratory Control Sample
DLCS	Duplicate Laboratory Control Sample
MB	Method Blank
MCL	Method Calibration Limit
MDL	Method Detection Limit
mL	Milliliters
MS	Matrix Spiked sample
DMS	Duplicate Matrix Spiked sample
NO	Number of peaks meeting all identification criteria
PCDD(s)	Polychlorinated dibenzo-p-dioxin(s)
PCDF(s)	Polychlorinated dibenzofuran(s)
ppb	Parts per billion
ppm	Parts per million
ppq	Parts per quadrillion
ppt	Parts per trillion
QA	Quality Assurance
QC	Quality Control
Ratio	Ratio of areas from monitored ions for an analyte
% Rec.	Percent recovery
RPD	Relative Percent Difference
RRF	Relative Response Factor
RT	Retention Time
SDG	Sample Delivery Group
S/N	Signal-to-noise ratio
TEF	Toxicity Equivalence Factor
TEQ	Toxicity Equivalence Quotient

10450 Stancliff Rd, Houston, TX 77099 | 281-530-5656 | www.alsglobal.com

ALS Environmental

State Certifications, Accreditations, and Licenses

Agency	Number	Expire Date
American Association for Laboratory Accreditation	2897.01 2020	11/30/2021
Arizona Department of Health Services	AZ0793-2020	5/27/2021
Arkansas Department of Environmental Quality	20-030-0	3/26/2021
California Department of Health Services	2919-2020	4/30/2021
Department of Defense	A2LA 2897.01	11/30/2021
Florida Department of Health	E87611-2020	6/30/2021
Hawaii Department of Health	2020	4/30/2021
Illinois Environmental Protection Agency	2000322020-4	5/9/2021
Kansas Department of Health and Environment	E-10352-2020	7/31/2021
Louisiana Department of Environmental Quality	03087-2020	6/30/2021
Louisiana Department of Health and Hospitals	LA028-2020	12/31/2020
Maine Department of Health and Human Services	2020016	6/5/2022
Maryland Department of the Environment	343-2020	6/30/2021
Michigan Depratment of Environmental Quality	9971-2020	4/30/2021
Minnesota Department of Health	1785988	12/31/2020
Nebraska Department of Health and Human Services	NE-OS-25-13 (2020)	4/30/2021
Nevada Department of Concervation and Natural Resources	TX026932021-1	7/31/2021
New Hampshire Environmental Laboratory Accreditation Program	209420	4/24/2021
New Jersey Department of Environmental Protection	TX008	6/30/2021
New York Department of Health	11707	3/31/2021
Oklahoma Department of Environmental Quality	2020-123	8/31/2021
Pennsylvania Department of Environmental Protection	014	6/30/2021
Tennessee Department of Environment and Concervation	04016-2020	4/30/2021
Texas Commision on Environmental Quality	T104704231-20-26	4/30/2021
United States Department of Agriculture	P330-19-00299	10/10/2022
Washington Department of Health	C819	11/14/2020

Chain of Custody

ALS Environmental - Houston HRMS
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID: 14895**

SUBCONTRACT TO:

ALS Environmental
10450 Stancliff RoadSuite 210
Houston, TX 77084 **Phone:** +1 281 530 5656

CUSTOMER INFORMATION:

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

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS20100455
TSR:	Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS20100455-01**	**16WW58-201008**	**Groundwater**	**08 Oct 2020 07:50**
	SUB_Perch-6850			19 Oct 2020
2.	**HS20100455-02**	**16WW57-201008**	**Groundwater**	**08 Oct 2020 07:50**
	SUB_Perch-6850			19 Oct 2020
3.	**HS20100455-03**	**16WW23-201008**	**Groundwater**	**08 Oct 2020 09:45**
	SUB_Perch-6850			19 Oct 2020
4.	**HS20100455-04**	**16WW24-201008**	**Groundwater**	**08 Oct 2020 10:30**
	SUB_Perch-6850			19 Oct 2020
5.	**HS20100455-05**	**16WW16-201008**	**Groundwater**	**08 Oct 2020 11:15**
	SUB_Perch-6850			19 Oct 2020

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

QC Level: DOD IV (DoD Data Package)

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID:** **14895**

Relinquished By:	J. Mungan	Date/Time:	
Received By:	Robert G	Date/Time:	10/9/26 1206
Cooler ID(s):		Temperature(s):	

ALS Environmental

Cooler Receipt Form

Project Chemist: CG

Client/Project: ALS-H

Thermometer ID: IR41

Date/Time Received: 101912D Initials: CG

Date/Time Logged in: 101912 Initials: CG

1. Method of delivery: ○ US Mail ○ Fed Ex ○ UPS ○ DHL ☑ Courier (AIG) ○ Client
2. Samples received in: ☑ Cooler ○ Box ○ Envelope ○ Other
3. Were custody seals on coolers? ○ Yes ☑ No
   Were they intact? ○ Yes ○ No ☑ N/A
   Were they signed and dated? ○ Yes ○ No ☑ N/A
   If yes, how many and where?
4. Packing Material: ○ Inserts ☑ Baggies ○ Bubble Wrap ○ Gel Packs ☑ Wet Ice ○ Sleeves ○ Other
5. Foreign or Regulated Soil? ○ Yes ○ No Location of Sampling:

Cooler Tracking Number	COC ID	Date Opened	Time Opened	Opened By	Temp. °C	Temp Blank?
–		101912D	1200	CG	2.8	☒
						☐
						☐
						☐

6. Were custody papers properly filled out (ink, signed, dated, etc)? ☑ Yes ○ No
7. Did all bottles arrive in good condition (not broken, no signs of leakage)? ☑ Yes ○ No
8. Were all sample labels complete (i.e., sample ID, analysis, preservation, etc)? ☑ Yes ○ No
9. Were appropriate bottles/containers and volumes received for the requested tests? ☑ Yes ○ No
10. Did sample labels and tags agree with custody documents? ☑ Yes ○ No

Notes, Discrepancies, & Resolutions:

Service request Label:

HS-HRMSCoolerReceipt R1.0

ALS Environmental - Houston HRMS

10450 Stancliff Rd., Suite 210
Houston, TX 77099
T: +1 713 266 1599
F: +1 713 266 1599
www.alsglobal.com

SAMPLE ACCEPTANCE POLICY

This policy outlines the criteria samples must meet to be accepted by ALS Environmental – Houston HRMS.

Cooler Custody Seals (desirable, mandatory if specified in SAP):

- ✓ Intact on outside of cooler, signed and dated

Chain-of-Custody (COC) documentation (mandatory):

The following is required on each COC:

- ✓ Sample ID, the location, date and time of collection, collector's name, preservation type, sample type, and any other special remarks concerning the sampleThe COC must be completed in ink.
- ✓ Signature and date of relinquishing party.

In the absence of a COC at sample receipt, the COC will be requested from the client.

Sample Integrity (mandatory):

Samples are inspected upon arrival to ensure that sample integrity was not compromised during transfer to the laboratory.

- ✓ Sample containers must arrive in good condition (not broken or leaking).
- ✓ Samples must be labeled appropriately, including Sample IDs, and requested test using durable labels and indelible ink.
- ✓ The correct type of sample bottle must be used for the method requested.
- ✓ An appropriate sample volume, or weight, must be received.
- ✓ Sample IDs and number of containers must reconcile with the COC.
- ✓ Samples must be received within the method defined holding time.

Temperature Requirement (varies by sample matrix):

- ✓ Aqueous and Non-aqueous samples must be shipped and stored cold, at 0 to 6ºC.
- ✓ Tissue samples must be shipped and stored frozen, at -20 to -10ºC.
- ✓ Air samples are shipped and stored cold, at 0 to 6ºC
- ✓ The sample temperature must be recorded on the COC

All cooler inspections are documented on the Cooler Receipt Form (CRF). A separate CRF is completed for each service request. Any samples not meeting the above criteria are noted on the CRF and the Project Manager notified. The Project Manager must resolve any sample integrity issues with the client prior to proceeding with the analysis. Such resolutions are documented in writing and filed with the project folder. Data associated with samples received outside of this acceptance policy will be qualified on the case narrative of the final report

Preparation Information Benchsheets

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

Preparation Information Benchsheet

Prep Run#: 368004 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
Team: Semivoa GCMS/GRIVERA **Prep Method:** Method **Prep Date/Time:** 10/19/20 09:25

#	Lab Code	Client ID	B#	Method /Test	pH	Cl	Matrix	Amt. Ext.	Sample Description
1	E2000965-001	CDG-15-10062020	.01	6850/ClO4 DOD			Ground Water	10mL	
2	E2000965-002	HEDG-FB-10062020	.01	6850/ClO4 DOD			Ground Water	10mL	
3	E2000965-003	CDG-12-10062020	.01	6850/ClO4 DOD			Ground Water	10mL	
4	E2000965-004	CDG-1-10062020	.01	6850/ClO4 DOD			Ground Water	10mL	
5	E2000965-005	CDG-17-10062020	.01	6850/ClO4 DOD			Ground Water	10mL	
6	E2000966-001	HEDG IDW-052020	.01	6850/ClO4 DOD			Ground Water	10mL	
7	E2000966-002	Test Area IDW-012020	.01	6850/ClO4 DOD			Ground Water	10mL	
8	E2000968-001	CDG-13-10072020	.01	6850/ClO4 DOD			Ground Water	10mL	
9	E2000968-002	CDG-11-10072020	.01	6850/ClO4 DOD			Ground Water	10mL	
10	E2000968-003	HEDG-FD-10072020	.01	6850/ClO4 DOD			Ground Water	10mL	
11	E2000968-004	CDG-2-10072020	.01	6850/ClO4 DOD			Ground Water	10mL	
12	E2000968-005	CDG-10-10072020	.01	6850/ClO4 DOD			Ground Water	10mL	
13	E2000968-006	CDG-14-10072020	.01	6850/ClO4 DOD			Ground Water	10mL	
14	E2000968-007	CDG-16-10072020	.01	6850/ClO4 DOD			Ground Water	10mL	
15	E2000971-001	16WW58-201008	.01	6850/ClO4 DOD			Ground Water	10mL	
16	E2000971-002	16WW57-201008	.01	6850/ClO4 DOD			Ground Water	10mL	
17	E2000971-003	16WW23-201008	.01	6850/ClO4 DOD			Ground Water	10mL	
18	E2000971-004	50WW24-201008	.01	6850/ClO4 DOD			Ground Water	10mL	
19	E2000971-005	16WW16-201008	.01	6850/ClO4 DOD			Ground Water	10mL	
20	EQ2000512-01	MB		6850/ClO4 DOD			Liquid	10mL	
21	EQ2000512-02	LCS		6850/ClO4 DOD			Liquid	10mL	
22	EQ2000512-03	DLCS		6850/ClO4 DOD			Liquid	10mL	

Spiking Solutions

Name: Perchlorate Intermediate Stock1 Inventory ID 209764 Logbook Ref: Perchlorate Int. Stock1 51820 Expires On: 11/18/2020

EQ2000512-02	1.00µL	EQ2000512-03	1.00µL

Name: Sodium Perchlorate 1 ug/mL (IS) (18-O) as CLO4 Inventory ID 212340 Logbook Ref: Sodium Perchlorate Expires On: 07/13/2022

E2000965-001	100.00µL	E2000965-002	100.00µL	E2000965-003	100.00µL	E2000965-004	100.00µL	E2000965-005	100.00µL	E2000966-001	100.00µL
E2000966-002	100.00µL	E2000968-001	100.00µL	E2000968-002	100.00µL	E2000968-003	100.00µL	E2000968-004	100.00µL	E2000968-005	100.00µL
E2000968-006	100.00µL	E2000968-007	100.00µL	E2000971-001	100.00µL	E2000971-002	100.00µL	E2000971-003	100.00µL	E2000971-004	100.00µL
E2000971-005	100.00µL	EQ2000512-01	100.00µL	EQ2000512-02	100.00µL	EQ2000512-03	100.00µL				

Preparation Information Benchsheet

Prep Run#: 368004
Team: Semivoa GCMS/GRIVERA

Prep WorkFlow: GenExt28Day
Prep Method: Method

Status: Prepped
Prep Date/Time: 10/19/20 09:25

Preparation Steps

Step: Preparation
Started: 10/19/20 09:25
Finished: 10/19/20 14:58
By: GRIVERA
Comments

Comments:

Reviewed By: GR Date: 10/19/2020

Chain of Custody

Relinquished By: Date:

Received By: Date:

Extracts Examined
Yes No

Analytical Results

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000971
Project:	HS20100455	**Date Collected:**	10/ 8/20 0750
Sample Matrix:	Ground Water	**Date Received:**	10/ 9/20
Sample Name:	16WW58-201008	**Units:**	µg/L
Lab Code:	E2000971-001	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	10/19/20	10/21/20 10:47	368004	700177	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000971
Project:	HS20100455	**Date Collected:**	10/ 8/20 0750
Sample Matrix:	Ground Water	**Date Received:**	10/ 9/20
Sample Name:	16WW57-201008	**Units:**	µg/L
Lab Code:	E2000971-002	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	10/19/20	10/19/20 19:36	368004	700168	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000971
Project:	HS20100455	**Date Collected:**	10/ 8/20 0945
Sample Matrix:	Ground Water	**Date Received:**	10/ 9/20
Sample Name:	16WW23-201008	**Units:**	µg/L
Lab Code:	E2000971-003	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	10/19/20	10/21/20 10:55	368004	700177	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000971
Project:	HS20100455	**Date Collected:**	10/ 8/20 1030
Sample Matrix:	Ground Water	**Date Received:**	10/ 9/20
Sample Name:	50WW24-201008	**Units:**	µg/L
Lab Code:	E2000971-004	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	10/19/20	10/21/20 11:03	368004	700177	

Printed 10/21/20 16:32

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000971
Project:	HS20100455	**Date Collected:**	10/ 8/20 1115
Sample Matrix:	Ground Water	**Date Received:**	10/ 9/20
Sample Name:	16WW16-201008	**Units:**	µg/L
Lab Code:	E2000971-005	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**480**		1.00	0.500	0.250	10	10/19/20	10/20/20 19:48	368004	700170	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000971
Project:	HS20100455	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	µg/L
Lab Code:	EQ2000512-01	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	10/19/20	10/19/20 17:05	368004	700168	

Accuracy & Precision

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000971
Project:	HS20100455	**Date Analyzed:**	10/19/20 - 10/20/20
Sample Matrix:	Ground Water		

Lab Control Sample Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method:	6850	**Units:**	µg/L
Prep Method:	Method	**Basis:**	NA
		Extraction Lot:	368004

	Lab Control Sample EQ2000512-02			Duplicate Lab Control Sample EQ2000512-03					
Analyte Name	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Perchlorate	0.106	0.100	106	0.104	0.100	104	84 - 119	2	15

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

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

Printed 10/21/20 16:33

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000971
Project:	HS20100455	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2000512-02	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.106**		0.100	0.0500	0.0250	1	10/19/20	10/19/20 17:13	368004	700168	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000971
Project:	HS20100455	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Duplicate Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2000512-03	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.104**		0.100	0.0500	0.0250	1	10/19/20	10/20/20 19:01	368004	700170	

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

October 16, 2020

Analytical Report for Service Request No: K2009172

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

RE: ALS Houston DOD TOC / HS20100455

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory October 13, 2020
For your reference, these analyses have been assigned our service request number **K2009172.**

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

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

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

for Kelley Lovejoy
Project Manager

RIGHT SOLUTIONS | RIGHT PARTNER

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
Qualifiers
State Certifications, Accreditations, And Licenses
Case Narrative
Chain of Custody
General Chemistry
Raw Data
    General Chemistry

Acronyms

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

Inorganic Data Qualifiers

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

Metals Data Qualifiers

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

Organic Data Qualifiers

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

Additional Petroleum Hydrocarbon Specific Qualifiers

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

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

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

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

Case Narrative

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

1317 South 13th Ave, Kelso, WA 98626 | 1-360-577-7222 | www.alsglobal.com

ALS Environmental

Client: ALS Environmental - US
Project: ALS Houston DOD TOC
Sample Matrix: Ground Water

Service Request: K2009172
Date Received: 10/13/2020

CASE NARRATIVE

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

Sample Receipt:

Three ground water samples were received for analysis at ALS Environmental on 10/13/2020. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The samples were stored at minimum in accordance with the analytical method requirements.

General Chemistry:

No significant anomalies were noted with this analysis.

Approved by Noe D. Davis Date 10/16/2020

Chain of Custody

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

K2009172

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID: 14894**

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:	HS20100455
TSR:	Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS20100455-01**	**16WW58-201008**	**Groundwater**	**08 Oct 2020 07:50**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			19 Oct 2020
2.	**HS20100455-02**	**16WW57-201008**	**Groundwater**	**08 Oct 2020 07:50**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			19 Oct 2020
3.	**HS20100455-05**	**16WW16-201008**	**Groundwater**	**08 Oct 2020 11:15**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			19 Oct 2020

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

QC Level: DOD IV (DoD Data Package)

Relinquished By:	J. Mancuso	Date/Time:	10/12/20 18:00
Received By:	N Pedersen	Date/Time:	10/13/20 1015
Cooler ID(s):		Temperature(s):	

PM IK

Cooler Receipt and Preservation Form

Client AIS Houston Service Request K20 09172

Received: 10/13/20 Opened: 10/13/20 By: AP Unloaded: 10/13/20 By: AP

1. Samples were received via? *USPS* *Fed Ex* *UPS* *DHL* *PDX* *Courier* *Hand Delivered*
2. Samples were received in: (circle) *Cooler* *Box* *Envelope* *Other* _____ *NA*
3. Were custody seals on coolers? NA Y N If yes, how many and where? 2 front
   If present, were custody seals intact? Y N If present, were they signed and dated? Y N
4. Was a Temperature Blank present in cooler? NA Y N If yes, notate the temperature in the appropriate column below:
   If no, take the temperature of a representative sample bottle contained within the cooler; notate in the column "Sample Temp":
5. Were samples received within the method specified temperature ranges? NA Y N
   If no, were they received on ice and same day as collected? If not, notate the cooler # below and notify the PM. NA Y N

If applicable, tissue samples were received: *Frozen* *Partially Thawed* *Thawed*

Temp Blank	Sample Temp	IR Gun	Cooler #/COC ID / NA	Out of temp indicate with "X"	PM Notified If out of temp	Tracking Number NA	Filed
1.3	—	IR01		—	—	1591 8888 1407 3	
			14894				
			14891				

6. Packing material: *Inserts* *Baggies* *Bubble Wrap* *Gel Packs* *Wet Ice* *Dry Ice* *Sleeves* _____
7. Were custody papers properly filled out (ink, signed, etc.)? NA Y N
8. Were samples received in good condition (unbroken) NA Y N
9. Were all sample labels complete (ie, analysis, preservation, etc.)? NA Y N
10. Did all sample labels and tags agree with custody papers? NA Y N
11. Were appropriate bottles/containers and volumes received for the tests indicated? NA Y N
12. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* NA Y N
13. Were VOA vials received without headspace? *Indicate in the table below.* NA Y N
14. Was C12/Res negative? NA Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count Bottle Type	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:**	K2009172
Project:	ALS Houston DOD TOC/HS20100455	**Date Collected:**	10/8/20
Sample Matrix:	Ground Water	**Date Received:**	10/13/20
Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA

Carbon, Total Organic

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
16WW58-201008	K2009172-001	**4.13**	0.50	0.20	0.07	1	10/14/20 09:53	
16WW57-201008	K2009172-002	**13.1**	0.50	0.20	0.07	1	10/14/20 09:53	
16WW16-201008	K2009172-003	**3.35**	0.50	0.20	0.07	1	10/14/20 09:53	
Method Blank	K2009172-MB	ND U	0.50	0.20	0.07	1	10/14/20 09:53	

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K2009172
Project	ALS Houston DOD TOC/HS20100455	**Date Collected:**	10/08/20
Sample Matrix:	Ground Water	**Date Received:**	10/13/20
		Date Analyzed:	10/14/20

Replicate Sample Summary
General Chemistry Parameters

Sample Name:	16WW58-201008	**Units:**	mg/L
Lab Code:	K2009172-001	**Basis:**	NA

Analyte Name	Analysis Method	LOQ	LOD	MDL	Sample Result	Duplicate Sample K2009172-001DUP Result	Average	RPD	RPD Limit
Carbon, Total Organic	SM 5310 C	0.50	0.20	0.07	4.13	4.00	4.06	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:**	K2009172
Project:	ALS Houston DOD TOC/HS20100455	**Date Collected:**	10/08/20
Sample Matrix:	Ground Water	**Date Received:**	10/13/20
		Date Analyzed:	10/14/20
		Date Extracted:	NA

Matrix Spike Summary
Carbon, Total Organic

Sample Name:	16WW58-201008	**Units:**	mg/L
Lab Code:	K2009172-001	**Basis:**	NA
Analysis Method:	SM 5310 C		
Prep Method:	None		

Matrix Spike
K2009172-001MS

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Carbon, Total Organic	4.13	27.3	25.0	93	83-117

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

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

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

Matrix Spike and Matrix Spike Duplicate Data is presented for information purposes only. The matrix may or may not be relevant to samples reported in this report. The laboratory evaluates system performance based on the LCS and LCSD control limits.

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K2009172
Project:	ALS Houston DOD TOC/HS20100455	**Date Analyzed:**	10/14/20
Sample Matrix:	Ground Water	**Date Extracted:**	NA

Lab Control Sample Summary
Carbon, Total Organic

Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA
		Analysis Lot:	699336

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K2009172-LCS	23.8	25.0	95	83-117

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US **Service Request:** K2009172
Project: ALS Houston DOD TOC/HS20100455

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	699336	KQ2015677-13	10/14/20 09:53	25.0	24.9	99	90-110
CCV2	699336	KQ2015677-14	10/14/20 09:53	25.0	25.1	100	90-110
CCV3	699336	KQ2015677-15	10/14/20 09:53	25.0	24.5	98	90-110
CCV4	699336	KQ2015677-16	10/14/20 09:53	25.0	24.4	98	90-110
CCV5	699336	KQ2015677-17	10/14/20 09:53	25.0	24.5	98	90-110
CCV6	699336	KQ2015677-18	10/14/20 09:53	25.0	24.8	99	90-110

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US **Service Request:**K2009172
Project: ALS Houston DOD TOC/HS20100455

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	699336	KQ2015677-07	10/14/20 09:53	0.50	0.20	0.07	ND	U
CCB2	699336	KQ2015677-08	10/14/20 09:53	0.50	0.20	0.07	ND	U
CCB3	699336	KQ2015677-09	10/14/20 09:53	0.50	0.20	0.07	ND	U
CCB4	699336	KQ2015677-10	10/14/20 09:53	0.50	0.20	0.07	ND	U
CCB5	699336	KQ2015677-11	10/14/20 09:53	0.50	0.20	0.07	ND	U
CCB6	699336	KQ2015677-12	10/14/20 09:53	0.50	0.20	0.07	ND	U

Raw Data

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

General Chemistry

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

Work Request #	8395	8919	9036	8568	8767	8787	9172
Tier:	IV	IV	IV	IV	I	II	IV
Date Analyzed:	10-14-70		8870 IV	9059 I			
Analyst:	MK				Run #	699335/699336 699515	
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:

8767-3 high RPD less than 5 times MRL
9059-1 "

Final Approved by: [signature] Date: 10/16/20

DQREPORT

Analytical Results Summary

Instrument Name: K-TOC-01 **Analyst:** MKANALY **Analysis Lot:** 699335 **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
K2008395-008	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	1.76 mg/L	10 mL	1.76 mg/L	1	0.07	0.50			10/14/20 09:53:00	N	IV
K2008919-001	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	1.43 mg/L	10 mL	1.43 mg/L	1	0.07	0.50			10/14/20 09:53:00	N	IV
K2008919-002	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	1.40 mg/L	10 mL	1.40 mg/L	1	0.07	0.50			10/14/20 09:53:00	N	IV
K2008919-003	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	2.57 mg/L	10 mL	2.57 mg/L	1	0.07	0.50			10/14/20 09:53:00	N	IV
K2008919-004	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	1.33 mg/L	10 mL	1.33 mg/L	1	0.07	0.50			10/14/20 09:53:00	N	IV
K2008919-005	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	1.35 mg/L	10 mL	1.35 mg/L	1	0.07	0.50			10/14/20 09:53:00	N	IV
K2009036-001	Carbon, Dissolved Organic (DOC)	N/A		Wastewater	1.81 mg/L	10 mL	1.81 mg/L	1	0.07	0.50			10/14/20 09:53:00	N	II
K2009036-002	Carbon, Dissolved Organic (DOC)	N/A		Wastewater	2.66 mg/L	10 mL	2.66 mg/L	1	0.07	0.50			10/14/20 09:53:00	N	II
K2009036-003	Carbon, Dissolved Organic (DOC)	N/A		Wastewater	2.16 mg/L	10 mL	2.16 mg/L	1	0.07	0.50			10/14/20 09:53:00	N	II
K2009036-004	Carbon, Dissolved Organic (DOC)	N/A		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			10/14/20 09:53:00	N	II
KQ2015676-01	Carbon, Dissolved Organic (DOC)	LCS		Surface Water	23.60 mg/L	10 mL	23.6 mg/L	1	0.07	0.50	94		10/14/20 09:53:00	N	IV
KQ2015676-02	Carbon, Dissolved Organic (DOC)	DLCS		Surface Water	23.87 mg/L	10 mL	23.9 mg/L	1	0.07	0.50	95	1	10/14/20 09:53:00	N	IV
KQ2015676-03	Carbon, Dissolved Organic (DOC)	MB		Surface Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			10/14/20 09:53:00	N	IV
KQ2015676-04	Carbon, Dissolved Organic (DOC)	CCB		Surface Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			10/14/20 09:53:00	N	IV
KQ2015676-05	Carbon, Dissolved Organic (DOC)	CCB		Surface Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			10/14/20 09:53:00	N	IV
KQ2015676-06	Carbon, Dissolved Organic (DOC)	CCB		Surface Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			10/14/20 09:53:00	N	IV
KQ2015676-07	Carbon, Dissolved Organic (DOC)	CCB		Surface Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			10/14/20 09:53:00	N	IV
KQ2015676-08	Carbon, Dissolved Organic (DOC)	CCB		Surface Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			10/14/20 09:53:00	N	IV
KQ2015676-09	Carbon, Dissolved Organic (DOC)	CCB		Surface Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			10/14/20 09:53:00	N	IV
KQ2015676-10	Carbon, Dissolved Organic (DOC)	CCV		Surface Water	24.86 mg/L	10 mL	24.9 mg/L	1					10/14/20 09:53:00	N	IV
KQ2015676-11	Carbon, Dissolved Organic (DOC)	CCV		Surface Water	25.06 mg/L	10 mL	25.1 mg/L	1					10/14/20 09:53:00	N	IV
KQ2015676-12	Carbon, Dissolved Organic (DOC)	CCV		Surface Water	24.49 mg/L	10 mL	24.5 mg/L	1					10/14/20 09:53:00	N	IV
KQ2015676-13	Carbon, Dissolved Organic (DOC)	CCV		Surface Water	24.44 mg/L	10 mL	24.4 mg/L	1					10/14/20 09:53:00	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-01 **Analyst:** MKANALY **Analysis Lot:** 699335 **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
KQ2015676-14	Carbon, Dissolved Organic (DOC)	CCV		Surface Water	24.53 mg/L	10 mL	24.5 mg/L	1					10/14/20 09:53:00	N	IV
KQ2015676-15	Carbon, Dissolved Organic (DOC)	CCV		Surface Water	24.80 mg/L	10 mL	24.8 mg/L	1					10/14/20 09:53:00	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-01 **Analyst:** MKANALY **Analysis Lot:** 699336 **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
K2008568-001	Carbon, Total Organic	N/A		Surface Water	1.93 mg/L	10 mL	1.93 mg/L	1	0.07	0.50			10/14/20 09:53:00	N	IV
K2008568-002	Carbon, Total Organic	N/A		Surface Water	1.83 mg/L	10 mL	1.83 mg/L	1	0.07	0.50			10/14/20 09:53:00	N	IV
K2008568-007	Carbon, Total Organic	N/A		Surface Water	2.03 mg/L	10 mL	2.03 mg/L	1	0.07	0.50			10/14/20 09:53:00	Y	IV
K2008767-003	Carbon, Total Organic	N/A		Drinking Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			10/14/20 09:53:00	N	I
K2008787-001	Carbon, Total Organic	N/A		Water	2.04 mg/L	10 mL	2.04 mg/L	1	0.07	0.50			10/14/20 09:53:00	N	II
K2008919-001	Carbon, Total Organic	N/A		Surface Water	1.56 mg/L	10 mL	1.56 mg/L	1	0.07	0.50			10/14/20 09:53:00	N	IV
K2008919-002	Carbon, Total Organic	N/A		Surface Water	1.61 mg/L	10 mL	1.61 mg/L	1	0.07	0.50			10/14/20 09:53:00	N	IV
K2008919-003	Carbon, Total Organic	N/A		Surface Water	3.15 mg/L	10 mL	3.15 mg/L	1	0.07	0.50			10/14/20 09:53:00	N	IV
K2008919-004	Carbon, Total Organic	N/A		Surface Water	1.47 mg/L	10 mL	1.47 mg/L	1	0.07	0.50			10/14/20 09:53:00	N	IV
K2008919-005	Carbon, Total Organic	N/A		Surface Water	1.95 mg/L	10 mL	1.95 mg/L	1	0.07	0.50			10/14/20 09:53:00	N	IV
K2009036-001	Carbon, Total Organic	N/A		Wastewater	1.77 mg/L	10 mL	1.77 mg/L	1	0.07	0.50			10/14/20 09:53:00	N	II
K2009172-001	Carbon, Total Organic	N/A		Ground Water	4.13 mg/L	10 mL	4.13 mg/L	1	0.07	0.50			10/14/20 09:53:00	N	IV
K2009172-002	Carbon, Total Organic	N/A		Ground Water	13.11 mg/L	10 mL	13.1 mg/L	1	0.07	0.50			10/14/20 09:53:00	N	IV
K2009172-003	Carbon, Total Organic	N/A		Ground Water	3.35 mg/L	10 mL	3.35 mg/L	1	0.07	0.50			10/14/20 09:53:00	N	IV
KQ2015677-01	Carbon, Total Organic	DUP	K2008787-001	Water	2.04 mg/L	10 mL	2.04 mg/L	1	0.07	0.50		<1	10/14/20 09:53:00	N	II
KQ2015677-02	Carbon, Total Organic	MS	K2008787-001	Water	28.37 mg/L	10 mL	28.4 mg/L	1	0.07	0.50	105		10/14/20 09:53:00	N	II
KQ2015677-03	Carbon, Total Organic	DUP	K2008568-007	Surface Water	2.16 mg/L	10 mL	2.16 mg/L	1	0.07	0.50		6	10/14/20 09:53:00	N	IV
KQ2015677-04	Carbon, Total Organic	MS	K2008568-007	Surface Water	29.00 mg/L	10 mL	29.0 mg/L	1	0.07	0.50	108		10/14/20 09:53:00	N	IV
KQ2015677-05	Carbon, Total Organic	LCS		Surface Water	23.85 mg/L	10 mL	23.8 mg/L	1	0.07	0.50	95		10/14/20 09:53:00	N	IV
KQ2015677-06	Carbon, Total Organic	MB		Surface Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			10/14/20 09:53:00	N	IV
KQ2015677-07	Carbon, Total Organic	CCB		Surface Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			10/14/20 09:53:00	N	IV
KQ2015677-08	Carbon, Total Organic	CCB		Surface Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			10/14/20 09:53:00	N	IV
KQ2015677-09	Carbon, Total Organic	CCB		Surface Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			10/14/20 09:53:00	N	IV
KQ2015677-10	Carbon, Total Organic	CCB		Surface Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			10/14/20 09:53:00	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-01 **Analyst:** MKANALY **Analysis Lot:** 699336 **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
KQ2015677-11	Carbon, Total Organic	CCB		Surface Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			10/14/20 09:53:00	N	IV
KQ2015677-12	Carbon, Total Organic	CCB		Surface Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			10/14/20 09:53:00	N	IV
KQ2015677-13	Carbon, Total Organic	CCV		Surface Water	24.86 mg/L	10 mL	24.9 mg/L	1					10/14/20 09:53:00	N	IV
KQ2015677-14	Carbon, Total Organic	CCV		Surface Water	25.06 mg/L	10 mL	25.1 mg/L	1					10/14/20 09:53:00	N	IV
KQ2015677-15	Carbon, Total Organic	CCV		Surface Water	24.49 mg/L	10 mL	24.5 mg/L	1					10/14/20 09:53:00	N	IV
KQ2015677-16	Carbon, Total Organic	CCV		Surface Water	24.44 mg/L	10 mL	24.4 mg/L	1					10/14/20 09:53:00	N	IV
KQ2015677-17	Carbon, Total Organic	CCV		Surface Water	24.53 mg/L	10 mL	24.5 mg/L	1					10/14/20 09:53:00	N	IV
KQ2015677-18	Carbon, Total Organic	CCV		Surface Water	24.80 mg/L	10 mL	24.8 mg/L	1					10/14/20 09:53:00	N	IV
KQ2015677-19	Carbon, Total Organic	DUP	K2009172-001	Ground Water	4.00 mg/L	10 mL	4.00 mg/L	1	0.07	0.50		3	10/14/20 09:53:00	N	IV
KQ2015677-20	Carbon, Total Organic	MS	K2009172-001	Ground Water	27.29 mg/L	10 mL	27.3 mg/L	1	0.07	0.50	93		10/14/20 09:53:00	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-01 **Analyst:** MKANALY **Analysis Lot:** 699515 **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
K2008870-001	Carbon, Total Organic	N/A		Water	1.45 mg/L	10 mL	1.45 mg/L	1	0.07	0.50			10/14/20 09:53:00	N	IV
K2009036-002	Carbon, Total Organic	N/A		Wastewater	2.70 mg/L	10 mL	2.70 mg/L	1	0.07	0.50			10/14/20 09:53:00	N	II
K2009036-003	Carbon, Total Organic	N/A		Wastewater	2.07 mg/L	10 mL	2.07 mg/L	1	0.07	0.50			10/14/20 09:53:00	N	II
K2009036-004	Carbon, Total Organic	N/A		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			10/14/20 09:53:00	N	II
K2009059-001	Carbon, Total Organic	N/A		Drinking Water	4951.00 mg/L	10 mL	4950 mg/L	1	0.07	0.50			10/14/20 09:53:00	N	I
KQ2015678-01	Carbon, Total Organic	DUP	K2008870-001	Water	1.49 mg/L	10 mL	1.49 mg/L	1	0.07	0.50		3	10/14/20 09:53:00	N	IV
KQ2015678-02	Carbon, Total Organic	MS	K2008870-001	Water	27.84 mg/L	10 mL	27.8 mg/L	1	0.07	0.50	106		10/14/20 09:53:00	N	IV
KQ2015678-03	Carbon, Total Organic	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			10/14/20 09:53:00	N	IV
KQ2015678-04	Carbon, Total Organic	LCS		Water	23.95 mg/L	10 mL	24.0 mg/L	1	0.07	0.50	96		10/14/20 09:53:00	N	IV
KQ2015678-05	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			10/14/20 09:53:00	N	IV
KQ2015678-06	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			10/14/20 09:53:00	N	IV
KQ2015678-07	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			10/14/20 09:53:00	N	IV
KQ2015678-08	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			10/14/20 09:53:00	N	IV
KQ2015678-09	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			10/14/20 09:53:00	N	IV
KQ2015678-10	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			10/14/20 09:53:00	N	IV
KQ2015678-11	Carbon, Total Organic	CCV		Water	24.86 mg/L	10 mL	24.9 mg/L	1					10/14/20 09:53:00	N	IV
KQ2015678-12	Carbon, Total Organic	CCV		Water	25.06 mg/L	10 mL	25.1 mg/L	1					10/14/20 09:53:00	N	IV
KQ2015678-13	Carbon, Total Organic	CCV		Water	24.49 mg/L	10 mL	24.5 mg/L	1					10/14/20 09:53:00	N	IV
KQ2015678-14	Carbon, Total Organic	CCV		Water	24.44 mg/L	10 mL	24.4 mg/L	1					10/14/20 09:53:00	N	IV
KQ2015678-15	Carbon, Total Organic	CCV		Water	24.53 mg/L	10 mL	24.5 mg/L	1					10/14/20 09:53:00	N	IV
KQ2015678-16	Carbon, Total Organic	CCV		Water	24.80 mg/L	10 mL	24.8 mg/L	1					10/14/20 09:53:00	N	IV

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

Schedule: 101420

Version: 17
Instrument: Fusion1
Last Saved by: Fusion1 (Fusion1)
Last Saved on: 2020/10/14 19:45 - 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 1	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 [25.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
2	Sample	ICS	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
74	Sample	LOD	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
73	Sample	LOQ	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
3	Sample	K2008787-001	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
4	Sample	K2008787-001D	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
5	Sample	K2008787-001MS	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
6	Sample	K2009172-001	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
7	Sample	K2009172-001D	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
8	Sample	K2009172-001MS	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
9	Sample	K2009172-002	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B 2	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	K2009172-003	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
11	Sample	K2008395-003* 8*	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
12	Sample	K2008568-001	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
13	Sample	K2008568-002	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
14	Sample	K2008568-007	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
15	Sample	K2008568-007D	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
16	Sample	K2008568-007MS	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
17	Sample	K2009059-001	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
18	Sample	K2008994-001*5	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
19	Sample	K2008787-003	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 3	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 [25.0 ppm]	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
21	Sample	K2008974-001	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
22	Sample	K2008974-002	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
23	Sample	K2008919-001	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
24	Sample	K2008919-002	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
25	Sample	K2008919-003	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
26	Sample	K2008919-004	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
27	Sample	K2008919-005	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
28	Sample	K2008919-001*	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 4	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
29	Sample	K2008919-002*	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
30	Sample	K2008919-003*	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
31	Sample	K2008919-004*	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
32	Sample	K2008919-005*	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
33	Sample	K2009036-001	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
34	Sample	K2009036-002	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
35	Sample	K2009036-003	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
36	Sample	K2009036-004	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready

Schedule: 101420

Position	Sample Type	Sample ID	Method ID (Calibration ID)	Reps	Use	State
37	Sample	K2009036-001*	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
38	Sample	K2009036-002*	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
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
C	Check Standard	[TOC] LCS [25.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
40	Sample	K2009036-003*	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
41	Sample	K2009036-004*	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
43	Sample	LOD	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
44	Sample	LOQ	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
45	Sample	K2008870-001	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
46	Sample	K2008870-001D	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
47	Sample	K2008870-001MS	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 - 101420
Wednesday, October 14, 2020 09:53 AM

(View - Reps, Unused Reps, Meta-Data, Signature, History)
Printed on 2020/10/15 18:49 - Thursday

Report Summary Information

*DOC

Company Location:	Gen Chem Lab		
Schedule Name:	101420	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) (v5) Fusion1 (Fusion1) (v6) Fusion1 (Fusion1) (v7) Fusion1 (Fusion1) (v12) Fusion1 (Fusion1) (v15) Fusion1 (Fusion1) (v16) Fusion1 (Fusion1) (v17)		
Comment:			

Report Results

Sample Type: Clean — From Schedule Version 2

	Pos	Analysis Type	Sample ID	Start Time
◆	(clean)		Clean	2020/10/14 09:53

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	13.54	27.93	14.39	49.66	05:28
2	TC Clean	7.77	20.96	13.19	50.00	04:07
3	TC Clean	0.96	14.32	13.36	49.96	03:59
4	TC Clean	0.82	13.99	13.17	50.01	04:00

Sample Type: Clean — From Schedule Version 5

	Pos	Analysis Type	Sample ID	Start Time
◆	(clean)		Clean	2020/10/14 10:15

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	-0.27	12.84	13.11	49.60	05:26

2	TC Clean	3.54	16.73	13.19	49.91	04:05
3	TC Clean	0.80	14.15	13.36	49.93	03:50
4	TC Clean	0.67	13.77	13.10	49.99	03:53

Sample Type: Clean

From Schedule Version 6

	Pos	Analysis Type	Sample ID	Start Time
◆	(clean)		Clean	2020/10/14 10:37

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	-0.51	12.71	13.21	49.64	05:26
2	TC Clean	3.55	16.85	13.31	49.92	04:06
3	TC Clean	0.85	14.05	13.19	49.99	03:49
4	TC Clean	0.58	13.79	13.21	49.95	03:49

Sample Type: Blank (Creating v1461)

From Schedule Version 6

	Pos	Analysis Type	Sample ID	Start Time
◆	(blank)		Reagent/Acid Blank	2020/10/14 10:59

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	-0.58	12.42	13.00	49.70	05:16
2	TC Clean	3.85	17.01	13.15	49.95	04:04
3	TC Clean	1.29	14.19	12.90	49.94	03:58
4	TC Clean	0.93	13.96	13.04	49.96	03:59
5	Reagent Blank	5.12	17.97	12.85	49.94	05:09
6	Acid Blank	0.24	13.04	12.80	49.67	05:32

Sample Type: Sample

From Schedule Version 6

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	D	TOC	RB	0.0531 ppm	0.0000 ppm	0.0000%	2020/10/14 11:33

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0531	0.5310	9.62	22.57	12.95	50.17	10:31

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

1:10	(TC) 9.2445 (IC) (v1461)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

Sample Type: Check Standard --> CCV 25 ppm

From Schedule Version 6

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.8648 ppm (PASS)	0.0000 ppm	0%	2020/10/14 11:48

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.8648	248.6476	184.31	197.28	12.96	50.12	10:29

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)	50 ppmC

Sample Type: Check Standard --> CCB

From Schedule Version 6

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2020/10/14 12:03

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	7.23	20.42	13.19	50.08	10:35

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)	0 ppmC

Sample Type: Sample

From Schedule Version 6

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	1	TOC	MB1	0.0000 ppm	0.0000 ppm	0.0000%	2020/10/14 12:18

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.06	19.92	12.86	50.05	10:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2445 (IC) (v1461)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

Sample Type: Check Standard --> LCS

From Schedule Version 6

	Pos	BAT	Concentration	Dil	Sample ID	Min / Max	Result	Std. Dev.	RSD	Start Time

			(ppm)			(% dev)				
◆	C	TOC	25.0000	1:1	[TOC] LCS [25.0 ppm]	0 / infinity (NA / NA)	23.8479 ppm (PASS)	0.0000 ppm	0%	2020/10/14 12:32

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	23.8479	238.4791	177.18	190.14	12.96	50.15	10:27

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)	25 ppmC

Sample Type: Sample

From Schedule Version 6

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	2	TOC	ICS	0.0000 ppm	0.0000 ppm	0.0000%	2020/10/14 12:47

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.98	21.93	12.95	50.13	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2445 (IC) (v1461)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	74	TOC	LOD	0.0000 ppm	0.0000 ppm	0.0000%	2020/10/14 13:02

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.18	20.23	13.05	50.12	10:28
2	TOC	0.0000	0.0000	7.35	20.32	12.96	50.19	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2445 (IC) (v1461)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	73	TOC	LOQ	0.1572 ppm	0.0078 ppm	4.9400%	2020/10/14 13:30

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.1517	1.5175	10.31	23.39	13.08	50.12	10:31
2	TOC	0.1627	1.6272	10.39	23.49	13.10	50.13	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2445 (IC) (v1461)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	3	TOC	K2008787-001	2.0411 ppm	0.0271 ppm	1.3300%	2020/10/14 13:58

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.0219	20.2193	23.43	36.31	12.89	50.21	10:25
2	TOC	2.0603	20.6028	23.70	36.74	13.05	50.11	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2445 (IC) (v1461)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	4	TOC	K2008787-001D	2.0430 ppm	0.0532 ppm	2.6100%	2020/10/14 14:26

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.0054	20.0539	23.31	36.44	13.13	50.08	10:25
2	TOC	2.0807	20.8066	23.84	36.82	12.98	50.20	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2445 (IC) (v1461)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	5	TOC	K2008787-001MS	28.3726 ppm	0.0574 ppm	0.2000%	2020/10/14 14:54

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	28.4132	284.1317	208.56	221.59	13.04	50.09	10:27
2	TOC	28.3321	283.3206	207.99	220.99	13.00	50.16	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2445 (IC) (v1461)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	6	TOC	K2009172-001	4.1262 ppm	0.1258 ppm	3.0500%	2020/10/14 15:22

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.2151	42.1514	38.81	51.73	12.91	50.11	10:26
2	TOC	4.0372	40.3723	37.57	50.51	12.95	50.11	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2445 (IC) (v1461)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

Sample Type: Sample From Schedule Version 7

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	7	TOC	K2009172-001D	4.0013 ppm	0.0359 ppm	0.9000%	2020/10/14 15:50

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.9759	39.7593	37.14	50.10	12.96	50.09	10:30

2	TOC	4.0267	40.2668	37.49	50.36	12.87	50.16	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2445 (IC) (v1461)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	8	TOC	K2009172-001MS	27.2894 ppm	0.9292 ppm	3.4000%	2020/10/14 16:18

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	26.6324	266.3237	196.07	209.24	13.18	50.08	10:27
2	TOC	27.9464	279.4645	205.28	218.36	13.08	50.22	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2445 (IC) (v1461)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	9	TOC	K2009172-002	13.1133 ppm	0.1966 ppm	1.5000%	2020/10/14 16:46

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	13.2523	132.5229	102.21	115.21	13.00	50.08	10:27
2	TOC	12.9743	129.7430	100.26	113.34	13.08	50.16	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2445 (IC) (v1461)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

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)	25.0616 ppm (PASS)	0.0000 ppm	0%	2020/10/14 17:14

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	25.0616	250.6162	185.70	198.68	12.99	50.06	10:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)	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%	2020/10/14 17:29

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	6.96	19.95	12.98	50.15	10:28

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)	0 ppmC

Sample Type: Sample — From Schedule Version 7

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	10	TOC	K2009172-003	3.3538 ppm	0.1190 ppm	3.5500%	2020/10/14 17:43

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.4379	34.3793	33.36	46.43	13.07	50.06	10:30
2	TOC	3.2696	32.6957	32.18	45.05	12.87	50.20	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2445 (IC) (v1461)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

Sample Type: Sample — From Schedule Version 12

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	11	TOC	K2008395-003	1.7566 ppm	0.0224 ppm	1.2700%	2020/10/14 18:11

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.7408	17.4081	21.46	34.54	13.08	50.09	10:28
2	TOC	1.7725	17.7246	21.68	34.57	12.89	50.05	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2445 (IC) (v1461)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

Sample Type: Sample — From Schedule Version 15

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	12	TOC	K2008568-001	1.9343 ppm	0.0014 ppm	0.0700%	2020/10/14 18:39

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.9353	19.3526	22.82	35.69	12.87	50.19	10:26
2	TOC	1.9333	19.3326	22.81	35.86	13.06	50.12	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2445 (IC) (v1461)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	13	TOC	K2008568-002	1.8298 ppm	0.0181 ppm	0.9900%	2020/10/14 19:07

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.8169	18.1694	21.99	35.08	13.09	50.08	10:28
2	TOC	1.8426	18.4260	22.17	35.09	12.92	50.04	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2445 (IC) (v1461)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

Sample Type: Sample From Schedule Version 16

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	14	TOC	K2008568-007	2.0272 ppm	0.0167 ppm	0.8300%	2020/10/14 19:36

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.0154	20.1537	23.38	36.39	13.01	50.02	10:28
2	TOC	2.0390	20.3904	23.55	36.72	13.17	50.02	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2445 (IC) (v1461)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

Sample Type: Sample From Schedule Version 17

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	15	TOC	K2008568-007D	2.1584 ppm	0.0380 ppm	1.7600%	2020/10/14 20:03

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.1853	21.8530	24.57	37.64	13.07	50.19	10:29
2	TOC	2.1316	21.3155	24.20	37.12	12.92	50.16	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2445 (IC) (v1461)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	16	TOC	K2008568-007MS	29.0019 ppm	1.1530 ppm	3.9800%	2020/10/14 20:32

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	28.1867	281.8665	206.97	219.98	13.01	50.15	10:25
2	TOC	29.8172	298.1720	218.41	231.51	13.10	50.14	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2445 (IC) (v1461)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	17	TOC	K2009059-001	0.4951 ppm	0.0860 ppm	17.3700%	2020/10/14 21:00

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5559	5.5589	13.14	25.95	12.81	50.13	10:27
2	TOC	0.4343	4.3429	12.29	25.27	12.98	50.13	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2445 (IC) (v1461)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	18	TOC	K2008994-001*5	4.0367 ppm	0.0315 ppm	0.7800%	2020/10/14 21:28

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.0589	40.5890	37.72	50.73	13.01	50.13	10:27
2	TOC	4.0144	40.1442	37.40	50.52	13.12	50.17	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2445 (IC) (v1461)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	19	TOC	K2008787-003	0.0017 ppm	0.0025 ppm	141.4200%	2020/10/14 21:56

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.93	22.00	13.08	50.18	10:27
2	TOC	0.0035	0.0349	9.27	22.31	13.05	50.21	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2445 (IC) (v1461)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 17

	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)	24.4881 ppm (PASS)	0.0000 ppm	0%	2020/10/14 22:24

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.4881	244.8812	181.67	194.71	13.04	50.20	10:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)	50 ppmC

Sample Type: Check Standard --> CCB From Schedule Version 17

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2020/10/14 22:39

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	6.50	19.64	13.14	50.20	10:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)	0 ppmC

Sample Type: Sample From Schedule Version 17

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	20	TOC	MB2	0.0000 ppm	0.0000 ppm	0.0000%	2020/10/14 22:53

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.06	19.23	13.16	50.22	10:37

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2445 (IC) (v1461)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

Sample Type: Check Standard --> LCS From Schedule Version 17

	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)	23.5967 ppm (PASS)	0.0000 ppm	0%	2020/10/14 23:08

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	23.5967	235.9673	175.42	188.56	13.14	50.23	10:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)	25 ppmC

Sample Type: Check Standard --> LCS From Schedule Version 17

	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)	23.8709 ppm (PASS)	0.0000 ppm	0%	2020/10/14 23:23

	Base									

Pos	Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	23.8709	238.7086	177.34	190.57	13.23	50.22	10:29

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)	25 ppmC

Sample Type: Sample From Schedule Version 17

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	21	TOC	K2008974-001	0.9286 ppm	0.0541 ppm	5.8300%	2020/10/14 23:37

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.9669	9.6688	16.03	29.20	13.17	50.26	10:25
2	TOC	0.8903	8.9033	15.49	28.85	13.36	50.33	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2445 (IC) (v1461)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	22	TOC	K2008974-002	0.9251 ppm	0.0256 ppm	2.7700%	2020/10/15 00:05

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.9432	9.4321	15.86	28.92	13.06	50.34	10:25
2	TOC	0.9070	9.0701	15.61	28.97	13.36	50.37	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2445 (IC) (v1461)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	23	TOC	K2008919-001	1.5620 ppm	0.0018 ppm	0.1200%	2020/10/15 00:33

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.5633	15.6333	20.21	33.58	13.37	50.39	10:25
2	TOC	1.5608	15.6076	20.19	33.39	13.20	50.47	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2445 (IC) (v1461)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	24	TOC	K2008919-002	1.6082 ppm	0.0503 ppm	3.1300%	2020/10/15 01:01

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.5726	15.7260	20.28	33.30	13.03	50.45	10:28
2	TOC	1.6437	16.4373	20.78	33.90	13.12	50.49	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2445 (IC) (v1461)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	25	TOC	K2008919-003	3.1466 ppm	0.0162 ppm	0.5200%	2020/10/15 01:29

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.1351	31.3514	31.24	44.54	13.30	50.51	10:28
2	TOC	3.1581	31.5809	31.40	44.81	13.41	50.54	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2445 (IC) (v1461)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	26	TOC	K2008919-004	1.4710 ppm	0.0317 ppm	2.1500%	2020/10/15 01:57

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.4486	14.4857	19.41	32.88	13.47	50.57	10:25
2	TOC	1.4933	14.9333	19.72	33.13	13.41	50.57	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2445 (IC) (v1461)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	27	TOC	K2008919-005	1.9526 ppm	0.0261 ppm	1.3400%	2020/10/15 02:25

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.9341	19.3412	22.81	36.16	13.35	50.62	10:32
2	TOC	1.9710	19.7104	23.07	36.53	13.46	50.63	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2445 (IC) (v1461)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	28	TOC	K2008919-001*	1.4295 ppm	0.0025 ppm	0.1800%	2020/10/15 02:53

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.4278	14.2776	19.26	32.58	13.32	50.65	10:27
2	TOC	1.4313	14.3132	19.28	32.50	13.22	50.67	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2445 (IC) (v1461)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 17

	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)	24.4407 ppm (PASS)	0.0000 ppm	0%	2020/10/15 03:21

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.4407	244.4065	181.34	194.71	13.37	50.70	10:35

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)	50 ppmC

Sample Type: Check Standard --> CCB From Schedule Version 17

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2020/10/15 03:36

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	6.80	20.13	13.32	50.73	10:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)	0 ppmC

Sample Type: Sample From Schedule Version 17

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	29	TOC	K2008919-002*	1.3953 ppm	0.0171 ppm	1.2300%	2020/10/15 03:51

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.4074	14.0737	19.12	32.44	13.32	50.78	10:29
2	TOC	1.3831	13.8314	18.95	32.34	13.39	50.78	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2445 (IC) (v1461)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	30	TOC	K2008919-003*	2.5685 ppm	0.0167 ppm	0.6500%	2020/10/15 04:19

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.5803	25.8032	27.34	40.69	13.35	50.80	10:29
2	TOC	2.5567	25.5665	27.18	40.72	13.54	50.81	10:26

Dilution	Blank Contribution	Method	Calibration

1:10	(TC) 9.2445 (IC) (v1461)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	31	TOC	K2008919-004*	1.3309 ppm	0.0366 ppm	2.7500%	2020/10/15 04:47

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.3568	13.5677	18.76	31.98	13.22	50.81	10:26
2	TOC	1.3050	13.0502	18.40	31.82	13.42	50.81	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2445 (IC) (v1461)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	32	TOC	K2008919-005*	1.3484 ppm	0.0717 ppm	5.3200%	2020/10/15 05:15

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.2977	12.9775	18.35	31.82	13.47	50.84	10:30
2	TOC	1.3991	13.9911	19.06	32.28	13.22	50.84	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2445 (IC) (v1461)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	33	TOC	K2009036-001	1.7664 ppm	0.0078 ppm	0.4400%	2020/10/15 05:43

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.7719	17.7189	21.67	35.24	13.56	50.84	10:30
2	TOC	1.7609	17.6091	21.60	35.15	13.56	50.85	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2445 (IC) (v1461)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	34	TOC	K2009036-002	2.7030 ppm	0.0322 ppm	1.1900%	2020/10/15 06:11

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.7257	27.2572	28.36	41.83	13.47	50.86	10:29
2	TOC	2.6802	26.8025	28.05	41.56	13.52	50.85	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2445 (IC) (v1461)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	35	TOC	K2009036-003	2.0660 ppm	0.0119 ppm	0.5800%	2020/10/15 06:39

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.0576	20.5757	23.68	37.19	13.52	50.87	10:25
2	TOC	2.0744	20.7439	23.80	37.42	13.62	50.86	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2445 (IC) (v1461)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	36	TOC	K2009036-004	0.0000 ppm	0.0000 ppm	0.0000%	2020/10/15 07:07

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.52	21.03	13.51	50.84	10:31
2	TOC	0.0000	0.0000	7.22	20.81	13.60	50.82	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2445 (IC) (v1461)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	37	TOC	K2009036-001*	1.8119 ppm	0.0306 ppm	1.6900%	2020/10/15 07:35

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.7903	17.9028	21.80	35.32	13.51	50.81	10:25
2	TOC	1.8336	18.3361	22.11	35.51	13.41	50.82	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2445 (IC) (v1461)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	38	TOC	K2009036-002*	2.6632 ppm	0.0251 ppm	0.9400%	2020/10/15 08:03

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.6455	26.4547	27.80	41.35	13.55	50.79	10:28
2	TOC	2.6810	26.8096	28.05	41.49	13.44	50.80	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2445 (IC) (v1461)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 17

	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)	24.5283 ppm (PASS)	0.0000 ppm	0%	2020/10/15 08:31

Pos	Base Analysis	ID	Rep	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run

	Type		#							Time
B	TOC	25 ppm	1	24.5283	245.2833	181.95	195.42	13.46	50.81	10:34

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)	50 ppmC

Sample Type: Check Standard --> CCB From Schedule Version 17

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2020/10/15 08:46

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	7.43	20.86	13.43	50.78	10:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)	0 ppmC

Sample Type: Sample From Schedule Version 17

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	39	TOC	MB3	0.0000 ppm	0.0000 ppm	0.0000%	2020/10/15 09:00

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.16	20.47	13.30	50.76	10:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2445 (IC) (v1461)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

Sample Type: Check Standard --> LCS From Schedule Version 17

	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)	23.9527 ppm (PASS)	0.0000 ppm	0%	2020/10/15 09:15

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	23.9527	239.5269	177.92	191.19	13.28	50.73	10:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)	25 ppmC

Sample Type: Check Standard --> LCS From Schedule Version 17

	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)	24.1889 ppm (PASS)	0.0000 ppm	0%	2020/10/15 09:30

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	24.1889	241.8890	179.57	192.98	13.41	50.73	10:29

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)	25 ppmC

Sample Type: Sample From Schedule Version 17

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	40	TOC	K2009036-003*	2.1628 ppm	0.0708 ppm	3.2700%	2020/10/15 09:44

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.2128	22.1281	24.77	38.29	13.53	50.72	10:30
2	TOC	2.1127	21.1274	24.06	37.68	13.62	50.69	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2445 (IC) (v1461)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	41	TOC	K2009036-004*	0.0000 ppm	0.0000 ppm	0.0000%	2020/10/15 10:12

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.15	21.60	13.44	50.68	10:25
2	TOC	0.0000	0.0000	8.16	21.56	13.40	50.65	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2445 (IC) (v1461)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	43	TOC	LOD	0.0000 ppm	0.0000 ppm	0.0000%	2020/10/15 10:40

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.26	21.56	13.30	50.61	10:27
2	TOC	0.0000	0.0000	8.38	21.67	13.29	50.59	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2445 (IC) (v1461)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

		Analysis			Std. Dev.		

	Pos	Type	Sample ID	Result (ppmC)	(ppmC)	RSD	Start Time
◆	44	TOC	LOQ	0.1670 ppm	0.0222 ppm	13.2800%	2020/10/15 11:09

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.1513	1.5132	10.31	23.59	13.28	50.57	10:24
2	TOC	0.1827	1.8268	10.53	23.72	13.19	50.54	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2445 (IC) (v1461)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	45	TOC	K2008870-001	1.4549 ppm	0.0791 ppm	5.4400%	2020/10/15 11:36

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.3990	13.9896	19.06	32.28	13.23	50.52	10:29
2	TOC	1.5109	15.1087	19.84	32.88	13.04	50.48	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2445 (IC) (v1461)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	46	TOC	K2008870-001D	1.4933 ppm	0.0481 ppm	3.2200%	2020/10/15 12:05

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.5273	15.2726	19.96	33.04	13.08	50.45	10:24
2	TOC	1.4593	14.5926	19.48	32.82	13.34	50.45	10:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2445 (IC) (v1461)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	47	TOC	K2008870-001MS	27.8353 ppm	0.1468 ppm	0.5300%	2020/10/15 12:33

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	27.7315	277.3147	203.78	216.79	13.01	50.40	10:27
2	TOC	27.9390	279.3904	205.23	218.26	13.02	50.37	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.2445 (IC) (v1461)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 17

	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)	24.7966 ppm (PASS)	0.0000 ppm	0%	2020/10/15 13:01

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.7966	247.9661	183.84	196.78	12.94	50.32	10:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)	50 ppmC

Sample Type: Check Standard --> CCB From Schedule Version 17

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2020/10/15 13:16

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	7.50	20.40	12.90	50.30	10:29

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)	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
v1460	1.7417	0.1200	0.0000	0.0000	0.0000	2020/10/12 11:28	Fusion1 (Fusion1)
v1461	1.7083	0.2430	0.0000	0.0000	0.0000	2020/10/14 11:33	Fusion1 (Fusion1)

Calibrations

Name: CAS_salt_010711 (TOC)

Version:	v38	Calibration curve formula:	TOC: y = 7.015x + 9.892
Ver Creation:	2020/06/13 16:40	r^2 value:	TOC: r^2 = 0.99974
Comment:			
Operator:	Fusion1 (Fusion1)		
Basic Analysis Type	TOC		

Basic Analysis Type: TOC

Sample ID	Y Raw Value	X Expected	Message	End Time

DI Water	9.5750	0.0000		2020/06/13 15:13
0.500 ppm	12.9010	0.5000		2020/06/13 15:28
1.0 ppm	15.6320	1.0000		2020/06/13 15:42
5.0 ppm	43.2510	5.0000		2020/06/13 15:56
10 ppm	82.4040	10.0000		2020/06/13 16:11
25 ppm	188.6880	25.0000		2020/06/13 16:25
50 ppm	358.6500	50.0000		2020/06/13 16:39

Methods

Name: CAS_salt_010711 (TOC)

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

Parameter	Value
SampleVolume	10.0 mL
Dilution	1:10
AcidVolume	0.5 ml
ReagentVolume	2.0 ml
UVReactorPrerinse	Off
UVReactorPrerinseVolume	5.0
NumberOfUVReactorPrerinses	1
ICSpargeTime	1.00 mins
DetectorSweepFlow	500 ml/min
PreSpargeTime	2.00 mins
SystemFlow	500 ml/min

Advanced Parameter	Value
NeedleRinseVolume	5.0 ml
VialPrimeVolume	2.0 ml
ICSamplePrimeVolume	2.0 ml
ICSpargeRinseVolume	12.0 ml
BaselineStabilizeTime	0.70 min
DetectorPressureFlow	150 ml/min
SyringeSpeedWaste	10
SyringeSpeedAcid	7
SyringeSpeedReagent	7
SyringeSpeedDIWater	7
NDIRPressurization	60 psig
SyringeSpeedSampleDispense	5
SyringeSpeedSampleAspirate	4
SyringeSpeedUVDispense	5
SyringeSpeedUVAspirate	5
SyringeSpeedICDispense	5
SyringeSpeedICAspirate	5
NDIRPressureStabilize	1.75 min
SampleMixing	Off
SampleMixingCycles	1
SampleMixingVolume	10.0
LowLevelFilterNDIR	Off

Acceptance / Approval

Electronic Signatures

Report				

Version	User Name	Acceptance	Reason	Date

Report History

Report History

Report Version	User Name	System Reason	User Reason	Date
1	Fusion1 (Fusion1)	Schedule completed	Schedule completed	2020/10/15 13:31

ALS Environmental

StarLIMS Run: 699335/699336/699515

Analysis: DOC/TOC

Method: SM 5310 C, 9060A, 415.1, 9060

CCV: 19-GEN-8-40-C 50 ppm LCS: 19-GEN-8-41-k 25.0 ppm

ICAL Date: 6/16/2020

ICAL ID: 19-GEN-8-22-G

ICS ID: 19-GEN-8-35-J

ICS TV: 25.0 ppm ICS % R < 1

Spike ID: 19-GEN-8-15-B 0.05 ml of 5000 ppm stock ---> 10.0 ml = 25.0 ppm x dilution factor

Sodium Persulfate: 19-GEN-08-45-J

21 % H3PO4: 19-GEN-08-46-F

Equipment ID: K-TOC-03

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

FILTER ID: 16967789

Analyzed By:	MC	Date Analyzed:	10/15/20
Reviewed By:		Date Reviewed:	

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

October 31, 2020

Susan Huang
Aptim Environmental & Infrastucture, Inc.
2500 City West Blvd., Suite 1700
Houston, TX 77042

Work Order: **HS20100719**

Laboratory Results for: **LHAAP 16 October 2020**

Dear Susan Huang,

ALS Environmental received 7 sample(s) on Oct 14, 2020 for the analysis presented in the following report.

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

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

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

Sincerely,

Generated By: JUMOKE.LAWAL
RJ Modashia
Project Manager

ALS Houston, US Date: 31-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
Work Order: HS20100719

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS20100719-01	16WW36-201013	Groundwater		13-Oct-2020 07:35	14-Oct-2020 09:15	☐
HS20100719-02	16WW35-201013	Groundwater		13-Oct-2020 08:20	14-Oct-2020 09:15	☐
HS20100719-03	16IW09-201013	Groundwater		13-Oct-2020 09:10	14-Oct-2020 09:15	☐
HS20100719-04	16WW55-201013	Groundwater		13-Oct-2020 10:00	14-Oct-2020 09:15	☐
HS20100719-05	16IW03-201013	Groundwater		13-Oct-2020 10:50	14-Oct-2020 09:15	☐
HS20100719-06	16IW10-201013	Groundwater		13-Oct-2020 11:50	14-Oct-2020 09:15	☐
HS20100719-07	Trip blank-201008	Water	CG 092320 -87	13-Oct-2020 07:35	14-Oct-2020 09:15	☐

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 31-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
Work Order: HS20100719

CASE NARRATIVE

Work Order Comments

- The analysis for Perchlorate was subcontracted our ALS Houston TX, High Resolution Lab. Final report attached.
  The analysis for TOC was subcontracted to ALS Kelso, WA. Final report attached.

GC Semivolatiles by Method RSK-175

Batch ID: R371090

Sample ID: 16IW03-201013 (HS20100719-05MS)

- The recovery of the Matrix Spike (MS) associated to this analyte was outside of the established control limits. However, the LCS was within control limits. The recovery of the MS may be due to sample matrix interference.

Sample ID: 16IW03-201013 (HS20100719-05MSD)

- The recovery of the Matrix Spike Duplicate (MSD) associated to this analyte was outside of the established control limits. However, the LCS was within control limits. The failed recovery of the MSD may be due to sample matrix interference.

GCMS Volatiles by Method SW8260

Batch ID: R371372

Sample ID: 16WW35-201013 (HS20100719-02)

- Surrogate failure (4-Bromofluorobenzene) confirmed by re-analysis @ higher dilution.

Batch ID: R371450

Sample ID: HS20100780-04MS

- MS and MSD are for an unrelated sample

Wet Chemistry by Method SW9056

Batch ID: R371460

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

WetChemistry by Method SW9056

Batch ID: R370990

Sample ID: 16IW03-201013 (HS20100719-05MS)

- The recovery of the Matrix Spike (MS) and/or Matrix Spike Duplicate (MSD) associated with this analyte was outside of the established control limits. However, the LCS was within control limits. The recovery of the MS/MSD may be due to sample matrix interference. (Nitrogen, Nitrate (As N))

Sample ID: 16IW03-201013 (HS20100719-05MSD)

- The recovery of the Matrix Spike (MS) and/or Matrix Spike Duplicate (MSD) associated with this analyte was outside of the established control limits. However, the LCS was within control limits. The recovery of the MS/MSD may be due to sample matrix interference. (Sulfate)

Sample ID: 16WW35-201013 (HS20100719-02)

- Sample ran at 5X due to high concentration of Sulfate

Sample ID: 16WW36-201013 (HS20100719-01)

- Sample ran at 5X due to high concentration of Sulfate

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 31-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
Work Order: HS20100719

CASE NARRATIVE

WetChemistry by Method SW9056

Batch ID: R370990

Sample ID: HS20100651-02MS

- MS and MSD are for an unrelated sample (Nitrogen, Nitrate (As N),Sulfate)

WetChemistry by Method SM2320B

Batch ID: R370623

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 31-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
Sample ID: 16WW36-201013
Collection Date: 13-Oct-2020 07:35

ANALYTICAL REPORT
WorkOrder:HS20100719
Lab ID:HS20100719-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	50	U	15	50	50	UG/L	50	27-Oct-2020 14:36
1,1-Dichloroethene	**170**		**10**	**25**	**50**	**UG/L**	50	27-Oct-2020 14:36
1,2-Dichloroethane	25	U	10	25	50	UG/L	50	27-Oct-2020 14:36
cis-1,2-Dichloroethene	**26,000**		**100**	**250**	**500**	**UG/L**	500	27-Oct-2020 15:39
Methylene chloride	50	U	20	50	100	UG/L	50	27-Oct-2020 14:36
Trichloroethene	**22,000**		**100**	**250**	**500**	**UG/L**	500	27-Oct-2020 15:39
Vinyl chloride	**180**		**10**	**25**	**50**	**UG/L**	50	27-Oct-2020 14:36
Surr: 1,2-Dichloroethane-d4	*85.7*			**0**	*81-118*	*%REC*	*50*	*27-Oct-2020 14:36*
Surr: 1,2-Dichloroethane-d4	*86.5*			**0**	*81-118*	*%REC*	*500*	*27-Oct-2020 15:39*
Surr: 4-Bromofluorobenzene	*85.4*			**0**	*85-114*	*%REC*	*50*	*27-Oct-2020 14:36*
Surr: 4-Bromofluorobenzene	*90.0*			**0**	*85-114*	*%REC*	*500*	*27-Oct-2020 15:39*
Surr: Dibromofluoromethane	*85.8*			**0**	*80-119*	*%REC*	*500*	*27-Oct-2020 15:39*
Surr: Dibromofluoromethane	*84.6*			**0**	*80-119*	*%REC*	*50*	*27-Oct-2020 14:36*
Surr: Toluene-d8	*98.8*			**0**	*89-112*	*%REC*	*50*	*27-Oct-2020 14:36*
Surr: Toluene-d8	*98.2*			**0**	*89-112*	*%REC*	*500*	*27-Oct-2020 15:39*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PVL
Ethane	**0.00109**		**0.000144**	**0.000250**	**0.00100**	**mg/L**	1	21-Oct-2020 14:23
Ethene	**0.0101**		**0.000234**	**0.000500**	**0.00100**	**mg/L**	1	21-Oct-2020 14:23
Methane	**0.273**		**0.00214**	**0.00500**	**0.0100**	**mg/L**	20	21-Oct-2020 16:08
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: TH
Alkalinity, Total (As CaCO3)	**563**	a	**5.00**	**5.00**	**5.00**	**mg/L**	1	15-Oct-2020 23:06
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**2.41**		**0.150**	**0.500**	**0.500**	**mg/L**	5	14-Oct-2020 23:38
Nitrogen, Nitrate (As N)	0.500	U	0.150	0.500	0.500	mg/L	5	14-Oct-2020 23:38
Sulfate	**2,840**		**10.0**	**25.0**	**25.0**	**mg/L**	50	15-Oct-2020 08:57
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	22-Oct-2020 13:19
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	31-Oct-2020 13:27

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 31-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
Sample ID: 16WW35-201013
Collection Date: 13-Oct-2020 08:20

ANALYTICAL REPORT
WorkOrder:HS20100719
Lab ID:HS20100719-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	2.5	U	1.5	2.5	5.0	UG/L	5	26-Oct-2020 14:16
1,1-Dichloroethene	**93**		**1.0**	**2.5**	**5.0**	**UG/L**	5	26-Oct-2020 14:16
1,2-Dichloroethane	2.5	U	1.0	2.5	5.0	UG/L	5	26-Oct-2020 14:16
cis-1,2-Dichloroethene	**1,600**		**50**	**120**	**250**	**UG/L**	250	26-Oct-2020 17:26
Methylene chloride	5.0	U	2.0	5.0	10	UG/L	5	26-Oct-2020 14:16
Trichloroethene	**11,000**		**50**	**120**	**250**	**UG/L**	250	26-Oct-2020 17:26
Vinyl chloride	**97**		**1.0**	**2.5**	**5.0**	**UG/L**	5	26-Oct-2020 14:16
Surr: 1,2-Dichloroethane-d4	*85.1*			**0**	*81-118*	*%REC*	*5*	*26-Oct-2020 14:16*
Surr: 1,2-Dichloroethane-d4	*86.3*			**0**	*81-118*	*%REC*	*250*	*26-Oct-2020 17:26*
Surr: 4-Bromofluorobenzene	*84.8*	*S*		**0**	*85-114*	*%REC*	*5*	*26-Oct-2020 14:16*
Surr: 4-Bromofluorobenzene	*85.5*			**0**	*85-114*	*%REC*	*250*	*26-Oct-2020 17:26*
Surr: Dibromofluoromethane	*88.2*			**0**	*80-119*	*%REC*	*250*	*26-Oct-2020 17:26*
Surr: Dibromofluoromethane	*88.7*			**0**	*80-119*	*%REC*	*5*	*26-Oct-2020 14:16*
Surr: Toluene-d8	*96.9*			**0**	*89-112*	*%REC*	*5*	*26-Oct-2020 14:16*
Surr: Toluene-d8	*95.4*			**0**	*89-112*	*%REC*	*250*	*26-Oct-2020 17:26*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PVL
Ethane	**0.00101**		**0.000144**	**0.000250**	**0.00100**	**mg/L**	1	21-Oct-2020 14:41
Ethene	**0.00934**		**0.000234**	**0.000500**	**0.00100**	**mg/L**	1	21-Oct-2020 14:41
Methane	**0.0969**		**0.00107**	**0.00250**	**0.00500**	**mg/L**	10	21-Oct-2020 16:17
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: TH
Alkalinity, Total (As CaCO3)	**1,140**	a	**5.00**	**5.00**	**5.00**	**mg/L**	1	15-Oct-2020 23:16
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	0.500	U	0.150	0.500	0.500	mg/L	5	14-Oct-2020 23:56
Nitrogen, Nitrate (As N)	0.500	U	0.150	0.500	0.500	mg/L	5	14-Oct-2020 23:56
Sulfate	**9,510**		**40.0**	**100**	**100**	**mg/L**	200	28-Oct-2020 05:33
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	22-Oct-2020 13:19
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	31-Oct-2020 13:27

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 31-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
Sample ID: 16IW09-201013
Collection Date: 13-Oct-2020 09:10

ANALYTICAL REPORT
WorkOrder:HS20100719
Lab ID:HS20100719-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	26-Oct-2020 13:13
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	26-Oct-2020 13:13
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	26-Oct-2020 13:13
cis-1,2-Dichloroethene	**4.1**		**0.20**	**0.50**	**1.0**	**UG/L**	1	26-Oct-2020 13:13
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	26-Oct-2020 13:13
Trichloroethene	**5.8**		**0.20**	**0.50**	**1.0**	**UG/L**	1	26-Oct-2020 13:13
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	26-Oct-2020 13:13
Surr: 1,2-Dichloroethane-d4	*83.2*			**0**	*81-118*	*%REC*	*1*	*26-Oct-2020 13:13*
Surr: 4-Bromofluorobenzene	*87.8*			**0**	*85-114*	*%REC*	*1*	*26-Oct-2020 13:13*
Surr: Dibromofluoromethane	*86.7*			**0**	*80-119*	*%REC*	*1*	*26-Oct-2020 13:13*
Surr: Toluene-d8	*97.0*			**0**	*89-112*	*%REC*	*1*	*26-Oct-2020 13:13*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PVL
Ethane	0.000250	U	0.000144	0.000250	0.00100	mg/L	1	21-Oct-2020 14:57
Ethene	**0.00125**		**0.000234**	**0.000500**	**0.00100**	**mg/L**	1	21-Oct-2020 14:57
Methane	0.000250	U	0.000107	0.000250	0.000500	mg/L	1	21-Oct-2020 14:57
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: TH
Alkalinity, Total (As CaCO3)	**698**	a	**5.00**	**5.00**	**5.00**	**mg/L**	1	15-Oct-2020 23:24
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**7.76**		**0.0300**	**0.100**	**0.100**	**mg/L**	1	15-Oct-2020 00:14
Nitrogen, Nitrate (As N)	**0.499**		**0.0300**	**0.100**	**0.100**	**mg/L**	1	15-Oct-2020 00:14
Sulfate	**11.2**		**0.200**	**0.500**	**0.500**	**mg/L**	1	15-Oct-2020 00:14
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	22-Oct-2020 13:19
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	31-Oct-2020 13:27

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 31-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
Sample ID: 16WW55-201013
Collection Date: 13-Oct-2020 10:00

ANALYTICAL REPORT
WorkOrder:HS20100719
Lab ID:HS20100719-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	5.0	U	3.0	5.0	10	UG/L	10	26-Oct-2020 16:44
1,1-Dichloroethene	5.0	U	2.0	5.0	10	UG/L	10	26-Oct-2020 16:44
1,2-Dichloroethane	**12**		**2.0**	**5.0**	**10**	**UG/L**	10	26-Oct-2020 16:44
cis-1,2-Dichloroethene	**450**		**2.0**	**5.0**	**10**	**UG/L**	10	26-Oct-2020 16:44
Methylene chloride	10	U	4.0	10	20	UG/L	10	26-Oct-2020 16:44
Trichloroethene	**4,400**		**20**	**50**	**100**	**UG/L**	100	26-Oct-2020 17:05
Vinyl chloride	**26**		**2.0**	**5.0**	**10**	**UG/L**	10	26-Oct-2020 16:44
Surr: 1,2-Dichloroethane-d4	*87.0*			**0**	*81-118*	*%REC*	*100*	*26-Oct-2020 17:05*
Surr: 1,2-Dichloroethane-d4	*87.1*			**0**	*81-118*	*%REC*	*10*	*26-Oct-2020 16:44*
Surr: 4-Bromofluorobenzene	*88.8*			**0**	*85-114*	*%REC*	*10*	*26-Oct-2020 16:44*
Surr: 4-Bromofluorobenzene	*85.7*			**0**	*85-114*	*%REC*	*100*	*26-Oct-2020 17:05*
Surr: Dibromofluoromethane	*87.8*			**0**	*80-119*	*%REC*	*100*	*26-Oct-2020 17:05*
Surr: Dibromofluoromethane	*88.0*			**0**	*80-119*	*%REC*	*10*	*26-Oct-2020 16:44*
Surr: Toluene-d8	*97.1*			**0**	*89-112*	*%REC*	*10*	*26-Oct-2020 16:44*
Surr: Toluene-d8	*98.4*			**0**	*89-112*	*%REC*	*100*	*26-Oct-2020 17:05*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PVL
Ethane	0.000250	U	0.000144	0.000250	0.00100	mg/L	1	21-Oct-2020 15:14
Ethene	**0.00107**		**0.000234**	**0.000500**	**0.00100**	**mg/L**	1	21-Oct-2020 15:14
Methane	**0.0301**		**0.000107**	**0.000250**	**0.000500**	**mg/L**	1	21-Oct-2020 15:14
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: TH
Alkalinity, Total (As CaCO3)	**355**	a	**5.00**	**5.00**	**5.00**	**mg/L**	1	15-Oct-2020 23:30
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**4.75**		**0.0300**	**0.100**	**0.100**	**mg/L**	1	15-Oct-2020 00:32
Nitrogen, Nitrate (As N)	0.100	U	0.0300	0.100	0.100	mg/L	1	15-Oct-2020 00:32
Sulfate	**745**		**2.00**	**5.00**	**5.00**	**mg/L**	10	15-Oct-2020 10:27
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	22-Oct-2020 13:19
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	31-Oct-2020 13:27

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 31-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
Sample ID: 16IW03-201013
Collection Date: 13-Oct-2020 10:50

ANALYTICAL REPORT
WorkOrder:HS20100719
Lab ID:HS20100719-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	**4.1**	J	**1.5**	**5.0**	**5.0**	**UG/L**	5	26-Oct-2020 14:59
1,1-Dichloroethene	**38**		**1.0**	**2.5**	**5.0**	**UG/L**	5	26-Oct-2020 14:59
1,2-Dichloroethane	**5.4**		**1.0**	**2.5**	**5.0**	**UG/L**	5	26-Oct-2020 14:59
cis-1,2-Dichloroethene	**11,000**		**40**	**100**	**200**	**UG/L**	200	26-Oct-2020 15:41
Methylene chloride	5.0	U	2.0	5.0	10	UG/L	5	26-Oct-2020 14:59
Trichloroethene	**10,000**		**40**	**100**	**200**	**UG/L**	200	26-Oct-2020 15:41
Vinyl chloride	**530**		**1.0**	**2.5**	**5.0**	**UG/L**	5	26-Oct-2020 14:59
Surr: 1,2-Dichloroethane-d4	*87.4*			**0**	*81-118*	*%REC*	*5*	*26-Oct-2020 14:59*
Surr: 1,2-Dichloroethane-d4	*83.8*			**0**	*81-118*	*%REC*	*200*	*26-Oct-2020 15:41*
Surr: 4-Bromofluorobenzene	*85.9*			**0**	*85-114*	*%REC*	*5*	*26-Oct-2020 14:59*
Surr: 4-Bromofluorobenzene	*87.2*			**0**	*85-114*	*%REC*	*200*	*26-Oct-2020 15:41*
Surr: Dibromofluoromethane	*89.8*			**0**	*80-119*	*%REC*	*5*	*26-Oct-2020 14:59*
Surr: Dibromofluoromethane	*85.2*			**0**	*80-119*	*%REC*	*200*	*26-Oct-2020 15:41*
Surr: Toluene-d8	*96.3*			**0**	*89-112*	*%REC*	*5*	*26-Oct-2020 14:59*
Surr: Toluene-d8	*98.8*			**0**	*89-112*	*%REC*	*200*	*26-Oct-2020 15:41*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PVL
Ethane	**0.00498**		**0.000144**	**0.000250**	**0.00100**	**mg/L**	1	21-Oct-2020 17:13
Ethene	**0.0577**		**0.000234**	**0.000500**	**0.00100**	**mg/L**	1	21-Oct-2020 17:13
Methane	**0.685**		**0.00535**	**0.0125**	**0.0250**	**mg/L**	50	21-Oct-2020 17:27
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: TH
Alkalinity, Total (As CaCO3)	**771**	a	**5.00**	**5.00**	**5.00**	**mg/L**	1	15-Oct-2020 22:51
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**1.27**		**0.0300**	**0.100**	**0.100**	**mg/L**	1	15-Oct-2020 00:50
Nitrogen, Nitrate (As N)	**0.665**		**0.0300**	**0.100**	**0.100**	**mg/L**	1	15-Oct-2020 00:50
Sulfate	**10.9**		**0.200**	**0.500**	**0.500**	**mg/L**	1	15-Oct-2020 00:50
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	22-Oct-2020 13:19
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	31-Oct-2020 13:27

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 31-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
Sample ID: 16IW10-201013
Collection Date: 13-Oct-2020 11:50

ANALYTICAL REPORT
WorkOrder:HS20100719
Lab ID:HS20100719-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	UG/L	1	26-Oct-2020 13:34
1,1-Dichloroethene	**0.67**	J	**0.20**	**0.50**	**1.0**	**UG/L**	1	26-Oct-2020 13:34
1,2-Dichloroethane	**0.98**	J	**0.20**	**0.50**	**1.0**	**UG/L**	1	26-Oct-2020 13:34
cis-1,2-Dichloroethene	**220**		**1.0**	**2.5**	**5.0**	**UG/L**	5	26-Oct-2020 17:47
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	26-Oct-2020 13:34
Trichloroethene	**46**		**0.20**	**0.50**	**1.0**	**UG/L**	1	26-Oct-2020 13:34
Vinyl chloride	**53**		**0.20**	**0.50**	**1.0**	**UG/L**	1	26-Oct-2020 13:34
Surr: 1,2-Dichloroethane-d4	*85.5*			**0**	*81-118*	*%REC*	*5*	*26-Oct-2020 17:47*
Surr: 1,2-Dichloroethane-d4	*83.9*			**0**	*81-118*	*%REC*	*1*	*26-Oct-2020 13:34*
Surr: 4-Bromofluorobenzene	*88.2*			**0**	*85-114*	*%REC*	*1*	*26-Oct-2020 13:34*
Surr: 4-Bromofluorobenzene	*88.9*			**0**	*85-114*	*%REC*	*5*	*26-Oct-2020 17:47*
Surr: Dibromofluoromethane	*88.3*			**0**	*80-119*	*%REC*	*1*	*26-Oct-2020 13:34*
Surr: Dibromofluoromethane	*85.1*			**0**	*80-119*	*%REC*	*5*	*26-Oct-2020 17:47*
Surr: Toluene-d8	*95.1*			**0**	*89-112*	*%REC*	*1*	*26-Oct-2020 13:34*
Surr: Toluene-d8	*99.5*			**0**	*89-112*	*%REC*	*5*	*26-Oct-2020 17:47*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PVL
Ethane	0.000250	U	0.000144	0.000250	0.00100	mg/L	1	21-Oct-2020 15:52
Ethene	**0.0191**		**0.000234**	**0.000500**	**0.00100**	**mg/L**	1	21-Oct-2020 15:52
Methane	**1.47**		**0.00535**	**0.0125**	**0.0250**	**mg/L**	50	21-Oct-2020 16:52
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: TH
Alkalinity, Total (As CaCO3)	**1,680**	a	**5.00**	**5.00**	**5.00**	**mg/L**	1	15-Oct-2020 23:42
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**94.8**		**0.150**	**0.500**	**0.500**	**mg/L**	5	15-Oct-2020 01:08
Nitrogen, Nitrate (As N)	0.500	U	0.150	0.500	0.500	mg/L	5	15-Oct-2020 01:08
Sulfate	**5.73**		**1.00**	**2.50**	**2.50**	**mg/L**	5	15-Oct-2020 01:08
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	22-Oct-2020 13:19
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	31-Oct-2020 13:27

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 31-Oct-20

Client:	Aptim Environmental & Infrastucture, Inc.	**ANALYTICAL REPORT**
Project:	LHAAP 16 October 2020	WorkOrder:HS20100719
Sample ID:	Trip blank-201008	Lab ID:HS20100719-07
Collection Date:	13-Oct-2020 07:35	Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	UG/L	1	26-Oct-2020 12:52
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	26-Oct-2020 12:52
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	26-Oct-2020 12:52
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	26-Oct-2020 12:52
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	26-Oct-2020 12:52
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	26-Oct-2020 12:52
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	26-Oct-2020 12:52
Surr: 1,2-Dichloroethane-d4	*84.8*			**0**	*81-118*	*%REC*	*1*	*26-Oct-2020 12:52*
Surr: 4-Bromofluorobenzene	*86.3*			**0**	*85-114*	*%REC*	*1*	*26-Oct-2020 12:52*
Surr: Dibromofluoromethane	*91.2*			**0**	*80-119*	*%REC*	*1*	*26-Oct-2020 12:52*
Surr: Toluene-d8	*100*			**0**	*89-112*	*%REC*	*1*	*26-Oct-2020 12:52*

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 31-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
WorkOrder: HS20100719

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R370623 (0)	**Test Name :** ALKALINITY BY SM2320B				**Matrix:** Groundwater	
HS20100719-01	16WW36-201013	13 Oct 2020 07:35			15 Oct 2020 23:06	1
HS20100719-02	16WW35-201013	13 Oct 2020 08:20			15 Oct 2020 23:16	1
HS20100719-03	16IW09-201013	13 Oct 2020 09:10			15 Oct 2020 23:24	1
HS20100719-04	16WW55-201013	13 Oct 2020 10:00			15 Oct 2020 23:30	1
HS20100719-05	16IW03-201013	13 Oct 2020 10:50			15 Oct 2020 22:51	1
HS20100719-06	16IW10-201013	13 Oct 2020 11:50			15 Oct 2020 23:42	1
Batch ID: R370990 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Groundwater	
HS20100719-01	16WW36-201013	13 Oct 2020 07:35			15 Oct 2020 08:57	50
HS20100719-01	16WW36-201013	13 Oct 2020 07:35			14 Oct 2020 23:38	5
HS20100719-02	16WW35-201013	13 Oct 2020 08:20			14 Oct 2020 23:56	5
HS20100719-03	16IW09-201013	13 Oct 2020 09:10			15 Oct 2020 00:14	1
HS20100719-04	16WW55-201013	13 Oct 2020 10:00			15 Oct 2020 10:27	10
HS20100719-04	16WW55-201013	13 Oct 2020 10:00			15 Oct 2020 00:32	1
HS20100719-05	16IW03-201013	13 Oct 2020 10:50			15 Oct 2020 00:50	1
HS20100719-06	16IW10-201013	13 Oct 2020 11:50			15 Oct 2020 01:08	5
Batch ID: R371062 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** Groundwater	
HS20100719-01	16WW36-201013	13 Oct 2020 07:35			22 Oct 2020 13:19	1
HS20100719-02	16WW35-201013	13 Oct 2020 08:20			22 Oct 2020 13:19	1
HS20100719-03	16IW09-201013	13 Oct 2020 09:10			22 Oct 2020 13:19	1
HS20100719-04	16WW55-201013	13 Oct 2020 10:00			22 Oct 2020 13:19	1
HS20100719-05	16IW03-201013	13 Oct 2020 10:50			22 Oct 2020 13:19	1
HS20100719-06	16IW10-201013	13 Oct 2020 11:50			22 Oct 2020 13:19	1
Batch ID: R371090 (0)	**Test Name :** DISSOLVED GASES BY RSK-175				**Matrix:** Groundwater	
HS20100719-01	16WW36-201013	13 Oct 2020 07:35			21 Oct 2020 16:08	20
HS20100719-01	16WW36-201013	13 Oct 2020 07:35			21 Oct 2020 14:23	1
HS20100719-02	16WW35-201013	13 Oct 2020 08:20			21 Oct 2020 16:17	10
HS20100719-02	16WW35-201013	13 Oct 2020 08:20			21 Oct 2020 14:41	1
HS20100719-03	16IW09-201013	13 Oct 2020 09:10			21 Oct 2020 14:57	1
HS20100719-04	16WW55-201013	13 Oct 2020 10:00			21 Oct 2020 15:14	1
HS20100719-05	16IW03-201013	13 Oct 2020 10:50			21 Oct 2020 17:27	50
HS20100719-05	16IW03-201013	13 Oct 2020 10:50			21 Oct 2020 17:13	1
HS20100719-06	16IW10-201013	13 Oct 2020 11:50			21 Oct 2020 16:52	50
HS20100719-06	16IW10-201013	13 Oct 2020 11:50			21 Oct 2020 15:52	1
Batch ID: R371372 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS20100719-07	Trip blank-201008	13 Oct 2020 07:35			26 Oct 2020 12:52	1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 31-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
WorkOrder: HS20100719

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R371372 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS20100719-02	16WW35-201013	13 Oct 2020 08:20			26 Oct 2020 17:26	250
HS20100719-02	16WW35-201013	13 Oct 2020 08:20			26 Oct 2020 14:16	5
HS20100719-03	16IW09-201013	13 Oct 2020 09:10			26 Oct 2020 13:13	1
HS20100719-04	16WW55-201013	13 Oct 2020 10:00			26 Oct 2020 17:05	100
HS20100719-04	16WW55-201013	13 Oct 2020 10:00			26 Oct 2020 16:44	10
HS20100719-05	16IW03-201013	13 Oct 2020 10:50			26 Oct 2020 15:41	200
HS20100719-05	16IW03-201013	13 Oct 2020 10:50			26 Oct 2020 14:59	5
HS20100719-06	16IW10-201013	13 Oct 2020 11:50			26 Oct 2020 17:47	5
HS20100719-06	16IW10-201013	13 Oct 2020 11:50			26 Oct 2020 13:34	1
Batch ID: R371450 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS20100719-01	16WW36-201013	13 Oct 2020 07:35			27 Oct 2020 15:39	500
HS20100719-01	16WW36-201013	13 Oct 2020 07:35			27 Oct 2020 14:36	50
Batch ID: R371460 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Groundwater	
HS20100719-02	16WW35-201013	13 Oct 2020 08:20			28 Oct 2020 05:33	200
Batch ID: R371717 (0)	**Test Name :** SUBCONTRACT ANALYSIS - TOC ANALYSIS				**Matrix:** Groundwater	
HS20100719-01	16WW36-201013	13 Oct 2020 07:35			31 Oct 2020 13:27	1
HS20100719-02	16WW35-201013	13 Oct 2020 08:20			31 Oct 2020 13:27	1
HS20100719-03	16IW09-201013	13 Oct 2020 09:10			31 Oct 2020 13:27	1
HS20100719-04	16WW55-201013	13 Oct 2020 10:00			31 Oct 2020 13:27	1
HS20100719-05	16IW03-201013	13 Oct 2020 10:50			31 Oct 2020 13:27	1
HS20100719-06	16IW10-201013	13 Oct 2020 11:50			31 Oct 2020 13:27	1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 31-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
WorkOrder: HS20100719

QC BATCH REPORT

Batch ID: R371090 (0) **Instrument:** FID-4 **Method:** DISSOLVED GASES BY RSK-175

MBLK Sample ID: **MBLK-201021** Units: **mg/L** Analysis Date: **21-Oct-2020 10:07**
Client ID: Run ID: **FID-4_371090** SeqNo: **5795268** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.000250	0.00100								U
Ethene	0.000500	0.00100								U
Methane	0.000250	0.000500								U

LCS Sample ID: **LCS-201021** Units: **mg/L** Analysis Date: **21-Oct-2020 10:14**
Client ID: Run ID: **FID-4_371090** SeqNo: **5795269** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0191	0.00100	0.01804	0	106	75 - 125				
Ethene	0.0193	0.00100	0.0168	0	115	75 - 125				
Methane	0.00952	0.000500	0.009647	0	98.7	75 - 125				

LCSD Sample ID: **LCSD-201021** Units: **mg/L** Analysis Date: **21-Oct-2020 10:25**
Client ID: Run ID: **FID-4_371090** SeqNo: **5795270** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0188	0.00100	0.01804	0	104	75 - 125	0.01912	1.54	30	
Ethene	0.0189	0.00100	0.0168	0	112	75 - 125	0.01928	2.21	30	
Methane	0.00950	0.000500	0.009647	0	98.5	75 - 125	0.009521	0.194	30	

MS Sample ID: **HS20100719-05MS** Units: **mg/L** Analysis Date: **21-Oct-2020 15:33**
Client ID: **16IW03-201013** Run ID: **FID-4_371090** SeqNo: **5795290** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0282	0.00100	0.01804	0.004980	129	75 - 125				S
Ethene	0.101	0.00100	0.0168	0.05770	260	75 - 125				SE
Methane	0.791	0.000500	0.009647	0.7829	84.8	75 - 125				EO

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 31-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
WorkOrder: HS20100719

QC BATCH REPORT

Batch ID: R371090 (0) **Instrument:** FID-4 **Method:** DISSOLVED GASES BY RSK-175

MSD Sample ID: **HS20100719-05MSD** Units: **mg/L** Analysis Date: **21-Oct-2020 15:44**
Client ID: **16IW03-201013** Run ID: **FID-4_371090** SeqNo: **5795291** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0268	0.00100	0.01804	0.004980	121	75 - 125	0.02820	4.92	30	
Ethene	0.101	0.00100	0.0168	0.05770	259	75 - 125	0.1014	0.15	30	SE
Methane	0.789	0.000500	0.009647	0.7829	64.7	75 - 125	0.7911	0.245	30	SEO

DUP Sample ID: **HS20100779-01DUP** Units: **mg/L** Analysis Date: **21-Oct-2020 11:26**
Client ID: Run ID: **FID-4_371090** SeqNo: **5795276** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.000250	0.00100					0	0	30	U
Ethene	0.000500	0.00100					0	0	30	U
Methane	0.0154	0.000500					0.01529	0.595	30	

The following samples were analyzed in this batch: HS20100719-01 HS20100719-02 HS20100719-03 HS20100719-04 HS20100719-05 HS20100719-06

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 31-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
WorkOrder: HS20100719

QC BATCH REPORT

Batch ID: R371372 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-201026** Units: **UG/L** Analysis Date: **26-Oct-2020 12:31**
Client ID: Run ID: **VOA6_371372** SeqNo: **5801594** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	0.50	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
Methylene chloride	1.0	2.0								U
Trichloroethene	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*42.52*	*1.0*	*50*	*0*	*85.0*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*43.05*	*1.0*	*50*	*0*	*86.1*	*85 - 114*				
Surr: Dibromofluoromethane	*43.8*	*1.0*	*50*	*0*	*87.6*	*80 - 119*				
Surr: Toluene-d8	*48.64*	*1.0*	*50*	*0*	*97.3*	*89 - 112*				

LCS Sample ID: **VLCSW-201026** Units: **UG/L** Analysis Date: **26-Oct-2020 11:49**
Client ID: Run ID: **VOA6_371372** SeqNo: **5801593** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	18.09	1.0	20	0	90.4	80 - 119				
1,1-Dichloroethene	19.45	1.0	20	0	97.3	71 - 131				
1,2-Dichloroethane	20.07	1.0	20	0	100	73 - 128				
cis-1,2-Dichloroethene	19.4	1.0	20	0	97.0	78 - 123				
Methylene chloride	17.36	2.0	20	0	86.8	74 - 124				
Trichloroethene	20.44	1.0	20	0	102	79 - 123				
Vinyl chloride	19.78	1.0	20	0	98.9	58 - 137				
Surr: 1,2-Dichloroethane-d4	*51.34*	*1.0*	*50*	*0*	*103*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*46.54*	*1.0*	*50*	*0*	*93.1*	*85 - 114*				
Surr: Dibromofluoromethane	*51.39*	*1.0*	*50*	*0*	*103*	*80 - 119*				
Surr: Toluene-d8	*48.55*	*1.0*	*50*	*0*	*97.1*	*89 - 112*				

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 31-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
WorkOrder: HS20100719

QC BATCH REPORT

Batch ID: R371372 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS20100719-05MS** Units: **UG/L** Analysis Date: **26-Oct-2020 16:02**
Client ID: **16IW03-201013** Run ID: **VOA6_371372** SeqNo: **5801601** PrepDate: DF: **200**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	4135	200	4000	0	103	80 - 119				
1,1-Dichloroethene	4884	200	4000	0	122	71 - 131				
1,2-Dichloroethane	4672	200	4000	0	117	73 - 128				
cis-1,2-Dichloroethene	15300	200	4000	10560	118	78 - 123				
Methylene chloride	3910	400	4000	0	97.7	74 - 124				
Trichloroethene	15370	200	4000	10480	122	79 - 123				
Vinyl chloride	5705	200	4000	771.5	123	58 - 137				
Surr: 1,2-Dichloroethane-d4	*8472*	*200*	*10000*	*0*	*84.7*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*8745*	*200*	*10000*	*0*	*87.5*	*85 - 114*				
Surr: Dibromofluoromethane	*8756*	*200*	*10000*	*0*	*87.6*	*80 - 119*				
Surr: Toluene-d8	*9275*	*200*	*10000*	*0*	*92.7*	*89 - 112*				

MSD Sample ID: **HS20100719-05MSD** Units: **UG/L** Analysis Date: **26-Oct-2020 16:23**
Client ID: **16IW03-201013** Run ID: **VOA6_371372** SeqNo: **5801602** PrepDate: DF: **200**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	4326	200	4000	0	108	80 - 119	4135	4.52	20	
1,1-Dichloroethene	4560	200	4000	0	114	71 - 131	4884	6.86	20	
1,2-Dichloroethane	4427	200	4000	0	111	73 - 128	4672	5.38	20	
cis-1,2-Dichloroethene	14990	200	4000	10560	111	78 - 123	15300	2	20	
Methylene chloride	3564	400	4000	0	89.1	74 - 124	3910	9.24	20	
Trichloroethene	15010	200	4000	10480	113	79 - 123	15370	2.37	20	
Vinyl chloride	5302	200	4000	771.5	113	58 - 137	5705	7.32	20	
Surr: 1,2-Dichloroethane-d4	*8511*	*200*	*10000*	*0*	*85.1*	*81 - 118*	*8472*	*0.464*	*20*	
Surr: 4-Bromofluorobenzene	*8769*	*200*	*10000*	*0*	*87.7*	*85 - 114*	*8745*	*0.276*	*20*	
Surr: Dibromofluoromethane	*8777*	*200*	*10000*	*0*	*87.8*	*80 - 119*	*8756*	*0.235*	*20*	
Surr: Toluene-d8	*9391*	*200*	*10000*	*0*	*93.9*	*89 - 112*	*9275*	*1.24*	*20*	

The following samples were analyzed in this batch: HS20100719-02 HS20100719-03 HS20100719-04 HS20100719-05 HS20100719-06 HS20100719-07

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 31-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
WorkOrder: HS20100719

QC BATCH REPORT

Batch ID: R371450 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-201027** Units: **UG/L** Analysis Date: **27-Oct-2020 13:54**
Client ID: Run ID: **VOA6_371450** SeqNo: **5804006** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	1.0	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
Methylene chloride	1.0	2.0								U
Trichloroethene	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*41.37*	*1.0*	*50*	*0*	*82.7*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*44.77*	*1.0*	*50*	*0*	*89.5*	*85 - 114*				
Surr: Dibromofluoromethane	*43.39*	*1.0*	*50*	*0*	*86.8*	*80 - 119*				
Surr: Toluene-d8	*48*	*1.0*	*50*	*0*	*96.0*	*89 - 112*				

LCS Sample ID: **VLCSW-201027** Units: **UG/L** Analysis Date: **27-Oct-2020 12:50**
Client ID: Run ID: **VOA6_371450** SeqNo: **5804005** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	20.26	1.0	20	0	101	80 - 119				
1,1-Dichloroethene	15.83	1.0	20	0	79.2	71 - 131				
1,2-Dichloroethane	21.88	1.0	20	0	109	73 - 128				
cis-1,2-Dichloroethene	19.66	1.0	20	0	98.3	78 - 123				
Methylene chloride	18.17	2.0	20	0	90.8	74 - 124				
Trichloroethene	21.03	1.0	20	0	105	79 - 123				
Vinyl chloride	15.8	1.0	20	0	79.0	58 - 137				
Surr: 1,2-Dichloroethane-d4	*52.31*	*1.0*	*50*	*0*	*105*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*51.74*	*1.0*	*50*	*0*	*103*	*85 - 114*				
Surr: Dibromofluoromethane	*51.25*	*1.0*	*50*	*0*	*102*	*80 - 119*				
Surr: Toluene-d8	*51.26*	*1.0*	*50*	*0*	*103*	*89 - 112*				

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 31-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
WorkOrder: HS20100719

QC BATCH REPORT

Batch ID: R371450 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS20100780-04MS** Units: **UG/L** Analysis Date: **27-Oct-2020 14:57**
Client ID: Run ID: **VOA6_371450** SeqNo: **5804009** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	31.02	1.0	20	0	155	80 - 119				S
1,1-Dichloroethene	19.28	1.0	20	0	96.4	71 - 131				
1,2-Dichloroethane	27	1.0	20	0	135	73 - 128				S
cis-1,2-Dichloroethene	21.01	1.0	20	0	105	78 - 123				
Methylene chloride	19.11	2.0	20	0	95.6	74 - 124				
Trichloroethene	26.4	1.0	20	0	132	79 - 123				S
Vinyl chloride	18.04	1.0	20	0	90.2	58 - 137				
Surr: 1,2-Dichloroethane-d4	*42.53*	*1.0*	*50*	*0*	*85.1*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*49.85*	*1.0*	*50*	*0*	*99.7*	*85 - 114*				
Surr: Dibromofluoromethane	*42.31*	*1.0*	*50*	*0*	*84.6*	*80 - 119*				
Surr: Toluene-d8	*47.64*	*1.0*	*50*	*0*	*95.3*	*89 - 112*				

MSD Sample ID: **HS20100780-04MSD** Units: **UG/L** Analysis Date: **27-Oct-2020 15:18**
Client ID: Run ID: **VOA6_371450** SeqNo: **5804010** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	31.46	1.0	20	0	157	80 - 119	31.02	1.41	20	S
1,1-Dichloroethene	17.88	1.0	20	0	89.4	71 - 131	19.28	7.55	20	
1,2-Dichloroethane	26.06	1.0	20	0	130	73 - 128	27	3.52	20	S
cis-1,2-Dichloroethene	19.83	1.0	20	0	99.2	78 - 123	21.01	5.76	20	
Methylene chloride	19.56	2.0	20	0	97.8	74 - 124	19.11	2.31	20	
Trichloroethene	25.32	1.0	20	0	127	79 - 123	26.4	4.19	20	S
Vinyl chloride	17.35	1.0	20	0	86.8	58 - 137	18.04	3.87	20	
Surr: 1,2-Dichloroethane-d4	*41.99*	*1.0*	*50*	*0*	*84.0*	*81 - 118*	*42.53*	*1.28*	*20*	
Surr: 4-Bromofluorobenzene	*47.88*	*1.0*	*50*	*0*	*95.8*	*85 - 114*	*49.85*	*4.04*	*20*	
Surr: Dibromofluoromethane	*42.97*	*1.0*	*50*	*0*	*85.9*	*80 - 119*	*42.31*	*1.54*	*20*	
Surr: Toluene-d8	*47.1*	*1.0*	*50*	*0*	*94.2*	*89 - 112*	*47.64*	*1.14*	*20*	

The following samples were analyzed in this batch: HS20100719-01

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 31-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
WorkOrder: HS20100719

QC BATCH REPORT

Batch ID: R370623 (0) **Instrument: ManTech01** **Method: ALKALINITY BY SM2320B**

MBLK Sample ID: **WBLKW2-201015** Units: **mg/L** Analysis Date: **15-Oct-2020 22:10**
Client ID: Run ID: **ManTech01_370623** SeqNo: **5784628** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	5.00	5.00								U

LCS Sample ID: **LCS2-201015** Units: **mg/L** Analysis Date: **15-Oct-2020 22:18**
Client ID: Run ID: **ManTech01_370623** SeqNo: **5784629** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	1029	5.00	1000	0	103	85 - 115				

LCSD Sample ID: **LCSD2-201015** Units: **mg/L** Analysis Date: **15-Oct-2020 22:43**
Client ID: Run ID: **ManTech01_370623** SeqNo: **5784632** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	1027	5.00	1000	0	103	85 - 115	1029	0.207	20	

DUP Sample ID: **HS20100719-05DUP** Units: **mg/L** Analysis Date: **15-Oct-2020 23:00**
Client ID: **16IW03-201013** Run ID: **ManTech01_370623** SeqNo: **5784634** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	778.2	5.00					770.8	0.953	20	

The following samples were analyzed in this batch: HS20100719-01 HS20100719-02 HS20100719-03 HS20100719-04 HS20100719-05 HS20100719-06

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 31-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
WorkOrder: HS20100719

QC BATCH REPORT

Batch ID: R370990 (0) **Instrument:** ICS-Integrion **Method:** ANIONS BY SW9056A

MBLK Sample ID: **MBLK-101320** Units: **mg/L** Analysis Date: **15-Oct-2020 03:50**
Client ID: Run ID: **ICS-Integrion_370990** SeqNo: **5792903** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	0.100	0.100								U
Nitrogen, Nitrate (As N)	0.100	0.100								U
Sulfate	0.500	0.500								U

LCS Sample ID: **LCS-101320** Units: **mg/L** Analysis Date: **15-Oct-2020 04:09**
Client ID: Run ID: **ICS-Integrion_370990** SeqNo: **5792904** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	4.096	0.100	4	0	102	80 - 120				
Nitrogen, Nitrate (As N)	4.014	0.100	4	0	100	80 - 120				
Sulfate	18.94	0.500	20	0	94.7	80 - 120				

LCSD Sample ID: **LCSD-101320** Units: **mg/L** Analysis Date: **13-Oct-2020 22:42**
Client ID: Run ID: **ICS-Integrion_370990** SeqNo: **5792881** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.973	0.100	4	0	99.3	80 - 120	4.096	3.06	20	
Nitrogen, Nitrate (As N)	4.009	0.100	4	0	100	80 - 120	4.014	0.13	20	
Sulfate	19.27	0.500	20	0	96.4	80 - 120	18.94	1.75	20	

MS Sample ID: **HS20100719-05MS** Units: **mg/L** Analysis Date: **15-Oct-2020 05:21**
Client ID: **16IW03-201013** Run ID: **ICS-Integrion_370990** SeqNo: **5792906** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.055	0.100	2	1.274	89.1	80 - 120				
Nitrogen, Nitrate (As N)	3.142	0.100	2	0.6648	124	80 - 120				S
Sulfate	19.35	0.500	10	10.95	84.0	80 - 120				

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 31-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
WorkOrder: HS20100719

QC BATCH REPORT

Batch ID: R370990 (0) **Instrument:** ICS-Integrion **Method:** ANIONS BY SW9056A

MS Sample ID: **HS20100651-02MS** Units: **mg/L** Analysis Date: **13-Oct-2020 20:54**
Client ID: Run ID: **ICS-Integrion_370990** SeqNo: **5792877** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	2.263	0.100	2	0.3639	95.0	80 - 120				
Nitrogen, Nitrate (As N)	2.796	0.100	2	0	140	80 - 120				S
Sulfate	200	0.500	10	198.5	15.8	80 - 120				SEO

MSD Sample ID: **HS20100719-05MSD** Units: **mg/L** Analysis Date: **15-Oct-2020 05:39**
Client ID: **16IW03-201013** Run ID: **ICS-Integrion_370990** SeqNo: **5792907** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.256	0.100	2	1.274	99.1	80 - 120	3.055	6.36	20	
Nitrogen, Nitrate (As N)	3.031	0.100	2	0.6648	118	80 - 120	3.142	3.57	20	
Sulfate	16.87	0.500	10	10.95	59.2	80 - 120	19.35	13.7	20	S

MSD Sample ID: **HS20100651-02MSD** Units: **mg/L** Analysis Date: **13-Oct-2020 21:12**
Client ID: Run ID: **ICS-Integrion_370990** SeqNo: **5792878** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	2.277	0.100	2	0.3639	95.7	80 - 120	2.263	0.599	20	
Nitrogen, Nitrate (As N)	2.769	0.100	2	0	138	80 - 120	2.796	0.974	20	S
Sulfate	198.8	0.500	10	198.5	3.71	80 - 120	200	0.604	20	SEO

The following samples were analyzed in this batch: HS20100719-01 HS20100719-02 HS20100719-03 HS20100719-04 HS20100719-05 HS20100719-06

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 31-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
WorkOrder: HS20100719

QC BATCH REPORT

Batch ID: R371460 (0) **Instrument:** ICS-Integrion **Method:** ANIONS BY SW9056A

MBLK Sample ID: **MBLK-102720** Units: **mg/L** Analysis Date: **28-Oct-2020 08:33**
Client ID: Run ID: **ICS-Integrion_371460** SeqNo: **5804154** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	0.500	0.500								U

LCS Sample ID: **LCS-102720** Units: **mg/L** Analysis Date: **28-Oct-2020 08:51**
Client ID: Run ID: **ICS-Integrion_371460** SeqNo: **5804155** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	18.05	0.500	20	0	90.2	80 - 120				

MS Sample ID: **HS20100779-02MS** Units: **mg/L** Analysis Date: **28-Oct-2020 07:03**
Client ID: Run ID: **ICS-Integrion_371460** SeqNo: **5804149** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	447.3	5.00	100	374.5	72.8	80 - 120				S

MSD Sample ID: **HS20100779-02MSD** Units: **mg/L** Analysis Date: **28-Oct-2020 07:21**
Client ID: Run ID: **ICS-Integrion_371460** SeqNo: **5804150** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	447.8	5.00	100	374.5	73.3	80 - 120	447.3	0.12	20	S

The following samples were analyzed in this batch: HS20100719-02

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 31-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
WorkOrder: **HS20100719**

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

RIGHT SOLUTIONS | RIGHT PARTNER

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	20-030-0	26-Mar-2021
California	2919, 2020-2021	30-Apr-2021
Dept of Defense	PJLA L20-507	22-Dec-2021
Florida	E87611-30-07/01/2020	30-Jun-2021
Illinois	2000322020-4	09-May-2021
Kansas	E-10352 2020-2021	31-Jul-2021
Kentucky	123043, 2020-2021	30-Apr-2021
Louisiana	03087, 2020-2021	30-Jun-2021
North Carolina	624-2020	31-Dec-2020
North Dakota	R-193 2020-2021	30-Apr-2021
Texas	T104704231-20-26	30-Apr-2021

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 31-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
Work Order: HS20100719

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS20100719-01	16WW36-201013	Login	10/14/2020 3:09:10 PM	JRM	Sub
HS20100719-01	16WW36-201013	Login	10/14/2020 3:09:10 PM	JRM	WET083
HS20100719-01	16WW36-201013	Login	10/14/2020 3:09:10 PM	JRM	VOA155
HS20100719-01	16WW36-201013	Login	10/14/2020 3:09:10 PM	JRM	RSK001
HS20100719-01	16WW36-201013	Login	10/14/2020 3:09:10 PM	JRM	Sub
HS20100719-07	Trip blank-201008	Login	10/14/2020 3:09:10 PM	JRM	VOA155

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 31-Oct-20

Sample Receipt Checklist

Work Order ID: HS20100719 **Date/Time Received:** **14-Oct-2020 09:15**

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

Completed By: /S/ Jared R. Makan (eSignature) 14-Oct-2020 15:15 (Date/Time) **Reviewed by:** /S/ RJ Modashia (eSignature) 14-Oct-2020 16:47 (Date/Time)

Matrices: **Water** Carrier name: **FedEx Priority Overnight**

	Yes	No	Not Present
Shipping container/cooler in good condition?	☑	☐	☐
Custody seals intact on shipping container/cooler?	☑	☐	☐
Custody seals intact on sample bottles?	☐	☐	☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	☐	☐	☑
Chain of custody present?	☑	☐	1 Page(s)
Chain of custody signed when relinquished and received?	☑	☐	
Samplers name present on COC?	☑	☐	
Chain of custody agrees with sample labels?	☑	☐	
Samples in proper container/bottle?	☑	☐	
Sample containers intact?	☑	☐	
Sufficient sample volume for indicated test?	☑	☐	
All samples received within holding time?	☑	☐	
Container/Temp Blank temperature in compliance?	☑	☐	

Temperature(s)/Thermometer(s):	1.7°C/1.7°C UC/C	IR31
Cooler(s)/Kit(s):	44997	
Date/Time sample(s) sent to storage:	10/14/2020 15:14	

	Yes	No	
Water - VOA vials have zero headspace?	☑	☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	☐	☐	N/A ☑
pH adjusted?	☐	☐	N/A ☑

pH adjusted by:

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

RIGHT SOLUTIONS | RIGHT PARTNER

CHAIN OF CUSTODY

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

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

Project No. 501032

Job: LHAAP 16 October 2020

Prepared By: Scott Beesinger

P.O. Number

Field Sample I.D. Time	Sample Matrix	Date /	MS / MSD	No. OF CONTAINERS	VOC by SW 8260B	TOC by SM5310C	MEE by RSK 175	Anions (bromide, sulfate, nitrate) by SW9056 and Alkalinity by SM2320	Bromide by SW9056	Perchlorate by SW6850	Metals (arsenic, chromium, manganese, nickel, thallium) by SW6020				Remarks (Preservatives, etc.)	Lab I.D.#
16WW36-201013	WG	10/13/20/0735		10	X	X	X	X	X	X						
16WW35-201013	WG	10/13/20/0820		10	X	X	X	X	X	X						
~~[illegible]~~ 16IW09-201013	WG	10/13/20/0910		10	X	X	X	X	X	X						
16WW55-201013	WG	10/13/20/1000		10	X	X	X	X	X	X						
16IW03-201013	WG	10/13/20/1050		10	X	X	X	X	X	X						
16IW03-201013-MS	WG	10/13/20/1050		10	X	X	X	X	X	X						
16IW03-201013-MSD	WG	10/13/20/1050		10	X	X	X	X	X	X						
16IW10-201013	WG	10/13/20/1150		10	X	X	X	X	X	X						

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

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	10/13/20	1430									

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition
J. [illegible]	10/14/20	09:15							

Remarks: Cooler 44997 IR31
Temp 1.7°C CFU

HS20100719

Aptim Environmental & Infrastucture, Inc.
LHAAP 16

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

RIGHT SOLUTIONS | RIGHT PARTNER

CHAIN OF CUSTODY

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

Page 1 of 1

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

Project No. 501032

Job: LHAAP 16 October 2020

Prepared By: Scott Beesinger

P.O. Number

Field Sample I.D. / Time	Sample Matrix	Date /	MS / MSD	No. OF CONTAINERS	VOC by SW 8260B	TOC by SM5310C	MEE by RSK 175	Anions (bromide, sulfate, nitrate) by SW9056 and Alkalinity by SM2320	Bromide by SW9056	Perchlorate by SW6850	Metals (arsenic, chromium, manganese, nickel, thallium) by SW6020				Remarks (Preservatives, etc.)	Lab I.D.#
TRIP BLANK-201013	W	10/13/20		2	X											

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

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	10/13/20	1430									

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition
J. Wasson	10/14/20	09:15							

Remarks: Cooler 44997 IR31
Temp 1.7°C CFO

HS20100719

Aptim Environmental & Infrastucture, Inc.
LHAAP 16

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS
10450 Stancliff Rd., Suite 2
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

CUSTODY SEAL

Date: 10/13/20 Time: 1430

Name: Scott Bressler

Company: EHA TX

Seal Broken By:

Date: 10/14

FedEx

TRK# 6221 1891 8877 8277

AB SGRA

WED - 14 OCT AA

PRIORITY OVERNIGHT

77099

TX-US

IAH

RIGHT SOLUTIONS | RIGHT PARTNER

October 22, 2020 Service Request No:E2000985

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

Laboratory Results for: HS20100719

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory October 14, 2020
For your reference, these analyses have been assigned our service request number **E2000985.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current TNI standards, where applicable, and except as noted in the laboratory case narrative provided. All results are intended to be considered in their entirety and ALS Environmental is not responsible for use of less than the complete final report. Results apply only to the items submitted to the laboratory, as received for analysis. In accordance with the current TNI Standard, a statement on the estimated uncertainty of measurement of any quantitative analysis will be supplied upon request.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Corey Grandits
Project Manager

ADDRESS 10450 Stancliff Rd., Suite 210, Houston, TX 77099
PHONE +1 281 530 5656 | FAX +1 281 530 5887
ALS Group USA, Corp.
dba ALS Environmental

RIGHT SOLUTIONS | RIGHT PARTNER

Certificate of Analysis

ALS Environmental - Houston HRMS
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Environmental

Client:	ALS Houston	**Service Request No.:**	E2000985
Project:	HS20100719	**Date Received:**	10/14/20
Sample Matrix:	W		

CASE NARRATIVE

All analyses were performed in adherence to the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier II. When appropriate to the method, method blank results have been reported with each analytical test.

Sample Receipt

Six samples were received for analysis at ALS Environmental in Houston on 10/14/20.

The samples were received in good condition and are consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

Data Validation Notes and Discussion

Precision and Accuracy:

EQ2000513: Laboratory Control Spike/Duplicate Laboratory Control Spike (LCS/DLCS) samples were analyzed and reported in addition to a MS/MSD for this extraction batch. The LCS, DLCS, MS, & MSD recoveries are within QC limits.

DoD Certification is held for the method/matrix/analytes provided in this report.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.

Use of ALS group USA Corp dba ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.

RIGHT SOLUTIONS | RIGHT PARTNER

Client: ALS Environmental - US **Service Request:**E2000985
Project: HS20100719

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
E2000985-001	16WW36-201013	10/13/2020	0735
E2000985-002	16WW35-201013	10/13/2020	0820
E2000985-003	16IW09-201013	10/13/2020	0910
E2000985-004	16WW55-201013	10/13/2020	1000
E2000985-005	16IW03-201013	10/13/2020	1050
E2000985-006	16IW10-201013	10/13/2020	1150

RIGHT SOLUTIONS | RIGHT PARTNER

Service Request Summary

Folder #: **E2000985**
Client Name: ALS Environmental - US
Project Name: HS20100719
Project Number:

Report To: RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Houston, TX 77099-4338
USA
Phone Number: 281-530-5656
Cell Number:
Fax Number: 281-530-5887
E-mail: rj.modashia@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 10/14/20
Internal Due Date: 10/28/2020
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: N
Report to MDL?: Y
P.O. Number: HS20100719
EDD: No EDD Specified

8 250 mL-Plastic Bottle HDPE WM CLEAR Unpreserved
Location: EHRMS-WIC 10E
Pressure Gas:

Lab Samp No.	Client Samp No	Matrix	Collected	HOUSTON ClO4 DOD/6850
E2000985-001	16WW36-201013	Water	10/13/20 0735	**IV**
E2000985-002	16WW35-201013	Water	10/13/20 0820	**IV**
E2000985-003	16IW09-201013	Water	10/13/20 0910	**IV**
E2000985-004	16WW55-201013	Water	10/13/20 1000	**IV**
E2000985-005	16IW03-201013	Water	10/13/20 1050	**IV**
E2000985-006	16IW10-201013	Water	10/13/20 1150	**IV**

Print
RIGHT SOLUTIONS | RIGHT PARTNER

Service Request Summary

Folder #: **E2000985**
Client Name: ALS Environmental - US
Project Name: HS20100719
Project Number:

Report To: RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Houston, TX 77099-4338
USA
Phone Number: 281-530-5656
Cell Number:
Fax Number: 281-530-5887
E-mail: rj.modashia@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 10/14/20
Internal Due Date: 10/28/2020
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: N
Report to MDL?: Y
P.O. Number: HS20100719
EDD: No EDD Specified

8 250 mL-Plastic Bottle HDPE WM CLEAR Unpreserved
Location: EHRMS-WIC 10E
Pressure Gas:

Test Comments:

Group	Test/Method	Samples	Comments
Semivoa GCMS	ClO4 DOD/6850	1	MS/MSD
Semivoa GCMS	ClO4 DOD/6850	5	Level II due 10/28,level IV 11/4

Print
RIGHT SOLUTIONS | RIGHT PARTNER

Data Qualifiers

Lab Standard

+	Possible Tedlar bag artifact.
A	TIC is a suspected aldol-condensation product
B	Analyte found in the associated method blank as well as in the sample.
BC	Reported results are not blank corrected.
BH	The back section of the tube yielded higher results than the front.
BT	Results indicated possible breakthrough; back section >=10% front section.
C	Result identification confirmed.
D	Compound identified in an analysis at a secondary dilution factor
D	Spike was diluted out
DE	Reported results are corrected for desorption efficiency.
E	Estimated value. Concentration above calibration range
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
H1	Sample analysis performed past holding time. See case narrative.
H2	Initial analysis within holding time. Reanalysis for the required dilution was past holding time.
H3	Sample was received and analyzed past holding time.
H4	Sample was extracted past required extraction holding time, but analyzed within analysis holding time. See case narrative.
I	Internal standard not within the specified limits. See case narrative.
J	Estimated Value. Concentration found below MRL.
K	A deflection in the QC ion may indicate interference with the quantitation of this ion. The concentration of this analyte should be considered as an estimate.
K	Analyte was detected above the method reporting limit prior to normalization.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
L1	Laboratory control sample recovery outside the specified limits; results may be biased high.
L2	Laboratory control sample recovery outside the specified limits; results may be biased low.
L3	Laboratory control sample recovery outside the specified limits.
M	Matrix interference; results may be biased high.
M	The duplicate injection precision not met.
M1	Matrix interference due to coelution with a non-target compound; results may be biased high.
N	Presumptive evidence of a compound for TICs that have been identified based on a mass spectral library search.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.

RIGHT SOLUTIONS | RIGHT PARTNER

Data Qualifiers

Lab Standard

P	Indicates chlorodiphenyl ether interference present at the retention time of the target compound.
P	Pesticide/Aroclor target analyte > 40% difference for detected concentrations between GC columns
Q	Indicates as estimated value because the P and P + 2 theoretical abundance ratio does not meet method criteria.
R	Duplicate Precision not met.
R1	Duplicate precision not within the specified limits; however, the results are below the MRL and considered estimated.
S	Surrogate recovery not within specified limits.
S	The reported value was determined by the Method of Standard Additions (MSA).
T	Analyte is a tentatively identified compound, result is estimated.
U	Compound was analyzed for, but was not detected (ND).
V1	The continuing calibration verification standard was outside (biased high) the specified limits for this compound.
V2	The continuing calibration verification standard was outside (biased low) the specified limits for this compound.
W	Result quantified, but the corresponding peak was detected outside the generated retention time window.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
X	See case narrative.
Y	Recovery outside limits
Y	The chromatogram resembles a petroleum product but does not match the calibration standard.
Z	The chromatogram does not resemble a petroleum product.
i	The MRL/MDL has been elevated due to a matrix interference.

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Laboratory Group

Acronyms

Cal	Calibration
Conc	CONCentration
Dioxin(s)	Polychlorinated dibenzo-p-dioxin(s)
EDL	Estimated Detection Limit
EMPC	Estimated Maximum Possible Concentration
Flags	Data qualifiers
Furan(s)	Polychlorinated dibenzofuran(s)
g	Grams
ICAL	Initial CALibration
ID	IDentifier
Ions	Masses monitored for the analyte during data acquisition
L	Liter (s)
LCS	Laboratory Control Sample
DLCS	Duplicate Laboratory Control Sample
MB	Method Blank
MCL	Method Calibration Limit
MDL	Method Detection Limit
mL	Milliliters
MS	Matrix Spiked sample
DMS	Duplicate Matrix Spiked sample
NO	Number of peaks meeting all identification criteria
PCDD(s)	Polychlorinated dibenzo-p-dioxin(s)
PCDF(s)	Polychlorinated dibenzofuran(s)
ppb	Parts per billion
ppm	Parts per million
ppq	Parts per quadrillion
ppt	Parts per trillion
QA	Quality Assurance
QC	Quality Control
Ratio	Ratio of areas from monitored ions for an analyte
% Rec.	Percent recovery
RPD	Relative Percent Difference
RRF	Relative Response Factor
RT	Retention Time
SDG	Sample Delivery Group
S/N	Signal-to-noise ratio
TEF	Toxicity Equivalence Factor
TEQ	Toxicity Equivalence Quotient

RIGHT SOLUTIONS | RIGHT PARTNER

10450 Stancliff Rd, Houston, TX 77099 | 281-530-5656 | www.alsglobal.com

ALS Environmental

State Certifications, Accreditations, and Licenses

Agency	Number	Expire Date
American Association for Laboratory Accreditation	2897.01 2020	11/30/2021
Arizona Department of Health Services	AZ0793-2020	5/27/2021
Arkansas Department of Environmental Quality	20-030-0	3/26/2021
California Department of Health Services	2919-2020	4/30/2021
Department of Defense	A2LA 2897.01	11/30/2021
Florida Department of Health	E87611-2020	6/30/2021
Hawaii Department of Health	2020	4/30/2021
Illinois Environmental Protection Agency	2000322020-4	5/9/2021
Kansas Department of Health and Environment	E-10352-2020	7/31/2021
Louisiana Department of Environmental Quality	03087-2020	6/30/2021
Louisiana Department of Health and Hospitals	LA028-2020	12/31/2020
Maine Department of Health and Human Services	2020016	6/5/2022
Maryland Department of the Environment	343-2020	6/30/2021
Michigan Depratment of Environmental Quality	9971-2020	4/30/2021
Minnesota Department of Health	1785988	12/31/2020
Nebraska Department of Health and Human Services	NE-OS-25-13 (2020)	4/30/2021
Nevada Department of Concervation and Natural Resources	TX026932021-1	7/31/2021
New Hampshire Environmental Laboratory Accreditation Program	209420	4/24/2021
New Jersey Department of Environmental Protection	TX008	6/30/2021
New York Department of Health	11707	3/31/2021
Oklahoma Department of Environmental Quality	2020-123	8/31/2021
Pennsylvania Department of Environmental Protection	014	6/30/2021
Tennessee Department of Environment and Concervation	04016-2020	4/30/2021
Texas Commision on Environmental Quality	T104704231-20-26	4/30/2021
United States Department of Agriculture	P330-19-00299	10/10/2022
Washington Department of Health	C819	11/14/2020

RIGHT SOLUTIONS | RIGHT PARTNER

Chain of Custody

ALS Environmental - Houston HRMS
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

RIGHT SOLUTIONS | RIGHT PARTNER

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID: 14937**

SUBCONTRACT TO:

ALS Environmental
10450 Stancliff RoadSuite 210
Houston, TX 77084 **Phone:** +1 281 530 5656

CUSTOMER INFORMATION:

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

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS20100719
TSR:	Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS20100719-01**	**16WW36-201013**	**Groundwater**	**13 Oct 2020 07:35**
	SUB_Perch-6850			28 Oct 2020
2.	**HS20100719-02**	**16WW35-201013**	**Groundwater**	**13 Oct 2020 08:20**
	SUB_Perch-6850			28 Oct 2020
3.	**HS20100719-03**	**16IW09-201013**	**Groundwater**	**13 Oct 2020 09:10**
	SUB_Perch-6850			28 Oct 2020
4.	**HS20100719-04**	**16WW55-201013**	**Groundwater**	**13 Oct 2020 10:00**
	SUB_Perch-6850			28 Oct 2020
5.	**HS20100719-05**	**16IW03-201013**	**Groundwater**	**13 Oct 2020 10:50**
	SUB_Perch-6850			28 Oct 2020
6.	**HS20100719-06**	**16IW10-201013**	**Groundwater**	**13 Oct 2020 11:50**
	SUB_Perch-6850			28 Oct 2020

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

HS20100719-05 MS/MSD

QC Level: DOD IV (DoD Data Package)

RIGHT SOLUTIONS | RIGHT PARTNER

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense**

COC ID: **14937**

Relinquished By: J. [illegible]

Date/Time:

Received By: [illegible]

Date/Time: 10/14/20 1500

Cooler ID(s):

Temperature(s):

ALS Environmental

Cooler Receipt Form

Project Chemist: CG

Client/Project: ALS-H

Thermometer ID: IR31

Date/Time Received: 10/14/20 Initials: ____

Date/Time Logged in: 10/14/20 Initials: CG

1. Method of delivery: ○ US Mail ○ Fed Ex ○ UPS ○ DHL ✓ ALS Courier ○ Client
2. Samples received in: ✓ Cooler ○ Box ○ Envelope ○ Other ____
3. Were custody seals on coolers? ○ Yes ✓ No
   Were they intact? ○ Yes ○ No ✓ N/A
   Were they signed and dated? ○ Yes ○ No ✓ N/A
   If yes, how many and where?
4. Packing Material: ○ Inserts ✓ Baggies ○ Bubble Wrap ○ Gel Packs ✓ Wet Ice ○ Sleeves ○ Other ____
5. Foreign or Regulated Soil? ○ Yes ○ No Location of Sampling: ____

Cooler Tracking Number	COC ID	Date Opened	Time Opened	Opened By	Temp. °C	Temp Blank?
–		10/14/20	1500	CG	3.3	☒
						☐
						☐
						☐

6. Were custody papers properly filled out (ink, signed, dated, etc)? ✓ Yes ○ No
7. Did all bottles arrive in good condition (not broken, no signs of leakage)? ✓ Yes ○ No
8. Were all sample labels complete (i.e., sample ID, analysis, preservation, etc)? ✓ Yes ○ No
9. Were appropriate bottles/containers and volumes received for the requested tests? ✓ Yes ○ No
10. Did sample labels and tags agree with custody documents? ✓ Yes ○ No

Notes, Discrepancies, & Resolutions:

Service request Label:

RIGHT SOLUTIONS | RIGHT PARTNER

10450 Stancliff Rd., Suite 210
Houston, TX 77099
T: +1 713 266 1599
F: +1 713 266 1599
www.alsglobal.com

SAMPLE ACCEPTANCE POLICY

This policy outlines the criteria samples must meet to be accepted by ALS Environmental – Houston HRMS.

Cooler Custody Seals (desirable, mandatory if specified in SAP):

- ✓ Intact on outside of cooler, signed and dated

Chain-of-Custody (COC) documentation (mandatory):

The following is required on each COC:

- ✓ Sample ID, the location, date and time of collection, collector's name, preservation type, sample type, and any other special remarks concerning the sampleThe COC must be completed in ink.
- ✓ Signature and date of relinquishing party.

In the absence of a COC at sample receipt, the COC will be requested from the client.

Sample Integrity (mandatory):

Samples are inspected upon arrival to ensure that sample integrity was not compromised during transfer to the laboratory.

- ✓ Sample containers must arrive in good condition (not broken or leaking).
- ✓ Samples must be labeled appropriately, including Sample IDs, and requested test using durable labels and indelible ink.
- ✓ The correct type of sample bottle must be used for the method requested.
- ✓ An appropriate sample volume, or weight, must be received.
- ✓ Sample IDs and number of containers must reconcile with the COC.
- ✓ Samples must be received within the method defined holding time.

Temperature Requirement (varies by sample matrix):

- ✓ Aqueous and Non-aqueous samples must be shipped and stored cold, at 0 to 6ºC.
- ✓ Tissue samples must be shipped and stored frozen, at -20 to -10ºC.
- ✓ Air samples are shipped and stored cold, at 0 to 6ºC
- ✓ The sample temperature must be recorded on the COC

All cooler inspections are documented on the Cooler Receipt Form (CRF). A separate CRF is completed for each service request. Any samples not meeting the above criteria are noted on the CRF and the Project Manager notified. The Project Manager must resolve any sample integrity issues with the client prior to proceeding with the analysis. Such resolutions are documented in writing and filed with the project folder. Data associated with samples received outside of this acceptance policy will be qualified on the case narrative of the final report

RIGHT SOLUTIONS | RIGHT PARTNER

Preparation Information Benchsheets

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

RIGHT SOLUTIONS | RIGHT PARTNER

Preparation Information Benchsheet

Prep Run#: 368005 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
Team: Semivoa GCMS/GRIVERA **Prep Method:** Method **Prep Date/Time:** 10/19/20 09:34

#	Lab Code	Client ID	B#	Method /Test	pH	Cl	Matrix	Amt. Ext.	Sample Description
1	E2000981-001	LH18/24-SP650_101320-AIX	.01	6850/ClO4 DOD			Water	10mL	
2	E2000982-001	LH18/24-SP140_101320	.01	6850/ClO4 DOD			Water	10mL	
3	E2000984-001	LH18/24-SP650_101320-AIX	.01	6850/ClO4 DOD			Water	10mL	
4	E2000985-001	16WW36-201013	.01	6850/ClO4 DOD			Water	10mL	
5	E2000985-002	16WW35-201013	.01	6850/ClO4 DOD			Water	10mL	
6	E2000985-003	16IW09-201013	.01	6850/ClO4 DOD			Water	10mL	
7	E2000985-004	16WW55-201013	.01	6850/ClO4 DOD			Water	10mL	
8	E2000985-005	16IW03-201013	.01	6850/ClO4 DOD			Water	10mL	
9	E2000985-006	16IW10-201013	.01	6850/ClO4 DOD			Water	10mL	
10	E2000996-001	16WW25-201014	.01	6850/ClO4 DOD			Water	10mL	
11	E2000996-002	16WW26-201014	.01	6850/ClO4 DOD			Water	10mL	
12	E2000996-003	16WW30-201014	.01	6850/ClO4 DOD			Water	10mL	
13	E2000996-004	16WW29-201014	.01	6850/ClO4 DOD			Water	10mL	
14	E2000996-005	16WW22-201014	.01	6850/ClO4 DOD			Water	10mL	
15	E2000996-006	16WW41-201014	.01	6850/ClO4 DOD			Water	10mL	
16	E2000996-007	16WW21-201014	.01	6850/ClO4 DOD			Water	10mL	
17	E2000996-008	16WW21-201014-FD	.01	6850/ClO4 DOD			Water	10mL	
18	E2000996-009	16WW39-201014	.01	6850/ClO4 DOD			Water	10mL	
19	EQ2000513-01	MB		6850/ClO4 DOD			Liquid	10mL	
20	EQ2000513-02	LCS		6850/ClO4 DOD			Liquid	10mL	
21	EQ2000513-03	DLCS		6850/ClO4 DOD			Liquid	10mL	
22	EQ2000513-04	16IW03-201013 MS	.01	6850/ClO4 DOD			Liquid	10mL	
23	EQ2000513-05	16IW03-201013 DMS	.01	6850/ClO4 DOD			Liquid	10mL	

Spiking Solutions

Name: Perchlorate Intermediate Stock1 Inventory ID 209764 Logbook Ref: Perchlorate Int. Stock1 51820 Expires On: 11/18/2020

EQ2000513-02	1.00µL	EQ2000513-03	1.00µL	EQ2000513-04	1.00µL	EQ2000513-05	1.00µL

Name: Sodium Perchlorate 1 ug/mL (IS) (18-O) as CLO4 Inventory ID 212340 Logbook Ref: Sodium Perchlorate Expires On: 07/13/2022

E2000981-001	100.00µL	E2000982-001	100.00µL	E2000984-001	100.00µL	E2000985-001	100.00µL	E2000985-002	100.00µL	E2000985-003	100.00µL
E2000985-004	100.00µL	E2000985-005	100.00µL	E2000985-006	100.00µL	E2000996-001	100.00µL	E2000996-002	100.00µL	E2000996-003	100.00µL
E2000996-004	100.00µL	E2000996-005	100.00µL	E2000996-006	100.00µL	E2000996-007	100.00µL	E2000996-008	100.00µL	E2000996-009	100.00µL
EQ2000513-01	100.00µL	EQ2000513-02	100.00µL	EQ2000513-03	100.00µL	EQ2000513-04	100.00µL	EQ2000513-05	100.00µL		

Preparation Information Benchsheet

Prep Run#: 368005
Team: Semivoa GCMS/GRIVERA

Prep WorkFlow: GenExt28Day
Prep Method: Method

Status: Prepped
Prep Date/Time: 10/19/20 09:34

Preparation Steps

Step: Preparation
Started: 10/19/20 09:34
Finished: 10/19/20 14:58
By: GRIVERA
Comments

Comments:

Reviewed By: GR Date: 10/19/2020

Chain of Custody

Relinquished By: Date:

Received By: Date:

Extracts Examined
Yes No

RIGHT SOLUTIONS | RIGHT PARTNER

Analytical Results

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000985
Project:	HS20100719	**Date Collected:**	10/13/20 0735
Sample Matrix:	Water	**Date Received:**	10/14/20
		Date Extracted:	10/19/20
		Date Analyzed:	10/19/20 21:26
Sample Name:	16WW36-201013	**Units:**	µg/L
Lab Code:	E2000985-001	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method:	6850	**Analysis Lot:**	700168
Prep Method:	Method	**Extraction Lot:**	368005
Data File Name:	I:\LCMS01\DATA\20201019\20201019_050	**Instrument Name:**	E-LCMS-01
		Dilution Factor:	1

CAS No.	Analyte Name	Result	Q	LOQ	LOD	MDL	Note
14797-73-0	Perchlorate	**0.167**		0.100	0.0500	0.0250	

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000985
Project:	HS20100719	**Date Collected:**	10/13/20 0820
Sample Matrix:	Water	**Date Received:**	10/14/20
		Date Extracted:	10/19/20
		Date Analyzed:	10/20/20 20:59
Sample Name:	16WW35-201013	**Units:**	µg/L
Lab Code:	E2000985-002	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method:	6850	**Analysis Lot:**	700170
Prep Method:	Method	**Extraction Lot:**	368005
Data File Name:	I:\LCMS01\DATA\20201020\20201020_039	**Instrument Name:**	E-LCMS-01
		Dilution Factor:	20

CAS No.	Analyte Name	Result	Q	LOQ	LOD	MDL	Note
14797-73-0	Perchlorate	**565**		2.00	1.00	0.500	

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000985
Project:	HS20100719	**Date Collected:**	10/13/20 0910
Sample Matrix:	Water	**Date Received:**	10/14/20
		Date Extracted:	10/19/20
		Date Analyzed:	10/21/20 11:26
Sample Name:	16IW09-201013	**Units:**	µg/L
Lab Code:	E2000985-003	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method:	6850	**Analysis Lot:**	700177
Prep Method:	Method	**Extraction Lot:**	368005
Data File Name:	I:\LCMS01\DATA\20201021\20201021_015	**Instrument Name:**	E-LCMS-01
		Dilution Factor:	1

CAS No.	Analyte Name	Result	Q	LOQ	LOD	MDL	Note
14797-73-0	Perchlorate	**0.0381**	J	0.100	0.0500	0.0250	

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000985
Project:	HS20100719	**Date Collected:**	10/13/20 1000
Sample Matrix:	Water	**Date Received:**	10/14/20
		Date Extracted:	10/19/20
		Date Analyzed:	10/20/20 21:15
Sample Name:	16WW55-201013	**Units:**	µg/L
Lab Code:	E2000985-004	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method:	6850	**Analysis Lot:**	700170
Prep Method:	Method	**Extraction Lot:**	368005
Data File Name:	I:\LCMS01\DATA\20201020\20201020_041	**Instrument Name:**	E-LCMS-01
		Dilution Factor:	10

CAS No.	Analyte Name	Result	Q	LOQ	LOD	MDL	Note
14797-73-0	Perchlorate	**287**		1.00	0.500	0.250	

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000985
Project:	HS20100719	**Date Collected:**	10/13/20 1050
Sample Matrix:	Water	**Date Received:**	10/14/20
		Date Extracted:	10/19/20
		Date Analyzed:	10/21/20 11:34
Sample Name:	16IW03-201013	**Units:**	µg/L
Lab Code:	E2000985-005	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method:	6850	**Analysis Lot:**	700177
Prep Method:	Method	**Extraction Lot:**	368005
Data File Name:	I:\LCMS01\DATA\20201021\20201021_016	**Instrument Name:**	E-LCMS-01
		Dilution Factor:	1

CAS No.	Analyte Name	Result	Q	LOQ	LOD	MDL	Note
14797-73-0	Perchlorate	**0.0876**	J	0.100	0.0500	0.0250	

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000985
Project:	HS20100719	**Date Collected:**	10/13/20 1150
Sample Matrix:	Water	**Date Received:**	10/14/20
		Date Extracted:	10/19/20
		Date Analyzed:	10/21/20 12:40
Sample Name:	16IW10-201013	**Units:**	µg/L
Lab Code:	E2000985-006	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method:	6850	**Analysis Lot:**	700177
Prep Method:	Method	**Extraction Lot:**	368005
Data File Name:	I:\LCMS01\DATA\20201021\20201021_022	**Instrument Name:**	E-LCMS-01
		Dilution Factor:	2

CAS No.	Analyte Name	Result	Q	LOQ	LOD	MDL	Note
14797-73-0	Perchlorate	ND	U	0.200	0.100	0.0500	

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000985
Project:	HS20100719	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
		Date Extracted:	10/19/20
		Date Analyzed:	10/19/20 20:15
Sample Name:	Method Blank	**Units:**	µg/L
Lab Code:	EQ2000513-01	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method:	6850	**Analysis Lot:**	700168
Prep Method:	Method	**Extraction Lot:**	368005
Data File Name:	I:\LCMS01\DATA\20201019\20201019_041	**Instrument Name:**	E-LCMS-01
		Dilution Factor:	1

CAS No.	Analyte Name	Result	Q	LOQ	LOD	MDL	Note
14797-73-0	Perchlorate	ND	U	0.100	0.0500	0.0250	

RIGHT SOLUTIONS | RIGHT PARTNER

Accuracy & Precision

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000985
Project:	HS20100719	**Date Analyzed:**	10/20/20
Sample Matrix:	Water		

Lab Control Sample Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method:	6850	**Units:**	µg/L
Prep Method:	Method	**Basis:**	NA
		Extraction Lot:	368005

	Lab Control Sample EQ2000513-02			Duplicate Lab Control Sample EQ2000513-03					
Analyte Name	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Perchlorate	0.105	0.100	105	0.108	0.100	108	84 - 119	3	15

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

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000985
Project:	HS20100719	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
		Date Extracted:	10/19/20
		Date Analyzed:	10/20/20 20:04
Sample Name:	Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2000513-02	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method:	6850	**Analysis Lot:**	700170
Prep Method:	Method	**Extraction Lot:**	368005
Data File Name:	I:\LCMS01\DATA\20201020\20201020_032	**Instrument Name:**	E-LCMS-01
		Dilution Factor:	1

CAS No.	Analyte Name	Result	Q	LOQ	LOD	MDL	Note
14797-73-0	Perchlorate	**0.105**		0.100	0.0500	0.0250	

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000985
Project:	HS20100719	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
		Date Extracted:	10/19/20
		Date Analyzed:	10/20/20 20:12
Sample Name:	Duplicate Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2000513-03	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method:	6850	**Analysis Lot:**	700170
Prep Method:	Method	**Extraction Lot:**	368005
Data File Name:	I:\LCMS01\DATA\20201020\20201020_033	**Instrument Name:**	E-LCMS-01
		Dilution Factor:	1

CAS No.	Analyte Name	Result	Q	LOQ	LOD	MDL	Note
14797-73-0	Perchlorate	**0.108**		0.100	0.0500	0.0250	

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000985
Project:	HS20100719	**Date Collected:**	10/13/20
Sample Matrix:	Water	**Date Received:**	10/14/20
		Date Analyzed:	10/20/20

Matrix Spike Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Sample Name:	16IW03-201013	**Units:**	µg/L
Lab Code:	E2000985-005	**Basis:**	NA

Analytical Method: 6850
Prep Method: Method

		16IW03-201013MS				16IW03-201013DMS					
		Matrix Spike				**Duplicate Matrix Spike**					
		EQ2000513-04				EQ2000513-05					
Analyte Name	**Sample Result**	**Result**	**Spike Amount**	**% Rec**		**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Perchlorate	0.0876	0.194	0.100	106		0.193	0.100	105	84 - 119	<1	15

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

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

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000985
Project:	HS20100719	**Date Collected:**	10/13/20 1050
Sample Matrix:	Water	**Date Received:**	10/14/20
		Date Extracted:	10/19/20
		Date Analyzed:	10/20/20 20:20
Sample Name:	16IW03-201013	**Units:**	µg/L
Lab Code:	EQ2000513-04	**Basis:**	NA
Run Type:	Matrix Spike		

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method:	6850	**Analysis Lot:**	700170
Prep Method:	Method	**Extraction Lot:**	368005
Data File Name:	I:\LCMS01\DATA\20201020\20201020_034	**Instrument Name:**	E-LCMS-01
		Dilution Factor:	1

CAS No.	Analyte Name	Result	Q	LOQ	LOD	MDL	Note
14797-73-0	Perchlorate	**0.194**		0.100	0.0500	0.0250	

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000985
Project:	HS20100719	**Date Collected:**	10/13/20 1050
Sample Matrix:	Water	**Date Received:**	10/14/20
		Date Extracted:	10/19/20
		Date Analyzed:	10/20/20 20:28
Sample Name:	16IW03-201013	**Units:**	µg/L
Lab Code:	EQ2000513-05	**Basis:**	NA
Run Type:	Duplicate Matrix Spike		

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method:	6850	**Analysis Lot:**	700170
Prep Method:	Method	**Extraction Lot:**	368005
Data File Name:	I:\LCMS01\DATA\20201020\20201020_035	**Instrument Name:**	E-LCMS-01
		Dilution Factor:	1

CAS No.	Analyte Name	Result	Q	LOQ	LOD	MDL	Note
14797-73-0	Perchlorate	**0.193**		0.100	0.0500	0.0250	

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

October 30, 2020

Analytical Report for Service Request No: K2009347

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

RE: ALS Houston DOD TOC / HS20100719

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory October 15, 2020
For your reference, these analyses have been assigned our service request number **K2009347.**

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
Qualifiers
State Certifications, Accreditations, And Licenses
Case Narrative
Chain of Custody
General Chemistry

RIGHT SOLUTIONS | RIGHT PARTNER

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.

RIGHT SOLUTIONS | RIGHT PARTNER

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.

RIGHT SOLUTIONS | RIGHT PARTNER

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.

RIGHT SOLUTIONS | RIGHT PARTNER

Case Narrative

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

RIGHT SOLUTIONS | RIGHT PARTNER

1317 South 13th Ave, Kelso, WA 98626 | 1-360-577-7222 | www.alsglobal.com

ALS Environmental

Client: ALS Environmental - US
Project: ALS Houston DOD TOC
Sample Matrix: Ground Water

Service Request: K2009347
Date Received: 10/15/2020

CASE NARRATIVE

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

Sample Receipt:

Six ground water samples were received for analysis at ALS Environmental on 10/15/2020. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The samples were stored at minimum in accordance with the analytical method requirements.

General Chemistry:

No significant anomalies were noted with this analysis.

Approved by Kelley Lovejoy Date 10/30/2020

RIGHT SOLUTIONS | RIGHT PARTNER

Chain of Custody

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

RIGHT SOLUTIONS | RIGHT PARTNER

K2009347

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID: 14936**

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:	HS20100719
TSR:	Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS20100719-01**	**16WW36-201013**	**Groundwater**	**13 Oct 2020 07:35**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			28 Oct 2020
2.	**HS20100719-02**	**16WW35-201013**	**Groundwater**	**13 Oct 2020 08:20**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			28 Oct 2020
3.	**HS20100719-03**	**16IW09-201013**	**Groundwater**	**13 Oct 2020 09:10**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			28 Oct 2020
4.	**HS20100719-04**	**16WW55-201013**	**Groundwater**	**13 Oct 2020 10:00**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			28 Oct 2020
5.	**HS20100719-05**	**16IW03-201013**	**Groundwater**	**13 Oct 2020 10:50**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			28 Oct 2020
6.	**HS20100719-06**	**16IW10-201013**	**Groundwater**	**13 Oct 2020 11:50**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			28 Oct 2020

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

HS20100719-05 MS/MSD

QC Level: DOD IV (DoD Data Package)

RIGHT SOLUTIONS | RIGHT PARTNER

K2009347

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID:** **14936**

Relinquished By:		Date/Time:	10/14/20 18:00
Received By:		Date/Time:	10/15/20 1000
Cooler ID(s):		Temperature(s):	

RIGHT SOLUTIONS | RIGHT PARTNER

PM KC

Cooler Receipt and Preservation Form

Client AIS-Houston Service Request K20 09347

Received: 10/15/20 Opened: 10/15/20 By: BR Unloaded: 10/15/20 By: BR

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
4. Was a Temperature Blank present in cooler? NA Y N If yes, notate the temperature in the appropriate column below:
   If no, take the temperature of a representative sample bottle contained within the cooler; notate in the column "Sample Temp":
5. Were samples received within the method specified temperature ranges? NA Y N
   If no, were they received on ice and same day as collected? If not, notate the cooler # below and notify the PM. NA Y N

If applicable, tissue samples were received: *Frozen* *Partially Thawed* *Thawed*

Temp Blank	Sample Temp	IR Gun	Cooler #/COC ID / NA	Out of temp indicate with "X"	PM Notified If out of temp	Tracking Number NA	Filed
1.4	—	1001	14936	—	—	189188815529	

6. Packing material: *Inserts* *Baggies* *Bubble Wrap* *Gel Packs* *Wet Ice* *Dry Ice* *Sleeves* _____
7. Were custody papers properly filled out (ink, signed, etc.)? NA Y N
8. Were samples received in good condition (unbroken) NA Y N
9. Were all sample labels complete (ie, analysis, preservation, etc.)? NA Y N
10. Did all sample labels and tags agree with custody papers? NA Y N
11. Were appropriate bottles/containers and volumes received for the tests indicated? NA Y N
12. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* NA Y N
13. Were VOA vials received without headspace? *Indicate in the table below.* NA Y N
14. Was C12/Res negative? NA Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

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

Notes, Discrepancies, Resolutions: RUSH

RIGHT SOLUTIONS | RIGHT PARTNER

General Chemistry

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	K2009347
Project:	ALS Houston DOD TOC/HS20100719	**Date Collected:**	10/13/20
Sample Matrix:	Ground Water	**Date Received:**	10/15/20
Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA

Carbon, Total Organic

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
16WW36-201013	K2009347-001	**18.3**	0.50	0.20	0.07	1	10/23/20 18:00	
16WW35-201013	K2009347-002	**65.5**	2.5	1.0	0.4	5	10/23/20 18:00	
16IW09-201013	K2009347-003	**1250**	50	20	7	100	10/26/20 10:05	
16WW55-201013	K2009347-004	**4.98**	0.50	0.20	0.07	1	10/23/20 18:00	
16IW03-201013	K2009347-005	**1190**	13	5	2	25	10/16/20 08:40	
16IW10-201013	K2009347-006	**1220**	13	5	2	25	10/16/20 08:40	
Method Blank	K2009347-MB1	ND U	0.50	0.20	0.07	1	10/16/20 08:40	
Method Blank	K2009347-MB2	ND U	0.50	0.20	0.07	1	10/23/20 18:00	
Method Blank	K2009347-MB3	ND U	0.50	0.20	0.07	1	10/26/20 10:05	

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K2009347
Project:	ALS Houston DOD TOC/HS20100719	**Date Collected:**	10/13/20
Sample Matrix:	Ground Water	**Date Received:**	10/15/20
		Date Analyzed:	10/23/20
		Date Extracted:	NA

Matrix Spike Summary
Carbon, Total Organic

Sample Name:	16WW55-201013	**Units:**	mg/L
Lab Code:	K2009347-004	**Basis:**	NA
Analysis Method:	SM 5310 C		
Prep Method:	None		

Matrix Spike
K2009347-004MS

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Carbon, Total Organic	4.98	27.6	25.0	91	83-117

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

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

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

Matrix Spike and Matrix Spike Duplicate Data is presented for information purposes only. The matrix may or may not be relevant to samples reported in this report. The laboratory evaluates system performance based on the LCS and LCSD control limits.

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K2009347
Project:	ALS Houston DOD TOC/HS20100719	**Date Collected:**	10/13/20
Sample Matrix:	Ground Water	**Date Received:**	10/15/20
		Date Analyzed:	10/16/20
		Date Extracted:	NA

Matrix Spike Summary
Carbon, Total Organic

Sample Name:	16IW03-201013	**Units:**	mg/L
Lab Code:	K2009347-005	**Basis:**	NA
Analysis Method:	SM 5310 C		
Prep Method:	None		

Matrix Spike
K2009347-005MS

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Carbon, Total Organic	1190	3710	2500	101	83-117

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

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

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

Matrix Spike and Matrix Spike Duplicate Data is presented for information purposes only. The matrix may or may not be relevant to samples reported in this report. The laboratory evaluates system performance based on the LCS and LCSD control limits.

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K2009347
Project:	ALS Houston DOD TOC/HS20100719	**Date Analyzed:**	10/23/20
Sample Matrix:	Ground Water	**Date Extracted:**	NA

Duplicate Lab Control Sample Summary
General Chemistry Parameters

Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA
		Analysis Lot:	700289

	Lab Control Sample K2009347-LCS1			Duplicate Lab Control Sample K2009347-DLCS1					
Analyte Name	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Carbon, Total Organic	24.5	25.0	98	24.2	25.0	97	83-117	1	10

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K2009347
Project:	ALS Houston DOD TOC/HS20100719	**Date Analyzed:**	10/26/20
Sample Matrix:	Ground Water	**Date Extracted:**	NA

Duplicate Lab Control Sample Summary
General Chemistry Parameters

Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA
		Analysis Lot:	701294

	Lab Control Sample K2009347-LCS2			Duplicate Lab Control Sample K2009347-DLCS2					
Analyte Name	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Carbon, Total Organic	23.9	25.0	96	23.8	25.0	95	83-117	<1	10

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K2009347
Project:	ALS Houston DOD TOC/HS20100719	**Date Analyzed:**	10/16/20
Sample Matrix:	Ground Water	**Date Extracted:**	NA

Lab Control Sample Summary
General Chemistry Parameters

Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA
		Analysis Lot:	699680

Lab Control Sample
K2009347-LCS3

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Carbon, Total Organic	24.5	25.0	98	83-117

RIGHT SOLUTIONS | RIGHT PARTNER

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

October 29, 2020

Susan Huang
Aptim Environmental & Infrastucture, Inc.
2500 City West Blvd., Suite 1700
Houston, TX 77042

Work Order: **HS20100779**

Laboratory Results for: **LHAAP 16 October 2020**

Dear Susan Huang,

ALS Environmental received 10 sample(s) on Oct 15, 2020 for the analysis presented in the following report.

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

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

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

Sincerely,

Generated By: JUMOKE.LAWAL

RJ Modashia
Project Manager

ALS Houston, US Date: 29-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
Work Order: HS20100779

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS20100779-01	16WW25-201014	Groundwater		14-Oct-2020 07:40	15-Oct-2020 09:10	☐
HS20100779-02	16WW26-201014	Groundwater		14-Oct-2020 08:25	15-Oct-2020 09:10	☐
HS20100779-03	16WW30-201014	Groundwater		14-Oct-2020 09:20	15-Oct-2020 09:10	☐
HS20100779-04	16WW29-201014	Groundwater		14-Oct-2020 10:05	15-Oct-2020 09:10	☐
HS20100779-05	16WW22-201014	Groundwater		14-Oct-2020 10:55	15-Oct-2020 09:10	☐
HS20100779-06	16WW41-201014	Groundwater		14-Oct-2020 11:45	15-Oct-2020 09:10	☐
HS20100779-07	16WW21-201014	Groundwater		14-Oct-2020 12:35	15-Oct-2020 09:10	☐
HS20100779-08	16WW21-201014-FD	Groundwater		14-Oct-2020 12:35	15-Oct-2020 09:10	☐
HS20100779-09	16WW39-201014	Groundwater		14-Oct-2020 13:25	15-Oct-2020 09:10	☐
HS20100779-10	Trip Blank	Water	CG 090120 -189	14-Oct-2020 00:00	15-Oct-2020 09:10	☐

ALS Houston, US Date: 29-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
Work Order: HS20100779

CASE NARRATIVE

Work Order Comments

- Analysis of Perchlorate was performed by ALS Houston TX, High Resolution. Laboratory. Final report attached.

  The analysis for TOC was subcontracted to ALS Environmental in Kelso WA. Final report attached.

GC Semivolatiles by Method RSK-175

Batch ID: R371090

Sample ID: HS20100719-05MS

- MS and MSD are for an unrelated sample

GCMS Volatiles by Method SW8260

Batch ID: R371099

Sample ID: 16WW26-201014 (HS20100779-02)

- 4-Bromofluorobenzene (Surrogate) and Toluene-d8 (Surrogate) exceeded recovery limit, compounds reported are not associated with these surrogates

Sample ID: 16WW39-201014 (HS20100779-09)

- Toluene-d8 (Surrogate) exceeded recovery limits. Compounds reported are not associated with this surrogate.

Sample ID: CCV-END

- Closing CCV exceeded %D recovery limits for some compounds.

Sample ID: HS20100714-01MS

- MS and MSD are for an unrelated sample

Batch ID: R371372

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

WetChemistry by Method SW9056

Batch ID: R371570

Sample ID: 16WW39-201014 (HS20100779-09)

- Sample ran at 2x due to high concentration of Chloride

Batch ID: R370723

Sample ID: 16WW25-201014 (HS20100779-01)

- Sample ran at 5X due to high concentration of Sulfate

Sample ID: 16WW29-201014 (HS20100779-04)

- Sample ran at 2X due to high concentration of Sulfate

Sample ID: 16WW41-201014 (HS20100779-06)

- Sample ran at 5X due to high concentration of Sulfate

ALS Houston, US Date: 29-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
Work Order: HS20100779

CASE NARRATIVE

WetChemistry by Method SW9056

Batch ID: R371460

Sample ID: 16WW26-201014 (HS20100779-02MS)

- The recovery of the Matrix Spike (MS) and/or Matrix Spike Duplicate (MSD) associated with this analyte was outside of the established control limits. However, the LCS was within control limits. The recovery of the MS/MSD may be due to sample matrix interference. (Sulfate)

WetChemistry by Method SM2320B

Batch ID: R370718

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

ALS Houston, US Date: 29-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
Sample ID: 16WW25-201014
Collection Date: 14-Oct-2020 07:40

ANALYTICAL REPORT
WorkOrder:HS20100779
Lab ID:HS20100779-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	UG/L	1	26-Oct-2020 18:50
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	26-Oct-2020 18:50
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	26-Oct-2020 18:50
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	26-Oct-2020 18:50
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	26-Oct-2020 18:50
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	26-Oct-2020 18:50
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	26-Oct-2020 18:50
Surr: 1,2-Dichloroethane-d4	*86.8*			**0**	*81-118*	*%REC*	*1*	*26-Oct-2020 18:50*
Surr: 4-Bromofluorobenzene	*86.2*			**0**	*85-114*	*%REC*	*1*	*26-Oct-2020 18:50*
Surr: Dibromofluoromethane	*89.3*			**0**	*80-119*	*%REC*	*1*	*26-Oct-2020 18:50*
Surr: Toluene-d8	*101*			**0**	*89-112*	*%REC*	*1*	*26-Oct-2020 18:50*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PVL
Ethane	0.000250	U	0.000144	0.000250	0.00100	mg/L	1	21-Oct-2020 11:10
Ethene	0.000500	U	0.000234	0.000500	0.00100	mg/L	1	21-Oct-2020 11:10
Methane	**0.0153**		**0.000107**	**0.000250**	**0.000500**	**mg/L**	1	21-Oct-2020 11:10
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: TH
Alkalinity, Total (As CaCO3)	**52.7**	a	**5.00**	**5.00**	**5.00**	**mg/L**	1	16-Oct-2020 21:21
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**2.11**		**0.150**	**0.500**	**0.500**	**mg/L**	5	15-Oct-2020 22:58
Nitrogen, Nitrate (As N)	0.500	U	0.150	0.500	0.500	mg/L	5	15-Oct-2020 22:58
Sulfate	**5,270**		**40.0**	**100**	**100**	**mg/L**	200	28-Oct-2020 05:51
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	22-Oct-2020 13:19
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	23-Oct-2020 09:16

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

ALS Houston, US Date: 29-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
Sample ID: 16WW26-201014
Collection Date: 14-Oct-2020 08:25

ANALYTICAL REPORT
WorkOrder:HS20100779
Lab ID:HS20100779-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	22-Oct-2020 18:37
1,1-Dichloroethene	**2.5**		**0.20**	**0.50**	**1.0**	**UG/L**	1	22-Oct-2020 18:37
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	22-Oct-2020 18:37
cis-1,2-Dichloroethene	**78**		**0.20**	**0.50**	**1.0**	**UG/L**	1	22-Oct-2020 18:37
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	22-Oct-2020 18:37
Trichloroethene	**850**		**2.0**	**5.0**	**10**	**UG/L**	10	22-Oct-2020 18:58
Vinyl chloride	**1.9**		**0.20**	**0.50**	**1.0**	**UG/L**	1	22-Oct-2020 18:37
Surr: 1,2-Dichloroethane-d4	*105*			**0**	*81-118*	*%REC*	*1*	*22-Oct-2020 18:37*
Surr: 1,2-Dichloroethane-d4	*86.0*			**0**	*81-118*	*%REC*	*10*	*22-Oct-2020 18:58*
Surr: 4-Bromofluorobenzene	*85.9*			**0**	*85-114*	*%REC*	*1*	*22-Oct-2020 18:37*
Surr: 4-Bromofluorobenzene	*123*	*S*		**0**	*85-114*	*%REC*	*10*	*22-Oct-2020 18:58*
Surr: Dibromofluoromethane	*96.0*			**0**	*80-119*	*%REC*	*1*	*22-Oct-2020 18:37*
Surr: Dibromofluoromethane	*101*			**0**	*80-119*	*%REC*	*10*	*22-Oct-2020 18:58*
Surr: Toluene-d8	*99.6*			**0**	*89-112*	*%REC*	*1*	*22-Oct-2020 18:37*
Surr: Toluene-d8	*132*	*S*		**0**	*89-112*	*%REC*	*10*	*22-Oct-2020 18:58*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PVL
Ethane	0.000250	U	0.000144	0.000250	0.00100	mg/L	1	21-Oct-2020 11:51
Ethene	0.000500	U	0.000234	0.000500	0.00100	mg/L	1	21-Oct-2020 11:51
Methane	**0.00450**		**0.000107**	**0.000250**	**0.000500**	**mg/L**	1	21-Oct-2020 11:51
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: TH
Alkalinity, Total (As CaCO3)	**38.4**	a	**5.00**	**5.00**	**5.00**	**mg/L**	1	16-Oct-2020 21:26
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**0.638**		**0.0300**	**0.100**	**0.100**	**mg/L**	1	15-Oct-2020 23:52
Nitrogen, Nitrate (As N)	0.100	U	0.0300	0.100	0.100	mg/L	1	15-Oct-2020 23:52
Sulfate	**375**		**2.00**	**5.00**	**5.00**	**mg/L**	10	28-Oct-2020 06:45
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	22-Oct-2020 13:19
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	23-Oct-2020 09:16

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

ALS Houston, US Date: 29-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
Sample ID: 16WW30-201014
Collection Date: 14-Oct-2020 09:20

ANALYTICAL REPORT
WorkOrder:HS20100779
Lab ID:HS20100779-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	22-Oct-2020 16:31
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	22-Oct-2020 16:31
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	22-Oct-2020 16:31
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	22-Oct-2020 16:31
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	22-Oct-2020 16:31
Trichloroethene	**5.7**		**0.20**	**0.50**	**1.0**	**UG/L**	1	22-Oct-2020 16:31
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	22-Oct-2020 16:31
Surr: 1,2-Dichloroethane-d4	*110*			**0**	*81-118*	*%REC*	*1*	*22-Oct-2020 16:31*
Surr: 4-Bromofluorobenzene	*98.8*			**0**	*85-114*	*%REC*	*1*	*22-Oct-2020 16:31*
Surr: Dibromofluoromethane	*86.1*			**0**	*80-119*	*%REC*	*1*	*22-Oct-2020 16:31*
Surr: Toluene-d8	*93.3*			**0**	*89-112*	*%REC*	*1*	*22-Oct-2020 16:31*
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**3.56**		**0.0300**	**0.100**	**0.100**	**mg/L**	1	29-Oct-2020 09:22
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	22-Oct-2020 13:19
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	23-Oct-2020 09:16

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

ALS Houston, US Date: 29-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
Sample ID: 16WW29-201014
Collection Date: 14-Oct-2020 10:05

ANALYTICAL REPORT
WorkOrder:HS20100779
Lab ID:HS20100779-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	22-Oct-2020 16:52
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	22-Oct-2020 16:52
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	22-Oct-2020 16:52
cis-1,2-Dichloroethene	**1.1**		**0.20**	**0.50**	**1.0**	**UG/L**	1	22-Oct-2020 16:52
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	22-Oct-2020 16:52
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	22-Oct-2020 16:52
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	22-Oct-2020 16:52
Surr: 1,2-Dichloroethane-d4	*108*			**0**	*81-118*	*%REC*	*1*	*22-Oct-2020 16:52*
Surr: 4-Bromofluorobenzene	*111*			**0**	*85-114*	*%REC*	*1*	*22-Oct-2020 16:52*
Surr: Dibromofluoromethane	*91.8*			**0**	*80-119*	*%REC*	*1*	*22-Oct-2020 16:52*
Surr: Toluene-d8	*112*			**0**	*89-112*	*%REC*	*1*	*22-Oct-2020 16:52*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PVL
Ethane	0.000250	U	0.000144	0.000250	0.00100	mg/L	1	21-Oct-2020 12:11
Ethene	**0.00113**		**0.000234**	**0.000500**	**0.00100**	**mg/L**	1	21-Oct-2020 12:11
Methane	**0.0153**		**0.000107**	**0.000250**	**0.000500**	**mg/L**	1	21-Oct-2020 12:11
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: TH
Alkalinity, Total (As CaCO3)	**71.8**	a	**5.00**	**5.00**	**5.00**	**mg/L**	1	16-Oct-2020 21:32
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**1.37**		**0.0600**	**0.200**	**0.200**	**mg/L**	2	16-Oct-2020 00:10
Nitrogen, Nitrate (As N)	0.200	U	0.0600	0.200	0.200	mg/L	2	16-Oct-2020 00:10
Sulfate	**1,200**		**20.0**	**50.0**	**50.0**	**mg/L**	100	28-Oct-2020 07:39
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	22-Oct-2020 13:19
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	23-Oct-2020 09:16

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

ALS Houston, US Date: 29-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
Sample ID: 16WW22-201014
Collection Date: 14-Oct-2020 10:55

ANALYTICAL REPORT
WorkOrder:HS20100779
Lab ID:HS20100779-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	UG/L	1	22-Oct-2020 17:13
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	22-Oct-2020 17:13
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	22-Oct-2020 17:13
cis-1,2-Dichloroethene	**3.0**		**0.20**	**0.50**	**1.0**	**UG/L**	1	22-Oct-2020 17:13
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	22-Oct-2020 17:13
Trichloroethene	**7.8**		**0.20**	**0.50**	**1.0**	**UG/L**	1	22-Oct-2020 17:13
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	22-Oct-2020 17:13
Surr: 1,2-Dichloroethane-d4	*109*			**0**	*81-118*	*%REC*	*1*	*22-Oct-2020 17:13*
Surr: 4-Bromofluorobenzene	*85.2*			**0**	*85-114*	*%REC*	*1*	*22-Oct-2020 17:13*
Surr: Dibromofluoromethane	*90.8*			**0**	*80-119*	*%REC*	*1*	*22-Oct-2020 17:13*
Surr: Toluene-d8	*108*			**0**	*89-112*	*%REC*	*1*	*22-Oct-2020 17:13*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PVL
Ethane	0.000250	U	0.000144	0.000250	0.00100	mg/L	1	21-Oct-2020 12:19
Ethene	0.000500	U	0.000234	0.000500	0.00100	mg/L	1	21-Oct-2020 12:19
Methane	**0.00204**		**0.000107**	**0.000250**	**0.000500**	**mg/L**	1	21-Oct-2020 12:19
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: TH
Alkalinity, Total (As CaCO3)	**183**	a	**5.00**	**5.00**	**5.00**	**mg/L**	1	16-Oct-2020 21:38
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**5.26**		**0.0300**	**0.100**	**0.100**	**mg/L**	1	16-Oct-2020 00:46
Nitrogen, Nitrate (As N)	0.100	U	0.0300	0.100	0.100	mg/L	1	16-Oct-2020 00:46
Sulfate	**163**		**2.00**	**5.00**	**5.00**	**mg/L**	10	28-Oct-2020 07:57
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	22-Oct-2020 13:19
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	23-Oct-2020 09:16

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

ALS Houston, US Date: 29-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
Sample ID: 16WW41-201014
Collection Date: 14-Oct-2020 11:45

ANALYTICAL REPORT
WorkOrder:HS20100779
Lab ID:HS20100779-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	5.0	U	3.0	5.0	10	UG/L	10	26-Oct-2020 19:32
1,1-Dichloroethene	**17**		**2.0**	**5.0**	**10**	**UG/L**	10	26-Oct-2020 19:32
1,2-Dichloroethane	**5.7**	J	**2.0**	**5.0**	**10**	**UG/L**	10	26-Oct-2020 19:32
cis-1,2-Dichloroethene	**2,400**		**20**	**50**	**100**	**UG/L**	100	26-Oct-2020 19:53
Methylene chloride	10	U	4.0	10	20	UG/L	10	26-Oct-2020 19:32
Trichloroethene	**5,400**		**20**	**50**	**100**	**UG/L**	100	26-Oct-2020 19:53
Vinyl chloride	**230**		**2.0**	**5.0**	**10**	**UG/L**	10	26-Oct-2020 19:32
Surr: 1,2-Dichloroethane-d4	*86.2*			**0**	*81-118*	*%REC*	*10*	*26-Oct-2020 19:32*
Surr: 1,2-Dichloroethane-d4	*82.1*			**0**	*81-118*	*%REC*	*100*	*26-Oct-2020 19:53*
Surr: 4-Bromofluorobenzene	*86.8*			**0**	*85-114*	*%REC*	*100*	*26-Oct-2020 19:53*
Surr: 4-Bromofluorobenzene	*85.9*			**0**	*85-114*	*%REC*	*10*	*26-Oct-2020 19:32*
Surr: Dibromofluoromethane	*89.5*			**0**	*80-119*	*%REC*	*10*	*26-Oct-2020 19:32*
Surr: Dibromofluoromethane	*84.4*			**0**	*80-119*	*%REC*	*100*	*26-Oct-2020 19:53*
Surr: Toluene-d8	*101*			**0**	*89-112*	*%REC*	*100*	*26-Oct-2020 19:53*
Surr: Toluene-d8	*98.2*			**0**	*89-112*	*%REC*	*10*	*26-Oct-2020 19:32*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PVL
Ethane	0.000250	U	0.000144	0.000250	0.00100	mg/L	1	21-Oct-2020 12:27
Ethene	**0.0107**		**0.000234**	**0.000500**	**0.00100**	**mg/L**	1	21-Oct-2020 12:27
Methane	**0.0145**		**0.000107**	**0.000250**	**0.000500**	**mg/L**	1	21-Oct-2020 12:27
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: TH
Alkalinity, Total (As CaCO3)	**1,000**	a	**5.00**	**5.00**	**5.00**	**mg/L**	1	16-Oct-2020 21:46
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	0.500	U	0.150	0.500	0.500	mg/L	5	16-Oct-2020 01:04
Nitrogen, Nitrate (As N)	0.500	U	0.150	0.500	0.500	mg/L	5	16-Oct-2020 01:04
Sulfate	**9,220**		**40.0**	**100**	**100**	**mg/L**	200	28-Oct-2020 08:15
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	22-Oct-2020 13:19
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	23-Oct-2020 09:16

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

ALS Houston, US Date: 29-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
Sample ID: 16WW21-201014
Collection Date: 14-Oct-2020 12:35

ANALYTICAL REPORT
WorkOrder:HS20100779
Lab ID:HS20100779-07
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	22-Oct-2020 17:34
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	22-Oct-2020 17:34
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	22-Oct-2020 17:34
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	22-Oct-2020 17:34
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	22-Oct-2020 17:34
Trichloroethene	**1.5**		**0.20**	**0.50**	**1.0**	**UG/L**	1	22-Oct-2020 17:34
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	22-Oct-2020 17:34
Surr: 1,2-Dichloroethane-d4	*108*			**0**	*81-118*	*%REC*	*1*	*22-Oct-2020 17:34*
Surr: 4-Bromofluorobenzene	*103*			**0**	*85-114*	*%REC*	*1*	*22-Oct-2020 17:34*
Surr: Dibromofluoromethane	*96.3*			**0**	*80-119*	*%REC*	*1*	*22-Oct-2020 17:34*
Surr: Toluene-d8	*101*			**0**	*89-112*	*%REC*	*1*	*22-Oct-2020 17:34*
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**0.864**		**0.0300**	**0.100**	**0.100**	**mg/L**	1	29-Oct-2020 09:40
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	22-Oct-2020 13:19
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	23-Oct-2020 09:16

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

ALS Houston, US Date: 29-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
Sample ID: 16WW21-201014-FD
Collection Date: 14-Oct-2020 12:35

ANALYTICAL REPORT
WorkOrder:HS20100779
Lab ID:HS20100779-08
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	26-Oct-2020 19:11
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	26-Oct-2020 19:11
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	26-Oct-2020 19:11
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	26-Oct-2020 19:11
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	26-Oct-2020 19:11
Trichloroethene	**1.9**		**0.20**	**0.50**	**1.0**	**UG/L**	1	26-Oct-2020 19:11
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	26-Oct-2020 19:11
Surr: 1,2-Dichloroethane-d4	*85.1*			**0**	*81-118*	*%REC*	*1*	*26-Oct-2020 19:11*
Surr: 4-Bromofluorobenzene	*87.8*			**0**	*85-114*	*%REC*	*1*	*26-Oct-2020 19:11*
Surr: Dibromofluoromethane	*85.7*			**0**	*80-119*	*%REC*	*1*	*26-Oct-2020 19:11*
Surr: Toluene-d8	*99.0*			**0**	*89-112*	*%REC*	*1*	*26-Oct-2020 19:11*
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**0.895**		**0.0300**	**0.100**	**0.100**	**mg/L**	1	29-Oct-2020 09:58
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	22-Oct-2020 13:19
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	23-Oct-2020 09:16

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

ALS Houston, US Date: 29-Oct-20

Client:	Aptim Environmental & Infrastucture, Inc.	**ANALYTICAL REPORT**
Project:	LHAAP 16 October 2020	WorkOrder:HS20100779
Sample ID:	16WW39-201014	Lab ID:HS20100779-09
Collection Date:	14-Oct-2020 13:25	Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	UG/L	1	22-Oct-2020 19:19
1,1-Dichloroethene	**1.7**		**0.20**	**0.50**	**1.0**	**UG/L**	1	22-Oct-2020 19:19
1,2-Dichloroethane	**1.3**		**0.20**	**0.50**	**1.0**	**UG/L**	1	22-Oct-2020 19:19
cis-1,2-Dichloroethene	**73**		**0.20**	**0.50**	**1.0**	**UG/L**	1	22-Oct-2020 19:19
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	22-Oct-2020 19:19
Trichloroethene	**350**		**2.0**	**5.0**	**10**	**UG/L**	10	22-Oct-2020 19:40
Vinyl chloride	**5.0**		**0.20**	**0.50**	**1.0**	**UG/L**	1	22-Oct-2020 19:19
Surr: 1,2-Dichloroethane-d4	*92.5*			**0**	*81-118*	*%REC*	*1*	*22-Oct-2020 19:19*
Surr: 1,2-Dichloroethane-d4	*98.0*			**0**	*81-118*	*%REC*	*10*	*22-Oct-2020 19:40*
Surr: 4-Bromofluorobenzene	*107*			**0**	*85-114*	*%REC*	*1*	*22-Oct-2020 19:19*
Surr: 4-Bromofluorobenzene	*113*			**0**	*85-114*	*%REC*	*10*	*22-Oct-2020 19:40*
Surr: Dibromofluoromethane	*89.1*			**0**	*80-119*	*%REC*	*1*	*22-Oct-2020 19:19*
Surr: Dibromofluoromethane	*99.8*			**0**	*80-119*	*%REC*	*10*	*22-Oct-2020 19:40*
Surr: Toluene-d8	*89.5*			**0**	*89-112*	*%REC*	*1*	*22-Oct-2020 19:19*
Surr: Toluene-d8	*118*	*S*		**0**	*89-112*	*%REC*	*10*	*22-Oct-2020 19:40*
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**7.90**		**0.0600**	**0.200**	**0.200**	**mg/L**	2	29-Oct-2020 10:16
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	22-Oct-2020 13:19
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	23-Oct-2020 09:16

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

ALS Houston, US Date: 29-Oct-20

Client:	Aptim Environmental & Infrastucture, Inc.	**ANALYTICAL REPORT**
Project:	LHAAP 16 October 2020	WorkOrder:HS20100779
Sample ID:	Trip Blank	Lab ID:HS20100779-10
Collection Date:	14-Oct-2020 00:00	Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	UG/L	1	26-Oct-2020 18:29
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	26-Oct-2020 18:29
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	26-Oct-2020 18:29
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	26-Oct-2020 18:29
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	26-Oct-2020 18:29
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	26-Oct-2020 18:29
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	26-Oct-2020 18:29
Surr: 1,2-Dichloroethane-d4	*84.6*			**0**	*81-118*	*%REC*	*1*	*26-Oct-2020 18:29*
Surr: 4-Bromofluorobenzene	*85.7*			**0**	*85-114*	*%REC*	*1*	*26-Oct-2020 18:29*
Surr: Dibromofluoromethane	*86.0*			**0**	*80-119*	*%REC*	*1*	*26-Oct-2020 18:29*
Surr: Toluene-d8	*96.7*			**0**	*89-112*	*%REC*	*1*	*26-Oct-2020 18:29*

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

ALS Houston, US Date: 29-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
WorkOrder: HS20100779

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R370718 (0)	**Test Name :** ALKALINITY BY SM2320B				**Matrix:** Groundwater	
HS20100779-01	16WW25-201014	14 Oct 2020 07:40			16 Oct 2020 21:21	1
HS20100779-02	16WW26-201014	14 Oct 2020 08:25			16 Oct 2020 21:26	1
HS20100779-04	16WW29-201014	14 Oct 2020 10:05			16 Oct 2020 21:32	1
HS20100779-05	16WW22-201014	14 Oct 2020 10:55			16 Oct 2020 21:38	1
HS20100779-06	16WW41-201014	14 Oct 2020 11:45			16 Oct 2020 21:46	1
Batch ID: R370723 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Groundwater	
HS20100779-01	16WW25-201014	14 Oct 2020 07:40			15 Oct 2020 22:58	5
HS20100779-02	16WW26-201014	14 Oct 2020 08:25			15 Oct 2020 23:52	1
HS20100779-04	16WW29-201014	14 Oct 2020 10:05			16 Oct 2020 00:10	2
HS20100779-05	16WW22-201014	14 Oct 2020 10:55			16 Oct 2020 00:46	1
HS20100779-06	16WW41-201014	14 Oct 2020 11:45			16 Oct 2020 01:04	5
Batch ID: R371062 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** Groundwater	
HS20100779-01	16WW25-201014	14 Oct 2020 07:40			22 Oct 2020 13:19	1
HS20100779-02	16WW26-201014	14 Oct 2020 08:25			22 Oct 2020 13:19	1
HS20100779-03	16WW30-201014	14 Oct 2020 09:20			22 Oct 2020 13:19	1
HS20100779-04	16WW29-201014	14 Oct 2020 10:05			22 Oct 2020 13:19	1
HS20100779-05	16WW22-201014	14 Oct 2020 10:55			22 Oct 2020 13:19	1
HS20100779-06	16WW41-201014	14 Oct 2020 11:45			22 Oct 2020 13:19	1
HS20100779-07	16WW21-201014	14 Oct 2020 12:35			22 Oct 2020 13:19	1
HS20100779-08	16WW21-201014-FD	14 Oct 2020 12:35			22 Oct 2020 13:19	1
HS20100779-09	16WW39-201014	14 Oct 2020 13:25			22 Oct 2020 13:19	1
Batch ID: R371090 (0)	**Test Name :** DISSOLVED GASES BY RSK-175				**Matrix:** Groundwater	
HS20100779-01	16WW25-201014	14 Oct 2020 07:40			21 Oct 2020 11:10	1
HS20100779-02	16WW26-201014	14 Oct 2020 08:25			21 Oct 2020 11:51	1
HS20100779-04	16WW29-201014	14 Oct 2020 10:05			21 Oct 2020 12:11	1
HS20100779-05	16WW22-201014	14 Oct 2020 10:55			21 Oct 2020 12:19	1
HS20100779-06	16WW41-201014	14 Oct 2020 11:45			21 Oct 2020 12:27	1
Batch ID: R371099 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS20100779-02	16WW26-201014	14 Oct 2020 08:25			22 Oct 2020 18:58	10
HS20100779-02	16WW26-201014	14 Oct 2020 08:25			22 Oct 2020 18:37	1
HS20100779-03	16WW30-201014	14 Oct 2020 09:20			22 Oct 2020 16:31	1
HS20100779-04	16WW29-201014	14 Oct 2020 10:05			22 Oct 2020 16:52	1
HS20100779-05	16WW22-201014	14 Oct 2020 10:55			22 Oct 2020 17:13	1
HS20100779-07	16WW21-201014	14 Oct 2020 12:35			22 Oct 2020 17:34	1
HS20100779-09	16WW39-201014	14 Oct 2020 13:25			22 Oct 2020 19:40	10
HS20100779-09	16WW39-201014	14 Oct 2020 13:25			22 Oct 2020 19:19	1

ALS Houston, US Date: 29-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
WorkOrder: HS20100779

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R371124 (0)	**Test Name :** SUBCONTRACT ANALYSIS - TOC ANALYSIS				**Matrix:** Groundwater	
HS20100779-01	16WW25-201014	14 Oct 2020 07:40			23 Oct 2020 09:16	1
HS20100779-02	16WW26-201014	14 Oct 2020 08:25			23 Oct 2020 09:16	1
HS20100779-03	16WW30-201014	14 Oct 2020 09:20			23 Oct 2020 09:16	1
HS20100779-04	16WW29-201014	14 Oct 2020 10:05			23 Oct 2020 09:16	1
HS20100779-05	16WW22-201014	14 Oct 2020 10:55			23 Oct 2020 09:16	1
HS20100779-06	16WW41-201014	14 Oct 2020 11:45			23 Oct 2020 09:16	1
HS20100779-07	16WW21-201014	14 Oct 2020 12:35			23 Oct 2020 09:16	1
HS20100779-08	16WW21-201014-FD	14 Oct 2020 12:35			23 Oct 2020 09:16	1
HS20100779-09	16WW39-201014	14 Oct 2020 13:25			23 Oct 2020 09:16	1
Batch ID: R371372 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS20100779-10	Trip Blank	14 Oct 2020 00:00			26 Oct 2020 18:29	1
Batch ID: R371372 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS20100779-01	16WW25-201014	14 Oct 2020 07:40			26 Oct 2020 18:50	1
HS20100779-06	16WW41-201014	14 Oct 2020 11:45			26 Oct 2020 19:53	100
HS20100779-06	16WW41-201014	14 Oct 2020 11:45			26 Oct 2020 19:32	10
HS20100779-08	16WW21-201014-FD	14 Oct 2020 12:35			26 Oct 2020 19:11	1
Batch ID: R371460 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Groundwater	
HS20100779-01	16WW25-201014	14 Oct 2020 07:40			28 Oct 2020 05:51	200
HS20100779-02	16WW26-201014	14 Oct 2020 08:25			28 Oct 2020 06:45	10
HS20100779-04	16WW29-201014	14 Oct 2020 10:05			28 Oct 2020 07:39	100
HS20100779-05	16WW22-201014	14 Oct 2020 10:55			28 Oct 2020 07:57	10
HS20100779-06	16WW41-201014	14 Oct 2020 11:45			28 Oct 2020 08:15	200
Batch ID: R371570 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Groundwater	
HS20100779-03	16WW30-201014	14 Oct 2020 09:20			29 Oct 2020 09:22	1
HS20100779-07	16WW21-201014	14 Oct 2020 12:35			29 Oct 2020 09:40	1
HS20100779-08	16WW21-201014-FD	14 Oct 2020 12:35			29 Oct 2020 09:58	1
HS20100779-09	16WW39-201014	14 Oct 2020 13:25			29 Oct 2020 10:16	2

ALS Houston, US Date: 29-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
WorkOrder: HS20100779

QC BATCH REPORT

Batch ID: R371090 (0) **Instrument:** FID-4 **Method:** DISSOLVED GASES BY RSK-175

MBLK Sample ID: **MBLK-201021** Units: **mg/L** Analysis Date: **21-Oct-2020 10:07**
Client ID: Run ID: **FID-4_371090** SeqNo: **5795268** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.000250	0.00100								U
Ethene	0.000500	0.00100								U
Methane	0.000250	0.000500								U

LCS Sample ID: **LCS-201021** Units: **mg/L** Analysis Date: **21-Oct-2020 10:14**
Client ID: Run ID: **FID-4_371090** SeqNo: **5795269** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0191	0.00100	0.01804	0	106	75 - 125				
Ethene	0.0193	0.00100	0.0168	0	115	75 - 125				
Methane	0.00952	0.000500	0.009647	0	98.7	75 - 125				

LCSD Sample ID: **LCSD-201021** Units: **mg/L** Analysis Date: **21-Oct-2020 10:25**
Client ID: Run ID: **FID-4_371090** SeqNo: **5795270** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0188	0.00100	0.01804	0	104	75 - 125	0.01912	1.54	30	
Ethene	0.0189	0.00100	0.0168	0	112	75 - 125	0.01928	2.21	30	
Methane	0.00950	0.000500	0.009647	0	98.5	75 - 125	0.009521	0.194	30	

MS Sample ID: **HS20100719-05MS** Units: **mg/L** Analysis Date: **21-Oct-2020 15:33**
Client ID: Run ID: **FID-4_371090** SeqNo: **5795290** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0282	0.00100	0.01804	0.004980	129	75 - 125				S
Ethene	0.101	0.00100	0.0168	0.05770	260	75 - 125				SE
Methane	0.791	0.000500	0.009647	0.7829	84.8	75 - 125				EO

ALS Houston, US Date: 29-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
WorkOrder: HS20100779

QC BATCH REPORT

Batch ID: R371090 (0) **Instrument:** FID-4 **Method:** DISSOLVED GASES BY RSK-175

MSD Sample ID: **HS20100719-05MSD** Units: **mg/L** Analysis Date: **21-Oct-2020 15:44**
Client ID: Run ID: **FID-4_371090** SeqNo: **5795291** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0268	0.00100	0.01804	0.004980	121	75 - 125	0.02820	4.92	30	
Ethene	0.101	0.00100	0.0168	0.05770	259	75 - 125	0.1014	0.15	30	SE
Methane	0.789	0.000500	0.009647	0.7829	64.7	75 - 125	0.7911	0.245	30	SEO

DUP Sample ID: **HS20100779-01DUP** Units: **mg/L** Analysis Date: **21-Oct-2020 11:26**
Client ID: **16WW25-201014** Run ID: **FID-4_371090** SeqNo: **5795276** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.000250	0.00100					0	0	30	U
Ethene	0.000500	0.00100					0	0	30	U
Methane	0.0154	0.000500					0.01529	0.595	30	

The following samples were analyzed in this batch: HS20100779-01 HS20100779-02 HS20100779-04 HS20100779-05 HS20100779-06

ALS Houston, US Date: 29-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
WorkOrder: HS20100779

QC BATCH REPORT

Batch ID: R371099 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-201022** Units: **UG/L** Analysis Date: **22-Oct-2020 12:18**
Client ID: Run ID: **VOA6_371099** SeqNo: **5795516** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	0.50	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
Methylene chloride	1.0	2.0								U
Trichloroethene	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*44.51*	*1.0*	*50*	*0*	*89.0*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.26*	*1.0*	*50*	*0*	*101*	*85 - 114*				
Surr: Dibromofluoromethane	*45.63*	*1.0*	*50*	*0*	*91.3*	*80 - 119*				
Surr: Toluene-d8	*51.48*	*1.0*	*50*	*0*	*103*	*89 - 112*				

LCS Sample ID: **VLCSW-201022** Units: **UG/L** Analysis Date: **22-Oct-2020 11:36**
Client ID: Run ID: **VOA6_371099** SeqNo: **5795515** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	21.25	1.0	20	0	106	80 - 119				
1,1-Dichloroethene	21.92	1.0	20	0	110	71 - 131				
1,2-Dichloroethane	19.82	1.0	20	0	99.1	73 - 128				
cis-1,2-Dichloroethene	20.83	1.0	20	0	104	78 - 123				
Methylene chloride	21.07	2.0	20	0	105	74 - 124				
Trichloroethene	19.98	1.0	20	0	99.9	79 - 123				
Vinyl chloride	21.88	1.0	20	0	109	58 - 137				
Surr: 1,2-Dichloroethane-d4	*54.03*	*1.0*	*50*	*0*	*108*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*52.68*	*1.0*	*50*	*0*	*105*	*85 - 114*				
Surr: Dibromofluoromethane	*52.08*	*1.0*	*50*	*0*	*104*	*80 - 119*				
Surr: Toluene-d8	*51.08*	*1.0*	*50*	*0*	*102*	*89 - 112*				

ALS Houston, US Date: 29-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
WorkOrder: HS20100779

QC BATCH REPORT

Batch ID: R371099 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS20100714-01MS** Units: **UG/L** Analysis Date: **22-Oct-2020 14:25**
Client ID: Run ID: **VOA6_371099** SeqNo: **5795522** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	41.45	1.0	20	0	207	80 - 119				S
1,1-Dichloroethene	26.05	1.0	20	0	130	71 - 131				
1,2-Dichloroethane	27.4	1.0	20	0	137	73 - 128				S
cis-1,2-Dichloroethene	24.01	1.0	20	0	120	78 - 123				
Methylene chloride	25.13	2.0	20	0	126	74 - 124				S
Trichloroethene	24.04	1.0	20	0	120	79 - 123				
Vinyl chloride	24.56	1.0	20	0	123	58 - 137				
Surr: 1,2-Dichloroethane-d4	*45.07*	*1.0*	*50*	*0*	*90.1*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*53.32*	*1.0*	*50*	*0*	*107*	*85 - 114*				
Surr: Dibromofluoromethane	*46.99*	*1.0*	*50*	*0*	*94.0*	*80 - 119*				
Surr: Toluene-d8	*52*	*1.0*	*50*	*0*	*104*	*89 - 112*				

MSD Sample ID: **HS20100714-01MSD** Units: **UG/L** Analysis Date: **22-Oct-2020 14:46**
Client ID: Run ID: **VOA6_371099** SeqNo: **5795523** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	39.18	1.0	20	0	196	80 - 119	41.45	5.63	20	S
1,1-Dichloroethene	23.68	1.0	20	0	118	71 - 131	26.05	9.55	20	
1,2-Dichloroethane	25.85	1.0	20	0	129	73 - 128	27.4	5.83	20	S
cis-1,2-Dichloroethene	22.57	1.0	20	0	113	78 - 123	24.01	6.21	20	
Methylene chloride	22.94	2.0	20	0	115	74 - 124	25.13	9.1	20	
Trichloroethene	22.21	1.0	20	0	111	79 - 123	24.04	7.9	20	
Vinyl chloride	22.25	1.0	20	0	111	58 - 137	24.56	9.86	20	
Surr: 1,2-Dichloroethane-d4	*44.64*	*1.0*	*50*	*0*	*89.3*	*81 - 118*	*45.07*	*0.969*	*20*	
Surr: 4-Bromofluorobenzene	*53.6*	*1.0*	*50*	*0*	*107*	*85 - 114*	*53.32*	*0.523*	*20*	
Surr: Dibromofluoromethane	*46.8*	*1.0*	*50*	*0*	*93.6*	*80 - 119*	*46.99*	*0.391*	*20*	
Surr: Toluene-d8	*51.6*	*1.0*	*50*	*0*	*103*	*89 - 112*	*52*	*0.776*	*20*	

The following samples were analyzed in this batch: HS20100779-02 HS20100779-03 HS20100779-04 HS20100779-05 HS20100779-07 HS20100779-09

ALS Houston, US Date: 29-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
WorkOrder: HS20100779

QC BATCH REPORT

Batch ID: R371372 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-201026** Units: **UG/L** Analysis Date: **26-Oct-2020 12:31**
Client ID: Run ID: **VOA6_371372** SeqNo: **5801594** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	0.50	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
Methylene chloride	1.0	2.0								U
Trichloroethene	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*42.52*	*1.0*	*50*	*0*	*85.0*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*43.05*	*1.0*	*50*	*0*	*86.1*	*85 - 114*				
Surr: Dibromofluoromethane	*43.8*	*1.0*	*50*	*0*	*87.6*	*80 - 119*				
Surr: Toluene-d8	*48.64*	*1.0*	*50*	*0*	*97.3*	*89 - 112*				

LCS Sample ID: **VLCSW-201026** Units: **UG/L** Analysis Date: **26-Oct-2020 11:49**
Client ID: Run ID: **VOA6_371372** SeqNo: **5801593** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	18.09	1.0	20	0	90.4	80 - 119				
1,1-Dichloroethene	19.45	1.0	20	0	97.3	71 - 131				
1,2-Dichloroethane	20.07	1.0	20	0	100	73 - 128				
cis-1,2-Dichloroethene	19.4	1.0	20	0	97.0	78 - 123				
Methylene chloride	17.36	2.0	20	0	86.8	74 - 124				
Trichloroethene	20.44	1.0	20	0	102	79 - 123				
Vinyl chloride	19.78	1.0	20	0	98.9	58 - 137				
Surr: 1,2-Dichloroethane-d4	*51.34*	*1.0*	*50*	*0*	*103*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*46.54*	*1.0*	*50*	*0*	*93.1*	*85 - 114*				
Surr: Dibromofluoromethane	*51.39*	*1.0*	*50*	*0*	*103*	*80 - 119*				
Surr: Toluene-d8	*48.55*	*1.0*	*50*	*0*	*97.1*	*89 - 112*				

ALS Houston, US Date: 29-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
WorkOrder: HS20100779

QC BATCH REPORT

Batch ID: R371372 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS20100719-05MS** Units: **UG/L** Analysis Date: **26-Oct-2020 16:02**
Client ID: Run ID: **VOA6_371372** SeqNo: **5801601** PrepDate: DF: **200**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	4135	200	4000	0	103	80 - 119				
1,1-Dichloroethene	4884	200	4000	0	122	71 - 131				
1,2-Dichloroethane	4672	200	4000	0	117	73 - 128				
cis-1,2-Dichloroethene	15300	200	4000	10560	118	78 - 123				
Methylene chloride	3910	400	4000	0	97.7	74 - 124				
Trichloroethene	15370	200	4000	10480	122	79 - 123				
Vinyl chloride	5705	200	4000	771.5	123	58 - 137				
Surr: 1,2-Dichloroethane-d4	*8472*	*200*	*10000*	*0*	*84.7*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*8745*	*200*	*10000*	*0*	*87.5*	*85 - 114*				
Surr: Dibromofluoromethane	*8756*	*200*	*10000*	*0*	*87.6*	*80 - 119*				
Surr: Toluene-d8	*9275*	*200*	*10000*	*0*	*92.7*	*89 - 112*				

MSD Sample ID: **HS20100719-05MSD** Units: **UG/L** Analysis Date: **26-Oct-2020 16:23**
Client ID: Run ID: **VOA6_371372** SeqNo: **5801602** PrepDate: DF: **200**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	4326	200	4000	0	108	80 - 119	4135	4.52	20	
1,1-Dichloroethene	4560	200	4000	0	114	71 - 131	4884	6.86	20	
1,2-Dichloroethane	4427	200	4000	0	111	73 - 128	4672	5.38	20	
cis-1,2-Dichloroethene	14990	200	4000	10560	111	78 - 123	15300	2	20	
Methylene chloride	3564	400	4000	0	89.1	74 - 124	3910	9.24	20	
Trichloroethene	15010	200	4000	10480	113	79 - 123	15370	2.37	20	
Vinyl chloride	5302	200	4000	771.5	113	58 - 137	5705	7.32	20	
Surr: 1,2-Dichloroethane-d4	*8511*	*200*	*10000*	*0*	*85.1*	*81 - 118*	*8472*	*0.464*	*20*	
Surr: 4-Bromofluorobenzene	*8769*	*200*	*10000*	*0*	*87.7*	*85 - 114*	*8745*	*0.276*	*20*	
Surr: Dibromofluoromethane	*8777*	*200*	*10000*	*0*	*87.8*	*80 - 119*	*8756*	*0.235*	*20*	
Surr: Toluene-d8	*9391*	*200*	*10000*	*0*	*93.9*	*89 - 112*	*9275*	*1.24*	*20*	

The following samples were analyzed in this batch: HS20100779-01 HS20100779-06 HS20100779-08 HS20100779-10

ALS Houston, US Date: 29-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
WorkOrder: HS20100779

QC BATCH REPORT

Batch ID: R370718 (0) **Instrument: ManTech01** **Method: ALKALINITY BY SM2320B**

MBLK Sample ID: **WBLKW1-201016** Units: **mg/L** Analysis Date: **16-Oct-2020 19:12**
Client ID: Run ID: **ManTech01_370718** SeqNo: **5786720** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	5.00	5.00								U

LCS Sample ID: **LCS1-201016** Units: **mg/L** Analysis Date: **16-Oct-2020 19:20**
Client ID: Run ID: **ManTech01_370718** SeqNo: **5786721** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	1030	5.00	1000	0	103	85 - 115				

LCSD Sample ID: **LCSD1-201016** Units: **mg/L** Analysis Date: **16-Oct-2020 19:29**
Client ID: Run ID: **ManTech01_370718** SeqNo: **5786722** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	1037	5.00	1000	0	104	85 - 115	1030	0.636	20	

DUP Sample ID: **HS20100868-02DUP** Units: **mg/L** Analysis Date: **16-Oct-2020 19:41**
Client ID: Run ID: **ManTech01_370718** SeqNo: **5786724** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	127.3	5.00					123.9	2.7	20	

The following samples were analyzed in this batch: HS20100779-01 HS20100779-02 HS20100779-04 HS20100779-05 HS20100779-06

ALS Houston, US Date: 29-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
WorkOrder: HS20100779

QC BATCH REPORT

Batch ID: R370723 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY SW9056A**

MBLK Sample ID: **MBLK-101520** Units: **mg/L** Analysis Date: **15-Oct-2020 20:16**
Client ID: Run ID: **ICS-Integrion_370723** SeqNo: **5787171** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	0.100	0.100								U
Nitrogen, Nitrate (As N)	0.100	0.100								U

LCS Sample ID: **LCS-101520** Units: **mg/L** Analysis Date: **15-Oct-2020 20:34**
Client ID: Run ID: **ICS-Integrion_370723** SeqNo: **5787172** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	4.06	0.100	4	0	101	80 - 120				
Nitrogen, Nitrate (As N)	4.033	0.100	4	0	101	80 - 120				

MS Sample ID: **HS20100754-03MS** Units: **mg/L** Analysis Date: **15-Oct-2020 20:52**
Client ID: Run ID: **ICS-Integrion_370723** SeqNo: **5787173** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	2.571	0.100	2	0.6885	94.1	80 - 120				
Nitrogen, Nitrate (As N)	2.556	0.100	2	0.5605	99.8	80 - 120				

MSD Sample ID: **HS20100754-03MSD** Units: **mg/L** Analysis Date: **15-Oct-2020 21:10**
Client ID: Run ID: **ICS-Integrion_370723** SeqNo: **5787174** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	2.539	0.100	2	0.6885	92.5	80 - 120	2.571	1.25	20	
Nitrogen, Nitrate (As N)	2.549	0.100	2	0.5605	99.4	80 - 120	2.556	0.286	20	

The following samples were analyzed in this batch: HS20100779-01 HS20100779-02 HS20100779-04 HS20100779-05 HS20100779-06

ALS Houston, US Date: 29-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
WorkOrder: HS20100779

QC BATCH REPORT

Batch ID: R371460 (0) **Instrument:** ICS-Integrion **Method:** ANIONS BY SW9056A

MBLK Sample ID: **MBLK-102720** Units: **mg/L** Analysis Date: **28-Oct-2020 08:33**
Client ID: Run ID: **ICS-Integrion_371460** SeqNo: **5804154** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	0.500	0.500								U

LCS Sample ID: **LCS-102720** Units: **mg/L** Analysis Date: **28-Oct-2020 08:51**
Client ID: Run ID: **ICS-Integrion_371460** SeqNo: **5804155** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	18.05	0.500	20	0	90.2	80 - 120				

MS Sample ID: **HS20100779-02MS** Units: **mg/L** Analysis Date: **28-Oct-2020 07:03**
Client ID: **16WW26-201014** Run ID: **ICS-Integrion_371460** SeqNo: **5804149** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	447.3	5.00	100	374.5	72.8	80 - 120				S

MSD Sample ID: **HS20100779-02MSD** Units: **mg/L** Analysis Date: **28-Oct-2020 07:21**
Client ID: **16WW26-201014** Run ID: **ICS-Integrion_371460** SeqNo: **5804150** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	447.8	5.00	100	374.5	73.3	80 - 120	447.3	0.12	20	S

The following samples were analyzed in this batch: HS20100779-01 HS20100779-02 HS20100779-04 HS20100779-05 HS20100779-06

ALS Houston, US Date: 29-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
WorkOrder: HS20100779

QC BATCH REPORT

Batch ID: R371570 (0) **Instrument:** ICS-Integrion **Method:** ANIONS BY SW9056A

MBLK Sample ID: **MBLK-102820** Units: **mg/L** Analysis Date: **28-Oct-2020 11:27**
Client ID: Run ID: **ICS-Integrion_371570** SeqNo: **5806771** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	0.100	0.100								U

LCS Sample ID: **LCS-102820** Units: **mg/L** Analysis Date: **28-Oct-2020 11:45**
Client ID: Run ID: **ICS-Integrion_371570** SeqNo: **5806772** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.851	0.100	4	0	96.3	80 - 120				

MS Sample ID: **HS20100780-04MS** Units: **mg/L** Analysis Date: **29-Oct-2020 07:15**
Client ID: Run ID: **ICS-Integrion_371570** SeqNo: **5806778** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	24.04	1.00	20	4.767	96.4	80 - 120				

MSD Sample ID: **HS20100780-04MSD** Units: **mg/L** Analysis Date: **29-Oct-2020 07:33**
Client ID: Run ID: **ICS-Integrion_371570** SeqNo: **5806779** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	23.89	1.00	20	4.767	95.6	80 - 120	24.04	0.63	20	

The following samples were analyzed in this batch: HS20100779-03 HS20100779-07 HS20100779-08 HS20100779-09

ALS Houston, US Date: 29-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
WorkOrder: **HS20100779**

QUALIFIERS, ACRONYMS, UNITS

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

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

Unit Reported	Description
mg/L	Milligrams per Liter

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	20-030-0	26-Mar-2021
California	2919, 2020-2021	30-Apr-2021
Dept of Defense	PJLA L20-507	22-Dec-2021
Florida	E87611-30-07/01/2020	30-Jun-2021
Illinois	2000322020-4	09-May-2021
Kansas	E-10352 2020-2021	31-Jul-2021
Kentucky	123043, 2020-2021	30-Apr-2021
Louisiana	03087, 2020-2021	30-Jun-2021
North Carolina	624-2020	31-Dec-2020
North Dakota	R-193 2020-2021	30-Apr-2021
Texas	T104704231-20-26	30-Apr-2021

ALS Houston, US Date: 29-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
Work Order: HS20100779

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS20100779-01	16WW25-201014	Login	10/15/2020 2:32:33 PM	JRM	Sub
HS20100779-01	16WW25-201014	Login	10/15/2020 2:32:33 PM	JRM	WET083
HS20100779-01	16WW25-201014	Login	10/15/2020 2:32:33 PM	JRM	VOA155
HS20100779-01	16WW25-201014	Login	10/15/2020 2:32:33 PM	JRM	RSK001
HS20100779-01	16WW25-201014	Login	10/15/2020 2:32:33 PM	JRM	Sub

ALS Houston, US Date: 29-Oct-20

Sample Receipt Checklist

Work Order ID: HS20100779 **Date/Time Received:** **15-Oct-2020 09:10**

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

Completed By: /S/ Jared R. Makan (eSignature) 15-Oct-2020 18:43 (Date/Time) **Reviewed by:** /S/ RJ Modashia (eSignature) 16-Oct-2020 14:46 (Date/Time)

Matrices: **Water** Carrier name: **ALS Courier**

	Yes	No	Not Present
Shipping container/cooler in good condition?	☑	☐	☐
Custody seals intact on shipping container/cooler?	☑	☐	☐
Custody seals intact on sample bottles?	☐	☐	☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	☐	☐	☑
Chain of custody present?	☑	☐	2 Page(s)
Chain of custody signed when relinquished and received?	☑	☐	
Samplers name present on COC?	☑	☐	
Chain of custody agrees with sample labels?	☑	☐	
Samples in proper container/bottle?	☑	☐	
Sample containers intact?	☑	☐	
Sufficient sample volume for indicated test?	☑	☐	
All samples received within holding time?	☑	☐	
Container/Temp Blank temperature in compliance?	☑	☐	

Temperature(s)/Thermometer(s):	1.4°C/1.4°C UC/C	IR31
Cooler(s)/Kit(s):	43908	
Date/Time sample(s) sent to storage:	10/15/2020 18:45	

	Yes	No	
Water - VOA vials have zero headspace?	☐	☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	☐	☐	N/A ☑
pH adjusted?	☐	☐	N/A ☑

pH adjusted by:

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

CHAIN OF CUSTODY

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

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

Project No. 501032

Job: LHAAP 16 October 2020

Prepared By: Scott Beesinger

P.O. Number

Field Sample I.D. Time	Sample Matrix	Date /	MS / MSD	No. OF CONTAINERS	VOC by SW 8260B	TOC by SM5310C	MEE by RSK 175	Anions (bromide, sulfate, nitrate) by SW9056 and Alkalinity by SM2320	Bromide by SW9056	Perchlorate by SW6850	Metals (arsenic, chromium, manganese, nickel, thallium) by SW6020				Remarks (Preservatives, etc.)	Lab I.D.#
16WW25-201014	WG	10/14/20/0740		10	X	X	X	X	X	X						
16WW26-201014	WG	10/14/20/0825		10	X	X	X	X	X	X						
16WW30-201014	WG	10/14/20/0920		7	X	X			X	X						
16WW29-201014	WG	10/14/20/1005		10	X	X	X	X	X	X						
16WW22-201014	WG	10/14/20/1055		10	X	X	X	X	X	X						
16WW41-201014	WG	10/14/20/1145		10	X	X	X	X	X	X						
16WW21-201014	WG	10/14/20/1235		7	X	X			X	X						
16WW21-201014-FD	WG	10/14/20/1235		7	X	X			X	X						

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

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	10/14/20	1430									

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition
J. Moreno	10/15/20	09:10							

Remarks: Cooler 43908 MC31
Temp 1.4°C CF 0

HS20100779

Aptim Environmental & Infrastucture, Inc.
LHAAP 16 October 2020

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

CHAIN OF CUSTODY

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

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

Project No. 501032

Job: LHAAP 16 October 2020

Prepared By: Scott Beesinger

P.O. Number

Field Sample I.D. Time	Sample Matrix	Date /	MS / MSD	No. OF CONTAINERS	VOC by SW 8260B	TOC by SM5310C	MEE by RSK 175	Anions (bromide, sulfate, nitrate) by SW9056 and Alkalinity by SM2320	Bromide by SW9056	Perchlorate by SW6850	Metals (arsenic, chromium, manganese, nickel, thallium) by SW6020				Remarks (Preservatives, etc.)	Lab I.D.#
16WW39-201014	WG	10/14/20/1325		7	X	X			X	X						
TRIpBlank-201014	W	10/14/20		2	X											

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

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	10/14/20	1430									

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition
J. Whatley	10/15/20	09:10							

Remarks:

HS20100779

Aptim Environmental & Infrastucture, Inc.
LHAAP 16 October 2020

(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

43908

CUSTODY SEAL

Date: 10/14/20 Time: 1400
Name: Scott Beesinger
Company: BHMTG

Seal Broken By: SM
Date: 10/15/20

43908

Must Deliver Next Business Day
Time and Tempature Sensitive!

ALS

43908

ORIGIN ID:SGRA (903) 930 6199
SCOTT BEESINGER
APTIM
1203 B EAST GRAND AVE.
PMB202
MARSHALL, TX 75670
UNITED STATES US

SHIP DATE: 23JUN20
ACTWGT: 1.00 LB MAN
CAD: 3060130/CAFE3211
DIMS: 19x16x13 IN

10 CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099
(281) 530-5656
REF: LHAAP 16 - B072394 - RJ
RMA:

FedEx Express

FedEx
TRK# 0221 1891 8877 8369

THU - 15 OCT AA
PRIORITY OVERNIGHT

AB SGRA

77099
TX-US
IAH

FID: 162785 140ct2020 CGGA 56D62/A07E/85A2

October 22, 2020

Service Request No:E2000996

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

Laboratory Results for: HS20100779

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory October 16, 2020
For your reference, these analyses have been assigned our service request number **E2000996.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current TNI standards, where applicable, and except as noted in the laboratory case narrative provided. All results are intended to be considered in their entirety and ALS Environmental is not responsible for use of less than the complete final report. Results apply only to the items submitted to the laboratory, as received for analysis. In accordance with the current TNI Standard, a statement on the estimated uncertainty of measurement of any quantitative analysis will be supplied upon request.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Corey Grandits
Project Manager

ADDRESS 10450 Stancliff Rd., Suite 210, Houston, TX 77099
PHONE +1 281 530 5656 | FAX +1 281 530 5887
ALS Group USA, Corp.
dba ALS Environmental

Certificate of Analysis

ALS Environmental - Houston HRMS
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

ALS Environmental

Client:	ALS Houston	**Service Request No.:**	E2000996
Project:	HS20100779	**Date Received:**	10/16/20
Sample Matrix:	W		

CASE NARRATIVE

All analyses were performed in adherence to the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier II. When appropriate to the method, method blank results have been reported with each analytical test.

Sample Receipt

Nine samples were received for analysis at ALS Environmental in Houston on 10/16/20.

The samples were received in good condition and are consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

Data Validation Notes and Discussion

Precision and Accuracy:

EQ2000513: Laboratory Control Spike/Duplicate Laboratory Control Spike (LCS/DLCS) samples were analyzed and reported in addition to a MS/MSD for this extraction batch. The LCS and DLCS recoveries are within QC limits. The MS/MSD was performed on an unrelated sample.

DoD Certification is held for the method/matrix/analytes provided in this report.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.

Use of ALS group USA Corp dba ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.

Client: ALS Environmental - US **Service Request:**E2000996
Project: HS20100779

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
E2000996-001	16WW25-201014	10/14/2020	0735
E2000996-002	16WW26-201014	10/14/2020	0825
E2000996-003	16WW30-201014	10/14/2020	0920
E2000996-004	16WW29-201014	10/14/2020	1005
E2000996-005	16WW22-201014	10/14/2020	1055
E2000996-006	16WW41-201014	10/14/2020	1145
E2000996-007	16WW21-201014	10/14/2020	1235
E2000996-008	16WW21-201014-FD	10/14/2020	1235
E2000996-009	16WW39-201014	10/14/2020	1325

Service Request Summary

Folder #: **E2000996**
Client Name: ALS Environmental - US
Project Name: HS20100779
Project Number:

Report To: RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Houston, TX 77099-4338
USA
Phone Number: 281-530-5656
Cell Number:
Fax Number: 281-530-5887
E-mail: rj.modashia@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 10/16/20
Internal Due Date: 10/29/2020
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: N
Report to MDL?: Y
P.O. Number: HS20100779
EDD: No EDD Specified

9 250 mL-Plastic Bottle HDPE WM CLEAR Unpreserved
Location: EHRMS-WIC 10D
Pressure Gas:

Lab Samp No.	Client Samp No	Matrix	Collected	HOUSTON CIO4 DOD/6850
E2000996-001	16WW25-201014	Water	10/14/20 0735	**IV**
E2000996-002	16WW26-201014	Water	10/14/20 0825	**IV**
E2000996-003	16WW30-201014	Water	10/14/20 0920	**IV**
E2000996-004	16WW29-201014	Water	10/14/20 1005	**IV**
E2000996-005	16WW22-201014	Water	10/14/20 1055	**IV**
E2000996-006	16WW41-201014	Water	10/14/20 1145	**IV**
E2000996-007	16WW21-201014	Water	10/14/20 1235	**IV**
E2000996-008	16WW21-201014-FD	Water	10/14/20 1235	**IV**
E2000996-009	16WW39-201014	Water	10/14/20 1325	**IV**

Service Request Summary

Folder #:	**E2000996**	Project Chemist:	Corey Grandits
Client Name:	ALS Environmental - US	Originating Lab:	HOUSTON
Project Name:	HS20100779	Logged By:	CGRANDITS
Project Number:		Date Received:	10/16/20
		Internal Due Date:	10/29/2020
Report To:	RJ Modashia ALS Laboratory Group 10450 Stancliff Road Houston, TX 77099-4338 USA	QAP:	LAB QAP
		Qualifier Set:	Lab Standard
		Formset:	Lab Standard
		Merged?:	N
Phone Number:	281-530-5656	Report to MDL?:	Y
Cell Number:		P.O. Number:	HS20100779
Fax Number:	281-530-5887	EDD:	No EDD Specified
E-mail:	rj.modashia@alsglobal.com		

9 250 mL-Plastic Bottle HDPE WM CLEAR Unpreserved

Location: EHRMS-WIC 10D

Pressure Gas:

Test Comments:

Group	Test/Method	Samples	Comments
Semivoa GCMS	ClO4 DOD/6850	9	Level II due 10/29,level IV 11/5

Data Qualifiers

Lab Standard

+	Possible Tedlar bag artifact.
A	TIC is a suspected aldol-condensation product
B	Analyte found in the associated method blank as well as in the sample.
BC	Reported results are not blank corrected.
BH	The back section of the tube yielded higher results than the front.
BT	Results indicated possible breakthrough; back section >=10% front section.
C	Result identification confirmed.
D	Compound identified in an analysis at a secondary dilution factor
D	Spike was diluted out
DE	Reported results are corrected for desorption efficiency.
E	Estimated value. Concentration above calibration range
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
H1	Sample analysis performed past holding time. See case narrative.
H2	Initial analysis within holding time. Reanalysis for the required dilution was past holding time.
H3	Sample was received and analyzed past holding time.
H4	Sample was extracted past required extraction holding time, but analyzed within analysis holding time. See case narrative.
I	Internal standard not within the specified limits. See case narrative.
J	Estimated Value. Concentration found below MRL.
K	A deflection in the QC ion may indicate interference with the quantitation of this ion. The concentration of this analyte should be considered as an estimate.
K	Analyte was detected above the method reporting limit prior to normalization.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
L1	Laboratory control sample recovery outside the specified limits; results may be biased high.
L2	Laboratory control sample recovery outside the specified limits; results may be biased low.
L3	Laboratory control sample recovery outside the specified limits.
M	Matrix interference; results may be biased high.
M	The duplicate injection precision not met.
M1	Matrix interference due to coelution with a non-target compound; results may be biased high.
N	Presumptive evidence of a compound for TICs that have been identified based on a mass spectral library search.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.

Data Qualifiers

Lab Standard

P	Indicates chlorodiphenyl ether interference present at the retention time of the target compound.
P	Pesticide/Aroclor target analyte > 40% difference for detected concentrations between GC columns
Q	Indicates as estimated value because the P and P + 2 theoretical abundance ratio does not meet method criteria.
R	Duplicate Precision not met.
R1	Duplicate precision not within the specified limits; however, the results are below the MRL and considered estimated.
S	Surrogate recovery not within specified limits.
S	The reported value was determined by the Method of Standard Additions (MSA).
T	Analyte is a tentatively identified compound, result is estimated.
U	Compound was analyzed for, but was not detected (ND).
V1	The continuing calibration verification standard was outside (biased high) the specified limits for this compound.
V2	The continuing calibration verification standard was outside (biased low) the specified limits for this compound.
W	Result quantified, but the corresponding peak was detected outside the generated retention time window.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
X	See case narrative.
Y	Recovery outside limits
Y	The chromatogram resembles a petroleum product but does not match the calibration standard.
Z	The chromatogram does not resemble a petroleum product.
i	The MRL/MDL has been elevated due to a matrix interference.

ALS Laboratory Group

Acronyms

Cal	Calibration
Conc	CONCentration
Dioxin(s)	Polychlorinated dibenzo-p-dioxin(s)
EDL	Estimated Detection Limit
EMPC	Estimated Maximum Possible Concentration
Flags	Data qualifiers
Furan(s)	Polychlorinated dibenzofuran(s)
g	Grams
ICAL	Initial CALibration
ID	IDentifier
Ions	Masses monitored for the analyte during data acquisition
L	Liter (s)
LCS	Laboratory Control Sample
DLCS	Duplicate Laboratory Control Sample
MB	Method Blank
MCL	Method Calibration Limit
MDL	Method Detection Limit
mL	Milliliters
MS	Matrix Spiked sample
DMS	Duplicate Matrix Spiked sample
NO	Number of peaks meeting all identification criteria
PCDD(s)	Polychlorinated dibenzo-p-dioxin(s)
PCDF(s)	Polychlorinated dibenzofuran(s)
ppb	Parts per billion
ppm	Parts per million
ppq	Parts per quadrillion
ppt	Parts per trillion
QA	Quality Assurance
QC	Quality Control
Ratio	Ratio of areas from monitored ions for an analyte
% Rec.	Percent recovery
RPD	Relative Percent Difference
RRF	Relative Response Factor
RT	Retention Time
SDG	Sample Delivery Group
S/N	Signal-to-noise ratio
TEF	Toxicity Equivalence Factor
TEQ	Toxicity Equivalence Quotient

10450 Stancliff Rd, Houston, TX 77099 | 281-530-5656 | www.alsglobal.com

ALS Environmental

State Certifications, Accreditations, and Licenses

Agency	Number	Expire Date
American Association for Laboratory Accreditation	2897.01 2020	11/30/2021
Arizona Department of Health Services	AZ0793-2020	5/27/2021
Arkansas Department of Environmental Quality	20-030-0	3/26/2021
California Department of Health Services	2919-2020	4/30/2021
Department of Defense	A2LA 2897.01	11/30/2021
Florida Department of Health	E87611-2020	6/30/2021
Hawaii Department of Health	2020	4/30/2021
Illinois Environmental Protection Agency	2000322020-4	5/9/2021
Kansas Department of Health and Environment	E-10352-2020	7/31/2021
Louisiana Department of Environmental Quality	03087-2020	6/30/2021
Louisiana Department of Health and Hospitals	LA028-2020	12/31/2020
Maine Department of Health and Human Services	2020016	6/5/2022
Maryland Department of the Environment	343-2020	6/30/2021
Michigan Depratment of Environmental Quality	9971-2020	4/30/2021
Minnesota Department of Health	1785988	12/31/2020
Nebraska Department of Health and Human Services	NE-OS-25-13 (2020)	4/30/2021
Nevada Department of Concervation and Natural Resources	TX026932021-1	7/31/2021
New Hampshire Environmental Laboratory Accreditation Program	209420	4/24/2021
New Jersey Department of Environmental Protection	TX008	6/30/2021
New York Department of Health	11707	3/31/2021
Oklahoma Department of Environmental Quality	2020-123	8/31/2021
Pennsylvania Department of Environmental Protection	014	6/30/2021
Tennessee Department of Environment and Concervation	04016-2020	4/30/2021
Texas Commision on Environmental Quality	T104704231-20-26	4/30/2021
United States Department of Agriculture	P330-19-00299	10/10/2022
Washington Department of Health	C819	11/14/2020

Chain of Custody

ALS Environmental - Houston HRMS
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID: 14951**

SUBCONTRACT TO:

ALS Environmental
10450 Stancliff RoadSuite 210
Houston, TX 77084

Phone: +1 281 530 5656

CUSTOMER INFORMATION:

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

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS20100779
TSR:	Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS20100779-01**	**16WW25-201014**	**Groundwater**	**14 Oct 2020 07:40**
	SUB_Perch-6850			22 Oct 2020
2.	**HS20100779-02**	**16WW26-201014**	**Groundwater**	**14 Oct 2020 08:25**
	SUB_Perch-6850			22 Oct 2020
3.	**HS20100779-03**	**16WW30-201014**	**Groundwater**	**14 Oct 2020 09:20**
	SUB_Perch-6850			22 Oct 2020
4.	**HS20100779-04**	**16WW29-201014**	**Groundwater**	**14 Oct 2020 10:05**
	SUB_Perch-6850			22 Oct 2020
5.	**HS20100779-05**	**16WW22-201014**	**Groundwater**	**14 Oct 2020 10:55**
	SUB_Perch-6850			22 Oct 2020
6.	**HS20100779-06**	**16WW41-201014**	**Groundwater**	**14 Oct 2020 11:45**
	SUB_Perch-6850			22 Oct 2020
7.	**HS20100779-07**	**16WW21-201014**	**Groundwater**	**14 Oct 2020 12:35**
	SUB_Perch-6850			22 Oct 2020
8.	**HS20100779-08**	**16WW21-201014-FD**	**Groundwater**	**14 Oct 2020 12:35**
	SUB_Perch-6850			22 Oct 2020
9.	**HS20100779-09**	**16WW39-201014**	**Groundwater**	**14 Oct 2020 13:25**

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID:** **14951**

LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
ANALYSIS REQUESTED			DUE DATE
SUB_Perch-6850			22 Oct 2020

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

QC Level: DOD IV (DoD Data Package)

Relinquished By:	J. [illegible]	Date/Time:	
Received By:	[illegible]	Date/Time:	10/16/20 [illegible]
Cooler ID(s):		Temperature(s):	

ALS Environmental

Cooler Receipt Form

Project Chemist: CG

Client/Project: ALS-11

Thermometer ID: 1051

Date/Time Received: 10/16/20

Initials: CG

Date/Time Logged in: 10/16/20

Initials: CG

1. Method of delivery: ○ US Mail ○ Fed Ex ○ UPS ○ DHL ✓ ALS Courier ○ Client
2. Samples received in: ✓ Cooler ○ Box ○ Envelope ○ Other
3. Were custody seals on coolers? ○ Yes ✓ No
   Were they intact? ○ Yes ○ No ✓ N/A
   Were they signed and dated? ○ Yes ○ No ✓ N/A
   If yes, how many and where?
4. Packing Material: ○ Inserts ✓ Baggies ○ Bubble Wrap ○ Gel Packs ✓ Wet Ice ○ Sleeves ○ Other
5. Foreign or Regulated Soil? ○ Yes ✓ No Location of Sampling:

Cooler Tracking Number	COC ID	Date Opened	Time Opened	Opened By	Temp. °C	Temp Blank?
–		10/16/20	1100	CG	1.1	☒
						☐
						☐
						☐

6. Were custody papers properly filled out (ink, signed, dated, etc)? ✓ Yes ○ No
7. Did all bottles arrive in good condition (not broken, no signs of leakage)? ✓ Yes ○ No
8. Were all sample labels complete (i.e., sample ID, analysis, preservation, etc)? ✓ Yes ○ No
9. Were appropriate bottles/containers and volumes received for the requested tests? ✓ Yes ○ No
10. Did sample labels and tags agree with custody documents? ✓ Yes ○ No

Notes, Discrepancies, & Resolutions:

Service request Label:

HS-HRMSCoolerReceipt R1.0

ALS Environmental - Houston HRMS

10450 Stancliff Rd., Suite 210
Houston, TX 77099
T: +1 713 266 1599
F: +1 713 266 1599
www.alsglobal.com

SAMPLE ACCEPTANCE POLICY

This policy outlines the criteria samples must meet to be accepted by ALS Environmental – Houston HRMS.

Cooler Custody Seals (desirable, mandatory if specified in SAP):

- ✓ Intact on outside of cooler, signed and dated

Chain-of-Custody (COC) documentation (mandatory):

The following is required on each COC:

- ✓ Sample ID, the location, date and time of collection, collector's name, preservation type, sample type, and any other special remarks concerning the sampleThe COC must be completed in ink.
- ✓ Signature and date of relinquishing party.

In the absence of a COC at sample receipt, the COC will be requested from the client.

Sample Integrity (mandatory):

Samples are inspected upon arrival to ensure that sample integrity was not compromised during transfer to the laboratory.

- ✓ Sample containers must arrive in good condition (not broken or leaking).
- ✓ Samples must be labeled appropriately, including Sample IDs, and requested test using durable labels and indelible ink.
- ✓ The correct type of sample bottle must be used for the method requested.
- ✓ An appropriate sample volume, or weight, must be received.
- ✓ Sample IDs and number of containers must reconcile with the COC.
- ✓ Samples must be received within the method defined holding time.

Temperature Requirement (varies by sample matrix):

- ✓ Aqueous and Non-aqueous samples must be shipped and stored cold, at 0 to 6ºC.
- ✓ Tissue samples must be shipped and stored frozen, at -20 to -10ºC.
- ✓ Air samples are shipped and stored cold, at 0 to 6ºC
- ✓ The sample temperature must be recorded on the COC

All cooler inspections are documented on the Cooler Receipt Form (CRF). A separate CRF is completed for each service request. Any samples not meeting the above criteria are noted on the CRF and the Project Manager notified. The Project Manager must resolve any sample integrity issues with the client prior to proceeding with the analysis. Such resolutions are documented in writing and filed with the project folder. Data associated with samples received outside of this acceptance policy will be qualified on the case narrative of the final report

Preparation Information Benchsheets

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

Preparation Information Benchsheet

Prep Run#: 368005 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
Team: Semivoa GCMS/GRIVERA **Prep Method:** Method **Prep Date/Time:** 10/19/20 09:34

#	Lab Code	Client ID	B#	Method /Test	pH	Cl	Matrix	Amt. Ext.	Sample Description
1	E2000981-001	LH18/24-SP650_101320-AIX	.01	6850/ClO4 DOD			Water	10mL	
2	E2000982-001	LH18/24-SP140_101320	.01	6850/ClO4 DOD			Water	10mL	
3	E2000984-001	LH18/24-SP650_101320-AIX	.01	6850/ClO4 DOD			Water	10mL	
4	E2000985-001	16WW36-201013	.01	6850/ClO4 DOD			Water	10mL	
5	E2000985-002	16WW35-201013	.01	6850/ClO4 DOD			Water	10mL	
6	E2000985-003	16IW09-201013	.01	6850/ClO4 DOD			Water	10mL	
7	E2000985-004	16WW55-201013	.01	6850/ClO4 DOD			Water	10mL	
8	E2000985-005	16IW03-201013	.01	6850/ClO4 DOD			Water	10mL	
9	E2000985-006	16IW10-201013	.01	6850/ClO4 DOD			Water	10mL	
10	E2000996-001	16WW25-201014	.01	6850/ClO4 DOD			Water	10mL	
11	E2000996-002	16WW26-201014	.01	6850/ClO4 DOD			Water	10mL	
12	E2000996-003	16WW30-201014	.01	6850/ClO4 DOD			Water	10mL	
13	E2000996-004	16WW29-201014	.01	6850/ClO4 DOD			Water	10mL	
14	E2000996-005	16WW22-201014	.01	6850/ClO4 DOD			Water	10mL	
15	E2000996-006	16WW41-201014	.01	6850/ClO4 DOD			Water	10mL	
16	E2000996-007	16WW21-201014	.01	6850/ClO4 DOD			Water	10mL	
17	E2000996-008	16WW21-201014-FD	.01	6850/ClO4 DOD			Water	10mL	
18	E2000996-009	16WW39-201014	.01	6850/ClO4 DOD			Water	10mL	
19	EQ2000513-01	MB		6850/ClO4 DOD			Liquid	10mL	
20	EQ2000513-02	LCS		6850/ClO4 DOD			Liquid	10mL	
21	EQ2000513-03	DLCS		6850/ClO4 DOD			Liquid	10mL	
22	EQ2000513-04	16IW03-201013 MS	.01	6850/ClO4 DOD			Liquid	10mL	
23	EQ2000513-05	16IW03-201013 DMS	.01	6850/ClO4 DOD			Liquid	10mL	

Spiking Solutions

Name: Perchlorate Intermediate Stock1 Inventory ID 209764 Logbook Ref: Perchlorate Int. Stock1 51820 Expires On: 11/18/2020

EQ2000513-02	1.00µL	EQ2000513-03	1.00µL	EQ2000513-04	1.00µL	EQ2000513-05	1.00µL

Name: Sodium Perchlorate 1 ug/mL (IS) (18-O) as CLO4 Inventory ID 212340 Logbook Ref: Sodium Perchlorate Expires On: 07/13/2022

E2000981-001	100.00µL	E2000982-001	100.00µL	E2000984-001	100.00µL	E2000985-001	100.00µL	E2000985-002	100.00µL	E2000985-003	100.00µL
E2000985-004	100.00µL	E2000985-005	100.00µL	E2000985-006	100.00µL	E2000996-001	100.00µL	E2000996-002	100.00µL	E2000996-003	100.00µL
E2000996-004	100.00µL	E2000996-005	100.00µL	E2000996-006	100.00µL	E2000996-007	100.00µL	E2000996-008	100.00µL	E2000996-009	100.00µL
EQ2000513-01	100.00µL	EQ2000513-02	100.00µL	EQ2000513-03	100.00µL	EQ2000513-04	100.00µL	EQ2000513-05	100.00µL		

Preparation Information Benchsheet

Prep Run#: 368005 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
Team: Semivoa GCMS/GRIVERA **Prep Method:** Method **Prep Date/Time:** 10/19/20 09:34

Preparation Steps

Step: Preparation
Started: 10/19/20 09:34
Finished: 10/19/20 14:58
By: GRIVERA
Comments

Comments:

Reviewed By: GR Date: 10/19/2020

Chain of Custody

Relinquished By: Date:
Received By: Date:

Extracts Examined
Yes No

Analytical Results

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000996
Project:	HS20100779	**Date Collected:**	10/14/20 0735
Sample Matrix:	Water	**Date Received:**	10/16/20
		Date Extracted:	10/19/20
		Date Analyzed:	10/19/20 22:13
Sample Name:	16WW25-201014	**Units:**	µg/L
Lab Code:	E2000996-001	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method:	6850	**Analysis Lot:**	700168
Prep Method:	Method	**Extraction Lot:**	368005
Data File Name:	I:\LCMS01\DATA\20201019\20201019_056	**Instrument Name:**	E-LCMS-01
		Dilution Factor:	1

CAS No.	Analyte Name	Result	Q	LOQ	LOD	MDL	Note
14797-73-0	Perchlorate	**0.0770**	J	0.100	0.0500	0.0250	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000996
Project:	HS20100779	**Date Collected:**	10/14/20 0825
Sample Matrix:	Water	**Date Received:**	10/16/20
		Date Extracted:	10/19/20
		Date Analyzed:	10/19/20 22:21
Sample Name:	16WW26-201014	**Units:**	µg/L
Lab Code:	E2000996-002	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method:	6850	**Analysis Lot:**	700168
Prep Method:	Method	**Extraction Lot:**	368005
Data File Name:	I:\LCMS01\DATA\20201019\20201019_057	**Instrument Name:**	E-LCMS-01
		Dilution Factor:	1

CAS No.	Analyte Name	Result	Q	LOQ	LOD	MDL	Note
14797-73-0	Perchlorate	ND	U	0.100	0.0500	0.0250	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000996
Project:	HS20100779	**Date Collected:**	10/14/20 0920
Sample Matrix:	Water	**Date Received:**	10/16/20
		Date Extracted:	10/19/20
		Date Analyzed:	10/21/20 11:58
Sample Name:	16WW30-201014	**Units:**	µg/L
Lab Code:	E2000996-003	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method:	6850	**Analysis Lot:**	700177
Prep Method:	Method	**Extraction Lot:**	368005
Data File Name:	I:\LCMS01\DATA\20201021\20201021_019	**Instrument Name:**	E-LCMS-01
		Dilution Factor:	1

CAS No.	Analyte Name	Result	Q	LOQ	LOD	MDL	Note
14797-73-0	Perchlorate	ND	U	0.100	0.0500	0.0250	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000996
Project:	HS20100779	**Date Collected:**	10/14/20 1005
Sample Matrix:	Water	**Date Received:**	10/16/20
		Date Extracted:	10/19/20
		Date Analyzed:	10/19/20 22:37
Sample Name:	16WW29-201014	**Units:**	µg/L
Lab Code:	E2000996-004	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method:	6850	**Analysis Lot:**	700168
Prep Method:	Method	**Extraction Lot:**	368005
Data File Name:	I:\LCMS01\DATA\20201019\20201019_059	**Instrument Name:**	E-LCMS-01
		Dilution Factor:	1

CAS No.	Analyte Name	Result	Q	LOQ	LOD	MDL	Note
14797-73-0	Perchlorate	ND	U	0.100	0.0500	0.0250	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000996
Project:	HS20100779	**Date Collected:**	10/14/20 1055
Sample Matrix:	Water	**Date Received:**	10/16/20
		Date Extracted:	10/19/20
		Date Analyzed:	10/21/20 12:06
Sample Name:	16WW22-201014	**Units:**	µg/L
Lab Code:	E2000996-005	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method:	6850	**Analysis Lot:**	700177
Prep Method:	Method	**Extraction Lot:**	368005
Data File Name:	I:\LCMS01\DATA\20201021\20201021_020	**Instrument Name:**	E-LCMS-01
		Dilution Factor:	1

CAS No.	Analyte Name	Result	Q	LOQ	LOD	MDL	Note
14797-73-0	Perchlorate	ND	U	0.100	0.0500	0.0250	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000996
Project:	HS20100779	**Date Collected:**	10/14/20 1145
Sample Matrix:	Water	**Date Received:**	10/16/20
		Date Extracted:	10/19/20
		Date Analyzed:	10/20/20 21:55
Sample Name:	16WW41-201014	**Units:**	µg/L
Lab Code:	E2000996-006	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method:	6850	**Analysis Lot:**	700170
Prep Method:	Method	**Extraction Lot:**	368005
Data File Name:	I:\LCMS01\DATA\20201020\20201020_046	**Instrument Name:**	E-LCMS-01
		Dilution Factor:	5

CAS No.	Analyte Name	Result	Q	LOQ	LOD	MDL	Note
14797-73-0	Perchlorate	**81.2**		0.500	0.250	0.125	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000996
Project:	HS20100779	**Date Collected:**	10/14/20 1235
Sample Matrix:	Water	**Date Received:**	10/16/20
		Date Extracted:	10/19/20
		Date Analyzed:	10/19/20 23:09
Sample Name:	16WW21-201014	**Units:**	µg/L
Lab Code:	E2000996-007	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method:	6850	**Analysis Lot:**	700168
Prep Method:	Method	**Extraction Lot:**	368005
Data File Name:	I:\LCMS01\DATA\20201019\20201019_063	**Instrument Name:**	E-LCMS-01
		Dilution Factor:	1

CAS No.	Analyte Name	Result	Q	LOQ	LOD	MDL	Note
14797-73-0	Perchlorate	ND	U	0.100	0.0500	0.0250	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000996
Project:	HS20100779	**Date Collected:**	10/14/20 1235
Sample Matrix:	Water	**Date Received:**	10/16/20
		Date Extracted:	10/19/20
		Date Analyzed:	10/19/20 23:16
Sample Name:	16WW21-201014-FD	**Units:**	µg/L
Lab Code:	E2000996-008	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method:	6850	**Analysis Lot:**	700168
Prep Method:	Method	**Extraction Lot:**	368005
Data File Name:	I:\LCMS01\DATA\20201019\20201019_064	**Instrument Name:**	E-LCMS-01
		Dilution Factor:	1

CAS No.	Analyte Name	Result	Q	LOQ	LOD	MDL	Note
14797-73-0	Perchlorate	ND	U	0.100	0.0500	0.0250	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000996
Project:	HS20100779	**Date Collected:**	10/14/20 1325
Sample Matrix:	Water	**Date Received:**	10/16/20
		Date Extracted:	10/19/20
		Date Analyzed:	10/21/20 12:48
Sample Name:	16WW39-201014	**Units:**	µg/L
Lab Code:	E2000996-009	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method:	6850	**Analysis Lot:**	700177
Prep Method:	Method	**Extraction Lot:**	368005
Data File Name:	I:\LCMS01\DATA\20201021\20201021_023	**Instrument Name:**	E-LCMS-01
		Dilution Factor:	2

CAS No.	Analyte Name	Result	Q	LOQ	LOD	MDL	Note
14797-73-0	Perchlorate	**1.08**		0.200	0.100	0.0500	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000996
Project:	HS20100779	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
		Date Extracted:	10/19/20
		Date Analyzed:	10/19/20 20:15
Sample Name:	Method Blank	**Units:**	µg/L
Lab Code:	EQ2000513-01	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method:	6850	**Analysis Lot:**	700168
Prep Method:	Method	**Extraction Lot:**	368005
Data File Name:	I:\LCMS01\DATA\20201019\20201019_041	**Instrument Name:**	E-LCMS-01
		Dilution Factor:	1

CAS No.	Analyte Name	Result	Q	LOQ	LOD	MDL	Note
14797-73-0	Perchlorate	ND	U	0.100	0.0500	0.0250	

Accuracy & Precision

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000996
Project:	HS20100779	**Date Analyzed:**	10/20/20
Sample Matrix:	Water		

Lab Control Sample Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method:	6850	**Units:**	µg/L
Prep Method:	Method	**Basis:**	NA
		Extraction Lot:	368005

	Lab Control Sample EQ2000513-02			Duplicate Lab Control Sample EQ2000513-03					
Analyte Name	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Perchlorate	0.105	0.100	105	0.108	0.100	108	84 - 119	3	15

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

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

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000996
Project:	HS20100779	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
		Date Extracted:	10/19/20
		Date Analyzed:	10/20/20 20:04
Sample Name:	Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2000513-02	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method:	6850	**Analysis Lot:**	700170
Prep Method:	Method	**Extraction Lot:**	368005
Data File Name:	I:\LCMS01\DATA\20201020\20201020_032	**Instrument Name:**	E-LCMS-01
		Dilution Factor:	1

CAS No.	Analyte Name	Result	Q	LOQ	LOD	MDL	Note
14797-73-0	Perchlorate	**0.105**		0.100	0.0500	0.0250	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000996
Project:	HS20100779	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
		Date Extracted:	10/19/20
		Date Analyzed:	10/20/20 20:12
Sample Name:	Duplicate Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2000513-03	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method:	6850	**Analysis Lot:**	700170
Prep Method:	Method	**Extraction Lot:**	368005
Data File Name:	I:\LCMS01\DATA\20201020\20201020_033	**Instrument Name:**	E-LCMS-01
		Dilution Factor:	1

CAS No.	Analyte Name	Result	Q	LOQ	LOD	MDL	Note
14797-73-0	Perchlorate	**0.108**		0.100	0.0500	0.0250	

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000996
Project:	HS20100779	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
		Date Analyzed:	10/20/20

Matrix Spike Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Sample Name:	Batch QC	**Units:**	µg/L
Lab Code:	E2000985-005	**Basis:**	NA

Analytical Method: 6850
Prep Method: Method

		Batch QCMS **Matrix Spike** EQ2000513-04				Batch QCDMS **Duplicate Matrix Spike** EQ2000513-05					
Analyte Name	**Sample Result**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Perchlorate	0.0876	0.194	0.100	106	0.193	0.100	105	84 - 119	<1	15

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

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

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

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000996
Project:	HS20100779	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
		Date Extracted:	10/19/20
		Date Analyzed:	10/20/20 20:20
Sample Name:	Batch QC	**Units:**	µg/L
Lab Code:	EQ2000513-04	**Basis:**	NA
Run Type:	Matrix Spike		

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method:	6850	**Analysis Lot:**	700170
Prep Method:	Method	**Extraction Lot:**	368005
Data File Name:	I:\LCMS01\DATA\20201020\20201020_034	**Instrument Name:**	E-LCMS-01
		Dilution Factor:	1

CAS No.	Analyte Name	Result	Q	LOQ	LOD	MDL	Note
14797-73-0	Perchlorate	**0.194**		0.100	0.0500	0.0250	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000996
Project:	HS20100779	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
		Date Extracted:	10/19/20
		Date Analyzed:	10/20/20 20:28
Sample Name:	Batch QC	**Units:**	µg/L
Lab Code:	EQ2000513-05	**Basis:**	NA
Run Type:	Duplicate Matrix Spike		

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method:	6850	**Analysis Lot:**	700170
Prep Method:	Method	**Extraction Lot:**	368005
Data File Name:	I:\LCMS01\DATA\20201020\20201020_035	**Instrument Name:**	E-LCMS-01
		Dilution Factor:	1

CAS No.	Analyte Name	Result	Q	LOQ	LOD	MDL	Note
14797-73-0	Perchlorate	**0.193**		0.100	0.0500	0.0250	

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

October 22, 2020

Analytical Report for Service Request No: K2009424

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

RE: HS20100779

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory October 16, 2020
For your reference, these analyses have been assigned our service request number **K2009424.**

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

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
Qualifiers
State Certifications, Accreditations, And Licenses
Case Narrative
Chain of Custody
General Chemistry
Raw Data
    General Chemistry

Acronyms

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

Inorganic Data Qualifiers

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

Metals Data Qualifiers

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

Organic Data Qualifiers

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

Additional Petroleum Hydrocarbon Specific Qualifiers

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

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

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

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

Case Narrative

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

1317 South 13th Ave, Kelso, WA 98626 | 1-360-577-7222 | www.alsglobal.com

ALS Environmental

Client: ALS Environmental - US
Project: HS20100779
Sample Matrix: Ground Water

Service Request: K2009424
Date Received: 10/16/2020

CASE NARRATIVE

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

Sample Receipt:

Nine ground water samples were received for analysis at ALS Environmental on 10/16/2020. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The samples were stored at minimum in accordance with the analytical method requirements.

General Chemistry:

Method SM 5310 C, 10/19/2020: The matrix spike recovery of Total Organic Carbon for sample 16WW25-201014 was outside control criteria. Recovery in the Laboratory Control Sample (LCS) was acceptable, which indicated the analytical batch was in control. The matrix spike outlier suggested a potential low bias in this matrix. No further corrective action was appropriate.

Approved by Kelley Lovejoy Date 10/22/2020

Chain of Custody

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

K2009424

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID:** **14949**

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:	HS20100779
TSR:	Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS20100779-01**	**16WW25-201014**	**Groundwater**	**14 Oct 2020 07:40**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			22 Oct 2020
2.	**HS20100779-02**	**16WW26-201014**	**Groundwater**	**14 Oct 2020 08:25**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			22 Oct 2020
3.	**HS20100779-03**	**16WW30-201014**	**Groundwater**	**14 Oct 2020 09:20**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			22 Oct 2020
4.	**HS20100779-04**	**16WW29-201014**	**Groundwater**	**14 Oct 2020 10:05**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			22 Oct 2020
5.	**HS20100779-05**	**16WW22-201014**	**Groundwater**	**14 Oct 2020 10:55**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			22 Oct 2020
6.	**HS20100779-06**	**16WW41-201014**	**Groundwater**	**14 Oct 2020 11:45**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			22 Oct 2020
7.	**HS20100779-07**	**16WW21-201014**	**Groundwater**	**14 Oct 2020 12:35**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			22 Oct 2020
8.	**HS20100779-08**	**16WW21-201014-FD**	**Groundwater**	**14 Oct 2020 12:35**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			22 Oct 2020
9.	**HS20100779-09**	**16WW39-201014**	**Groundwater**	**14 Oct 2020 13:25**

Received By Nlederson ALS 10/16/20 0950

KL2009424

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID: 14949**

LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
ANALYSIS REQUESTED			DUE DATE
TOC Analysis with DOD Level IV/EQuIS APTIM EDD			22 Oct 2020

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

QC Level: DOD IV (DoD Data Package)

Relinquished By:	J. Mulcahy	Date/Time:	10/15/20 18:00
Received By:	N Pedersen	Date/Time:	10/16/20 0950
Cooler ID(s):		Temperature(s):	

PM KL

Cooler Receipt and Preservation Form

Client ALS Houston Service Request K20 09474

Received: 10/16/20 Opened: 10/16/20 By: AX Unloaded: 10/16/20 By: AX

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
4. Was a Temperature Blank present in cooler? NA Y N If yes, notate the temperature in the appropriate column below:
   If no, take the temperature of a representative sample bottle contained within the cooler; notate in the column "Sample Temp":
5. Were samples received within the method specified temperature ranges? NA Y N
   If no, were they received on ice and same day as collected? If not, notate the cooler # below and notify the PM. NA Y N

If applicable, tissue samples were received: *Frozen* *Partially Thawed* *Thawed*

Temp Blank	Sample Temp	IR Gun	Cooler #/COC ID / NA	Out of temp indicate with "X"	PM Notified If out of temp	Tracking Number NA	Filed
0.6	—	IR02		—	—	1691 8881 5860	
			14949				
			14975				

6. Packing material: *Inserts* *Baggies* *Bubble Wrap* *Gel Packs* *Wet Ice* *Dry Ice* *Sleeves* _____
7. Were custody papers properly filled out (ink, signed, etc.)? NA Y N
8. Were samples received in good condition (unbroken) NA Y N
9. Were all sample labels complete (ie, analysis, preservation, etc.)? NA Y N
10. Did all sample labels and tags agree with custody papers? NA Y N
11. Were appropriate bottles/containers and volumes received for the tests indicated? NA Y N
12. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* NA Y N
13. Were VOA vials received without headspace? *Indicate in the table below.* NA Y N
14. Was C12/Res negative? NA Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count Bottle Type	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:**	K2009424
Project:	HS20100779	**Date Collected:**	10/14/20
Sample Matrix:	Ground Water	**Date Received:**	10/16/20
Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA

Carbon, Total Organic

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
16WW25-201014	K2009424-001	**27.7**	0.50	0.20	0.07	1	10/19/20 11:49	
16WW26-201014	K2009424-002	**2.11**	0.50	0.20	0.07	1	10/19/20 11:49	
16WW30-201014	K2009424-003	**2.13**	0.50	0.20	0.07	1	10/19/20 11:49	
16WW29-201014	K2009424-004	**11.2**	0.50	0.20	0.07	1	10/19/20 11:49	
16WW22-201014	K2009424-005	**0.81**	0.50	0.20	0.07	1	10/19/20 11:49	
16WW41-201014	K2009424-006	**40.8**	0.50	0.20	0.07	1	10/19/20 11:49	
16WW21-201014	K2009424-007	**0.58**	0.50	0.20	0.07	1	10/19/20 11:49	
16WW21-201014-FD	K2009424-008	**0.12**	0.50	0.20	0.07	1	10/19/20 11:49	**J**
16WW39-201014	K2009424-009	**2.31**	0.50	0.20	0.07	1	10/19/20 11:49	
Method Blank	K2009424-MB	ND	0.50	0.20	0.07	1	10/19/20 11:49	U

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K2009424
Project	HS20100779	**Date Collected:**	10/14/20
Sample Matrix:	Ground Water	**Date Received:**	10/16/20
		Date Analyzed:	10/19/20

Replicate Sample Summary
General Chemistry Parameters

Sample Name:	16WW25-201014	**Units:**	mg/L
Lab Code:	K2009424-001	**Basis:**	NA

Analyte Name	Analysis Method	LOQ	LOD	MDL	Sample Result	Duplicate Sample K2009424-001DUP Result	Average	RPD	RPD Limit
Carbon, Total Organic	SM 5310 C	0.50	0.20	0.07	27.7	27.1	27.4	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:**	K2009424
Project:	HS20100779	**Date Collected:**	10/14/20
Sample Matrix:	Ground Water	**Date Received:**	10/16/20
		Date Analyzed:	10/19/20
		Date Extracted:	NA

Matrix Spike Summary
Carbon, Total Organic

Sample Name:	16WW25-201014	**Units:**	mg/L
Lab Code:	K2009424-001	**Basis:**	NA
Analysis Method:	SM 5310 C		
Prep Method:	None		

Matrix Spike
K2009424-001MS

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Carbon, Total Organic	27.7	48.1	25.0	82 *	83-117

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

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

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

Matrix Spike and Matrix Spike Duplicate Data is presented for information purposes only. The matrix may or may not be relevant to samples reported in this report. The laboratory evaluates system performance based on the LCS and LCSD control limits.

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K2009424
Project:	HS20100779	**Date Analyzed:**	10/19/20
Sample Matrix:	Ground Water	**Date Extracted:**	NA

Lab Control Sample Summary
Carbon, Total Organic

Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA
		Analysis Lot:	700002

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K2009424-LCS	23.9	25.0	95	83-117

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

November 09, 2020

Susan Huang
Aptim Environmental & Infrastucture, Inc.
2500 City West Blvd., Suite 1700
Houston, TX 77042

Work Order: **HS20101079**

Laboratory Results for: **LHAAP 16 October 2020**

Dear Susan Huang,

ALS Environmental received 8 sample(s) on Oct 21, 2020 for the analysis presented in the following report.

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

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

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

Sincerely,

Generated By: JUMOKE.LAWAL

RJ Modashia
Project Manager

ALS Houston, US Date: 09-Nov-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
Work Order: HS20101079

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS20101079-01	16EW01-201020	Groundwater		20-Oct-2020 07:45	21-Oct-2020 09:30	☐
HS20101079-02	16WW49-201020	Groundwater		20-Oct-2020 08:50	21-Oct-2020 09:30	☐
HS20101079-03	16WW48-201020	Groundwater		20-Oct-2020 09:55	21-Oct-2020 09:30	☐
HS20101079-04	16WW51-201020	Groundwater		20-Oct-2020 10:55	21-Oct-2020 09:30	☐
HS20101079-05	16EW08-201020	Groundwater		20-Oct-2020 11:45	21-Oct-2020 09:30	☐
HS20101079-06	16EW04-201020	Groundwater		20-Oct-2020 12:30	21-Oct-2020 09:30	☐
HS20101079-07	16RW01-201020	Groundwater		20-Oct-2020 13:15	21-Oct-2020 09:30	☐
HS20101079-08	Trip Blank-201020	Water	CG-060320-207	20-Oct-2020 00:00	21-Oct-2020 09:30	☐

ALS Houston, US Date: 09-Nov-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
Work Order: HS20101079

CASE NARRATIVE

Work Order Comments

- Analysis of Perchlorate was performed by ALS Houston TX, High Resolution. Laboratory. Final report attached

  The analysis for TOC was subcontracted to ALS Environmental in Kelso WA. Final report attached

GC Semivolatiles by Method RSK-175

Batch ID: R371594

Sample ID: 16WW48-201020 (HS20101079-03MS)

- The recovery of the Matrix Spike (MS) associated to this analyte was outside of the established control limits. However, the LCS was within control limits. The recovery of the MS may be due to sample matrix interference.

Sample ID: 16WW48-201020 (HS20101079-03MSD)

- The recovery of the Matrix Spike Duplicate (MSD) associated to this analyte was outside of the established control limits. However, the LCS was within control limits. The failed recovery of the MSD may be due to sample matrix interference.
- The RPD between the MS and MSD was outside of the control limit.

Sample ID: HS20101123-01MS

- MS and MSD are for an unrelated sample

GCMS Volatiles by Method SW8260

Batch ID: R371553

Sample ID: 16EW04-201020 (HS20101079-06)

- Surrogate failure for sample HS20101079-06 due to matrix. Confirmed by re-analysis @ higher dilution.

Sample ID: 16WW48-201020 (HS20101079-03MS)

- The recovery of the Matrix Spike (MS) associated to this analyte was outside of the established control limits. However, the LCS was within control limits. The recovery of the MS may be due to sample matrix interference.

Sample ID: 16WW48-201020 (HS20101079-03MSD)

- The recovery of the Matrix Spike Duplicate (MSD) associated to this analyte was outside of the established control limits. However, the LCS was within control limits. The failed recovery of the MSD may be due to sample matrix interference.

WetChemistry by Method SM2320B

Batch ID: R371121

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

WetChemistry by Method SW9056

Batch ID: R371048

Sample ID: 16EW01-201020 (HS20101079-01)

- Sample ran at 5X due to high concentration of non targeted analyte

Sample ID: 16WW48-201020 (HS20101079-03)

- Sample ran at 5X due to high concentration of non targeted analyte

ALS Houston, US Date: 09-Nov-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
Work Order: HS20101079

CASE NARRATIVE

WetChemistry by Method SW9056

Batch ID: R371048

Sample ID: 16WW48-201020 (HS20101079-03MS)

- The MS and/or MSD recovery was outside of the control limits; however, the result in the parent sample is greater than 4x the spike amount. (Sulfate)

Batch ID: R371917

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

ALS Houston, US Date: 09-Nov-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
Sample ID: 16EW01-201020
Collection Date: 20-Oct-2020 07:45

ANALYTICAL REPORT
WorkOrder:HS20101079
Lab ID:HS20101079-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	12	U	7.5	12	25	UG/L	25	28-Oct-2020 19:27
1,1-Dichloroethene	**29**		**5.0**	**12**	**25**	**UG/L**	25	28-Oct-2020 19:27
1,2-Dichloroethane	**25**		**5.0**	**12**	**25**	**UG/L**	25	28-Oct-2020 19:27
cis-1,2-Dichloroethene	**7,600**		**50**	**120**	**250**	**UG/L**	250	28-Oct-2020 19:48
Methylene chloride	25	U	10	25	50	UG/L	25	28-Oct-2020 19:27
Trichloroethene	**5,400**		**50**	**120**	**250**	**UG/L**	250	28-Oct-2020 19:48
Vinyl chloride	**630**		**5.0**	**12**	**25**	**UG/L**	25	28-Oct-2020 19:27
Surr: 1,2-Dichloroethane-d4	*82.0*			**0**	*81-118*	*%REC*	*25*	*28-Oct-2020 19:27*
Surr: 1,2-Dichloroethane-d4	*81.0*			**0**	*81-118*	*%REC*	*250*	*28-Oct-2020 19:48*
Surr: 4-Bromofluorobenzene	*86.1*			**0**	*85-114*	*%REC*	*25*	*28-Oct-2020 19:27*
Surr: 4-Bromofluorobenzene	*88.3*			**0**	*85-114*	*%REC*	*250*	*28-Oct-2020 19:48*
Surr: Dibromofluoromethane	*83.6*			**0**	*80-119*	*%REC*	*250*	*28-Oct-2020 19:48*
Surr: Dibromofluoromethane	*85.8*			**0**	*80-119*	*%REC*	*25*	*28-Oct-2020 19:27*
Surr: Toluene-d8	*98.2*			**0**	*89-112*	*%REC*	*25*	*28-Oct-2020 19:27*
Surr: Toluene-d8	*95.6*			**0**	*89-112*	*%REC*	*250*	*28-Oct-2020 19:48*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PVL
Ethane	0.00250	U	0.00144	0.00250	0.0100	mg/L	10	26-Oct-2020 14:15
Ethene	**0.112**		**0.00234**	**0.00500**	**0.0100**	**mg/L**	10	26-Oct-2020 14:15
Methane	**0.182**		**0.00107**	**0.00250**	**0.00500**	**mg/L**	10	26-Oct-2020 14:15
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: TH
Alkalinity, Total (As CaCO3)	**517**	a	**5.00**	**5.00**	**5.00**	**mg/L**	1	22-Oct-2020 23:02
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**7.02**		**0.150**	**0.500**	**0.500**	**mg/L**	5	21-Oct-2020 15:21
Nitrogen, Nitrate (As N)	0.500	U	0.150	0.500	0.500	mg/L	5	21-Oct-2020 15:21
Sulfate	**3,960**		**20.0**	**50.0**	**50.0**	**mg/L**	100	21-Oct-2020 20:45
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	27-Oct-2020 14:22
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	09-Nov-2020 09:42

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

ALS Houston, US Date: 09-Nov-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
Sample ID: 16WW49-201020
Collection Date: 20-Oct-2020 08:50

ANALYTICAL REPORT
WorkOrder:HS20101079
Lab ID:HS20101079-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	UG/L	1	28-Oct-2020 14:53
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Oct-2020 14:53
1,2-Dichloroethane	**0.66**	J	**0.20**	**0.50**	**1.0**	**UG/L**	1	28-Oct-2020 14:53
cis-1,2-Dichloroethene	**190**		**1.0**	**2.5**	**5.0**	**UG/L**	5	28-Oct-2020 17:00
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	28-Oct-2020 14:53
Trichloroethene	**4.8**		**0.20**	**0.50**	**1.0**	**UG/L**	1	28-Oct-2020 14:53
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	28-Oct-2020 14:53
Surr: 1,2-Dichloroethane-d4	*81.1*			**0**	*81-118*	*%REC*	*1*	*28-Oct-2020 14:53*
Surr: 1,2-Dichloroethane-d4	*84.1*			**0**	*81-118*	*%REC*	*5*	*28-Oct-2020 17:00*
Surr: 4-Bromofluorobenzene	*89.7*			**0**	*85-114*	*%REC*	*1*	*28-Oct-2020 14:53*
Surr: 4-Bromofluorobenzene	*86.8*			**0**	*85-114*	*%REC*	*5*	*28-Oct-2020 17:00*
Surr: Dibromofluoromethane	*84.8*			**0**	*80-119*	*%REC*	*1*	*28-Oct-2020 14:53*
Surr: Dibromofluoromethane	*85.8*			**0**	*80-119*	*%REC*	*5*	*28-Oct-2020 17:00*
Surr: Toluene-d8	*96.8*			**0**	*89-112*	*%REC*	*5*	*28-Oct-2020 17:00*
Surr: Toluene-d8	*98.0*			**0**	*89-112*	*%REC*	*1*	*28-Oct-2020 14:53*
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**2.66**		**0.0300**	**0.100**	**0.100**	**mg/L**	1	03-Nov-2020 02:55
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	27-Oct-2020 14:22
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	09-Nov-2020 09:42

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

ALS Houston, US Date: 09-Nov-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
Sample ID: 16WW48-201020
Collection Date: 20-Oct-2020 09:55

ANALYTICAL REPORT
WorkOrder:HS20101079
Lab ID:HS20101079-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	25	U	7.5	25	25	UG/L	25	28-Oct-2020 15:35
1,1-Dichloroethene	**32**		**5.0**	**12**	**25**	**UG/L**	25	28-Oct-2020 15:35
1,2-Dichloroethane	**44**		**5.0**	**12**	**25**	**UG/L**	25	28-Oct-2020 15:35
cis-1,2-Dichloroethene	**16,000**		**50**	**120**	**250**	**UG/L**	250	28-Oct-2020 15:14
Methylene chloride	25	U	10	25	50	UG/L	25	28-Oct-2020 15:35
Trichloroethene	**14,000**		**50**	**120**	**250**	**UG/L**	250	28-Oct-2020 15:14
Vinyl chloride	**57**		**5.0**	**12**	**25**	**UG/L**	25	28-Oct-2020 15:35
Surr: 1,2-Dichloroethane-d4	*83.0*			**0**	*81-118*	*%REC*	*250*	*28-Oct-2020 15:14*
Surr: 1,2-Dichloroethane-d4	*81.1*			**0**	*81-118*	*%REC*	*25*	*28-Oct-2020 15:35*
Surr: 4-Bromofluorobenzene	*88.0*			**0**	*85-114*	*%REC*	*250*	*28-Oct-2020 15:14*
Surr: 4-Bromofluorobenzene	*88.9*			**0**	*85-114*	*%REC*	*25*	*28-Oct-2020 15:35*
Surr: Dibromofluoromethane	*84.6*			**0**	*80-119*	*%REC*	*250*	*28-Oct-2020 15:14*
Surr: Dibromofluoromethane	*87.5*			**0**	*80-119*	*%REC*	*25*	*28-Oct-2020 15:35*
Surr: Toluene-d8	*97.0*			**0**	*89-112*	*%REC*	*250*	*28-Oct-2020 15:14*
Surr: Toluene-d8	*96.0*			**0**	*89-112*	*%REC*	*25*	*28-Oct-2020 15:35*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PVL
Ethane	0.000250	U	0.000144	0.000250	0.00100	mg/L	1	26-Oct-2020 13:05
Ethene	**0.00123**		**0.000234**	**0.000500**	**0.00100**	**mg/L**	1	26-Oct-2020 13:05
Methane	**0.00353**		**0.000107**	**0.000250**	**0.000500**	**mg/L**	1	26-Oct-2020 13:05
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: TH
Alkalinity, Total (As CaCO3)	**351**	a	**5.00**	**5.00**	**5.00**	**mg/L**	1	22-Oct-2020 22:49
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**7.35**		**0.150**	**0.500**	**0.500**	**mg/L**	5	21-Oct-2020 15:39
Nitrogen, Nitrate (As N)	0.500	U	0.150	0.500	0.500	mg/L	5	21-Oct-2020 15:39
Sulfate	**2,490**		**20.0**	**50.0**	**50.0**	**mg/L**	100	21-Oct-2020 21:03
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	27-Oct-2020 14:22
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	09-Nov-2020 09:42

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

ALS Houston, US Date: 09-Nov-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
Sample ID: 16WW51-201020
Collection Date: 20-Oct-2020 10:55

ANALYTICAL REPORT
WorkOrder:HS20101079
Lab ID:HS20101079-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	2.5	U	1.5	2.5	5.0	UG/L	5	28-Oct-2020 17:21
1,1-Dichloroethene	2.5	U	1.0	2.5	5.0	UG/L	5	28-Oct-2020 17:21
1,2-Dichloroethane	2.5	U	1.0	2.5	5.0	UG/L	5	28-Oct-2020 17:21
cis-1,2-Dichloroethene	**50**		**1.0**	**2.5**	**5.0**	**UG/L**	5	28-Oct-2020 17:21
Methylene chloride	5.0	U	2.0	5.0	10	UG/L	5	28-Oct-2020 17:21
Trichloroethene	**1,700**		**10**	**25**	**50**	**UG/L**	50	28-Oct-2020 17:42
Vinyl chloride	2.5	U	1.0	2.5	5.0	UG/L	5	28-Oct-2020 17:21
Surr: 1,2-Dichloroethane-d4	*82.0*			**0**	*81-118*	*%REC*	*5*	*28-Oct-2020 17:21*
Surr: 1,2-Dichloroethane-d4	*82.3*			**0**	*81-118*	*%REC*	*50*	*28-Oct-2020 17:42*
Surr: 4-Bromofluorobenzene	*90.4*			**0**	*85-114*	*%REC*	*50*	*28-Oct-2020 17:42*
Surr: 4-Bromofluorobenzene	*89.2*			**0**	*85-114*	*%REC*	*5*	*28-Oct-2020 17:21*
Surr: Dibromofluoromethane	*83.7*			**0**	*80-119*	*%REC*	*5*	*28-Oct-2020 17:21*
Surr: Dibromofluoromethane	*84.7*			**0**	*80-119*	*%REC*	*50*	*28-Oct-2020 17:42*
Surr: Toluene-d8	*97.2*			**0**	*89-112*	*%REC*	*5*	*28-Oct-2020 17:21*
Surr: Toluene-d8	*98.3*			**0**	*89-112*	*%REC*	*50*	*28-Oct-2020 17:42*
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**4.65**		**0.0300**	**0.100**	**0.100**	**mg/L**	1	03-Nov-2020 03:13
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	27-Oct-2020 14:22
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	09-Nov-2020 09:42

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

ALS Houston, US Date: 09-Nov-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
Sample ID: 16EW08-201020
Collection Date: 20-Oct-2020 11:45

ANALYTICAL REPORT
WorkOrder:HS20101079
Lab ID:HS20101079-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Oct-2020 14:32
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Oct-2020 14:32
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Oct-2020 14:32
cis-1,2-Dichloroethene	**1.7**		**0.20**	**0.50**	**1.0**	**UG/L**	1	28-Oct-2020 14:32
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	28-Oct-2020 14:32
Trichloroethene	**1.6**		**0.20**	**0.50**	**1.0**	**UG/L**	1	28-Oct-2020 14:32
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	28-Oct-2020 14:32
Surr: 1,2-Dichloroethane-d4	*81.1*			**0**	*81-118*	*%REC*	*1*	*28-Oct-2020 14:32*
Surr: 4-Bromofluorobenzene	*86.5*			**0**	*85-114*	*%REC*	*1*	*28-Oct-2020 14:32*
Surr: Dibromofluoromethane	*84.8*			**0**	*80-119*	*%REC*	*1*	*28-Oct-2020 14:32*
Surr: Toluene-d8	*95.9*			**0**	*89-112*	*%REC*	*1*	*28-Oct-2020 14:32*
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**9.59**		**0.0300**	**0.100**	**0.100**	**mg/L**	1	03-Nov-2020 03:31
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	27-Oct-2020 14:22
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	09-Nov-2020 09:42

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

ALS Houston, US Date: 09-Nov-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
Sample ID: 16EW04-201020
Collection Date: 20-Oct-2020 12:30

ANALYTICAL REPORT
WorkOrder:HS20101079
Lab ID:HS20101079-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	10	U	3.0	10	10	UG/L	10	28-Oct-2020 18:03
1,1-Dichloroethene	**5.9**	J	**2.0**	**5.0**	**10**	**UG/L**	10	28-Oct-2020 18:03
1,2-Dichloroethane	5.0	U	2.0	5.0	10	UG/L	10	28-Oct-2020 18:03
cis-1,2-Dichloroethene	**4,400**		**20**	**50**	**100**	**UG/L**	100	28-Oct-2020 18:24
Methylene chloride	10	U	4.0	10	20	UG/L	10	28-Oct-2020 18:03
Trichloroethene	**520**		**2.0**	**5.0**	**10**	**UG/L**	10	28-Oct-2020 18:03
Vinyl chloride	5.0	U	2.0	5.0	10	UG/L	10	28-Oct-2020 18:03
Surr: 1,2-Dichloroethane-d4	*80.5*	*S*		**0**	*81-118*	*%REC*	*10*	*28-Oct-2020 18:03*
Surr: 1,2-Dichloroethane-d4	*81.6*			**0**	*81-118*	*%REC*	*100*	*28-Oct-2020 18:24*
Surr: 4-Bromofluorobenzene	*87.3*			**0**	*85-114*	*%REC*	*10*	*28-Oct-2020 18:03*
Surr: 4-Bromofluorobenzene	*88.5*			**0**	*85-114*	*%REC*	*100*	*28-Oct-2020 18:24*
Surr: Dibromofluoromethane	*86.4*			**0**	*80-119*	*%REC*	*10*	*28-Oct-2020 18:03*
Surr: Dibromofluoromethane	*85.8*			**0**	*80-119*	*%REC*	*100*	*28-Oct-2020 18:24*
Surr: Toluene-d8	*97.2*			**0**	*89-112*	*%REC*	*10*	*28-Oct-2020 18:03*
Surr: Toluene-d8	*95.8*			**0**	*89-112*	*%REC*	*100*	*28-Oct-2020 18:24*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	27-Oct-2020 14:22

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

ALS Houston, US Date: 09-Nov-20

Client:	Aptim Environmental & Infrastucture, Inc.	**ANALYTICAL REPORT**
Project:	LHAAP 16 October 2020	WorkOrder:HS20101079
Sample ID:	16RW01-201020	Lab ID:HS20101079-07
Collection Date:	20-Oct-2020 13:15	Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	5.0	U	3.0	5.0	10	UG/L	10	28-Oct-2020 18:45
1,1-Dichloroethene	5.0	U	2.0	5.0	10	UG/L	10	28-Oct-2020 18:45
1,2-Dichloroethane	5.0	U	2.0	5.0	10	UG/L	10	28-Oct-2020 18:45
cis-1,2-Dichloroethene	**120**		**2.0**	**5.0**	**10**	**UG/L**	10	28-Oct-2020 18:45
Methylene chloride	10	U	4.0	10	20	UG/L	10	28-Oct-2020 18:45
Trichloroethene	**4,000**		**20**	**50**	**100**	**UG/L**	100	28-Oct-2020 19:06
Vinyl chloride	5.0	U	2.0	5.0	10	UG/L	10	28-Oct-2020 18:45
Surr: 1,2-Dichloroethane-d4	*81.6*			**0**	*81-118*	*%REC*	*10*	*28-Oct-2020 18:45*
Surr: 1,2-Dichloroethane-d4	*84.9*			**0**	*81-118*	*%REC*	*100*	*28-Oct-2020 19:06*
Surr: 4-Bromofluorobenzene	*85.5*			**0**	*85-114*	*%REC*	*10*	*28-Oct-2020 18:45*
Surr: 4-Bromofluorobenzene	*88.8*			**0**	*85-114*	*%REC*	*100*	*28-Oct-2020 19:06*
Surr: Dibromofluoromethane	*84.0*			**0**	*80-119*	*%REC*	*10*	*28-Oct-2020 18:45*
Surr: Dibromofluoromethane	*86.5*			**0**	*80-119*	*%REC*	*100*	*28-Oct-2020 19:06*
Surr: Toluene-d8	*98.9*			**0**	*89-112*	*%REC*	*10*	*28-Oct-2020 18:45*
Surr: Toluene-d8	*96.4*			**0**	*89-112*	*%REC*	*100*	*28-Oct-2020 19:06*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	27-Oct-2020 14:22

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

ALS Houston, US Date: 09-Nov-20

Client:	Aptim Environmental & Infrastucture, Inc.	**ANALYTICAL REPORT**
Project:	LHAAP 16 October 2020	WorkOrder:HS20101079
Sample ID:	Trip Blank-201020	Lab ID:HS20101079-08
Collection Date:	20-Oct-2020 00:00	Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Oct-2020 14:11
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Oct-2020 14:11
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Oct-2020 14:11
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Oct-2020 14:11
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	28-Oct-2020 14:11
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Oct-2020 14:11
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	28-Oct-2020 14:11
Surr: 1,2-Dichloroethane-d4	*81.9*			**0**	*81-118*	*%REC*	*1*	*28-Oct-2020 14:11*
Surr: 4-Bromofluorobenzene	*86.8*			**0**	*85-114*	*%REC*	*1*	*28-Oct-2020 14:11*
Surr: Dibromofluoromethane	*81.7*			**0**	*80-119*	*%REC*	*1*	*28-Oct-2020 14:11*
Surr: Toluene-d8	*97.0*			**0**	*89-112*	*%REC*	*1*	*28-Oct-2020 14:11*

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

ALS Houston, US Date: 09-Nov-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
WorkOrder: HS20101079

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R371048 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Groundwater	
HS20101079-01	16EW01-201020	20 Oct 2020 07:45			21 Oct 2020 20:45	100
HS20101079-01	16EW01-201020	20 Oct 2020 07:45			21 Oct 2020 15:21	5
HS20101079-03	16WW48-201020	20 Oct 2020 09:55			21 Oct 2020 21:03	100
HS20101079-03	16WW48-201020	20 Oct 2020 09:55			21 Oct 2020 15:39	5
Batch ID: R371121 (0)	**Test Name :** ALKALINITY BY SM2320B				**Matrix:** Groundwater	
HS20101079-01	16EW01-201020	20 Oct 2020 07:45			22 Oct 2020 23:02	1
HS20101079-03	16WW48-201020	20 Oct 2020 09:55			22 Oct 2020 22:49	1
Batch ID: R371410 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** Groundwater	
HS20101079-01	16EW01-201020	20 Oct 2020 07:45			27 Oct 2020 14:22	1
HS20101079-02	16WW49-201020	20 Oct 2020 08:50			27 Oct 2020 14:22	1
HS20101079-03	16WW48-201020	20 Oct 2020 09:55			27 Oct 2020 14:22	1
HS20101079-04	16WW51-201020	20 Oct 2020 10:55			27 Oct 2020 14:22	1
HS20101079-05	16EW08-201020	20 Oct 2020 11:45			27 Oct 2020 14:22	1
HS20101079-06	16EW04-201020	20 Oct 2020 12:30			27 Oct 2020 14:22	1
HS20101079-07	16RW01-201020	20 Oct 2020 13:15			27 Oct 2020 14:22	1
Batch ID: R371553 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS20101079-08	Trip Blank-201020	20 Oct 2020 00:00			28 Oct 2020 14:11	1
Batch ID: R371553 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS20101079-01	16EW01-201020	20 Oct 2020 07:45			28 Oct 2020 19:48	250
HS20101079-01	16EW01-201020	20 Oct 2020 07:45			28 Oct 2020 19:27	25
HS20101079-02	16WW49-201020	20 Oct 2020 08:50			28 Oct 2020 17:00	5
HS20101079-02	16WW49-201020	20 Oct 2020 08:50			28 Oct 2020 14:53	1
HS20101079-03	16WW48-201020	20 Oct 2020 09:55			28 Oct 2020 15:35	25
HS20101079-03	16WW48-201020	20 Oct 2020 09:55			28 Oct 2020 15:14	250
HS20101079-04	16WW51-201020	20 Oct 2020 10:55			28 Oct 2020 17:42	50
HS20101079-04	16WW51-201020	20 Oct 2020 10:55			28 Oct 2020 17:21	5
HS20101079-05	16EW08-201020	20 Oct 2020 11:45			28 Oct 2020 14:32	1
HS20101079-06	16EW04-201020	20 Oct 2020 12:30			28 Oct 2020 18:24	100
HS20101079-06	16EW04-201020	20 Oct 2020 12:30			28 Oct 2020 18:03	10
HS20101079-07	16RW01-201020	20 Oct 2020 13:15			28 Oct 2020 19:06	100
HS20101079-07	16RW01-201020	20 Oct 2020 13:15			28 Oct 2020 18:45	10
Batch ID: R371594 (0)	**Test Name :** DISSOLVED GASES BY RSK-175				**Matrix:** Groundwater	
HS20101079-01	16EW01-201020	20 Oct 2020 07:45			26 Oct 2020 14:15	10
HS20101079-03	16WW48-201020	20 Oct 2020 09:55			26 Oct 2020 13:05	1

ALS Houston, US Date: 09-Nov-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
WorkOrder: HS20101079

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R371917 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Groundwater	
HS20101079-02	16WW49-201020	20 Oct 2020 08:50			03 Nov 2020 02:55	1
HS20101079-04	16WW51-201020	20 Oct 2020 10:55			03 Nov 2020 03:13	1
HS20101079-05	16EW08-201020	20 Oct 2020 11:45			03 Nov 2020 03:31	1
Batch ID: R372182 (0)	**Test Name :** SUBCONTRACT ANALYSIS - TOC ANALYSIS				**Matrix:** Groundwater	
HS20101079-01	16EW01-201020	20 Oct 2020 07:45			09 Nov 2020 09:42	1
HS20101079-02	16WW49-201020	20 Oct 2020 08:50			09 Nov 2020 09:42	1
HS20101079-03	16WW48-201020	20 Oct 2020 09:55			09 Nov 2020 09:42	1
HS20101079-04	16WW51-201020	20 Oct 2020 10:55			09 Nov 2020 09:42	1
HS20101079-05	16EW08-201020	20 Oct 2020 11:45			09 Nov 2020 09:42	1

ALS Houston, US Date: 09-Nov-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
WorkOrder: HS20101079

QC BATCH REPORT

Batch ID: R371594 (0) **Instrument:** FID-4 **Method:** DISSOLVED GASES BY RSK-175

MBLK Sample ID: **MBLK-201026** Units: **mg/L** Analysis Date: **26-Oct-2020 10:00**
Client ID: Run ID: **FID-4_371594** SeqNo: **5807445** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.000250	0.00100								U
Ethene	0.000500	0.00100								U
Methane	0.000250	0.000500								U

LCS Sample ID: **LCS-201026** Units: **mg/L** Analysis Date: **26-Oct-2020 10:08**
Client ID: Run ID: **FID-4_371594** SeqNo: **5807446** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0204	0.00100	0.01804	0	113	75 - 125				
Ethene	0.0186	0.00100	0.0168	0	111	75 - 125				
Methane	0.00935	0.000500	0.009647	0	96.9	75 - 125				

LCSD Sample ID: **LCSD-201026** Units: **mg/L** Analysis Date: **26-Oct-2020 10:19**
Client ID: Run ID: **FID-4_371594** SeqNo: **5807447** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0200	0.00100	0.01804	0	111	75 - 125	0.02037	1.7	30	
Ethene	0.0179	0.00100	0.0168	0	107	75 - 125	0.01859	3.66	30	
Methane	0.0105	0.000500	0.009647	0	109	75 - 125	0.009349	11.8	30	

MS Sample ID: **HS20101123-01MS** Units: **mg/L** Analysis Date: **26-Oct-2020 14:31**
Client ID: Run ID: **FID-4_371594** SeqNo: **5807468** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0245	0.00100	0.01804	0	136	75 - 125				S
Ethene	0.0261	0.00100	0.0168	0.002009	144	75 - 125				S
Methane	0.0131	0.000500	0.009647	0.001258	123	75 - 125				

ALS Houston, US Date: 09-Nov-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
WorkOrder: HS20101079

QC BATCH REPORT

Batch ID: R371594 (0) **Instrument:** FID-4 **Method:** DISSOLVED GASES BY RSK-175

MS Sample ID: **HS20101079-03MS** Units: **mg/L** Analysis Date: **26-Oct-2020 13:16**
Client ID: **16WW48-201020** Run ID: **FID-4_371594** SeqNo: **5807463** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0111	0.00100	0.01804	0	61.4	75 - 125				S
Ethene	0.0124	0.00100	0.0168	0.001226	66.7	75 - 125				S
Methane	0.00691	0.000500	0.009647	0.003527	35.1	75 - 125				S

MSD Sample ID: **HS20101123-01MSD** Units: **mg/L** Analysis Date: **26-Oct-2020 14:49**
Client ID: Run ID: **FID-4_371594** SeqNo: **5807469** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0251	0.00100	0.01804	0	139	75 - 125	0.02450	2.53	30	S
Ethene	0.0267	0.00100	0.0168	0.002009	147	75 - 125	0.02614	2.06	30	S
Methane	0.0123	0.000500	0.009647	0.001258	114	75 - 125	0.01312	6.57	30	

MSD Sample ID: **HS20101079-03MSD** Units: **mg/L** Analysis Date: **26-Oct-2020 13:34**
Client ID: **16WW48-201020** Run ID: **FID-4_371594** SeqNo: **5807464** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0261	0.00100	0.01804	0	144	75 - 125	0.01109	80.6	30	SR
Ethene	0.0261	0.00100	0.0168	0.001226	148	75 - 125	0.01244	71	30	SR
Methane	0.0133	0.000500	0.009647	0.003527	102	75 - 125	0.006909	63.5	30	R

The following samples were analyzed in this batch: HS20101079-01 HS20101079-03

ALS Houston, US Date: 09-Nov-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
WorkOrder: HS20101079

QC BATCH REPORT

Batch ID: R371553 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-201028** Units: **UG/L** Analysis Date: **28-Oct-2020 13:50**
Client ID: Run ID: **VOA6_371553** SeqNo: **5806473** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	0.50	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
Methylene chloride	1.0	2.0								U
Trichloroethene	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*41.26*	*1.0*	*50*	*0*	*82.5*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*44.08*	*1.0*	*50*	*0*	*88.2*	*85 - 114*				
Surr: Dibromofluoromethane	*42.6*	*1.0*	*50*	*0*	*85.2*	*80 - 119*				
Surr: Toluene-d8	*48.88*	*1.0*	*50*	*0*	*97.8*	*89 - 112*				

LCS Sample ID: **VLCSW-201028** Units: **UG/L** Analysis Date: **28-Oct-2020 13:08**
Client ID: Run ID: **VOA6_371553** SeqNo: **5806472** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	21.12	1.0	20	0	106	80 - 119				
1,1-Dichloroethene	14.99	1.0	20	0	75.0	71 - 131				
1,2-Dichloroethane	22.35	1.0	20	0	112	73 - 128				
cis-1,2-Dichloroethene	19.47	1.0	20	0	97.3	78 - 123				
Methylene chloride	17.67	2.0	20	0	88.3	74 - 124				
Trichloroethene	23.08	1.0	20	0	115	79 - 123				
Vinyl chloride	15.03	1.0	20	0	75.1	58 - 137				
Surr: 1,2-Dichloroethane-d4	*54.48*	*1.0*	*50*	*0*	*109*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*52.44*	*1.0*	*50*	*0*	*105*	*85 - 114*				
Surr: Dibromofluoromethane	*50.84*	*1.0*	*50*	*0*	*102*	*80 - 119*				
Surr: Toluene-d8	*51.14*	*1.0*	*50*	*0*	*102*	*89 - 112*				

ALS Houston, US Date: 09-Nov-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
WorkOrder: HS20101079

QC BATCH REPORT

Batch ID: R371553 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS20101079-03MS** Units: **UG/L** Analysis Date: **28-Oct-2020 15:56**
Client ID: **16WW48-201020** Run ID: **VOA6_371553** SeqNo: **5806479** PrepDate: DF: **250**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	5403	250	5000	0	108	80 - 119				
1,1-Dichloroethene	4587	250	5000	0	91.7	71 - 131				
1,2-Dichloroethane	5789	250	5000	0	116	73 - 128				
cis-1,2-Dichloroethene	21390	250	5000	15590	116	78 - 123				
Methylene chloride	4565	500	5000	0	91.3	74 - 124				
Trichloroethene	22570	250	5000	14450	162	79 - 123				S
Vinyl chloride	4371	250	5000	0	87.4	58 - 137				
Surr: 1,2-Dichloroethane-d4	*10410*	*250*	*12500*	*0*	*83.3*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*11430*	*250*	*12500*	*0*	*91.5*	*85 - 114*				
Surr: Dibromofluoromethane	*10830*	*250*	*12500*	*0*	*86.6*	*80 - 119*				
Surr: Toluene-d8	*11820*	*250*	*12500*	*0*	*94.5*	*89 - 112*				

MSD Sample ID: **HS20101079-03MSD** Units: **UG/L** Analysis Date: **28-Oct-2020 16:18**
Client ID: **16WW48-201020** Run ID: **VOA6_371553** SeqNo: **5806480** PrepDate: DF: **250**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	5616	250	5000	0	112	80 - 119	5403	3.86	20	
1,1-Dichloroethene	4292	250	5000	0	85.8	71 - 131	4587	6.65	20	
1,2-Dichloroethane	5992	250	5000	0	120	73 - 128	5789	3.46	20	
cis-1,2-Dichloroethene	21130	250	5000	15590	111	78 - 123	21390	1.22	20	
Methylene chloride	4721	500	5000	0	94.4	74 - 124	4565	3.36	20	
Trichloroethene	21390	250	5000	14450	139	79 - 123	22570	5.38	20	S
Vinyl chloride	4299	250	5000	0	86.0	58 - 137	4371	1.66	20	
Surr: 1,2-Dichloroethane-d4	*11120*	*250*	*12500*	*0*	*88.9*	*81 - 118*	*10410*	*6.61*	*20*	
Surr: 4-Bromofluorobenzene	*11370*	*250*	*12500*	*0*	*90.9*	*85 - 114*	*11430*	*0.572*	*20*	
Surr: Dibromofluoromethane	*11020*	*250*	*12500*	*0*	*88.2*	*80 - 119*	*10830*	*1.78*	*20*	
Surr: Toluene-d8	*11770*	*250*	*12500*	*0*	*94.2*	*89 - 112*	*11820*	*0.375*	*20*	

The following samples were analyzed in this batch:

HS20101079-01	HS20101079-02	HS20101079-03	HS20101079-04
HS20101079-05	HS20101079-06	HS20101079-07	HS20101079-08

ALS Houston, US Date: 09-Nov-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
WorkOrder: HS20101079

QC BATCH REPORT

Batch ID: R371048 (0) **Instrument:** ICS-Integrion **Method:** ANIONS BY SW9056A

MBLK Sample ID: **MBLK-102120** Units: **mg/L** Analysis Date: **22-Oct-2020 01:51**
Client ID: Run ID: **ICS-Integrion_371048** SeqNo: **5794524** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	0.100	0.100								U
Nitrogen, Nitrate (As N)	0.100	0.100								U
Sulfate	0.500	0.500								U

LCS Sample ID: **LCS-102120** Units: **mg/L** Analysis Date: **22-Oct-2020 02:09**
Client ID: Run ID: **ICS-Integrion_371048** SeqNo: **5794525** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	4.022	0.100	4	0	101	80 - 120				
Nitrogen, Nitrate (As N)	4.148	0.100	4	0	104	80 - 120				
Sulfate	18.79	0.500	20	0	94.0	80 - 120				

MS Sample ID: **HS20101079-03MS** Units: **mg/L** Analysis Date: **21-Oct-2020 20:09**
Client ID: **16WW48-201020** Run ID: **ICS-Integrion_371048** SeqNo: **5794518** PrepDate: DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	16.76	0.500	10	7.352	94.1	80 - 120				
Nitrogen, Nitrate (As N)	11.47	0.500	10	0	115	80 - 120				
Sulfate	2338	2.50	50	2334	7.79	80 - 120				SEO

MSD Sample ID: **HS20101079-03MSD** Units: **mg/L** Analysis Date: **21-Oct-2020 20:27**
Client ID: **16WW48-201020** Run ID: **ICS-Integrion_371048** SeqNo: **5794519** PrepDate: DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	16.87	0.500	10	7.352	95.2	80 - 120	16.76	0.633	20	
Nitrogen, Nitrate (As N)	11.56	0.500	10	0	116	80 - 120	11.47	0.768	20	
Sulfate	2350	2.50	50	2334	32.3	80 - 120	2338	0.523	20	SEO

The following samples were analyzed in this batch: HS20101079-01 HS20101079-03

ALS Houston, US Date: 09-Nov-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
WorkOrder: HS20101079

QC BATCH REPORT

Batch ID: R371121 (0) **Instrument:** ManTech01 **Method:** ALKALINITY BY SM2320B

MBLK Sample ID: **WBLKW2-201022** Units: **mg/L** Analysis Date: **22-Oct-2020 22:09**
Client ID: Run ID: **ManTech01_371121** SeqNo: **5796038** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	5.00	5.00								U

LCS Sample ID: **WLCS2-201022** Units: **mg/L** Analysis Date: **22-Oct-2020 22:17**
Client ID: Run ID: **ManTech01_371121** SeqNo: **5796039** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	1013	5.00	1000	0	101	85 - 115				

LCSD Sample ID: **WLCSD2-201022** Units: **mg/L** Analysis Date: **22-Oct-2020 22:42**
Client ID: Run ID: **ManTech01_371121** SeqNo: **5796042** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	1016	5.00	1000	0	102	85 - 115	1013	0.301	20	

DUP Sample ID: **HS20101079-03DUP** Units: **mg/L** Analysis Date: **22-Oct-2020 22:55**
Client ID: **16WW48-201020** Run ID: **ManTech01_371121** SeqNo: **5796044** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	343.9	5.00					351.3	2.13	20	

The following samples were analyzed in this batch: HS20101079-01 HS20101079-03

ALS Houston, US Date: 09-Nov-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
WorkOrder: HS20101079

QC BATCH REPORT

Batch ID: R371917 (0) **Instrument:** ICS-Integrion **Method:** ANIONS BY SW9056A

MBLK Sample ID: **MBLK-110220** Units: **mg/L** Analysis Date: **02-Nov-2020 11:19**
Client ID: Run ID: **ICS-Integrion_371917** SeqNo: **5814879** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	0.100	0.100								U

LCS Sample ID: **LCS-110220** Units: **mg/L** Analysis Date: **02-Nov-2020 11:37**
Client ID: Run ID: **ICS-Integrion_371917** SeqNo: **5814880** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.828	0.100	4	0	95.7	80 - 120				

MS Sample ID: **HS20101310-11MS** Units: **mg/L** Analysis Date: **03-Nov-2020 06:49**
Client ID: Run ID: **ICS-Integrion_371917** SeqNo: **5814901** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.111	0.100	2	1.274	91.9	80 - 120				

MSD Sample ID: **HS20101310-11MSD** Units: **mg/L** Analysis Date: **03-Nov-2020 07:07**
Client ID: Run ID: **ICS-Integrion_371917** SeqNo: **5814902** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.191	0.100	2	1.274	95.9	80 - 120	3.111	2.53	20	

The following samples were analyzed in this batch: HS20101079-02 HS20101079-04 HS20101079-05

ALS Houston, US Date: 09-Nov-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
WorkOrder: **HS20101079**

QUALIFIERS, ACRONYMS, UNITS

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

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

Unit Reported	Description
mg/L	Milligrams per Liter

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	20-030-0	26-Mar-2021
California	2919, 2020-2021	30-Apr-2021
Dept of Defense	PJLA L20-507	22-Dec-2021
Florida	E87611-30-07/01/2020	30-Jun-2021
Illinois	2000322020-4	09-May-2021
Kansas	E-10352 2020-2021	31-Jul-2021
Kentucky	123043, 2020-2021	30-Apr-2021
Louisiana	03087, 2020-2021	30-Jun-2021
North Carolina	624-2020	31-Dec-2020
North Dakota	R-193 2020-2021	30-Apr-2021
Texas	T104704231-20-26	30-Apr-2021

ALS Houston, US Date: 09-Nov-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
Work Order: HS20101079

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS20101079-01	16EW01-201020	Login	10/21/2020 1:00:57 PM	PMG	Sub
HS20101079-01	16EW01-201020	Login	10/21/2020 1:00:57 PM	PMG	WET068
HS20101079-01	16EW01-201020	Login	10/21/2020 1:00:57 PM	PMG	VOA260
HS20101079-01	16EW01-201020	Login	10/21/2020 1:00:57 PM	PMG	RSK022
HS20101079-01	16EW01-201020	Login	10/21/2020 1:00:57 PM	PMG	Sub

ALS Houston, US Date: 09-Nov-20

Sample Receipt Checklist

Work Order ID: HS20101079 **Date/Time Received:** **21-Oct-2020 09:30**

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

Completed By: /S/ Paresh M. Giga (eSignature) 21-Oct-2020 13:23 (Date/Time) **Reviewed by:** /S/ RJ Modashia (eSignature) 21-Oct-2020 16:38 (Date/Time)

Matrices: **GW/Water** Carrier name: **FedEx**

	Yes	No	
Shipping container/cooler in good condition?	☑	☐	Not Present ☐
Custody seals intact on shipping container/cooler?	☑	☐	Not Present ☐
Custody seals intact on sample bottles?	☐	☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	☐	☐	Not Present ☑
Chain of custody present?	☑	☐	2 Page(s)
Chain of custody signed when relinquished and received?	☑	☐	COC IDs:None
Samplers name present on COC?	☐	☑	
Chain of custody agrees with sample labels?	☑	☐	
Samples in proper container/bottle?	☑	☐	
Sample containers intact?	☑	☐	
Sufficient sample volume for indicated test?	☑	☐	
All samples received within holding time?	☑	☐	
Container/Temp Blank temperature in compliance?	☑	☐	

Temperature(s)/Thermometer(s):	1.5C U/c	IR31
Cooler(s)/Kit(s):	43016	
Date/Time sample(s) sent to storage:	10/21/2020 13:45	

	Yes	No	
Water - VOA vials have zero headspace?	☑	☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	☐	☐	N/A ☑
pH adjusted?	☐	☐	N/A ☑

pH adjusted by:

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

CHAIN OF CUSTODY

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

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

Project No. 501032

Job: **LHAAP 16 October 2020**

Prepared By: Scott Beesinger

P.O. Number

Field Sample I.D. Time	Sample Matrix	Date /	MS / MSD	No. OF CONTAINERS	VOC by SW 8260B	TOC by SM5310C	MEE by RSK 175	Anions (bromide, sulfate, nitrate) by SW9056 and Alkalinity by SM2320	Bromide by SW9056	Perchlorate by SW6850	Metals (arsenic, chromium, manganese, nickel, thallium) by SW6020				Remarks (Preservatives, etc.)
16EW01-201020	WG	10/20/20/0745		10	X	X	X	X	X	X					
16WW49-201020	WG	10/20/20/0850		7	X	X			X	X					
16WW48-201020	WG	10/20/20/0955		10	X	X	X	X	X	X					
16WW48-201020-MS	WG	10/20/20/0955		10	X	X	X	X	X	X					
16WW48-201020-MSD	WG	10/20/20/0955		10	X	X	X	X	X	X					
16WW51-201020	WG	10/20/20/1055		7	X	X			X	X					
16EW08-201020	WG	10/20/20/1145		7	X	X			X	X					
16EW04-201020	WG	10/20/20/1230		4	X					X					

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

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	10/20/20	1430									

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition
J. Hinerman	10/21/20	09:50							

Remarks:
Cooler 43016 Temp 1.5 1231 CFU

Aptim Environmental & Infrastructure, Inc.
LHAAP 16 October 2020
HS20101079

CHAIN OF CUSTODY

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

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

Project No. 501032

Job: **LHAAP 16 October 2020**

Prepared By: Scott Beesinger

P.O. Number

Field Sample I.D. Time	Sample Matrix	Date /	MS / MSD	No. OF CONTAINERS	VOC by SW 8260B	TOC by SM5310C	MEE by RSK 175	Anions (bromide, sulfate, nitrate) by SW9056 and Alkalinity by SM2320	Bromide by SW9056	Perchlorate by SW6850	Metals (arsenic, chromium, manganese, nickel, thallium) by SW6020				Remarks (Preservatives, etc.)
16RW01-201020	W G	10/20/20/1315		4	X					X					
TRIP BLANK-201020	W	10/20/20		2	X										

Analyses

Aptim Environmental & Infrastructure, Inc.
LHAAP 16 October 2020

HS20101079

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

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	10/20/20	1430									

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition
J. [illegible]	10/21/20	09:30							

Remarks:

(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

U3016

CUSTODY SEAL

Date: 10/20/20 Time: 1430
Name: Scott Beesinger
Company: BHAPL

Seal Broken By: SM
Date: 10/21/20

U3016 OCT 21 2020

Must Deliver Next Business Day
Time and Tempature Sensitive!

U3016

ORIGIN ID:SGRA (903) 930-6193
SCOTT BEESINGER
APTIM
1203-B EAST GRAND AVE.
PMB202
MARSHALL, TX 75670
UNITED STATES US

SHIP DATE: 20JUN20
ACTWGT: 1.00 LB MAN
CAD: 3001307/CFE3211
DIMS: 19x16x10 IN

10 CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099
(281) 530-5656
REF: LHAAP 16 - B072394 - RJ
RMA:

FedEx Express

FedEx
TRK# 0221 1891 8877 8325

WED - 21 OCT AA
PRIORITY OVERNIGHT

AB SGRA

77099
TX-US
IAH

October 26, 2020

Service Request No:E2001015

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

Laboratory Results for: HS20101079

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory October 22, 2020
For your reference, these analyses have been assigned our service request number **E2001015.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current TNI standards, where applicable, and except as noted in the laboratory case narrative provided. All results are intended to be considered in their entirety and ALS Environmental is not responsible for use of less than the complete final report. Results apply only to the items submitted to the laboratory, as received for analysis. In accordance with the current TNI Standard, a statement on the estimated uncertainty of measurement of any quantitative analysis will be supplied upon request.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Corey Grandits
Project Manager

ADDRESS 10450 Stancliff Rd., Suite 210, Houston, TX 77099
PHONE +1 281 530 5656 | FAX +1 281 530 5887
ALS Group USA, Corp.
dba ALS Environmental

Certificate of Analysis

ALS Environmental - Houston HRMS
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

ALS Environmental

Client:	ALS Houston	**Service Request No.:**	E2001015
Project:	HS20101079	**Date Received:**	10/22/20
Sample Matrix:	W		

CASE NARRATIVE

All analyses were performed in adherence to the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier II. When appropriate to the method, method blank results have been reported with each analytical test.

Sample Receipt

Seven samples were received for analysis at ALS Environmental in Houston on 10/22/20.

The samples were received in good condition and are consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

Data Validation Notes and Discussion

Precision and Accuracy:

EQ2000533: Laboratory Control Spike/Duplicate Laboratory Control Spike (LCS/DLCS) samples were analyzed and reported in addition to a MS/MSD for this extraction batch. The LCS/DLCS recoveries pass. MS/MSD recoveries were outside control limits, Sample result is 10X greater than the spike amount.

DoD Certification is held for the method/matrix/analytes provided in this report.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.

Use of ALS group USA Corp dba ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.

Client: ALS Environmental - US **Service Request:**E2001015
Project: HS20101079

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
E2001015-001	16EW01-201020	10/20/2020	0745
E2001015-002	16WW49-201020	10/20/2020	0850
E2001015-003	16WW48-201020	10/20/2020	0955
E2001015-004	16WW51-201020	10/20/2020	1055
E2001015-005	16EW08-201020	10/20/2020	1145
E2001015-006	16EW04-201020	10/20/2020	1230
E2001015-007	16RW01-201020	10/20/2020	1315

Service Request Summary

Folder #: **E2001015**
Client Name: ALS Environmental - US
Project Name: HS20101079
Project Number:

Report To: RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Houston, TX 77099-4338
USA
Phone Number: 281-530-5656
Cell Number:
Fax Number: 281-530-5887
E-mail: rj.modashia@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 10/22/20
Internal Due Date: 11/4/2020
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS20101079
EDD: No EDD Specified

9 250 mL-Plastic Bottle HDPE WM CLEAR Unpreserved
Location: EHRMS-WIC 10B
Pressure Gas:

Lab Samp No.	Client Samp No	Matrix	Collected	HOUSTON CIO4 DOD/6850
E2001015-001	16EW01-201020	Ground Water	10/20/20 0745	**IV**
E2001015-002	16WW49-201020	Ground Water	10/20/20 0850	**IV**
E2001015-003	16WW48-201020	Ground Water	10/20/20 0955	**IV**
E2001015-004	16WW51-201020	Ground Water	10/20/20 1055	**IV**
E2001015-005	16EW08-201020	Ground Water	10/20/20 1145	**IV**
E2001015-006	16EW04-201020	Ground Water	10/20/20 1230	**IV**
E2001015-007	16RW01-201020	Ground Water	10/20/20 1315	**IV**

Service Request Summary

Folder #: **E2001015**
Client Name: ALS Environmental - US
Project Name: HS20101079
Project Number:

Report To: RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Houston, TX 77099-4338
USA
Phone Number: 281-530-5656
Cell Number:
Fax Number: 281-530-5887
E-mail: rj.modashia@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 10/22/20
Internal Due Date: 11/4/2020
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS20101079
EDD: No EDD Specified

9 250 mL-Plastic Bottle HDPE WM CLEAR Unpreserved
Location: EHRMS-WIC 10B
Pressure Gas:

Test Comments:

Group	Test/Method	Samples	Comments
Semivoa GCMS	ClO4 DOD/6850	6	Level II due 11/4,level IV 11/11
Semivoa GCMS	ClO4 DOD/6850	1	MS/MSD

Data Qualifiers

Lab Standard

+	Possible Tedlar bag artifact.
A	TIC is a suspected aldol-condensation product
B	Analyte found in the associated method blank as well as in the sample.
BC	Reported results are not blank corrected.
BH	The back section of the tube yielded higher results than the front.
BT	Results indicated possible breakthrough; back section >=10% front section.
C	Result identification confirmed.
D	Compound identified in an analysis at a secondary dilution factor
D	Spike was diluted out
DE	Reported results are corrected for desorption efficiency.
E	Estimated value. Concentration above calibration range
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
H1	Sample analysis performed past holding time. See case narrative.
H2	Initial analysis within holding time. Reanalysis for the required dilution was past holding time.
H3	Sample was received and analyzed past holding time.
H4	Sample was extracted past required extraction holding time, but analyzed within analysis holding time. See case narrative.
I	Internal standard not within the specified limits. See case narrative.
J	Estimated Value. Concentration found below MRL.
K	A deflection in the QC ion may indicate interference with the quantitation of this ion. The concentration of this analyte should be considered as an estimate.
K	Analyte was detected above the method reporting limit prior to normalization.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
L1	Laboratory control sample recovery outside the specified limits; results may be biased high.
L2	Laboratory control sample recovery outside the specified limits; results may be biased low.
L3	Laboratory control sample recovery outside the specified limits.
M	Matrix interference; results may be biased high.
M	The duplicate injection precision not met.
M1	Matrix interference due to coelution with a non-target compound; results may be biased high.
N	Presumptive evidence of a compound for TICs that have been identified based on a mass spectral library search.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.

Data Qualifiers

Lab Standard

P	Indicates chlorodiphenyl ether interference present at the retention time of the target compound.
P	Pesticide/Aroclor target analyte > 40% difference for detected concentrations between GC columns
Q	Indicates as estimated value because the P and P + 2 theoretical abundance ratio does not meet method criteria.
R	Duplicate Precision not met.
R1	Duplicate precision not within the specified limits; however, the results are below the MRL and considered estimated.
S	Surrogate recovery not within specified limits.
S	The reported value was determined by the Method of Standard Additions (MSA).
T	Analyte is a tentatively identified compound, result is estimated.
U	Compound was analyzed for, but was not detected (ND).
V1	The continuing calibration verification standard was outside (biased high) the specified limits for this compound.
V2	The continuing calibration verification standard was outside (biased low) the specified limits for this compound.
W	Result quantified, but the corresponding peak was detected outside the generated retention time window.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
X	See case narrative.
Y	Recovery outside limits
Y	The chromatogram resembles a petroleum product but does not match the calibration standard.
Z	The chromatogram does not resemble a petroleum product.
i	The MRL/MDL has been elevated due to a matrix interference.

ALS Laboratory Group

Acronyms

Cal	Calibration
Conc	CONCentration
Dioxin(s)	Polychlorinated dibenzo-p-dioxin(s)
EDL	Estimated Detection Limit
EMPC	Estimated Maximum Possible Concentration
Flags	Data qualifiers
Furan(s)	Polychlorinated dibenzofuran(s)
g	Grams
ICAL	Initial CALibration
ID	IDentifier
Ions	Masses monitored for the analyte during data acquisition
L	Liter (s)
LCS	Laboratory Control Sample
DLCS	Duplicate Laboratory Control Sample
MB	Method Blank
MCL	Method Calibration Limit
MDL	Method Detection Limit
mL	Milliliters
MS	Matrix Spiked sample
DMS	Duplicate Matrix Spiked sample
NO	Number of peaks meeting all identification criteria
PCDD(s)	Polychlorinated dibenzo-p-dioxin(s)
PCDF(s)	Polychlorinated dibenzofuran(s)
ppb	Parts per billion
ppm	Parts per million
ppq	Parts per quadrillion
ppt	Parts per trillion
QA	Quality Assurance
QC	Quality Control
Ratio	Ratio of areas from monitored ions for an analyte
% Rec.	Percent recovery
RPD	Relative Percent Difference
RRF	Relative Response Factor
RT	Retention Time
SDG	Sample Delivery Group
S/N	Signal-to-noise ratio
TEF	Toxicity Equivalence Factor
TEQ	Toxicity Equivalence Quotient

10450 Stancliff Rd, Houston, TX 77099 | 281-530-5656 | www.alsglobal.com

ALS Environmental

State Certifications, Accreditations, and Licenses

Agency	Number	Expire Date
American Association for Laboratory Accreditation	2897.01 2020	11/30/2021
Arizona Department of Health Services	AZ0793-2020	5/27/2021
Arkansas Department of Environmental Quality	20-030-0	3/26/2021
California Department of Health Services	2919-2020	4/30/2021
Department of Defense	A2LA 2897.01	11/30/2021
Florida Department of Health	E87611-2020	6/30/2021
Hawaii Department of Health	2020	4/30/2021
Illinois Environmental Protection Agency	2000322020-4	5/9/2021
Kansas Department of Health and Environment	E-10352-2020	7/31/2021
Louisiana Department of Environmental Quality	03087-2020	6/30/2021
Louisiana Department of Health and Hospitals	LA028-2020	12/31/2020
Maine Department of Health and Human Services	2020016	6/5/2022
Maryland Department of the Environment	343-2020	6/30/2021
Michigan Depratment of Environmental Quality	9971-2020	4/30/2021
Minnesota Department of Health	1785988	12/31/2020
Nebraska Department of Health and Human Services	NE-OS-25-13 (2020)	4/30/2021
Nevada Department of Concervation and Natural Resources	TX026932021-1	7/31/2021
New Hampshire Environmental Laboratory Accreditation Program	209420	4/24/2021
New Jersey Department of Environmental Protection	TX008	6/30/2021
New York Department of Health	11707	3/31/2021
Oklahoma Department of Environmental Quality	2020-123	8/31/2021
Pennsylvania Department of Environmental Protection	014	6/30/2021
Tennessee Department of Environment and Concervation	04016-2020	4/30/2021
Texas Commision on Environmental Quality	T104704231-20-26	4/30/2021
United States Department of Agriculture	P330-19-00299	10/10/2022
Washington Department of Health	C819	11/14/2020

Chain of Custody

ALS Environmental - Houston HRMS
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID: 14981**

SUBCONTRACT TO:

ALS Environmental
10450 Stancliff RoadSuite 210
Houston, TX 77084 **Phone:** +1 281 530 5656

CUSTOMER INFORMATION:

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

INVOICE INFORMATION:

Company: ALS Houston
Contact: Accounts Payable
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Reference: HS20101079
TSR: Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS20101079-01**	**16EW01-201020**	**Groundwater**	**20 Oct 2020 07:45**
	SUB_Perch-6850			04 Nov 2020
2.	**HS20101079-02**	**16WW49-201020**	**Groundwater**	**20 Oct 2020 08:50**
	SUB_Perch-6850			04 Nov 2020
3.	**HS20101079-03**	**16WW48-201020**	**Groundwater**	**20 Oct 2020 09:55**
	SUB_Perch-6850			04 Nov 2020
4.	**HS20101079-04**	**16WW51-201020**	**Groundwater**	**20 Oct 2020 10:55**
	SUB_Perch-6850			04 Nov 2020
5.	**HS20101079-05**	**16EW08-201020**	**Groundwater**	**20 Oct 2020 11:45**
	SUB_Perch-6850			04 Nov 2020
6.	**HS20101079-06**	**16EW04-201020**	**Groundwater**	**20 Oct 2020 12:30**
	SUB_Perch-6850			04 Nov 2020
7.	**HS20101079-07**	**16RW01-201020**	**Groundwater**	**20 Oct 2020 13:15**
	SUB_Perch-6850			04 Nov 2020

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.
HS20101079-03 = MS/MSD

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID:** **14981**

QC Level: DOD IV (DoD Data Package)

Relinquished By:	J. [illegible]	Date/Time:	10/22/20
Received By:	[illegible]	Date/Time:	10/22/20 1105
Cooler ID(s):		Temperature(s):	

ALS Environmental

Cooler Receipt Form

Project Chemist: IH

Client/Project: ALS-H

Thermometer ID: 1031

Date/Time Received: 10/22/20 Initials: IH

Date/Time Logged in: 10/22/20 Initials: IH

1. Method of delivery: ○ US Mail ○ Fed Ex ○ UPS ○ DHL ☑ ALS Courier ○ Client
2. Samples received in: ☑ Cooler ○ Box ○ Envelope ○ Other
3. Were custody seals on coolers? ○ Yes ☑ No
   Were they intact? ○ Yes ○ No ☑ N/A
   Were they signed and dated? ○ Yes ○ No ☑ N/A
   If yes, how many and where?
4. Packing Material: ○ Inserts ☑ Baggies ○ Bubble Wrap ○ Gel Packs ☑ Wet Ice ○ Sleeves ○ Other
5. Foreign or Regulated Soil? ○ Yes ○ No Location of Sampling:

Cooler Tracking Number	COC ID	Date Opened	Time Opened	Opened By	Temp. °C	Temp Blank?
NA		10/22/20	1104	IH	2.8	☑
						☐
						☐
						☐

6. Were custody papers properly filled out (ink, signed, dated, etc)? ☑ Yes ○ No
7. Did all bottles arrive in good condition (not broken, no signs of leakage)? ☑ Yes ○ No
8. Were all sample labels complete (i.e., sample ID, analysis, preservation, etc)? ☑ Yes ○ No
9. Were appropriate bottles/containers and volumes received for the requested tests? ☑ Yes ○ No
10. Did sample labels and tags agree with custody documents? ☑ Yes ○ No

Notes, Discrepancies, & Resolutions:

Service request Label:

HS-HRMSCoolerReceipt R1.0

ALS Environmental - Houston HRMS

10450 Stancliff Rd., Suite 210
Houston, TX 77099
T: +1 713 266 1599
F: +1 713 266 1599
www.alsglobal.com

SAMPLE ACCEPTANCE POLICY

This policy outlines the criteria samples must meet to be accepted by ALS Environmental – Houston HRMS.

Cooler Custody Seals (desirable, mandatory if specified in SAP):

- ✓ Intact on outside of cooler, signed and dated

Chain-of-Custody (COC) documentation (mandatory):

The following is required on each COC:

- ✓ Sample ID, the location, date and time of collection, collector's name, preservation type, sample type, and any other special remarks concerning the sampleThe COC must be completed in ink.
- ✓ Signature and date of relinquishing party.

In the absence of a COC at sample receipt, the COC will be requested from the client.

Sample Integrity (mandatory):

Samples are inspected upon arrival to ensure that sample integrity was not compromised during transfer to the laboratory.

- ✓ Sample containers must arrive in good condition (not broken or leaking).
- ✓ Samples must be labeled appropriately, including Sample IDs, and requested test using durable labels and indelible ink.
- ✓ The correct type of sample bottle must be used for the method requested.
- ✓ An appropriate sample volume, or weight, must be received.
- ✓ Sample IDs and number of containers must reconcile with the COC.
- ✓ Samples must be received within the method defined holding time.

Temperature Requirement (varies by sample matrix):

- ✓ Aqueous and Non-aqueous samples must be shipped and stored cold, at 0 to 6ºC.
- ✓ Tissue samples must be shipped and stored frozen, at -20 to -10ºC.
- ✓ Air samples are shipped and stored cold, at 0 to 6ºC
- ✓ The sample temperature must be recorded on the COC

All cooler inspections are documented on the Cooler Receipt Form (CRF). A separate CRF is completed for each service request. Any samples not meeting the above criteria are noted on the CRF and the Project Manager notified. The Project Manager must resolve any sample integrity issues with the client prior to proceeding with the analysis. Such resolutions are documented in writing and filed with the project folder. Data associated with samples received outside of this acceptance policy will be qualified on the case narrative of the final report

Preparation Information Benchsheets

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

Preparation Information Benchsheet

Prep Run#: 368381 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
Team: Semivoa GCMS/GRIVERA **Prep Method:** Method **Prep Date/Time:** 10/23/20 14:19

#	Lab Code	Client ID	B#	Method /Test	pH	Cl	Matrix	Amt. Ext.	Sample Description
1	E2001014-001	16WW44-201019	.01	6850/ClO4 DOD			Ground Water	10mL	
2	E2001014-002	16WW37-201019	.01	6850/ClO4 DOD			Ground Water	10mL	
3	E2001014-003	16WW38-201019	.01	6850/ClO4 DOD			Ground Water	10mL	
4	E2001014-004	16WW14-201019	.01	6850/ClO4 DOD			Ground Water	10mL	
5	E2001014-005	16WW34-201019	.01	6850/ClO4 DOD			Ground Water	10mL	
6	E2001014-006	16WW34-201019-FD	.01	6850/ClO4 DOD			Ground Water	10mL	
7	E2001014-007	16WW33-201019	.01	6850/ClO4 DOD			Ground Water	10mL	
8	E2001014-008	16WW32-201019	.01	6850/ClO4 DOD			Ground Water	10mL	
9	E2001014-009	16WW31-201019	.01	6850/ClO4 DOD			Ground Water	10mL	
10	E2001014-010	16WW46-201019	.01	6850/ClO4 DOD			Ground Water	10mL	
11	E2001015-001	16EW01-201020	.01	6850/ClO4 DOD			Ground Water	10mL	
12	E2001015-002	16WW49-201020	.01	6850/ClO4 DOD			Ground Water	10mL	
13	E2001015-003	16WW48-201020	.01	6850/ClO4 DOD			Ground Water	10mL	
14	E2001015-004	16WW51-201020	.01	6850/ClO4 DOD			Ground Water	10mL	
15	E2001015-005	16EW08-201020	.01	6850/ClO4 DOD			Ground Water	10mL	
16	E2001015-006	16EW04-201020	.01	6850/ClO4 DOD			Ground Water	10mL	
17	E2001015-007	16RW01-201020	.01	6850/ClO4 DOD			Ground Water	10mL	
18	E2001016-001	LH18/24-SP650_102120-AIX	.01	6850/ClO4 DOD			Ground Water	10mL	
19	EQ2000533-01	MB		6850/ClO4 DOD			Liquid	10mL	
20	EQ2000533-02	LCS		6850/ClO4 DOD			Liquid	10mL	
21	EQ2000533-03	DLCS		6850/ClO4 DOD			Liquid	10mL	
22	EQ2000533-04	16WW48-201020 MS	.01	6850/ClO4 DOD			Liquid	10mL	
23	EQ2000533-05	16WW48-201020 DMS	.01	6850/ClO4 DOD			Liquid	10mL	

Spiking Solutions

Name: Perchlorate Intermediate Stock1 Inventory ID 209764 Logbook Ref: Perchlorate Int. Stock1 51820 Expires On: 11/18/2020

EQ2000533-02	1.00µL	EQ2000533-03	1.00µL	EQ2000533-04	1.00µL	EQ2000533-05	1.00µL

Name: Sodium Perchlorate 1 ug/mL (IS) (18-O) as CLO4 Inventory ID 212340 Logbook Ref: Sodium Perchlorate Expires On: 07/13/2022

E2001014-001	100.00µL	E2001014-002	100.00µL	E2001014-003	100.00µL	E2001014-004	100.00µL	E2001014-005	100.00µL	E2001014-006	100.00µL
E2001014-007	100.00µL	E2001014-008	100.00µL	E2001014-009	100.00µL	E2001014-010	100.00µL	E2001015-001	100.00µL	E2001015-002	100.00µL
E2001015-003	100.00µL	E2001015-004	100.00µL	E2001015-005	100.00µL	E2001015-006	100.00µL	E2001015-007	100.00µL	E2001016-001	100.00µL
EQ2000533-01	100.00µL	EQ2000533-02	100.00µL	EQ2000533-03	100.00µL	EQ2000533-04	100.00µL	EQ2000533-05	100.00µL		

Preparation Information Benchsheet

Prep Run#: 368381 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
Team: Semivoa GCMS/GRIVERA **Prep Method:** Method **Prep Date/Time:** 10/23/20 14:19

Preparation Steps

Step: Preparation
Started: 10/23/20 14:19
Finished: 10/23/20 15:00
By: GRIVERA
Comments

Comments: _____

Reviewed By: GR Date: 10/26/2020

Chain of Custody

Relinquished By:		Date:	Extracts Examined
Received By:		Date:	Yes No

Analytical Results

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2001015
Project:	HS20101079	**Date Collected:**	10/20/20 0745
Sample Matrix:	Ground Water	**Date Received:**	10/22/20
Sample Name:	16EW01-201020	**Units:**	µg/L
Lab Code:	E2001015-001	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**27.5**		0.100	0.0500	0.0250	1	10/23/20	10/26/20 10:50	368381	700826	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2001015
Project:	HS20101079	**Date Collected:**	10/20/20 0850
Sample Matrix:	Ground Water	**Date Received:**	10/22/20
Sample Name:	16WW49-201020	**Units:**	µg/L
Lab Code:	E2001015-002	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	10/23/20	10/26/20 10:58	368381	700826	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2001015
Project:	HS20101079	**Date Collected:**	10/20/20 0955
Sample Matrix:	Ground Water	**Date Received:**	10/22/20
Sample Name:	16WW48-201020	**Units:**	µg/L
Lab Code:	E2001015-003	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**167**		1.00	0.500	0.250	10	10/23/20	10/26/20 12:39	368381	700826	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2001015
Project:	HS20101079	**Date Collected:**	10/20/20 1055
Sample Matrix:	Ground Water	**Date Received:**	10/22/20
Sample Name:	16WW51-201020	**Units:**	µg/L
Lab Code:	E2001015-004	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	10/23/20	10/23/20 21:36	368381	700781	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2001015
Project:	HS20101079	**Date Collected:**	10/20/20 1145
Sample Matrix:	Ground Water	**Date Received:**	10/22/20
Sample Name:	16EW08-201020	**Units:**	µg/L
Lab Code:	E2001015-005	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	10/23/20	10/23/20 21:44	368381	700781	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2001015
Project:	HS20101079	**Date Collected:**	10/20/20 1230
Sample Matrix:	Ground Water	**Date Received:**	10/22/20
Sample Name:	16EW04-201020	**Units:**	µg/L
Lab Code:	E2001015-006	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	10/23/20	10/23/20 21:52	368381	700781	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2001015
Project:	HS20101079	**Date Collected:**	10/20/20 1315
Sample Matrix:	Ground Water	**Date Received:**	10/22/20
Sample Name:	16RW01-201020	**Units:**	µg/L
Lab Code:	E2001015-007	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	10/23/20	10/23/20 22:00	368381	700781	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2001015
Project:	HS20101079	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	µg/L
Lab Code:	EQ2000533-01	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	10/23/20	10/26/20 11:06	368381	700826	

Accuracy & Precision

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2001015
Project:	HS20101079	**Date Analyzed:**	10/26/20
Sample Matrix:	Ground Water		

Lab Control Sample Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method:	6850	**Units:**	µg/L
Prep Method:	Method	**Basis:**	NA
		Extraction Lot:	368381

	Lab Control Sample EQ2000533-02			Duplicate Lab Control Sample EQ2000533-03					
Analyte Name	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Perchlorate	0.106	0.100	106	0.110	0.100	110	84 - 119	4	15

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

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

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2001015
Project:	HS20101079	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2000533-02	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.106**		0.100	0.0500	0.0250	1	10/23/20	10/26/20 11:13	368381	700826	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2001015
Project:	HS20101079	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Duplicate Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2000533-03	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.110**		0.100	0.0500	0.0250	1	10/23/20	10/26/20 11:21	368381	700826	

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2001015
Project:	HS20101079	**Date Collected:**	10/20/20
Sample Matrix:	Ground Water	**Date Received:**	10/22/20
		Date Analyzed:	10/26/20

Matrix Spike Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Sample Name:	16WW48-201020	**Units:**	µg/L
Lab Code:	E2001015-003	**Basis:**	NA

Analytical Method: 6850
Prep Method: Method

		16WW48-201020MS				16WW48-201020DMS					
		Matrix Spike				**Duplicate Matrix Spike**					
		EQ2000533-04				EQ2000533-05					
Analyte Name	**Sample Result**	**Result**	**Spike Amount**	**% Rec**		**Result**	**Spike Amount**	**% Rec**		**% Rec Limits**	**RPD**	**RPD Limit**
Perchlorate	167	167	0.100	151	#	167	0.100	249	#	84 - 119	<1	15

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

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

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

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2001015
Project:	HS20101079	**Date Collected:**	10/20/20 0955
Sample Matrix:	Ground Water	**Date Received:**	10/22/20
Sample Name:	16WW48-201020	**Units:**	µg/L
Lab Code:	EQ2000533-04	**Basis:**	NA
Run Type:	Matrix Spike		

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**167**		1.00	0.500	0.250	10	10/23/20	10/26/20 12:16	368381	700826	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2001015
Project:	HS20101079	**Date Collected:**	10/20/20 0955
Sample Matrix:	Ground Water	**Date Received:**	10/22/20
Sample Name:	16WW48-201020	**Units:**	µg/L
Lab Code:	EQ2000533-05	**Basis:**	NA
Run Type:	Duplicate Matrix Spike		

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**167**		1.00	0.500	0.250	10	10/23/20	10/26/20 12:24	368381	700826	

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

November 06, 2020

Analytical Report for Service Request No: K2009599

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

RE: ALS Houston DOD TOC

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory October 22, 2020
For your reference, these analyses have been assigned our service request number **K2009599.**

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

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
Qualifiers
State Certifications, Accreditations, And Licenses
Case Narrative
Chain of Custody
General Chemistry
Raw Data
    General Chemistry

Acronyms

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

Inorganic Data Qualifiers

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

Metals Data Qualifiers

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

Organic Data Qualifiers

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

Additional Petroleum Hydrocarbon Specific Qualifiers

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

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

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

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

Case Narrative

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

1317 South 13th Ave, Kelso, WA 98626 | 1-360-577-7222 | www.alsglobal.com

ALS Environmental

Client: ALS Environmental - US
Project: ALS Houston DOD TOC
Sample Matrix: Ground Water

Service Request: K2009599
Date Received: 10/22/2020

CASE NARRATIVE

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

Sample Receipt:

Five ground water samples were received for analysis at ALS Environmental on 10/22/2020. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The samples were stored at minimum in accordance with the analytical method requirements.

General Chemistry:

No significant anomalies were noted with this analysis.

Approved by Kelley Lovejoy Date 11/06/2020

Chain of Custody

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

K2009599

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID: 14982**

SUBCONTRACT TO:

ALS Environmental Kelso
1317 S. 13th Avenue
Kelso, WA 98626 **Phone:** +1 360 501 3312

CUSTOMER INFORMATION:

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

INVOICE INFORMATION:

Company: ALS Houston
Contact: Accounts Payable
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Reference: HS20101079
TSR: Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS20101079-01**	**16EW01-201020**	**Groundwater**	**20 Oct 2020 07:45**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			04 Nov 2020
2.	**HS20101079-02**	**16WW49-201020**	**Groundwater**	**20 Oct 2020 08:50**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			04 Nov 2020
3.	**HS20101079-03**	**16WW48-201020**	**Groundwater**	**20 Oct 2020 09:55**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			04 Nov 2020
4.	**HS20101079-04**	**16WW51-201020**	**Groundwater**	**20 Oct 2020 10:55**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			04 Nov 2020
5.	**HS20101079-05**	**16EW08-201020**	**Groundwater**	**20 Oct 2020 11:45**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			04 Nov 2020

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.
HS20101079-03 = MS/MSD

QC Level: DOD IV (DoD Data Package)

Received by NRedersen ALS 10/22/20 1000

K2009599

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID: 14982**

Relinquished By:		Date/Time:	10/21/2020 1800
Received By:	MKedersen	Date/Time:	10/22/20 1000
Cooler ID(s):		Temperature(s):	

PM KL

Cooler Receipt and Preservation Form

Client AIS Houston Service Request K20 09599

Received: 10/22/20 Opened: 10/22/20 By: AP Unloaded: 10/22/20 By: AP

1. Samples were received via? *USPS* *Fed Ex* *UPS* *DHL* *PDX* *Courier* *Hand Delivered*
2. Samples were received in: (circle) *Cooler* *Box* *Envelope* *Other* _____ *NA*
3. Were custody seals on coolers? NA Y N If yes, how many and where? 2 Front
   If present, were custody seals intact? Y N If present, were they signed and dated? Y N
4. Was a Temperature Blank present in cooler? NA Y N If yes, notate the temperature in the appropriate column below:
   If no, take the temperature of a representative sample bottle contained within the cooler; notate in the column "Sample Temp":
5. Were samples received within the method specified temperature ranges? NA Y N
   If no, were they received on ice and same day as collected? If not, notate the cooler # below and notify the PM. NA Y N

If applicable, tissue samples were received: *Frozen* *Partially Thawed* *Thawed*

Temp Blank	Sample Temp	IR Gun	Cooler #/COC ID / NA	Out of temp indicate with "X"	PM Notified If out of temp	Tracking Number NA	Filed
0.7	—	IR01	14952	—	—	1891 8881 8403	

6. Packing material: *Inserts* *Baggies* *Bubble Wrap* *Gel Packs* *Wet Ice* *Dry Ice* *Sleeves* _____
7. Were custody papers properly filled out (ink, signed, etc.)? NA Y N
8. Were samples received in good condition (unbroken) NA Y N
9. Were all sample labels complete (ie, analysis, preservation, etc.)? NA Y N
10. Did all sample labels and tags agree with custody papers? NA Y N
11. Were appropriate bottles/containers and volumes received for the tests indicated? NA Y N
12. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* NA Y N
13. Were VOA vials received without headspace? *Indicate in the table below.* NA Y N
14. Was C12/Res negative? NA Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count Bottle Type	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:**	K2009599
Project:	ALS Houston DOD TOC	**Date Collected:**	10/20/20
Sample Matrix:	Ground Water	**Date Received:**	10/22/20
Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA

Carbon, Total Organic

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
16EW01-201020	K2009599-001	**14.4**	0.50	0.20	0.07	1	11/03/20 11:36	
16WW49-201020	K2009599-002	**3.74**	0.50	0.20	0.07	1	11/03/20 11:36	
16WW48-201020	K2009599-003	**8.44**	0.50	0.20	0.07	1	11/03/20 11:36	
16WW51-201020	K2009599-004	**4.52**	0.50	0.20	0.07	1	11/03/20 11:36	
16EW08-201020	K2009599-005	**332**	5.0	2.0	0.7	10	11/03/20 11:36	
Method Blank	K2009599-MB	ND	0.50	0.20	0.07	1	11/03/20 11:36	U

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K2009599
Project	ALS Houston DOD TOC	**Date Collected:**	10/20/20
Sample Matrix:	Ground Water	**Date Received:**	10/22/20
		Date Analyzed:	11/03/20

Replicate Sample Summary
General Chemistry Parameters

Sample Name:	16WW48-201020	**Units:**	mg/L
Lab Code:	K2009599-003	**Basis:**	NA

Analyte Name	Analysis Method	LOQ	LOD	MDL	Sample Result	Duplicate Sample K2009599-003DUP Result	Average	RPD	RPD Limit
Carbon, Total Organic	SM 5310 C	0.50	0.20	0.07	8.44	8.47	8.46	<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:**	K2009599
Project:	ALS Houston DOD TOC	**Date Collected:**	10/20/20
Sample Matrix:	Ground Water	**Date Received:**	10/22/20
		Date Analyzed:	11/3/20
		Date Extracted:	NA

Matrix Spike Summary
Carbon, Total Organic

Sample Name:	16WW48-201020	**Units:**	mg/L
Lab Code:	K2009599-003	**Basis:**	NA
Analysis Method:	SM 5310 C		
Prep Method:	None		

Matrix Spike
K2009599-003MS

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Carbon, Total Organic	8.44	30.5	25.0	88	83-117

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

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

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

Matrix Spike and Matrix Spike Duplicate Data is presented for information purposes only. The matrix may or may not be relevant to samples reported in this report. The laboratory evaluates system performance based on the LCS and LCSD control limits.

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K2009599
Project:	ALS Houston DOD TOC	**Date Analyzed:**	11/03/20
Sample Matrix:	Ground Water	**Date Extracted:**	NA

Lab Control Sample Summary
Carbon, Total Organic

Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA
		Analysis Lot:	701641

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K2009599-LCS	24.0	25.0	96	83-117

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US **Service Request:** K2009599
Project: ALS Houston DOD TOC

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	701641	KQ2017240-01	11/03/20 11:36	25.0	25.7	103	90-110
CCV2	701641	KQ2017240-02	11/03/20 11:36	25.0	26.1	104	90-110
CCV3	701641	KQ2017240-03	11/03/20 11:36	25.0	25.8	103	90-110
CCV4	701641	KQ2017240-04	11/03/20 11:36	25.0	25.9	103	90-110
CCV5	701641	KQ2017240-16	11/03/20 11:36	25.0	25.8	103	90-110
CCV6	701641	KQ2017240-18	11/03/20 11:36	25.0	25.9	103	90-110

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: ALS Houston DOD TOC

Service Request:K2009599

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	701641	KQ2017240-05	11/03/20 11:36	0.50	0.20	0.07	ND	U
CCB2	701641	KQ2017240-06	11/03/20 11:36	0.50	0.20	0.07	ND	U
CCB3	701641	KQ2017240-07	11/03/20 11:36	0.50	0.20	0.07	ND	U
CCB4	701641	KQ2017240-08	11/03/20 11:36	0.50	0.20	0.07	ND	U
CCB5	701641	KQ2017240-15	11/03/20 11:36	0.50	0.20	0.07	ND	U
CCB6	701641	KQ2017240-17	11/03/20 11:36	0.50	0.20	0.07	ND	U

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

October 30, 2020

Susan Huang
Aptim Environmental & Infrastucture, Inc.
2500 City West Blvd., Suite 1700
Houston, TX 77042

Work Order: **HS20101089**

Laboratory Results for: **LHAAP 16 October 2020**

Dear Susan Huang,

ALS Environmental received 11 sample(s) on Oct 21, 2020 for the analysis presented in the following report.

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

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

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

Sincerely,

Generated By: DAYNA.FISHER

RJ Modashia
Project Manager

ALS Houston, US Date: 30-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
Work Order: HS20101089

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS20101089-01	16WW44-201019	Groundwater		19-Oct-2020 07:50	21-Oct-2020 09:30	☐
HS20101089-02	16WW37-201019	Groundwater		19-Oct-2020 08:35	21-Oct-2020 09:30	☐
HS20101089-03	16WW38-201019	Groundwater		19-Oct-2020 09:15	21-Oct-2020 09:30	☐
HS20101089-04	16WW14-201019	Groundwater		19-Oct-2020 10:00	21-Oct-2020 09:30	☐
HS20101089-05	16WW34-201019	Groundwater		19-Oct-2020 10:45	21-Oct-2020 09:30	☐
HS20101089-06	16WW34-201019-FD	Groundwater		19-Oct-2020 10:45	21-Oct-2020 09:30	☐
HS20101089-07	16WW33-201019	Groundwater		19-Oct-2020 11:30	21-Oct-2020 09:30	☐
HS20101089-08	16WW32-201019	Groundwater		19-Oct-2020 12:15	21-Oct-2020 09:30	☐
HS20101089-09	16WW31-201019	Groundwater		19-Oct-2020 12:55	21-Oct-2020 09:30	☐
HS20101089-10	16WW46-201019	Groundwater		19-Oct-2020 13:40	21-Oct-2020 09:30	☐
HS20101089-11	Trip Blank-201019	Groundwater		19-Oct-2020 00:00	21-Oct-2020 09:30	☐

ALS Houston, US Date: 30-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
Work Order: HS20101089

CASE NARRATIVE

Work Order Comments

- The analysis for Perchlorate was subcontracted to our ALS Houston TX, High Resolution Lab. Final report attached.

GCMS Volatiles by Method SW8260

Batch ID: R371614

Sample ID: HS20101248-06MS

- MS and MSD are for an unrelated sample

ALS Houston, US Date: 30-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
Sample ID: 16WW44-201019
Collection Date: 19-Oct-2020 07:50

ANALYTICAL REPORT
WorkOrder:HS20101089
Lab ID:HS20101089-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	29-Oct-2020 13:57
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	29-Oct-2020 13:57
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	29-Oct-2020 13:57
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	29-Oct-2020 13:57
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	29-Oct-2020 13:57
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	29-Oct-2020 13:57
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	29-Oct-2020 13:57
Surr: 1,2-Dichloroethane-d4	*83.7*			**0**	*81-118*	*%REC*	*1*	*29-Oct-2020 13:57*
Surr: 4-Bromofluorobenzene	*87.6*			**0**	*85-114*	*%REC*	*1*	*29-Oct-2020 13:57*
Surr: Dibromofluoromethane	*85.9*			**0**	*80-119*	*%REC*	*1*	*29-Oct-2020 13:57*
Surr: Toluene-d8	*97.4*			**0**	*89-112*	*%REC*	*1*	*29-Oct-2020 13:57*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	27-Oct-2020 14:22

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

ALS Houston, US Date: 30-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
Sample ID: 16WW37-201019
Collection Date: 19-Oct-2020 08:35

ANALYTICAL REPORT
WorkOrder:HS20101089
Lab ID:HS20101089-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	29-Oct-2020 14:39
1,1-Dichloroethene	**0.64**	J	**0.20**	**0.50**	**1.0**	**UG/L**	1	29-Oct-2020 14:39
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	29-Oct-2020 14:39
cis-1,2-Dichloroethene	**5.9**		**0.20**	**0.50**	**1.0**	**UG/L**	1	29-Oct-2020 14:39
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	29-Oct-2020 14:39
Trichloroethene	**120**		**0.20**	**0.50**	**1.0**	**UG/L**	1	29-Oct-2020 14:39
Vinyl chloride	**1.4**		**0.20**	**0.50**	**1.0**	**UG/L**	1	29-Oct-2020 14:39
Surr: 1,2-Dichloroethane-d4	*84.0*			**0**	*81-118*	*%REC*	*1*	*29-Oct-2020 14:39*
Surr: 4-Bromofluorobenzene	*87.7*			**0**	*85-114*	*%REC*	*1*	*29-Oct-2020 14:39*
Surr: Dibromofluoromethane	*86.0*			**0**	*80-119*	*%REC*	*1*	*29-Oct-2020 14:39*
Surr: Toluene-d8	*96.0*			**0**	*89-112*	*%REC*	*1*	*29-Oct-2020 14:39*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	27-Oct-2020 14:22

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

ALS Houston, US Date: 30-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
Sample ID: 16WW38-201019
Collection Date: 19-Oct-2020 09:15

ANALYTICAL REPORT
WorkOrder:HS20101089
Lab ID:HS20101089-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	5.0	U	3.0	5.0	10	UG/L	10	29-Oct-2020 15:00
1,1-Dichloroethene	**20**		**2.0**	**5.0**	**10**	**UG/L**	10	29-Oct-2020 15:00
1,2-Dichloroethane	5.0	U	2.0	5.0	10	UG/L	10	29-Oct-2020 15:00
cis-1,2-Dichloroethene	**1,100**		**2.0**	**5.0**	**10**	**UG/L**	10	29-Oct-2020 15:00
Methylene chloride	10	U	4.0	10	20	UG/L	10	29-Oct-2020 15:00
Trichloroethene	**3,800**		**20**	**50**	**100**	**UG/L**	100	29-Oct-2020 16:24
Vinyl chloride	**100**		**2.0**	**5.0**	**10**	**UG/L**	10	29-Oct-2020 15:00
Surr: 1,2-Dichloroethane-d4	*82.5*			**0**	*81-118*	*%REC*	*10*	*29-Oct-2020 15:00*
Surr: 1,2-Dichloroethane-d4	*83.4*			**0**	*81-118*	*%REC*	*100*	*29-Oct-2020 16:24*
Surr: 4-Bromofluorobenzene	*87.2*			**0**	*85-114*	*%REC*	*100*	*29-Oct-2020 16:24*
Surr: 4-Bromofluorobenzene	*88.9*			**0**	*85-114*	*%REC*	*10*	*29-Oct-2020 15:00*
Surr: Dibromofluoromethane	*84.3*			**0**	*80-119*	*%REC*	*10*	*29-Oct-2020 15:00*
Surr: Dibromofluoromethane	*86.8*			**0**	*80-119*	*%REC*	*100*	*29-Oct-2020 16:24*
Surr: Toluene-d8	*96.5*			**0**	*89-112*	*%REC*	*10*	*29-Oct-2020 15:00*
Surr: Toluene-d8	*95.9*			**0**	*89-112*	*%REC*	*100*	*29-Oct-2020 16:24*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	27-Oct-2020 14:22

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

ALS Houston, US Date: 30-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
Sample ID: 16WW14-201019
Collection Date: 19-Oct-2020 10:00

ANALYTICAL REPORT
WorkOrder:HS20101089
Lab ID:HS20101089-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	29-Oct-2020 14:18
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	29-Oct-2020 14:18
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	29-Oct-2020 14:18
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	29-Oct-2020 14:18
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	29-Oct-2020 14:18
Trichloroethene	**25**		**0.20**	**0.50**	**1.0**	**UG/L**	1	29-Oct-2020 14:18
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	29-Oct-2020 14:18
Surr: 1,2-Dichloroethane-d4	*81.1*			**0**	*81-118*	*%REC*	*1*	*29-Oct-2020 14:18*
Surr: 4-Bromofluorobenzene	*87.0*			**0**	*85-114*	*%REC*	*1*	*29-Oct-2020 14:18*
Surr: Dibromofluoromethane	*82.6*			**0**	*80-119*	*%REC*	*1*	*29-Oct-2020 14:18*
Surr: Toluene-d8	*97.0*			**0**	*89-112*	*%REC*	*1*	*29-Oct-2020 14:18*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	27-Oct-2020 14:22

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

ALS Houston, US Date: 30-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
Sample ID: 16WW34-201019
Collection Date: 19-Oct-2020 10:45

ANALYTICAL REPORT
WorkOrder:HS20101089
Lab ID:HS20101089-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	UG/L	1	29-Oct-2020 18:52
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	29-Oct-2020 18:52
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	29-Oct-2020 18:52
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	29-Oct-2020 18:52
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	29-Oct-2020 18:52
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	29-Oct-2020 18:52
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	29-Oct-2020 18:52
Surr: 1,2-Dichloroethane-d4	*81.5*			**0**	*81-118*	*%REC*	*1*	*29-Oct-2020 18:52*
Surr: 4-Bromofluorobenzene	*86.5*			**0**	*85-114*	*%REC*	*1*	*29-Oct-2020 18:52*
Surr: Dibromofluoromethane	*84.0*			**0**	*80-119*	*%REC*	*1*	*29-Oct-2020 18:52*
Surr: Toluene-d8	*96.9*			**0**	*89-112*	*%REC*	*1*	*29-Oct-2020 18:52*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	27-Oct-2020 14:22

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

ALS Houston, US Date: 30-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
Sample ID: 16WW34-201019-FD
Collection Date: 19-Oct-2020 10:45

ANALYTICAL REPORT
WorkOrder:HS20101089
Lab ID:HS20101089-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	29-Oct-2020 17:28
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	29-Oct-2020 17:28
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	29-Oct-2020 17:28
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	29-Oct-2020 17:28
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	29-Oct-2020 17:28
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	29-Oct-2020 17:28
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	29-Oct-2020 17:28
Surr: 1,2-Dichloroethane-d4	*82.8*			**0**	*81-118*	*%REC*	*1*	*29-Oct-2020 17:28*
Surr: 4-Bromofluorobenzene	*90.0*			**0**	*85-114*	*%REC*	*1*	*29-Oct-2020 17:28*
Surr: Dibromofluoromethane	*85.5*			**0**	*80-119*	*%REC*	*1*	*29-Oct-2020 17:28*
Surr: Toluene-d8	*94.9*			**0**	*89-112*	*%REC*	*1*	*29-Oct-2020 17:28*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	27-Oct-2020 14:22

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

ALS Houston, US

Date: 30-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.

ANALYTICAL REPORT

Project: LHAAP 16 October 2020

WorkOrder:HS20101089

Sample ID: 16WW33-201019

Lab ID:HS20101089-07

Collection Date: 19-Oct-2020 11:30

Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	29-Oct-2020 17:49
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	29-Oct-2020 17:49
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	29-Oct-2020 17:49
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	29-Oct-2020 17:49
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	29-Oct-2020 17:49
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	29-Oct-2020 17:49
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	29-Oct-2020 17:49
Surr: 1,2-Dichloroethane-d4	*84.0*			**0**	*81-118*	*%REC*	*1*	*29-Oct-2020 17:49*
Surr: 4-Bromofluorobenzene	*86.7*			**0**	*85-114*	*%REC*	*1*	*29-Oct-2020 17:49*
Surr: Dibromofluoromethane	*84.7*			**0**	*80-119*	*%REC*	*1*	*29-Oct-2020 17:49*
Surr: Toluene-d8	*96.7*			**0**	*89-112*	*%REC*	*1*	*29-Oct-2020 17:49*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	27-Oct-2020 14:22

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

ALS Houston, US Date: 30-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
Sample ID: 16WW32-201019
Collection Date: 19-Oct-2020 12:15

ANALYTICAL REPORT
WorkOrder:HS20101089
Lab ID:HS20101089-08
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	UG/L	1	29-Oct-2020 18:10
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	29-Oct-2020 18:10
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	29-Oct-2020 18:10
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	29-Oct-2020 18:10
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	29-Oct-2020 18:10
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	29-Oct-2020 18:10
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	29-Oct-2020 18:10
Surr: 1,2-Dichloroethane-d4	*85.7*			**0**	*81-118*	*%REC*	*1*	*29-Oct-2020 18:10*
Surr: 4-Bromofluorobenzene	*87.7*			**0**	*85-114*	*%REC*	*1*	*29-Oct-2020 18:10*
Surr: Dibromofluoromethane	*87.9*			**0**	*80-119*	*%REC*	*1*	*29-Oct-2020 18:10*
Surr: Toluene-d8	*97.8*			**0**	*89-112*	*%REC*	*1*	*29-Oct-2020 18:10*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	27-Oct-2020 14:22

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

ALS Houston, US Date: 30-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
Sample ID: 16WW31-201019
Collection Date: 19-Oct-2020 12:55

ANALYTICAL REPORT
WorkOrder:HS20101089
Lab ID:HS20101089-09
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	29-Oct-2020 18:31
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	29-Oct-2020 18:31
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	29-Oct-2020 18:31
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	29-Oct-2020 18:31
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	29-Oct-2020 18:31
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	29-Oct-2020 18:31
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	29-Oct-2020 18:31
Surr: 1,2-Dichloroethane-d4	*81.5*			**0**	*81-118*	*%REC*	*1*	*29-Oct-2020 18:31*
Surr: 4-Bromofluorobenzene	*88.6*			**0**	*85-114*	*%REC*	*1*	*29-Oct-2020 18:31*
Surr: Dibromofluoromethane	*84.0*			**0**	*80-119*	*%REC*	*1*	*29-Oct-2020 18:31*
Surr: Toluene-d8	*98.6*			**0**	*89-112*	*%REC*	*1*	*29-Oct-2020 18:31*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	27-Oct-2020 14:22

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

ALS Houston, US Date: 30-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
Sample ID: 16WW46-201019
Collection Date: 19-Oct-2020 13:40

ANALYTICAL REPORT
WorkOrder:HS20101089
Lab ID:HS20101089-10
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	UG/L	1	29-Oct-2020 17:06
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	29-Oct-2020 17:06
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	29-Oct-2020 17:06
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	29-Oct-2020 17:06
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	29-Oct-2020 17:06
Trichloroethene	**0.66**	J	**0.20**	**0.50**	**1.0**	**UG/L**	1	29-Oct-2020 17:06
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	29-Oct-2020 17:06
Surr: 1,2-Dichloroethane-d4	*81.9*			**0**	*81-118*	*%REC*	*1*	*29-Oct-2020 17:06*
Surr: 4-Bromofluorobenzene	*89.1*			**0**	*85-114*	*%REC*	*1*	*29-Oct-2020 17:06*
Surr: Dibromofluoromethane	*84.7*			**0**	*80-119*	*%REC*	*1*	*29-Oct-2020 17:06*
Surr: Toluene-d8	*95.6*			**0**	*89-112*	*%REC*	*1*	*29-Oct-2020 17:06*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	27-Oct-2020 14:22

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

ALS Houston, US Date: 30-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
Sample ID: Trip Blank-201019
Collection Date: 19-Oct-2020 00:00

ANALYTICAL REPORT
WorkOrder:HS20101089
Lab ID:HS20101089-11
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	29-Oct-2020 13:27
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	29-Oct-2020 13:27
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	29-Oct-2020 13:27
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	29-Oct-2020 13:27
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	29-Oct-2020 13:27
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	29-Oct-2020 13:27
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	29-Oct-2020 13:27
Surr: 1,2-Dichloroethane-d4	*83.0*			**0**	*81-118*	*%REC*	*1*	*29-Oct-2020 13:27*
Surr: 4-Bromofluorobenzene	*88.5*			**0**	*85-114*	*%REC*	*1*	*29-Oct-2020 13:27*
Surr: Dibromofluoromethane	*84.8*			**0**	*80-119*	*%REC*	*1*	*29-Oct-2020 13:27*
Surr: Toluene-d8	*97.2*			**0**	*89-112*	*%REC*	*1*	*29-Oct-2020 13:27*

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

ALS Houston, US Date: 30-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
WorkOrder: HS20101089

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R371410 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** Groundwater	
HS20101089-01	16WW44-201019	19 Oct 2020 07:50			27 Oct 2020 14:22	1
HS20101089-02	16WW37-201019	19 Oct 2020 08:35			27 Oct 2020 14:22	1
HS20101089-03	16WW38-201019	19 Oct 2020 09:15			27 Oct 2020 14:22	1
HS20101089-04	16WW14-201019	19 Oct 2020 10:00			27 Oct 2020 14:22	1
HS20101089-05	16WW34-201019	19 Oct 2020 10:45			27 Oct 2020 14:22	1
HS20101089-06	16WW34-201019-FD	19 Oct 2020 10:45			27 Oct 2020 14:22	1
HS20101089-07	16WW33-201019	19 Oct 2020 11:30			27 Oct 2020 14:22	1
HS20101089-08	16WW32-201019	19 Oct 2020 12:15			27 Oct 2020 14:22	1
HS20101089-09	16WW31-201019	19 Oct 2020 12:55			27 Oct 2020 14:22	1
HS20101089-10	16WW46-201019	19 Oct 2020 13:40			27 Oct 2020 14:22	1
Batch ID: R371614 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS20101089-01	16WW44-201019	19 Oct 2020 07:50			29 Oct 2020 13:57	1
HS20101089-02	16WW37-201019	19 Oct 2020 08:35			29 Oct 2020 14:39	1
HS20101089-03	16WW38-201019	19 Oct 2020 09:15			29 Oct 2020 16:24	100
HS20101089-03	16WW38-201019	19 Oct 2020 09:15			29 Oct 2020 15:00	10
HS20101089-04	16WW14-201019	19 Oct 2020 10:00			29 Oct 2020 14:18	1
HS20101089-05	16WW34-201019	19 Oct 2020 10:45			29 Oct 2020 18:52	1
HS20101089-06	16WW34-201019-FD	19 Oct 2020 10:45			29 Oct 2020 17:28	1
HS20101089-07	16WW33-201019	19 Oct 2020 11:30			29 Oct 2020 17:49	1
HS20101089-08	16WW32-201019	19 Oct 2020 12:15			29 Oct 2020 18:10	1
HS20101089-09	16WW31-201019	19 Oct 2020 12:55			29 Oct 2020 18:31	1
HS20101089-10	16WW46-201019	19 Oct 2020 13:40			29 Oct 2020 17:06	1
HS20101089-11	Trip Blank-201019	19 Oct 2020 00:00			29 Oct 2020 13:27	1

ALS Houston, US Date: 30-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
WorkOrder: HS20101089

QC BATCH REPORT

Batch ID: R371614 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-201029** Units: **UG/L** Analysis Date: **29-Oct-2020 13:05**
Client ID: Run ID: **VOA6_371614** SeqNo: **5808455** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	0.50	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
Methylene chloride	1.0	2.0								U
Trichloroethene	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*41.79*	*1.0*	*50*	*0*	*83.6*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*43.87*	*1.0*	*50*	*0*	*87.7*	*85 - 114*				
Surr: Dibromofluoromethane	*42.31*	*1.0*	*50*	*0*	*84.6*	*80 - 119*				
Surr: Toluene-d8	*48.23*	*1.0*	*50*	*0*	*96.5*	*89 - 112*				

LCS Sample ID: **VLCSW-201029** Units: **UG/L** Analysis Date: **29-Oct-2020 12:23**
Client ID: Run ID: **VOA6_371614** SeqNo: **5808454** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	20.97	1.0	20	0	105	80 - 119				
1,1-Dichloroethene	16.86	1.0	20	0	84.3	71 - 131				
1,2-Dichloroethane	23.98	1.0	20	0	120	73 - 128				
cis-1,2-Dichloroethene	22.31	1.0	20	0	112	78 - 123				
Methylene chloride	19.68	2.0	20	0	98.4	74 - 124				
Trichloroethene	22.6	1.0	20	0	113	79 - 123				
Vinyl chloride	16.02	1.0	20	0	80.1	58 - 137				
Surr: 1,2-Dichloroethane-d4	*52.21*	*1.0*	*50*	*0*	*104*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.4*	*1.0*	*50*	*0*	*101*	*85 - 114*				
Surr: Dibromofluoromethane	*53.14*	*1.0*	*50*	*0*	*106*	*80 - 119*				
Surr: Toluene-d8	*50.31*	*1.0*	*50*	*0*	*101*	*89 - 112*				

ALS Houston, US Date: 30-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
WorkOrder: HS20101089

QC BATCH REPORT

Batch ID: R371614 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS20101248-06MS** Units: **UG/L** Analysis Date: **29-Oct-2020 15:42**
Client ID: Run ID: **VOA6_371614** SeqNo: **5808462** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	23.16	1.0	20	0	116	80 - 119				
1,1-Dichloroethene	17.61	1.0	20	0	88.1	71 - 131				
1,2-Dichloroethane	25.12	1.0	20	0	126	73 - 128				
cis-1,2-Dichloroethene	21.66	1.0	20	0	108	78 - 123				
Methylene chloride	19.42	2.0	20	0	97.1	74 - 124				
Trichloroethene	26.79	1.0	20	0	134	79 - 123				S
Vinyl chloride	17.31	1.0	20	0	86.6	58 - 137				
Surr: 1,2-Dichloroethane-d4	*41.55*	*1.0*	*50*	*0*	*83.1*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*43.99*	*1.0*	*50*	*0*	*88.0*	*85 - 114*				
Surr: Dibromofluoromethane	*44.45*	*1.0*	*50*	*0*	*88.9*	*80 - 119*				
Surr: Toluene-d8	*49.29*	*1.0*	*50*	*0*	*98.6*	*89 - 112*				

MSD Sample ID: **HS20101248-06MSD** Units: **UG/L** Analysis Date: **29-Oct-2020 16:03**
Client ID: Run ID: **VOA6_371614** SeqNo: **5808463** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	20.91	1.0	20	0	105	80 - 119	23.16	10.2	20	
1,1-Dichloroethene	16.45	1.0	20	0	82.2	71 - 131	17.61	6.84	20	
1,2-Dichloroethane	24.09	1.0	20	0	120	73 - 128	25.12	4.19	20	
cis-1,2-Dichloroethene	19.77	1.0	20	0	98.8	78 - 123	21.66	9.16	20	
Methylene chloride	18.71	2.0	20	0	93.5	74 - 124	19.42	3.74	20	
Trichloroethene	25.11	1.0	20	0	126	79 - 123	26.79	6.47	20	S
Vinyl chloride	16.75	1.0	20	0	83.7	58 - 137	17.31	3.33	20	
Surr: 1,2-Dichloroethane-d4	*41.11*	*1.0*	*50*	*0*	*82.2*	*81 - 118*	*41.55*	*1.08*	*20*	
Surr: 4-Bromofluorobenzene	*42.84*	*1.0*	*50*	*0*	*85.7*	*85 - 114*	*43.99*	*2.64*	*20*	
Surr: Dibromofluoromethane	*43.51*	*1.0*	*50*	*0*	*87.0*	*80 - 119*	*44.45*	*2.13*	*20*	
Surr: Toluene-d8	*46.37*	*1.0*	*50*	*0*	*92.7*	*89 - 112*	*49.29*	*6.1*	*20*	

The following samples were analyzed in this batch:

HS20101089-01	HS20101089-02	HS20101089-03	HS20101089-04
HS20101089-05	HS20101089-06	HS20101089-07	HS20101089-08
HS20101089-09	HS20101089-10	HS20101089-11	

ALS Houston, US Date: 30-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
WorkOrder: **HS20101089**

QUALIFIERS, ACRONYMS, UNITS

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

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

ALS Houston, US Date: 30-Oct-20

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	20-030-0	26-Mar-2021
California	2919, 2020-2021	30-Apr-2021
Dept of Defense	PJLA L20-507	22-Dec-2021
Florida	E87611-30-07/01/2020	30-Jun-2021
Illinois	2000322020-4	09-May-2021
Kansas	E-10352 2020-2021	31-Jul-2021
Kentucky	123043, 2020-2021	30-Apr-2021
Louisiana	03087, 2020-2021	30-Jun-2021
North Carolina	624-2020	31-Dec-2020
North Dakota	R-193 2020-2021	30-Apr-2021
Texas	T104704231-20-26	30-Apr-2021

ALS Houston, US Date: 30-Oct-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
Work Order: HS20101089

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS20101089-01	16WW44-201019	Login	10/21/2020 2:15:30 PM	PMG	Sub
HS20101089-01	16WW44-201019	Login	10/21/2020 2:15:30 PM	PMG	WET209
HS20101089-01	16WW44-201019	Login	10/21/2020 2:15:30 PM	PMG	VOA091
HS20101089-01	16WW44-201019	Login	10/21/2020 2:15:30 PM	PMG	RSK008
HS20101089-01	16WW44-201019	Login	10/21/2020 2:15:30 PM	PMG	Sub

ALS Houston, US Date: 30-Oct-20

Sample Receipt Checklist

Work Order ID: HS20101089 **Date/Time Received:** **21-Oct-2020 09:30**

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

Completed By: /S/ Paresh M. Giga (eSignature) 21-Oct-2020 13:23 (Date/Time) **Reviewed by:** /S/ RJ Modashia (eSignature) 21-Oct-2020 16:37 (Date/Time)

Matrices: **GW/Water** Carrier name: **FedEx**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	2 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:None
Samplers name present on COC?	Yes ☐	No ☑	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	1.5C U/c	IR31
Cooler(s)/Kit(s):	43016	
Date/Time sample(s) sent to storage:	10/21/2020 14:40	

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:

01085496

CHAIN OF CUSTODY

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

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

Project No. 501032

Job: LHAAP 16 October 2020

Prepared By: Scott Beesinger

P.O. Number

Analyses

Field Sample I.D. Time	Sample Matrix	Date /	MS / MSD	No. OF CONTAINERS	VOC by SW 8260B	TOC by SM5310C	MEE by RSK 175	Anions (bromide, sulfate, nitrate) by SW9056 and Alkalinity by SM2320	Bromide by SW9056	Perchlorate by SW6850	Metals (arsenic, chromium, manganese, nickel, thallium) by SW6020				Remarks (Preservatives, etc.)
16WW44-201019	WG	10/19/20/0750		4	X					X					
16WW37-201019	WG	10/19/20/0835		4	X					X					
16WW38-201019	WG	10/19/20/0915		4	X					X					
16WW14-201019	WG	10/19/20/1000		4	X					X					
16WW34-201019	WG	10/19/20/1045		4	X					X					
16WW34-201019-FD	WG	10/19/20/1045		4	X					X					
16WW33-201019	WG	10/19/20/1130		4	X					X					
16WW32-201019	WG	10/19/20/1215		4	X					X					

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

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	10/20/20	1430									

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition
J. [illegible]	10/21/20	0930							

Remarks: Cooler 43016 Temp 1.5°C 1231 CFO

Aptim Environmental & Infrastructure, Inc.
LHAAP 16 October 2020

HS20101089

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

01085497

CHAIN OF CUSTODY

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

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

Project No. 501032

Job: **LHAAP 16 October 2020**

Prepared By: Scott Beesinger

P.O. Number

Field Sample I.D. Time	Sample Matrix	Date /	MS / MSD	No. OF CONTAINERS	VOC by SW 8260B	TOC by SM5310C	MEE by RSK 175	Anions (bromide, sulfate, nitrate) by SW9056 and Alkalinity by SM2320	Bromide by SW9056	Perchlorate by SW6850	Metals (arsenic, chromium, manganese, nickel, thallium) by SW6020				Remarks (Preservatives, etc.)
16WW31-201019	WG	10/19/20/1255		4	X					X					
16WW46-201019	WG	10/19/20/1340		4	X					X					
TRIP BLANK-201019	W	10/19/20		2	Y										

Aptim Environmental & Infrastructure, Inc.
LHAAP 16 October 2020

HS20101089

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

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	10/20/20	1430									

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition
J. [illegible]	10/21/20	09:30							

Remarks:

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

01085498

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

U3016

CUSTODY SEAL

Date: 10/20/20 Time: 1430
Name: Luis Bevenger
Company: BHMT

Seal Broken By: SM
Date: 10/21/20

U3016

Must Deliver Next Business Day
Time and Tempature Sensitive!

ALS

U3016

ORIGIN ID:SGRA (903) 930-6193
SCOTT BEESINGER
APTIM
1203-B EAST GRAND AVE.
PMB202
MARSHALL, TX 75670
UNITED STATES US

SHIP DATE: 22JUN20
ACTWGT: 1.00 LB MAN
CAD: 3001307/CAFE3211
DIMS: 19x16x1 IN

TO CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099
(281) 530-5656
REF: LHAAP 16 – 8072394 – RJ
RMA:

FedEx Express

FedEx
TRK# 0221 1891 8877 8325

WED - 21 OCT AA
PRIORITY OVERNIGHT

AB SGRA

77099
TX-US
IAH

FID: 775552 SU2020 GCA 5NR2/A97T/85A2

October 26, 2020

Service Request No:E2001014

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

Laboratory Results for: HS20101089

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory October 22, 2020
For your reference, these analyses have been assigned our service request number **E2001014.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current TNI standards, where applicable, and except as noted in the laboratory case narrative provided. All results are intended to be considered in their entirety and ALS Environmental is not responsible for use of less than the complete final report. Results apply only to the items submitted to the laboratory, as received for analysis. In accordance with the current TNI Standard, a statement on the estimated uncertainty of measurement of any quantitative analysis will be supplied upon request.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Corey Grandits
Project Manager

ADDRESS 10450 Stancliff Rd., Suite 210, Houston, TX 77099
PHONE +1 281 530 5656 | FAX +1 281 530 5887
ALS Group USA, Corp.
dba ALS Environmental

Certificate of Analysis

ALS Environmental - Houston HRMS
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

ALS Environmental

Client:	ALS Houston	**Service Request No.:**	E2001014
Project:	HS20101089	**Date Received:**	10/22/20
Sample Matrix:	W		

CASE NARRATIVE

All analyses were performed in adherence to the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier IV. When appropriate to the method, method blank results have been reported with each analytical test.

Sample Receipt

Ten samples were received for analysis at ALS Environmental in Houston on 10/22/20.

The samples were received in good condition and are consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

Data Validation Notes and Discussion

Precision and Accuracy:

EQ2000533: Laboratory Control Spike/Duplicate Laboratory Control Spike (LCS/DLCS) samples were analyzed and reported in addition to a MS/MSD for this extraction batch. The LCS/DLCS recoveries pass. MS/MSD was performed on an unrelated sample.

DoD Certification is held for the method/matrix/analytes provided in this report.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.

Use of ALS group USA Corp dba ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.

Client: ALS Environmental - US **Service Request:**E2001014
Project: HS20101089

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
E2001014-001	16WW44-201019	10/19/2020	0750
E2001014-002	16WW37-201019	10/19/2020	0835
E2001014-003	16WW38-201019	10/19/2020	0915
E2001014-004	16WW14-201019	10/19/2020	1000
E2001014-005	16WW34-201019	10/19/2020	1045
E2001014-006	16WW34-201019-FD	10/19/2020	1045
E2001014-007	16WW33-201019	10/19/2020	1130
E2001014-008	16WW32-201019	10/19/2020	1215
E2001014-009	16WW31-201019	10/19/2020	1255
E2001014-010	16WW46-201019	10/19/2020	1340

Service Request Summary

Folder #: **E2001014**
Client Name: ALS Environmental - US
Project Name: HS20101089
Project Number:

Report To: RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Houston, TX 77099-4338
USA
Phone Number: 281-530-5656
Cell Number:
Fax Number: 281-530-5887
E-mail: rj.modashia@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 10/22/20
Internal Due Date: 11/4/2020
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS20101089
EDD: No EDD Specified

10 250 mL-Plastic Bottle HDPE WM CLEAR Unpreserved
Location: EHRMS-WIC 10B
Pressure Gas:

Lab Samp No.	Client Samp No	Matrix	Collected	HOUSTON ClO4 DOD/6850
E2001014-001	16WW44-201019	Ground Water	10/19/20 0750	**IV**
E2001014-002	16WW37-201019	Ground Water	10/19/20 0835	**IV**
E2001014-003	16WW38-201019	Ground Water	10/19/20 0915	**IV**
E2001014-004	16WW14-201019	Ground Water	10/19/20 1000	**IV**
E2001014-005	16WW34-201019	Ground Water	10/19/20 1045	**IV**
E2001014-006	16WW34-201019-FD	Ground Water	10/19/20 1045	**IV**
E2001014-007	16WW33-201019	Ground Water	10/19/20 1130	**IV**
E2001014-008	16WW32-201019	Ground Water	10/19/20 1215	**IV**
E2001014-009	16WW31-201019	Ground Water	10/19/20 1255	**IV**
E2001014-010	16WW46-201019	Ground Water	10/19/20 1340	**IV**

Service Request Summary

Folder #:	**E2001014**
Client Name:	ALS Environmental - US
Project Name:	HS20101089
Project Number:	
Report To:	RJ Modashia ALS Laboratory Group 10450 Stancliff Road Houston, TX 77099-4338 USA
Phone Number:	281-530-5656
Cell Number:	
Fax Number:	281-530-5887
E-mail:	rj.modashia@alsglobal.com

Project Chemist:	Corey Grandits
Originating Lab:	HOUSTON
Logged By:	CGRANDITS
Date Received:	10/22/20
Internal Due Date:	11/4/2020
QAP:	LAB QAP
Qualifier Set:	Lab Standard
Formset:	Lab Standard
Merged?:	Y
Report to MDL?:	Y
P.O. Number:	HS20101089
EDD:	No EDD Specified

10 250 mL-Plastic Bottle HDPE WM CLEAR Unpreserved

Location: EHRMS-WIC 10B

Pressure Gas:

Test Comments:

Group	Test/Method	Samples	Comments
Semivoa GCMS	ClO4 DOD/6850	10	Level II due 11/4,level IV 11/11

Data Qualifiers

Lab Standard

+	Possible Tedlar bag artifact.
A	TIC is a suspected aldol-condensation product
B	Analyte found in the associated method blank as well as in the sample.
BC	Reported results are not blank corrected.
BH	The back section of the tube yielded higher results than the front.
BT	Results indicated possible breakthrough; back section >=10% front section.
C	Result identification confirmed.
D	Compound identified in an analysis at a secondary dilution factor
D	Spike was diluted out
DE	Reported results are corrected for desorption efficiency.
E	Estimated value. Concentration above calibration range
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
H1	Sample analysis performed past holding time. See case narrative.
H2	Initial analysis within holding time. Reanalysis for the required dilution was past holding time.
H3	Sample was received and analyzed past holding time.
H4	Sample was extracted past required extraction holding time, but analyzed within analysis holding time. See case narrative.
I	Internal standard not within the specified limits. See case narrative.
J	Estimated Value. Concentration found below MRL.
K	A deflection in the QC ion may indicate interference with the quantitation of this ion. The concentration of this analyte should be considered as an estimate.
K	Analyte was detected above the method reporting limit prior to normalization.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
L1	Laboratory control sample recovery outside the specified limits; results may be biased high.
L2	Laboratory control sample recovery outside the specified limits; results may be biased low.
L3	Laboratory control sample recovery outside the specified limits.
M	Matrix interference; results may be biased high.
M	The duplicate injection precision not met.
M1	Matrix interference due to coelution with a non-target compound; results may be biased high.
N	Presumptive evidence of a compound for TICs that have been identified based on a mass spectral library search.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.

Data Qualifiers

Lab Standard

P	Indicates chlorodiphenyl ether interference present at the retention time of the target compound.
P	Pesticide/Aroclor target analyte > 40% difference for detected concentrations between GC columns
Q	Indicates as estimated value because the P and P + 2 theoretical abundance ratio does not meet method criteria.
R	Duplicate Precision not met.
R1	Duplicate precision not within the specified limits; however, the results are below the MRL and considered estimated.
S	Surrogate recovery not within specified limits.
S	The reported value was determined by the Method of Standard Additions (MSA).
T	Analyte is a tentatively identified compound, result is estimated.
U	Compound was analyzed for, but was not detected (ND).
V1	The continuing calibration verification standard was outside (biased high) the specified limits for this compound.
V2	The continuing calibration verification standard was outside (biased low) the specified limits for this compound.
W	Result quantified, but the corresponding peak was detected outside the generated retention time window.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
X	See case narrative.
Y	Recovery outside limits
Y	The chromatogram resembles a petroleum product but does not match the calibration standard.
Z	The chromatogram does not resemble a petroleum product.
i	The MRL/MDL has been elevated due to a matrix interference.

ALS Laboratory Group

Acronyms

Cal	Calibration
Conc	CONCentration
Dioxin(s)	Polychlorinated dibenzo-p-dioxin(s)
EDL	Estimated Detection Limit
EMPC	Estimated Maximum Possible Concentration
Flags	Data qualifiers
Furan(s)	Polychlorinated dibenzofuran(s)
g	Grams
ICAL	Initial CALibration
ID	IDentifier
Ions	Masses monitored for the analyte during data acquisition
L	Liter (s)
LCS	Laboratory Control Sample
DLCS	Duplicate Laboratory Control Sample
MB	Method Blank
MCL	Method Calibration Limit
MDL	Method Detection Limit
mL	Milliliters
MS	Matrix Spiked sample
DMS	Duplicate Matrix Spiked sample
NO	Number of peaks meeting all identification criteria
PCDD(s)	Polychlorinated dibenzo-p-dioxin(s)
PCDF(s)	Polychlorinated dibenzofuran(s)
ppb	Parts per billion
ppm	Parts per million
ppq	Parts per quadrillion
ppt	Parts per trillion
QA	Quality Assurance
QC	Quality Control
Ratio	Ratio of areas from monitored ions for an analyte
% Rec.	Percent recovery
RPD	Relative Percent Difference
RRF	Relative Response Factor
RT	Retention Time
SDG	Sample Delivery Group
S/N	Signal-to-noise ratio
TEF	Toxicity Equivalence Factor
TEQ	Toxicity Equivalence Quotient

10450 Stancliff Rd, Houston, TX 77099 | 281-530-5656 | www.alsglobal.com

ALS Environmental

State Certifications, Accreditations, and Licenses

Agency	Number	Expire Date
American Association for Laboratory Accreditation	2897.01 2020	11/30/2021
Arizona Department of Health Services	AZ0793-2020	5/27/2021
Arkansas Department of Environmental Quality	20-030-0	3/26/2021
California Department of Health Services	2919-2020	4/30/2021
Department of Defense	A2LA 2897.01	11/30/2021
Florida Department of Health	E87611-2020	6/30/2021
Hawaii Department of Health	2020	4/30/2021
Illinois Environmental Protection Agency	2000322020-4	5/9/2021
Kansas Department of Health and Environment	E-10352-2020	7/31/2021
Louisiana Department of Environmental Quality	03087-2020	6/30/2021
Louisiana Department of Health and Hospitals	LA028-2020	12/31/2020
Maine Department of Health and Human Services	2020016	6/5/2022
Maryland Department of the Environment	343-2020	6/30/2021
Michigan Depratment of Environmental Quality	9971-2020	4/30/2021
Minnesota Department of Health	1785988	12/31/2020
Nebraska Department of Health and Human Services	NE-OS-25-13 (2020)	4/30/2021
Nevada Department of Concervation and Natural Resources	TX026932021-1	7/31/2021
New Hampshire Environmental Laboratory Accreditation Program	209420	4/24/2021
New Jersey Department of Environmental Protection	TX008	6/30/2021
New York Department of Health	11707	3/31/2021
Oklahoma Department of Environmental Quality	2020-123	8/31/2021
Pennsylvania Department of Environmental Protection	014	6/30/2021
Tennessee Department of Environment and Concervation	04016-2020	4/30/2021
Texas Commision on Environmental Quality	T104704231-20-26	4/30/2021
United States Department of Agriculture	P330-19-00299	10/10/2022
Washington Department of Health	C819	11/14/2020

Chain of Custody

ALS Environmental - Houston HRMS
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID: 14983**

SUBCONTRACT TO:

ALS Environmental
10450 Stancliff RoadSuite 210
Houston, TX 77084 **Phone:** +1 281 530 5656

CUSTOMER INFORMATION:

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

INVOICE INFORMATION:

Company: ALS Houston
Contact: Accounts Payable
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Reference: HS20101089
TSR: Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS20101089-01**	**16WW44-201019**	**Groundwater**	**19 Oct 2020 07:50**
	SUB_Perch-6850			04 Nov 2020
2.	**HS20101089-02**	**16WW37-201019**	**Groundwater**	**19 Oct 2020 08:35**
	SUB_Perch-6850			04 Nov 2020
3.	**HS20101089-03**	**16WW38-201019**	**Groundwater**	**19 Oct 2020 09:15**
	SUB_Perch-6850			04 Nov 2020
4.	**HS20101089-04**	**16WW14-201019**	**Groundwater**	**19 Oct 2020 10:00**
	SUB_Perch-6850			04 Nov 2020
5.	**HS20101089-05**	**16WW34-201019**	**Groundwater**	**19 Oct 2020 10:45**
	SUB_Perch-6850			04 Nov 2020
6.	**HS20101089-06**	**16WW34-201019-FD**	**Groundwater**	**19 Oct 2020 10:45**
	SUB_Perch-6850			04 Nov 2020
7.	**HS20101089-07**	**16WW33-201019**	**Groundwater**	**19 Oct 2020 11:30**
	SUB_Perch-6850			04 Nov 2020
8.	**HS20101089-08**	**16WW32-201019**	**Groundwater**	**19 Oct 2020 12:15**
	SUB_Perch-6850			04 Nov 2020
9.	**HS20101089-09**	**16WW31-201019**	**Groundwater**	**19 Oct 2020 12:55**

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID: 14983**

LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
ANALYSIS REQUESTED			DUE DATE
	SUB_Perch-6850		04 Nov 2020
10. HS20101089-10	**16WW46-201019**	**Groundwater**	**19 Oct 2020 13:40**
	SUB_Perch-6850		04 Nov 2020

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

QC Level: DOD IV (DoD Data Package)

Relinquished By:	J. Mauerman	Date/Time:	10/22/20
Received By:	in	Date/Time:	10/22/20 1105
Cooler ID(s):		Temperature(s):	

ALS Environmental

Cooler Receipt Form

Project Chemist: IH

Client/Project: ALS-H

Thermometer ID: 1031

Date/Time Received: 10/22/20 Initials: IH

Date/Time Logged in: 10/22/20 Initials: IH

1. Method of delivery: ○ US Mail ○ Fed Ex ○ UPS ○ DHL ☑ Courier (ALS) ○ Client

2. Samples received in: ☑ Cooler ○ Box ○ Envelope ○ Other

3. Were custody seals on coolers? ○ Yes ☑ No

Were they intact? ○ Yes ○ No ☑ N/A

Were they signed and dated? ○ Yes ○ No ☑ N/A

If yes, how many and where?

4. Packing Material: ○ Inserts ☑ Baggies ○ Bubble Wrap ○ Gel Packs ☑ Wet Ice ○ Sleeves ○ Other

5. Foreign or Regulated Soil? ○ Yes ○ No Location of Sampling:

Cooler Tracking Number	COC ID	Date Opened	Time Opened	Opened By	Temp. °C	Temp Blank?
NA		10/22/20	1104	IH	2.8	☑
						☐
						☐
						☐

6. Were custody papers properly filled out (ink, signed, dated, etc)? ☑ Yes ○ No

7. Did all bottles arrive in good condition (not broken, no signs of leakage)? ☑ Yes ○ No

8. Were all sample labels complete (i.e., sample ID, analysis, preservation, etc)? ☑ Yes ○ No

9. Were appropriate bottles/containers and volumes received for the requested tests? ☑ Yes ○ No

10. Did sample labels and tags agree with custody documents? ☑ Yes ○ No

Notes, Discrepancies, & Resolutions:

Service request Label:

HS-HRMSCoolerReceipt R1.0

ALS Environmental - Houston HRMS

10450 Stancliff Rd., Suite 210
Houston, TX 77099
T: +1 713 266 1599
F: +1 713 266 1599
www.alsglobal.com

SAMPLE ACCEPTANCE POLICY

This policy outlines the criteria samples must meet to be accepted by ALS Environmental – Houston HRMS.

Cooler Custody Seals (desirable, mandatory if specified in SAP):

- ✓ Intact on outside of cooler, signed and dated

Chain-of-Custody (COC) documentation (mandatory):

The following is required on each COC:

- ✓ Sample ID, the location, date and time of collection, collector's name, preservation type, sample type, and any other special remarks concerning the sampleThe COC must be completed in ink.
- ✓ Signature and date of relinquishing party.

In the absence of a COC at sample receipt, the COC will be requested from the client.

Sample Integrity (mandatory):

Samples are inspected upon arrival to ensure that sample integrity was not compromised during transfer to the laboratory.

- ✓ Sample containers must arrive in good condition (not broken or leaking).
- ✓ Samples must be labeled appropriately, including Sample IDs, and requested test using durable labels and indelible ink.
- ✓ The correct type of sample bottle must be used for the method requested.
- ✓ An appropriate sample volume, or weight, must be received.
- ✓ Sample IDs and number of containers must reconcile with the COC.
- ✓ Samples must be received within the method defined holding time.

Temperature Requirement (varies by sample matrix):

- ✓ Aqueous and Non-aqueous samples must be shipped and stored cold, at 0 to 6ºC.
- ✓ Tissue samples must be shipped and stored frozen, at -20 to -10ºC.
- ✓ Air samples are shipped and stored cold, at 0 to 6ºC
- ✓ The sample temperature must be recorded on the COC

All cooler inspections are documented on the Cooler Receipt Form (CRF). A separate CRF is completed for each service request. Any samples not meeting the above criteria are noted on the CRF and the Project Manager notified. The Project Manager must resolve any sample integrity issues with the client prior to proceeding with the analysis. Such resolutions are documented in writing and filed with the project folder. Data associated with samples received outside of this acceptance policy will be qualified on the case narrative of the final report

Preparation Information Benchsheets

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

Preparation Information Benchsheet

Prep Run#: 368381 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
Team: Semivoa GCMS/GRIVERA **Prep Method:** Method **Prep Date/Time:** 10/23/20 14:19

#	Lab Code	Client ID	B#	Method /Test	pH	Cl	Matrix	Amt. Ext.	Sample Description
1	E2001014-001	16WW44-201019	.01	6850/ClO4 DOD			Ground Water	10mL	
2	E2001014-002	16WW37-201019	.01	6850/ClO4 DOD			Ground Water	10mL	
3	E2001014-003	16WW38-201019	.01	6850/ClO4 DOD			Ground Water	10mL	
4	E2001014-004	16WW14-201019	.01	6850/ClO4 DOD			Ground Water	10mL	
5	E2001014-005	16WW34-201019	.01	6850/ClO4 DOD			Ground Water	10mL	
6	E2001014-006	16WW34-201019-FD	.01	6850/ClO4 DOD			Ground Water	10mL	
7	E2001014-007	16WW33-201019	.01	6850/ClO4 DOD			Ground Water	10mL	
8	E2001014-008	16WW32-201019	.01	6850/ClO4 DOD			Ground Water	10mL	
9	E2001014-009	16WW31-201019	.01	6850/ClO4 DOD			Ground Water	10mL	
10	E2001014-010	16WW46-201019	.01	6850/ClO4 DOD			Ground Water	10mL	
11	E2001015-001	16EW01-201020	.01	6850/ClO4 DOD			Ground Water	10mL	
12	E2001015-002	16WW49-201020	.01	6850/ClO4 DOD			Ground Water	10mL	
13	E2001015-003	16WW48-201020	.01	6850/ClO4 DOD			Ground Water	10mL	
14	E2001015-004	16WW51-201020	.01	6850/ClO4 DOD			Ground Water	10mL	
15	E2001015-005	16EW08-201020	.01	6850/ClO4 DOD			Ground Water	10mL	
16	E2001015-006	16EW04-201020	.01	6850/ClO4 DOD			Ground Water	10mL	
17	E2001015-007	16RW01-201020	.01	6850/ClO4 DOD			Ground Water	10mL	
18	E2001016-001	LH18/24-SP650_102120-AIX	.01	6850/ClO4 DOD			Ground Water	10mL	
19	EQ2000533-01	MB		6850/ClO4 DOD			Liquid	10mL	
20	EQ2000533-02	LCS		6850/ClO4 DOD			Liquid	10mL	
21	EQ2000533-03	DLCS		6850/ClO4 DOD			Liquid	10mL	
22	EQ2000533-04	16WW48-201020 MS	.01	6850/ClO4 DOD			Liquid	10mL	
23	EQ2000533-05	16WW48-201020 DMS	.01	6850/ClO4 DOD			Liquid	10mL	

Spiking Solutions

Name: Perchlorate Intermediate Stock1 Inventory ID 209764 Logbook Ref: Perchlorate Int. Stock1 51820 Expires On: 11/18/2020

EQ2000533-02	1.00µL	EQ2000533-03	1.00µL	EQ2000533-04	1.00µL	EQ2000533-05	1.00µL

Name: Sodium Perchlorate 1 ug/mL (IS) (18-O) as CLO4 Inventory ID 212340 Logbook Ref: Sodium Perchlorate Expires On: 07/13/2022

E2001014-001	100.00µL	E2001014-002	100.00µL	E2001014-003	100.00µL	E2001014-004	100.00µL	E2001014-005	100.00µL	E2001014-006	100.00µL
E2001014-007	100.00µL	E2001014-008	100.00µL	E2001014-009	100.00µL	E2001014-010	100.00µL	E2001015-001	100.00µL	E2001015-002	100.00µL
E2001015-003	100.00µL	E2001015-004	100.00µL	E2001015-005	100.00µL	E2001015-006	100.00µL	E2001015-007	100.00µL	E2001016-001	100.00µL
EQ2000533-01	100.00µL	EQ2000533-02	100.00µL	EQ2000533-03	100.00µL	EQ2000533-04	100.00µL	EQ2000533-05	100.00µL		

Preparation Information Benchsheet

Prep Run#: 368381
Team: Semivoa GCMS/GRIVERA

Prep WorkFlow: GenExt28Day
Prep Method: Method

Status: Prepped
Prep Date/Time: 10/23/20 14:19

Preparation Steps

Step: Preparation
Started: 10/23/20 14:19
Finished: 10/23/20 15:00
By: GRIVERA
Comments

Comments: _____

Reviewed By: GR Date: 10/26/2020

Chain of Custody

Relinquished By: _____ Date: _____

Received By: _____ Date: _____

Extracts Examined
Yes No

Analytical Results

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2001014
Project:	HS20101089	**Date Collected:**	10/19/20 0750
Sample Matrix:	Ground Water	**Date Received:**	10/22/20
Sample Name:	16WW44-201019	**Units:**	µg/L
Lab Code:	E2001014-001	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	10/23/20	10/26/20 10:42	368381	700826	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2001014
Project:	HS20101089	**Date Collected:**	10/19/20 0835
Sample Matrix:	Ground Water	**Date Received:**	10/22/20
Sample Name:	16WW37-201019	**Units:**	µg/L
Lab Code:	E2001014-002	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.393**		0.100	0.0500	0.0250	1	10/23/20	10/26/20 12:59	368381	700826	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2001014
Project:	HS20101089	**Date Collected:**	10/19/20 0915
Sample Matrix:	Ground Water	**Date Received:**	10/22/20
Sample Name:	16WW38-201019	**Units:**	µg/L
Lab Code:	E2001014-003	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	10/23/20	10/23/20 20:01	368381	700781	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2001014
Project:	HS20101089	**Date Collected:**	10/19/20 1000
Sample Matrix:	Ground Water	**Date Received:**	10/22/20
Sample Name:	16WW14-201019	**Units:**	µg/L
Lab Code:	E2001014-004	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	10/23/20	10/23/20 20:09	368381	700781	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2001014
Project:	HS20101089	**Date Collected:**	10/19/20 1045
Sample Matrix:	Ground Water	**Date Received:**	10/22/20
Sample Name:	16WW34-201019	**Units:**	µg/L
Lab Code:	E2001014-005	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	10/23/20	10/23/20 20:17	368381	700781	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2001014
Project:	HS20101089	**Date Collected:**	10/19/20 1045
Sample Matrix:	Ground Water	**Date Received:**	10/22/20
Sample Name:	16WW34-201019-FD	**Units:**	µg/L
Lab Code:	E2001014-006	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	10/23/20	10/23/20 20:24	368381	700781	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2001014
Project:	HS20101089	**Date Collected:**	10/19/20 1130
Sample Matrix:	Ground Water	**Date Received:**	10/22/20
Sample Name:	16WW33-201019	**Units:**	µg/L
Lab Code:	E2001014-007	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.0259**	J	0.100	0.0500	0.0250	1	10/23/20	10/23/20 20:32	368381	700781	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2001014
Project:	HS20101089	**Date Collected:**	10/19/20 1215
Sample Matrix:	Ground Water	**Date Received:**	10/22/20
Sample Name:	16WW32-201019	**Units:**	µg/L
Lab Code:	E2001014-008	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	10/23/20	10/23/20 20:40	368381	700781	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2001014
Project:	HS20101089	**Date Collected:**	10/19/20 1255
Sample Matrix:	Ground Water	**Date Received:**	10/22/20
Sample Name:	16WW31-201019	**Units:**	µg/L
Lab Code:	E2001014-009	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	10/23/20	10/23/20 20:48	368381	700781	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2001014
Project:	HS20101089	**Date Collected:**	10/19/20 1340
Sample Matrix:	Ground Water	**Date Received:**	10/22/20
Sample Name:	16WW46-201019	**Units:**	µg/L
Lab Code:	E2001014-010	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	10/23/20	10/23/20 21:04	368381	700781	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2001014
Project:	HS20101089	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	µg/L
Lab Code:	EQ2000533-01	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	10/23/20	10/26/20 11:06	368381	700826	

Accuracy & Precision

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2001014
Project:	HS20101089	**Date Analyzed:**	10/26/20
Sample Matrix:	Ground Water		

Lab Control Sample Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method:	6850	**Units:**	µg/L
Prep Method:	Method	**Basis:**	NA
		Extraction Lot:	368381

	Lab Control Sample EQ2000533-02			Duplicate Lab Control Sample EQ2000533-03					
Analyte Name	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Perchlorate	0.106	0.100	106	0.110	0.100	110	84 - 119	4	15

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

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

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2001014
Project:	HS20101089	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2000533-02	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.106**		0.100	0.0500	0.0250	1	10/23/20	10/26/20 11:13	368381	700826	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2001014
Project:	HS20101089	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Duplicate Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2000533-03	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.110**		0.100	0.0500	0.0250	1	10/23/20	10/26/20 11:21	368381	700826	

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2001014
Project:	HS20101089	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
		Date Analyzed:	10/26/20

Matrix Spike Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Sample Name:	Batch QC	**Units:**	µg/L
Lab Code:	E2001015-003	**Basis:**	NA

Analytical Method: 6850
Prep Method: Method

		Batch QCMS				Batch QCDMS					
		Matrix Spike				**Duplicate Matrix Spike**					
		EQ2000533-04				EQ2000533-05					
Analyte Name	**Sample Result**	**Result**	**Spike Amount**	**% Rec**		**Result**	**Spike Amount**	**% Rec**		**% Rec Limits**	**RPD**	**RPD Limit**
Perchlorate	167	167	0.100	151	#	167	0.100	249	#	84 - 119	<1	15

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

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

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

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2001014
Project:	HS20101089	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Batch QC	**Units:**	µg/L
Lab Code:	EQ2000533-04	**Basis:**	NA
Run Type:	Matrix Spike		

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**167**		1.00	0.500	0.250	10	10/23/20	10/26/20 12:16	368381	700826	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2001014
Project:	HS20101089	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Batch QC	**Units:**	µg/L
Lab Code:	EQ2000533-05	**Basis:**	NA
Run Type:	Duplicate Matrix Spike		

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**167**		1.00	0.500	0.250	10	10/23/20	10/26/20 12:24	368381	700826	

Initial Calibration

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

20201020

1st Review: Grivera
2nd Review: Kneir

Injection Log
LCMS01 -Shimadzu 8050

ICAL Date: 9/20/2020
Cal. Std. xp: 11/18/2020
ICAL ID: **EC2000045**

Mobile Phases **A:** 0.75% Formic Acid/Water 3100807-09 **B:** MeOH 3100802-01

			File Name	Acquisition Method	Dilution	R	Comments	Date/Time
1	PERCHLORATE1		20201020_009	Perchlorate6850b.lcm	1x	☒	3100806-05	10/20/2020 17:02
2	PERCHLORATE2		20201020_011	Perchlorate6850b.lcm	1x	☒	3100806-07	10/20/2020 17:18
3	PERCHLORATE3		20201020_012	Perchlorate6850b.lcm	1x	☒	3100807-01	10/20/2020 17:26
4	PERCHLORATE4		20201020_013	Perchlorate6850b.lcm	1x	☒	3100807-02	10/20/2020 17:34
5	PERCHLORATE5		20201020_014	Perchlorate6850b.lcm	1x	☒	3100807-03	10/20/2020 17:42
6	PERCHLORATE6		20201020_015	Perchlorate6850b.lcm	1x	☒	3100807-04	10/20/2020 17:50
7	PERCHLORATE7		20201020_016	Perchlorate6850b.lcm	1x	☒	3100807-05	10/20/2020 17:58
8	PERCHLORATE8		20201020_017	Perchlorate6850b.lcm	1x	☒	3100807-06	10/20/2020 18:06
9	PERCHLORATE9		20201020_018	Perchlorate6850b.lcm	1x	☒	3100807-07	10/20/2020 18:14
10	PERCHLORATEICV		20201020_019	Perchlorate6850b.lcm	1x	☒	3100807-08	10/20/2020 18:21
11	IB		20201020_020	Perchlorate6850b.lcm	1x	☒		10/20/2020 18:29
12	LODV		20201020_021	Perchlorate6850b.lcm	1x	☒		10/20/2020 18:37
13	ICS		20201020_022	Perchlorate6850b.lcm	1x	☒		10/20/2020 18:45
14	PERCHLORATE7		20201020_023	Perchlorate6850b.lcm	1x	☒	3100807-05	10/20/2020 18:53
15	EQ2000512-03RR		20201020_024	Perchlorate6850b.lcm	1x	☒		10/20/2020 19:01
16	E2000965-005X2		20201020_025	Perchlorate6850b.lcm	2x	☒		10/20/2020 19:09
17	E2000966-002X2		20201020_026	Perchlorate6850b.lcm	2x	☒		10/20/2020 19:17
18	E2000971-001X2		20201020_027	Perchlorate6850b.lcm	2x	☒		10/20/2020 19:25
19	E2000971-003X2		20201020_028	Perchlorate6850b.lcm	2x	☒		10/20/2020 19:33
20	E2000971-004X2		20201020_029	Perchlorate6850b.lcm	2x	☒		10/20/2020 19:40
21	E2000971-005X10		20201020_030	Perchlorate6850b.lcm	10x	☒		10/20/2020 19:48
22	PERCHLORATE7		20201020_031	Perchlorate6850b.lcm	1x	☒	3100807-05	10/20/2020 19:56
23	EQ2000513-02RR		20201020_032	Perchlorate6850b.lcm	1x	☒		10/20/2020 20:04
24	EQ2000513-03RR		20201020_033	Perchlorate6850b.lcm	1x	☒		10/20/2020 20:12
25	EQ2000513-04RR		20201020_034	Perchlorate6850b.lcm	1x	☒		10/20/2020 20:20
26	EQ2000513-05RR		20201020_035	Perchlorate6850b.lcm	1x	☒		10/20/2020 20:28
27	E2000981-001X2		20201020_036	Perchlorate6850b.lcm	2x	☒		10/20/2020 20:36
28	E2000982-001X200		20201020_037	Perchlorate6850b.lcm	200x	☒		10/20/2020 20:44
29	E2000984-001X2		20201020_038	Perchlorate6850b.lcm	2x	☒		10/20/2020 20:51
30	E2000985-002X20		20201020_039	Perchlorate6850b.lcm	20x	☒		10/20/2020 20:59
31	E2000985-003X2		20201020_040	Perchlorate6850b.lcm	2x	☒		10/20/2020 21:07
32	E2000985-004X10		20201020_041	Perchlorate6850b.lcm	10x	☒		10/20/2020 21:15
33	PERCHLORATE7		20201020_042	Perchlorate6850b.lcm	1x	☒	3100807-05	10/20/2020 21:23
34	E2000985-006X10		20201020_043	Perchlorate6850b.lcm	10x	☒		10/20/2020 21:31
35	E2000996-003X2		20201020_044	Perchlorate6850b.lcm	2x	☒		10/20/2020 21:39
36	E2000996-005X2		20201020_045	Perchlorate6850b.lcm	2x	☒		10/20/2020 21:47
37	E2000996-006X5		20201020_046	Perchlorate6850b.lcm	5x	☒		10/20/2020 21:55
38	E2000996-009X5		20201020_047	Perchlorate6850b.lcm	5x	☒		10/20/2020 22:02
39	PERCHLORATE7		20201020_048	Perchlorate6850b.lcm	1x	☒	3100807-05	10/20/2020 22:10
40	null		20201020_049	Perchlorate6850b.lcm	1x	☒		10/20/2020 22:15
41	null		20201020_050	Perchlorate6850b.lcm	1x	☒		10/20/2020 22:20
42								
43								

Initial Calibration - Detailed Report

Calibration ID: EC2000045 **Instrument ID:** E-LCMS-01
Column Name: 1

#	Lab Code	Sample Name	File Location	Aquisition Date
01	EC2000045-01	PERCHLORATE1	20201020_009	10/20/2020 17:02
02	EC2000045-02	PERCHLORATE2	20201020_011	10/20/2020 17:18
03	EC2000045-03	PERCHLORATE3	20201020_012	10/20/2020 17:26
04	EC2000045-04	PERCHLORATE4	20201020_013	10/20/2020 17:34
05	EC2000045-05	PERCHLORATE5	20201020_014	10/20/2020 17:42
06	EC2000045-06	PERCHLORATE6	20201020_015	10/20/2020 17:50
07	EC2000045-07	PERCHLORATE7	20201020_016	10/20/2020 17:58
08	EC2000045-08	PERCHLORATE8	20201020_017	10/20/2020 18:06
09	EC2000045-09	PERCHLORATE9	20201020_018	10/20/2020 18:14

Analyte	Curve Fit	Weighting		
Perchlorate	**Linear**	**Equal**	**R2 = 0.9997655579102110**	**Y=0.09298 X+0.005025**

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.1000	0.1448	02	0.7000	0.09763	03	1.0000	0.1037	04	2.0000	0.09831
05	5.0000	0.0959	06	10.0000	0.08798	07	20.0000	0.09511	08	30.0000	0.09343
09	50.0000	0.09287									

Analyte

Perchlorate

#	Amount	Calculated Conc	%D	#	Amount	Calculated Conc	%D	#	Amount	Calculated Conc	%D
01	0.1000	0.102	1.6	02	0.7000	0.681	-2.7	03	1.0000	1.06	6.1
04	2.0000	2.06	3.0	05	5.0000	5.10	2.1	06	10.0000	9.41	-5.9
07	20.0000	20.4	2.0	08	30.0000	30.1	0.3	09	50.0000	49.9	-0.2

Initial Calibration Verification Summary Report

Calibration ID:	EC2000045	**Instrument ID:**	E-LCMS-01
Datafile ID:	20201020_019	**Column Name:**	1

Analyte	Lab Code	Type	Curve Fit	True Value	Calc Conc	Units	Result	Criteria
Perchlorate	EC2000045-10	T	Linear	10	10.013	ng/mL	0.1	<= 15

ALS Group Houston

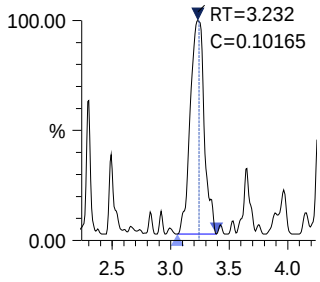
PERCHLORATE1

Date acquired: 10/20/2020 5:02:55 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20201020\20201020_009.lcd
Vial: 5 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE1	10/20/2020 5:02:55 PM	3205	0.10165	20201020_009	3.232	25.0000	1.0000	5
Sodium Perchlorate-18O4_IS	PERCHLORATE1	10/20/2020 5:02:55 PM	221415	1.00000	20201020_009	3.222	25.0000	1.0000	5

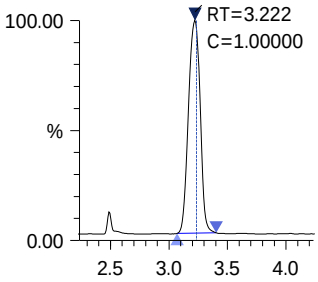
Perchlorate

Conc 0.10165
Area 3205
Q 99.00>83.00 (-) 3.87e2



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 221415
ISTD 107.00>89.00 (-) 3.20e4



ALS Group Houston

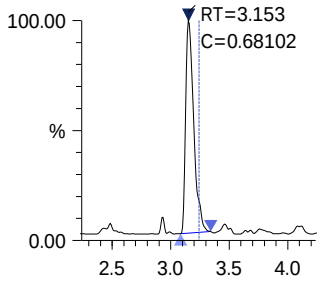
PERCHLORATE2

Date acquired: 10/20/2020 5:18:44 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20201020\20201020_011.lcd
Vial: 7 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE2	10/20/2020 5:18:44 PM	12196	0.68102	20201020_011	3.153	25.0000	1.0000	7
Sodium Perchlorate-18O4_IS	PERCHLORATE2	10/20/2020 5:18:44 PM	178459	1.00000	20201020_011	3.151	25.0000	1.0000	7

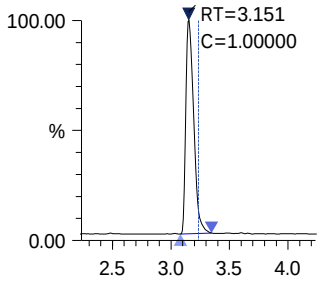
Perchlorate

Conc 0.68102
Area 12196
Q 99.00>83.00 (-) 2.52e3



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 178459
ISTD 107.00>89.00 (-) 3.74e4



ALS Group Houston

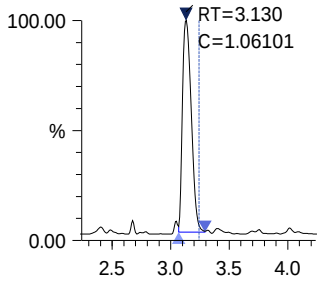
PERCHLORATE3

Date acquired: 10/20/2020 5:26:37 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20201020\20201020_012.lcd
Vial: 8 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE3	10/20/2020 5:26:37 PM	17953	1.06101	20201020_012	3.130	25.0000	1.0000	8
Sodium Perchlorate-18O4_IS	PERCHLORATE3	10/20/2020 5:26:37 PM	173169	1.00000	20201020_012	3.123	25.0000	1.0000	8

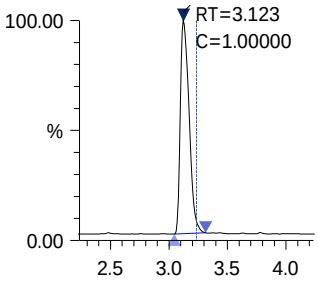
Perchlorate

Conc 1.06101
Area 17953
Q 99.00>83.00 (-) 3.39e3



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 173169
ISTD 107.00>89.00 (-) 3.29e4



ALS Group Houston

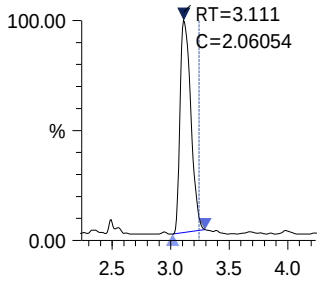
PERCHLORATE4

Date acquired: 10/20/2020 5:34:30 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20201020\20201020_013.lcd
Vial: 9 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE4	10/20/2020 5:34:30 PM	36954	2.06054	20201020_013	3.111	25.0000	1.0000	9
Sodium Perchlorate-18O4_IS	PERCHLORATE4	10/20/2020 5:34:30 PM	187954	1.00000	20201020_013	3.113	25.0000	1.0000	9

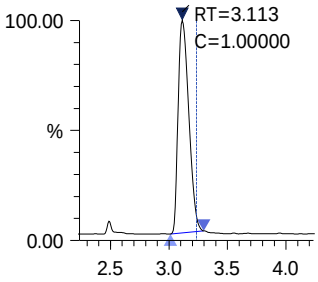
Perchlorate

Conc 2.06054
Area 36954
Q 99.00>83.00 (-) 5.74e3



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 187954
ISTD 107.00>89.00 (-) 2.97e4



ALS Group Houston

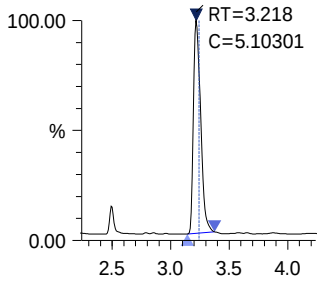
PERCHLORATE5

Date acquired: 10/20/2020 5:42:26 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20201020\20201020_014.lcd
Vial: 10 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE5	10/20/2020 5:42:26 PM	79828	5.10301	20201020_014	3.218	25.0000	1.0000	10
Sodium Perchlorate-18O4_IS	PERCHLORATE5	10/20/2020 5:42:26 PM	166486	1.00000	20201020_014	3.217	25.0000	1.0000	10

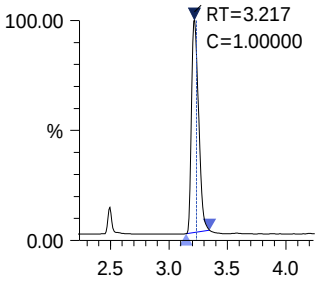
Perchlorate

Conc 5.10301
Area 79828
Q 99.00>83.00 (-) 1.88e4



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 166486
ISTD 107.00>89.00 (-) 3.98e4



ALS Group Houston

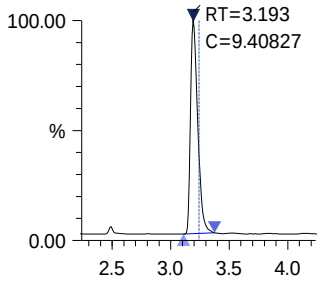
PERCHLORATE6

Date acquired: 10/20/2020 5:50:19 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20201020\20201020_015.lcd
Vial: 4 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE6	10/20/2020 5:50:19 PM	136097	9.40827	20201020_015	3.193	25.0000	1.0000	4
Sodium Perchlorate-18O4_IS	PERCHLORATE6	10/20/2020 5:50:19 PM	154693	1.00000	20201020_015	3.190	25.0000	1.0000	4

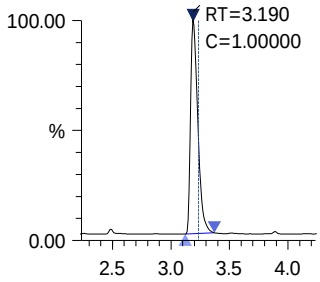
Perchlorate

Conc 9.40827
Area 136097
Q 99.00>83.00 (-) 3.16e4



Sodium Perchlorate-18O4 _IS

Conc 1.00000
Area 154693
ISTD 107.00>89.00 (-) 3.55e4



ALS Group Houston

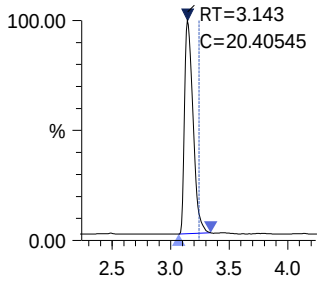
PERCHLORATE7

Date acquired: 10/20/2020 5:58:14 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20201020\20201020_016.lcd
Vial: 11 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE7	10/20/2020 5:58:14 PM	286302	20.40545	20201020_016	3.143	25.0000	1.0000	11
Sodium Perchlorate-18O4_IS	PERCHLORATE7	10/20/2020 5:58:14 PM	150504	1.00000	20201020_016	3.142	25.0000	1.0000	11

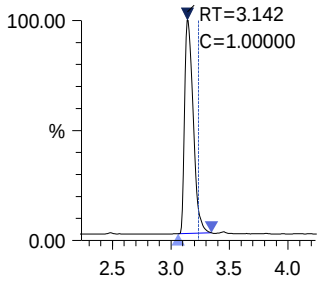
Perchlorate

Conc 20.40545
Area 286302
Q 99.00>83.00 (-) 5.58e4



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 150504
ISTD 107.00>89.00 (-) 2.89e4



ALS Group Houston

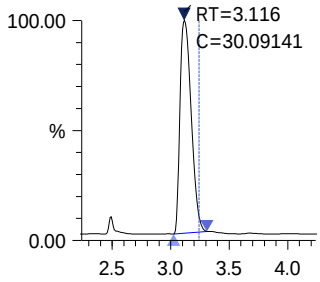
PERCHLORATE8

Date acquired: 10/20/2020 6:06:08 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20201020\20201020_017.lcd
Vial: 12 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE8	10/20/2020 6:06:08 PM	429904	30.09141	20201020_017	3.116	25.0000	1.0000	12
Sodium Perchlorate-18O4_IS	PERCHLORATE8	10/20/2020 6:06:08 PM	153380	1.00000	20201020_017	3.115	25.0000	1.0000	12

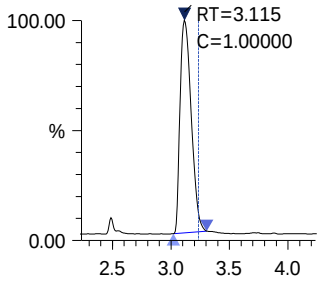
Perchlorate

Conc 30.09141
Area 429904
Q 99.00>83.00 (-) 6.42e4



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 153380
ISTD 107.00>89.00 (-) 2.32e4



ALS Group Houston

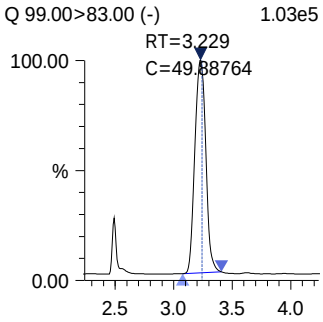
PERCHLORATE9

Date acquired: 10/20/2020 6:14:02 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20201020\20201020_018.lcd
Vial: 13 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE9	10/20/2020 6:14:02 PM	663959	49.88764	20201020_018	3.229	25.0000	1.0000	13
Sodium Perchlorate-18O4_IS	PERCHLORATE9	10/20/2020 6:14:02 PM	142988	1.00000	20201020_018	3.226	25.0000	1.0000	13

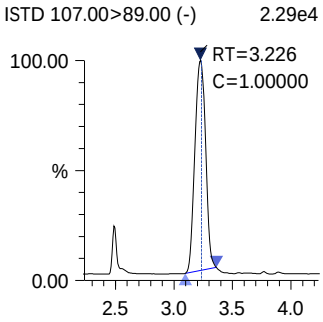
Perchlorate

Conc 49.88764
Area 663959



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 142988



ALS Group Houston

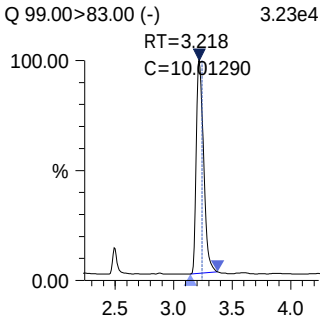
PERCHLORATEICV

Date acquired: 10/20/2020 6:21:55 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20201020\20201020_019.lcd
Vial: 14 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATEICV	10/20/2020 6:21:55 PM	138426	10.01290	20201020_019	3.218	25.0000	1.0000	14
Sodium Perchlorate-18O4_IS	PERCHLORATEICV	10/20/2020 6:21:55 PM	147890	1.00000	20201020_019	3.215	25.0000	1.0000	14

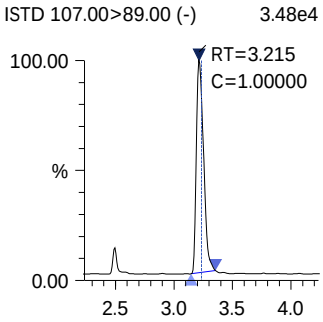
Perchlorate

Conc 10.01290
Area 138426



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 147890



Chromatograms and Selected Ion Monitoring

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 320, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

20201023

1st Review: Grivera
2nd Review: Kneir

Injection Log
LCMS01 -Shimadzu 8050

ICAL Date: 9/20/2020
Cal. Std. xp: 11/18/2020
ICAL ID: **EC2000045**

Mobile Phases **A:** 0.75% Formic Acid/Water 3100807-09 **B:** MeOH 3100802-01

			File Name	Acquisition Method	Dilution	R	Comments	Date/Time
1	null		20201023_001	Perchlorate6850b.lcm	1x	☒		10/23/2020 15:39
2	null		20201023_002	Perchlorate6850b.lcm	1x	☒		10/23/2020 15:46
3	IB		20201023_003	Perchlorate6850b.lcm	1x	☒		10/23/2020 16:04
4	IB		20201023_004	Perchlorate6850b.lcm	1x	☒		10/23/2020 16:12
5	LODV		20201023_005	Perchlorate6850b.lcm	1x	☒		10/23/2020 16:20
6	ICS		20201023_006	Perchlorate6850b.lcm	1x	☒		10/23/2020 16:28
7	PERCHLORATE7		20201023_007	Perchlorate6850b.lcm	1x	☒	3100807-05	10/23/2020 16:35
8	EQ2000532-01		20201023_008	Perchlorate6850b.lcm	1x	☒		10/23/2020 16:43
9	EQ2000532-02		20201023_009	Perchlorate6850b.lcm	1x	☒		10/23/2020 16:51
10	EQ2000532-03		20201023_010	Perchlorate6850b.lcm	1x	☒		10/23/2020 16:59
11	E2001001-001		20201023_011	Perchlorate6850b.lcm	1x	☒		10/23/2020 17:07
12	E2001001-002		20201023_012	Perchlorate6850b.lcm	1x	☒		10/23/2020 17:15
13	E2001001-003		20201023_013	Perchlorate6850b.lcm	1x	☒		10/23/2020 17:23
14	E2001001-004		20201023_014	Perchlorate6850b.lcm	1x	☒		10/23/2020 17:31
15	E2001001-005		20201023_015	Perchlorate6850b.lcm	1x	☒		10/23/2020 17:39
16	E2001001-006		20201023_016	Perchlorate6850b.lcm	1x	☒		10/23/2020 17:47
17	E2001001-007		20201023_017	Perchlorate6850b.lcm	1x	☒		10/23/2020 17:55
18	PERCHLORATE7		20201023_018	Perchlorate6850b.lcm	1x	☒	3100807-05	10/23/2020 18:02
19	E2001001-008		20201023_019	Perchlorate6850b.lcm	1x	☒		10/23/2020 18:10
20	E2001002-001		20201023_020	Perchlorate6850b.lcm	1x	☒		10/23/2020 18:18
21	E2001003-001		20201023_021	Perchlorate6850b.lcm	1x	☒		10/23/2020 18:26
22	E2001003-002		20201023_022	Perchlorate6850b.lcm	1x	☒		10/23/2020 18:34
23	E2001003-003		20201023_023	Perchlorate6850b.lcm	1x	☒		10/23/2020 18:42
24	E2001003-004		20201023_024	Perchlorate6850b.lcm	1x	☒		10/23/2020 18:50
25	EQ2000533-01		20201023_025	Perchlorate6850b.lcm	1x	☒		10/23/2020 18:58
26	EQ2000533-02		20201023_026	Perchlorate6850b.lcm	1x	☒		10/23/2020 19:06
27	EQ2000533-03		20201023_027	Perchlorate6850b.lcm	1x	☒		10/23/2020 19:13
28	EQ2000533-04		20201023_028	Perchlorate6850b.lcm	1x	☒		10/23/2020 19:21
29	PERCHLORATE7		20201023_029	Perchlorate6850b.lcm	1x	☒	3100807-05	10/23/2020 19:29
30	EQ2000533-05		20201023_030	Perchlorate6850b.lcm	1x	☒		10/23/2020 19:37
31	E2001014-001		20201023_031	Perchlorate6850b.lcm	1x	☒		10/23/2020 19:45
32	E2001014-002		20201023_032	Perchlorate6850b.lcm	1x	☒		10/23/2020 19:53
33	E2001014-003		20201023_033	Perchlorate6850b.lcm	1x	☒		10/23/2020 20:01
34	E2001014-004		20201023_034	Perchlorate6850b.lcm	1x	☒		10/23/2020 20:09
35	E2001014-005		20201023_035	Perchlorate6850b.lcm	1x	☒		10/23/2020 20:17
36	E2001014-006		20201023_036	Perchlorate6850b.lcm	1x	☒		10/23/2020 20:24
37	E2001014-007		20201023_037	Perchlorate6850b.lcm	1x	☒		10/23/2020 20:32
38	E2001014-008		20201023_038	Perchlorate6850b.lcm	1x	☒		10/23/2020 20:40
39	E2001014-009		20201023_039	Perchlorate6850b.lcm	1x	☒		10/23/2020 20:48
40	PERCHLORATE7		20201023_040	Perchlorate6850b.lcm	1x	☒	3100807-05	10/23/2020 20:56
41	E2001014-010		20201023_041	Perchlorate6850b.lcm	1x	☒		10/23/2020 21:04
42	E2001015-001		20201023_042	Perchlorate6850b.lcm	1x	☒		10/23/2020 21:12
43	E2001015-002		20201023_043	Perchlorate6850b.lcm	1x	☒		10/23/2020 21:20
44	E2001015-003		20201023_044	Perchlorate6850b.lcm	1x	☒		10/23/2020 21:28
45	E2001015-004		20201023_045	Perchlorate6850b.lcm	1x	☒		10/23/2020 21:36
46	E2001015-005		20201023_046	Perchlorate6850b.lcm	1x	☒		10/23/2020 21:44
47	E2001015-006		20201023_047	Perchlorate6850b.lcm	1x	☒		10/23/2020 21:52
48	E2001015-007		20201023_048	Perchlorate6850b.lcm	1x	☒		10/23/2020 22:00
49	E2001016-001		20201023_049	Perchlorate6850b.lcm	1x	☒		10/23/2020 22:07
50	PERCHLORATE7		20201023_050	Perchlorate6850b.lcm	1x	☒	3100807-05	10/23/2020 22:15
51	null		20201023_051	Perchlorate6850b.lcm	1x	☒		10/23/2020 22:20
52	null		20201023_052	Perchlorate6850b.lcm	1x	☒		10/23/2020 22:25
53								
54								
55								

20201026

1st Review: Grivera
2nd Review: Kneir

Injection Log
LCMS01 -Shimadzu 8050

ICAL Date: 9/20/2020
Cal. Std. xp: 11/18/2020
ICAL ID: **EC2000045**

Mobile Phases **A:** 0.75% Formic Acid/Water 3100807-09 **B:** MeOH 3100802-01

			File Name	Acquisition Method	Dilution	R	Comments	Date/Time
1	null		20201026_001	Perchlorate6850b.lcm	1x	☒		10/26/2020 9:44
2	null		20201026_002	Perchlorate6850b.lcm	1x	☒		10/26/2020 9:49
3	IB		20201026_003	Perchlorate6850b.lcm	1x	☒		10/26/2020 9:55
4	IB		20201026_004	Perchlorate6850b.lcm	1x	☒		10/26/2020 10:02
5	ICS		20201026_006	Perchlorate6850b.lcm	1x	☒		10/26/2020 10:18
6	PERCHLORATE7		20201026_007	Perchlorate6850b.lcm	1x	☒		10/26/2020 10:26
7	E2001003-002		20201026_008	Perchlorate6850b.lcm	1x	☒	3100807-05	10/26/2020 10:34
8	E2001014-001		20201026_009	Perchlorate6850b.lcm	1x	☒		10/26/2020 10:42
9	E2001015-001		20201026_010	Perchlorate6850b.lcm	1x	☒		10/26/2020 10:50
10	E2001015-002		20201026_011	Perchlorate6850b.lcm	1x	☒		10/26/2020 10:58
11	EQ2000533-01		20201026_012	Perchlorate6850b.lcm	1x	☒		10/26/2020 11:06
12	EQ2000533-02		20201026_013	Perchlorate6850b.lcm	1x	☒		10/26/2020 11:13
13	EQ2000533-03		20201026_014	Perchlorate6850b.lcm	1x	☒		10/26/2020 11:21
14	PERCHLORATE7		20201026_015	Perchlorate6850b.lcm	1x	☒		10/26/2020 11:29
15	LODV		20201026_016	Perchlorate6850b.lcm	1x	☒		10/26/2020 11:44
16	E2001003-001X500		20201026_017	Perchlorate6850b.lcm	500x	☒		10/26/2020 11:52
17	E2001003-003X100		20201026_018	Perchlorate6850b.lcm	100x	☒		10/26/2020 12:00
18	E2001003-004X1000		20201026_019	Perchlorate6850b.lcm	1000x	☒	3100807-05	10/26/2020 12:08
19	EQ2000533-04X10		20201026_020	Perchlorate6850b.lcm	10x	☒		10/26/2020 12:16
20	EQ2000533-05X10		20201026_021	Perchlorate6850b.lcm	10x	☒		10/26/2020 12:24
21	E2001014-002X2		20201026_022	Perchlorate6850b.lcm	2x	☒		10/26/2020 12:31
22	E2001015-003X10		20201026_023	Perchlorate6850b.lcm	10x	☒		10/26/2020 12:39
23	PERCHLORATE7		20201026_024	Perchlorate6850b.lcm	1x	☒		10/26/2020 12:47
24	E2001014-002		20201026_025	Perchlorate6850b.lcm	1x	☒		10/26/2020 12:59
25	PERCHLORATE7		20201026_026	Perchlorate6850b.lcm	1x	☒		10/26/2020 13:07
26								
27								
28								
29								
30								
31								
32								
33								
34								

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS20101089

Service Request: E2001014
Date Analyzed: 10/23/20

Continuing Calibration Verification Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
File ID: I:\LCMS01\DATA\20201023\20201023_029

Calibration Date: 10/20/20
Calibration ID: EC2000045
Analysis Lot: 700781
Units: ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Perchlorate	10.0	9.82	NA	NA	NA	-1.8	± 15 %	Linear

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS20101089

Service Request: E2001014
Date Analyzed: 10/23/20

Continuing Calibration Verification Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
File ID: I:\LCMS01\DATA\20201023\20201023_040

Calibration Date: 10/20/20
Calibration ID: EC2000045
Analysis Lot: 700781
Units: ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Perchlorate	10.0	9.53	NA	NA	NA	-4.7	± 15 %	Linear

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS20101089

Service Request: E2001014
Date Analyzed: 10/23/20

Continuing Calibration Verification Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
File ID: I:\LCMS01\DATA\20201023\20201023_050

Calibration Date: 10/20/20
Calibration ID: EC2000045
Analysis Lot: 700781
Units: ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Perchlorate	10.0	9.67	NA	NA	NA	-3.3	± 15 %	Linear

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS20101089

Service Request: E2001014
Date Analyzed: 10/26/20

Continuing Calibration Verification Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
File ID: I:\LCMS01\DATA\20201026\20201026_007

Calibration Date: 10/20/20
Calibration ID: EC2000045
Analysis Lot: 700826
Units: ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Perchlorate	10.0	9.74	NA	NA	NA	-2.6	± 15 %	Linear

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS20101089

Service Request: E2001014
Date Analyzed: 10/26/20

Continuing Calibration Verification Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
File ID: I:\LCMS01\DATA\20201026\20201026_015

Calibration Date: 10/20/20
Calibration ID: EC2000045
Analysis Lot: 700826
Units: ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Perchlorate	10.0	9.61	NA	NA	NA	-3.9	± 15 %	Linear

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS20101089

Service Request: E2001014
Date Analyzed: 10/26/20

Continuing Calibration Verification Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
File ID: I:\LCMS01\DATA\20201026\20201026_024

Calibration Date: 10/20/20
Calibration ID: EC2000045
Analysis Lot: 700826
Units: ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Perchlorate	10.0	9.49	NA	NA	NA	-5.1	± 15 %	Linear

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS20101089

Service Request: E2001014
Date Analyzed: 10/26/20

Continuing Calibration Verification Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
File ID: I:\LCMS01\DATA\20201026\20201026_026

Calibration Date: 10/20/20
Calibration ID: EC2000045
Analysis Lot: 700826
Units: ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Perchlorate	10.0	9.37	NA	NA	NA	-6.3	± 15 %	Linear

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2001014
Project:	HS20101089	**Date Analyzed:**	10/23/20 19:29

Internal Standard Area and RT Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

File ID:	I:\LCMS01\DATA\20201023\20201023_029	**Lab Code:**	EQ2000536-01
Instrument ID:	E-LCMS-01	**Analysis Lot:**	700781
Analytical Method:	6850	**Signal ID:**	1

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	169,894	3.17
	Upper Limit ==>	254,841	5.17
	Lower Limit ==>	84,947	1.17
Associated Analyses			
Continuing Calibration Verification	EQ2000536-01	205,363	3.14
16WW38-201019	E2001014-003	137,403	3.12
16WW14-201019	E2001014-004	94,522	3.07
16WW34-201019	E2001014-005	202,842	3.15
16WW34-201019-FD	E2001014-006	179,043	3.19
16WW33-201019	E2001014-007	146,998	3.16
16WW32-201019	E2001014-008	148,270	3.11
16WW31-201019	E2001014-009	181,986	3.10

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

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2001014
Project:	HS20101089	**Date Analyzed:**	10/23/20 20:56

Internal Standard Area and RT Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

File ID:	I:\LCMS01\DATA\20201023\20201023_040	**Lab Code:**	EQ2000536-02
Instrument ID:	E-LCMS-01	**Analysis Lot:**	700781
Analytical Method:	6850	**Signal ID:**	1

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	169,894	3.17
	Upper Limit ==>	254,841	5.17
	Lower Limit ==>	84,947	1.17
Associated Analyses			
Continuing Calibration Verification	EQ2000536-02	158,162	3.19
16WW46-201019	E2001014-010	85,083	3.12

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

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2001014
Project:	HS20101089	**Date Analyzed:**	10/23/20 22:15

Internal Standard Area and RT Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

File ID:	I:\LCMS01\DATA\20201023\20201023_050	**Lab Code:**	EQ2000536-03
Instrument ID:	E-LCMS-01	**Analysis Lot:**	700781
Analytical Method:	6850	**Signal ID:**	1

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	169,894	3.17
	Upper Limit ==>	254,841	5.17
	Lower Limit ==>	84,947	1.17
Associated Analyses			
Continuing Calibration Verification	EQ2000536-03	189,894	3.08

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

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2001014
Project:	HS20101089	**Date Analyzed:**	10/26/20 10:26

Internal Standard Area and RT Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

File ID:	I:\LCMS01\DATA\20201026\20201026_007	**Lab Code:**	EQ2000540-01
Instrument ID:	E-LCMS-01	**Analysis Lot:**	700826
Analytical Method:	6850	**Signal ID:**	1

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	169,894	3.17
	Upper Limit ==>	254,841	5.17
	Lower Limit ==>	84,947	1.17
Associated Analyses			
Continuing Calibration Verification	EQ2000540-01	226,473	3.06
16WW44-201019	E2001014-001	253,840	3.06
Method Blank	EQ2000533-01	248,798	3.06
Lab Control Sample	EQ2000533-02	253,069	3.07
Duplicate Lab Control Sample	EQ2000533-03	254,501	3.07

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

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2001014
Project:	HS20101089	**Date Analyzed:**	10/26/20 11:29

Internal Standard Area and RT Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

File ID:	I:\LCMS01\DATA\20201026\20201026_015	**Lab Code:**	EQ2000540-02
Instrument ID:	E-LCMS-01	**Analysis Lot:**	700826
Analytical Method:	6850	**Signal ID:**	1

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	169,894	3.17
	Upper Limit ==>	254,841	5.17
	Lower Limit ==>	84,947	1.17
Associated Analyses			
Continuing Calibration Verification	EQ2000540-02	224,624	3.06
Batch QCMS	EQ2000533-04	174,515	3.06
Batch QCDMS	EQ2000533-05	173,226	3.06
Batch QC	E2001015-003	166,464	3.05

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

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2001014
Project:	HS20101089	**Date Analyzed:**	10/26/20 12:47

Internal Standard Area and RT Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

File ID:	I:\LCMS01\DATA\20201026\20201026_024	**Lab Code:**	EQ2000540-03
Instrument ID:	E-LCMS-01	**Analysis Lot:**	700826
Analytical Method:	6850	**Signal ID:**	1

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	169,894	3.17
	Upper Limit ==>	254,841	5.17
	Lower Limit ==>	84,947	1.17
Associated Analyses			
Continuing Calibration Verification	EQ2000540-03	229,585	3.07
16WW37-201019	E2001014-002	173,136	2.98

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

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2001014
Project:	HS20101089	**Date Analyzed:**	10/26/20 13:07

Internal Standard Area and RT Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

File ID:	I:\LCMS01\DATA\20201026\20201026_026	**Lab Code:**	EQ2000540-04
Instrument ID:	E-LCMS-01	**Analysis Lot:**	700826
Analytical Method:	6850	**Signal ID:**	1

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	169,894	3.17
	Upper Limit ==>	254,841	5.17
	Lower Limit ==>	84,947	1.17
Associated Analyses			
Continuing Calibration Verification	EQ2000540-04	230,699	3.07

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

ALS Group Houston

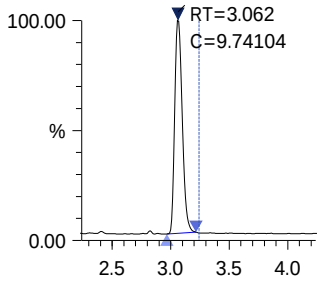
PERCHLORATE7

Date acquired: 10/26/2020 10:26:38 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20201026\20201026_007.lcd
Vial: 4 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE7	10/26/2020 10:26:38 AM	206255	9.74104	20201026_007	3.062	25.0000	1.0000	4
Sodium Perchlorate-18O4_IS	PERCHLORATE7	10/26/2020 10:26:38 AM	226473	1.00000	20201026_007	3.060	25.0000	1.0000	4

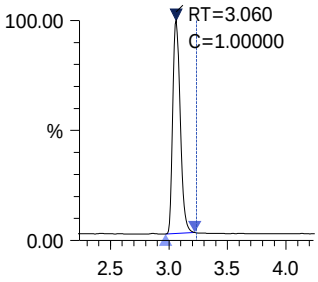
Perchlorate

Conc 9.74104
Area 206255
Q 99.00>83.00 (-) 4.70e4



Sodium Perchlorate-18O4 _IS

Conc 1.00000
Area 226473
ISTD 107.00>89.00 (-) 5.14e4



ALS Group Houston

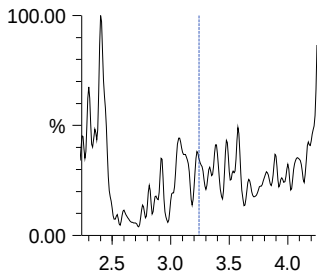
EQ2000533-01

Date acquired: 10/26/2020 11:06:08 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20201026\20201026_012.lcd
Vial: 17 | Inj. Volume: 25.0000uL | Tray: 4

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	EQ2000533-01	10/26/2020 11:06:08 AM	----	----	20201026_012	----	25.0000	1.0000	17
Sodium Perchlorate-18O4_IS	EQ2000533-01	10/26/2020 11:06:08 AM	248798	1.00000	20201026_012	3.064	25.0000	1.0000	17

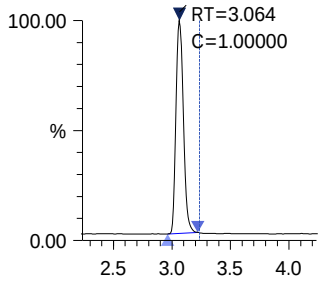
Perchlorate

Conc ----
Area ----
Q 99.00>83.00 (-) 2.84e2



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 248798
ISTD 107.00>89.00 (-) 5.74e4



ALS Group Houston

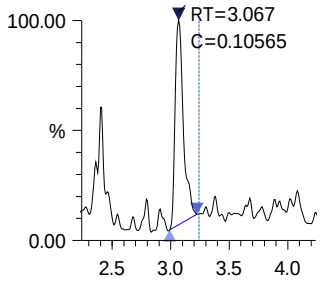
EQ2000533-02

Date acquired: 10/26/2020 11:13:59 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20201026\20201026_013.lcd
Vial: 18 | Inj. Volume: 25.0000uL | Tray: 4

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	EQ2000533-02	10/26/2020 11:13:59 AM	3757	0.10565	20201026_013	3.067	25.0000	1.0000	18
Sodium Perchlorate-18O4_IS	EQ2000533-02	10/26/2020 11:13:59 AM	253069	1.00000	20201026_013	3.065	25.0000	1.0000	18

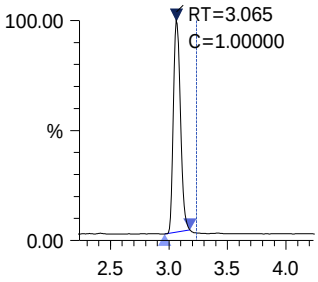
Perchlorate

Conc 0.10565
Area 3757
Q 99.00>83.00 (-) 8.11e2



Sodium Perchlorate-18O4 _IS

Conc 1.00000
Area 253069
ISTD 107.00>89.00 (-) 6.15e4



ALS Group Houston

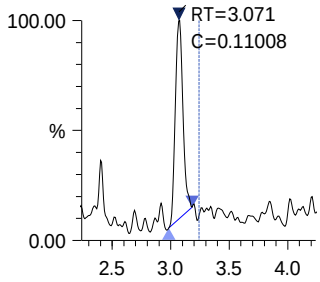
EQ2000533-03

Date acquired: 10/26/2020 11:21:53 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20201026\20201026_014.lcd
Vial: 19 | Inj. Volume: 25.0000uL | Tray: 4

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	EQ2000533-03	10/26/2020 11:21:53 AM	3884	0.11008	20201026_014	3.071	25.0000	1.0000	19
Sodium Perchlorate-18O4_IS	EQ2000533-03	10/26/2020 11:21:53 AM	254501	1.00000	20201026_014	3.065	25.0000	1.0000	19

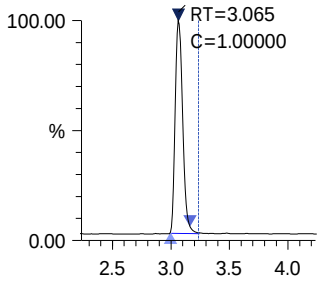
Perchlorate

Conc 0.11008
Area 3884
Q 99.00>83.00 (-) 9.36e2



Sodium Perchlorate-18O4 _IS

Conc 1.00000
Area 254501
ISTD 107.00>89.00 (-) 6.16e4



ALS Group Houston

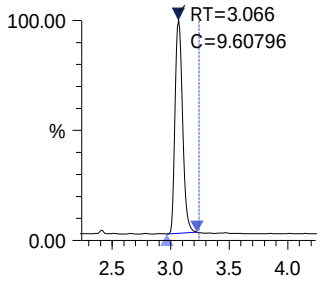
PERCHLORATE7

Date acquired: 10/26/2020 11:29:45 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20201026\20201026_015.lcd
Vial: 4 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE7	10/26/2020 11:29:45 AM	201792	9.60796	20201026_015	3.066	25.0000	1.0000	4
Sodium Perchlorate-18O4_IS	PERCHLORATE7	10/26/2020 11:29:45 AM	224624	1.00000	20201026_015	3.064	25.0000	1.0000	4

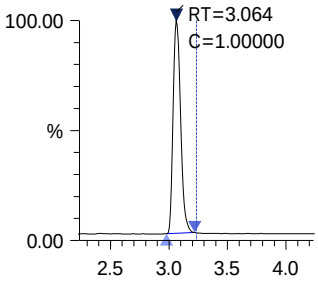
Perchlorate

Conc 9.60796
Area 201792
Q 99.00>83.00 (-) 4.61e4



Sodium Perchlorate-18O4 _IS

Conc 1.00000
Area 224624
ISTD 107.00>89.00 (-) 5.13e4



ALS Group Houston

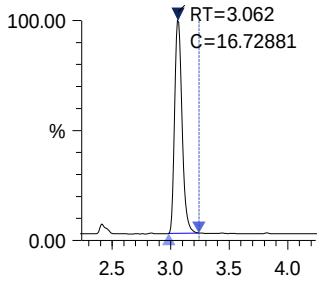
EQ2000533-04X10

Date acquired: 10/26/2020 12:16:12 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20201026\20201026_020.lcd
Vial: 20 | Inj. Volume: 25.0000uL | Tray: 4

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	EQ2000533-04X10	10/26/2020 12:16:12 PM	272319	16.72881	20201026_020	3.062	25.0000	1.0000	20
Sodium Perchlorate-18O4_IS	EQ2000533-04X10	10/26/2020 12:16:12 PM	174515	1.00000	20201026_020	3.060	25.0000	1.0000	20

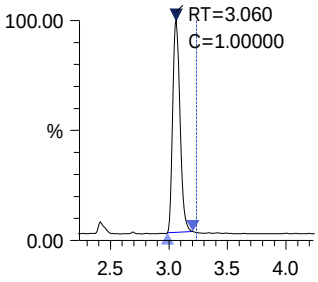
Perchlorate

Conc 16.72881
Area 272319
Q 99.00>83.00 (-) 6.29e4



Sodium Perchlorate-18O4 _IS

Conc 1.00000
Area 174515
ISTD 107.00>89.00 (-) 4.10e4



ALS Group Houston

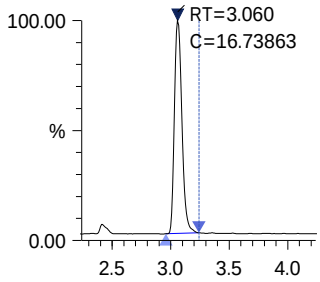
EQ2000533-05X10

Date acquired: 10/26/2020 12:24:04 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20201026\20201026_021.lcd
Vial: 21 | Inj. Volume: 25.0000uL | Tray: 4

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	EQ2000533-05X10	10/26/2020 12:24:04 PM	270465	16.73863	20201026_021	3.060	25.0000	1.0000	21
Sodium Perchlorate-18O4_IS	EQ2000533-05X10	10/26/2020 12:24:04 PM	173226	1.00000	20201026_021	3.058	25.0000	1.0000	21

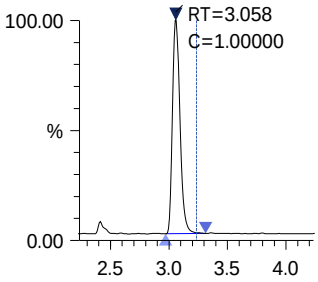
Perchlorate

Conc 16.73863
Area 270465
Q 99.00>83.00 (-) 6.19e4



Sodium Perchlorate-18O4 _IS

Conc 1.00000
Area 173226
ISTD 107.00>89.00 (-) 3.91e4



ALS Group Houston

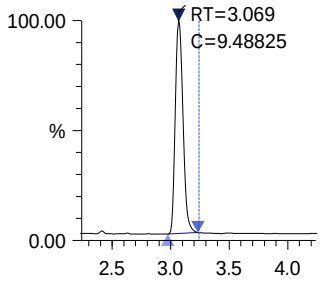
PERCHLORATE7

Date acquired: 10/26/2020 12:47:43 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20201026\20201026_024.lcd
Vial: 4 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE7	10/26/2020 12:47:43 PM	203693	9.48825	20201026_024	3.069	25.0000	1.0000	4
Sodium Perchlorate-18O4_IS	PERCHLORATE7	10/26/2020 12:47:43 PM	229585	1.00000	20201026_024	3.067	25.0000	1.0000	4

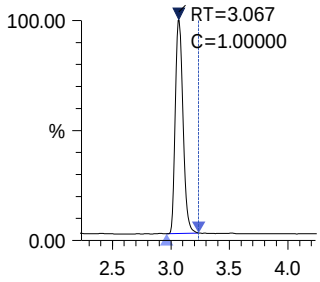
Perchlorate

Conc 9.48825
Area 203693
Q 99.00>83.00 (-) 4.54e4



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 229585
ISTD 107.00>89.00 (-) 5.07e4



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

November 10, 2020

Susan Huang
Aptim Environmental & Infrastucture, Inc.
2500 City West Blvd., Suite 1700
Houston, TX 77042

Work Order: **HS20101123**

Laboratory Results for: **LHAAP 16 October 2020**

Dear Susan Huang,

ALS Environmental received 12 sample(s) on Oct 22, 2020 for the analysis presented in the following report.

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

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

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

Sincerely,

Generated By: DAYNA.FISHER

RJ Modashia
Project Manager

ALS Houston, US Date: 10-Nov-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
Work Order: HS20101123

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS20101123-01	16WW56-201021	Groundwater		21-Oct-2020 07:50	22-Oct-2020 09:10	☐
HS20101123-02	16RW11-201021	Groundwater		21-Oct-2020 08:45	22-Oct-2020 09:10	☐
HS20101123-03	16RW11-201021-FD	Groundwater		21-Oct-2020 08:45	22-Oct-2020 09:10	☐
HS20101123-04	16IW20-201021	Groundwater		21-Oct-2020 09:30	22-Oct-2020 09:10	☐
HS20101123-05	16WW40-201021	Groundwater		21-Oct-2020 10:15	22-Oct-2020 09:10	☐
HS20101123-06	16WW12-201021	Groundwater		21-Oct-2020 11:00	22-Oct-2020 09:10	☐
HS20101123-07	16RW04-201021	Groundwater		21-Oct-2020 11:45	22-Oct-2020 09:10	☐
HS20101123-08	16RW04-201021-FD	Groundwater		21-Oct-2020 11:45	22-Oct-2020 09:10	☐
HS20101123-09	16EW02-201021	Groundwater		21-Oct-2020 12:35	22-Oct-2020 09:10	☐
HS20101123-10	16EW06-201021	Groundwater		21-Oct-2020 13:30	22-Oct-2020 09:10	☐
HS20101123-11	16EW06-201021-FD	Groundwater		21-Oct-2020 13:30	22-Oct-2020 09:10	☐
HS20101123-12	Trip Blank-201021	Water	CG-092320-76	21-Oct-2020 00:00	22-Oct-2020 09:10	☐

ALS Houston, US Date: 10-Nov-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
Work Order: HS20101123

CASE NARRATIVE

Work Order Comments

- The analysis for Perchlorate was subcontracted to our ALS Houston TX, High Resolution Lab. Final report attached.
- The analysis for TOC was subcontracted to ALS Kelso, WA. Final report attached.

GC Semivolatiles by Method RSK-175

Batch ID: R371594

Sample ID: 16WW56-201021 (HS20101123-01MS)

- The recovery of the Matrix Spike (MS) associated to this analyte was outside of the established control limits. However, the LCS was within control limits. The recovery of the MS may be due to sample matrix interference.

Sample ID: 16WW56-201021 (HS20101123-01MSD)

- The recovery of the Matrix Spike Duplicate (MSD) associated to this analyte was outside of the established control limits. However, the LCS was within control limits. The failed recovery of the MSD may be due to sample matrix interference.

Sample ID: HS20101079-03MS

- MS and MSD are for an unrelated sample

GCMS Volatiles by Method SW8260

Batch ID: R371939

Sample ID: 16EW06-201021 (HS20101123-10)

- Lowest practical dilution for sample HS20101123-10 due to matrix.

Sample ID: 16EW06-201021-FD (HS20101123-11)

- Lowest practical dilution for sample HS20101123-11 due to matrix.

Batch ID: R371935

Sample ID: 16WW56-201021 (HS20101123-01MS)

- MS and/or MSD recovered outside control limits

WetChemistry by Method SW9056

Batch ID: R372041

Sample ID: 16WW12-201021 (HS20101123-06)

- Sample ran at 2X due to high concentration of Chloride and Sulfate

Sample ID: 16WW40-201021 (HS20101123-05)

- Sample ran at 2X due to high concentration of Chloride and Sulfate

Sample ID: HS20110128-11MSD

- MSD is for an unrelated sample

Batch ID: R371917

Sample ID: HS20101310-11MSD

ALS Houston, US Date: 10-Nov-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
Work Order: HS20101123

CASE NARRATIVE

WetChemistry by Method SW9056

Batch ID: R371917

- MSD is for an unrelated sample (Sulfate)

Batch ID: R371188

Sample ID: 16EW02-201021 (HS20101123-09)

- Sample ran at 5X due to high concentration of Sulfate

Sample ID: 16WW56-201021 (HS20101123-01MS)

- The recovery of the Matrix Spike (MS) and/or Matrix Spike Duplicate (MSD) associated with this analyte was outside of the established control limits. However, the LCS was within control limits. The recovery of the MS/MSD may be due to sample matrix interference. (Bromide,Nitrogen, Nitrate (As N))

WetChemistry by Method SM2320B

Batch ID: R371123

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

ALS Houston, US Date: 10-Nov-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
Sample ID: 16WW56-201021
Collection Date: 21-Oct-2020 07:50

ANALYTICAL REPORT
WorkOrder:HS20101123
Lab ID:HS20101123-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Nov-2020 19:42
1,1-Dichloroethene	**1.5**		**0.20**	**0.50**	**1.0**	**UG/L**	1	03-Nov-2020 19:42
1,2-Dichloroethane	**0.66**	J	**0.20**	**0.50**	**1.0**	**UG/L**	1	03-Nov-2020 19:42
cis-1,2-Dichloroethene	**20**		**0.20**	**0.50**	**1.0**	**UG/L**	1	03-Nov-2020 19:42
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	03-Nov-2020 19:42
Trichloroethene	**270**		**1.0**	**2.5**	**5.0**	**UG/L**	5	03-Nov-2020 20:46
Vinyl chloride	**2.8**		**0.20**	**0.50**	**1.0**	**UG/L**	1	03-Nov-2020 19:42
Surr: 1,2-Dichloroethane-d4	*83.4*			**0**	*81-118*	*%REC*	*1*	*03-Nov-2020 19:42*
Surr: 1,2-Dichloroethane-d4	*85.7*			**0**	*81-118*	*%REC*	*5*	*03-Nov-2020 20:46*
Surr: 4-Bromofluorobenzene	*92.7*			**0**	*85-114*	*%REC*	*1*	*03-Nov-2020 19:42*
Surr: 4-Bromofluorobenzene	*91.8*			**0**	*85-114*	*%REC*	*5*	*03-Nov-2020 20:46*
Surr: Dibromofluoromethane	*84.4*			**0**	*80-119*	*%REC*	*1*	*03-Nov-2020 19:42*
Surr: Dibromofluoromethane	*84.3*			**0**	*80-119*	*%REC*	*5*	*03-Nov-2020 20:46*
Surr: Toluene-d8	*102*			**0**	*89-112*	*%REC*	*1*	*03-Nov-2020 19:42*
Surr: Toluene-d8	*101*			**0**	*89-112*	*%REC*	*5*	*03-Nov-2020 20:46*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PVL
Ethane	0.000250	U	0.000144	0.000250	0.00100	mg/L	1	26-Oct-2020 14:23
Ethene	**0.00201**		**0.000234**	**0.000500**	**0.00100**	**mg/L**	1	26-Oct-2020 14:23
Methane	**0.00126**		**0.000107**	**0.000250**	**0.000500**	**mg/L**	1	26-Oct-2020 14:23
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: TH
Alkalinity, Total (As CaCO3)	**233**	a	**5.00**	**5.00**	**5.00**	**mg/L**	1	23-Oct-2020 02:20
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**3.95**		**0.0300**	**0.100**	**0.100**	**mg/L**	1	22-Oct-2020 21:03
Nitrogen, Nitrate (As N)	0.100	U	0.0300	0.100	0.100	mg/L	1	22-Oct-2020 21:03
Sulfate	**1,190**		**20.0**	**50.0**	**50.0**	**mg/L**	100	03-Nov-2020 02:01
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	29-Oct-2020 18:36
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	09-Nov-2020 20:25

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

ALS Houston, US Date: 10-Nov-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
Sample ID: 16RW11-201021
Collection Date: 21-Oct-2020 08:45

ANALYTICAL REPORT
WorkOrder:HS20101123
Lab ID:HS20101123-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	UG/L	1	03-Nov-2020 21:07
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Nov-2020 21:07
1,2-Dichloroethane	**0.73**	J	**0.20**	**0.50**	**1.0**	**UG/L**	1	03-Nov-2020 21:07
cis-1,2-Dichloroethene	**3.5**		**0.20**	**0.50**	**1.0**	**UG/L**	1	03-Nov-2020 21:07
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	03-Nov-2020 21:07
Trichloroethene	**3.7**		**0.20**	**0.50**	**1.0**	**UG/L**	1	03-Nov-2020 21:07
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	03-Nov-2020 21:07
Surr: 1,2-Dichloroethane-d4	*85.8*			**0**	*81-118*	*%REC*	*1*	*03-Nov-2020 21:07*
Surr: 4-Bromofluorobenzene	*94.7*			**0**	*85-114*	*%REC*	*1*	*03-Nov-2020 21:07*
Surr: Dibromofluoromethane	*84.3*			**0**	*80-119*	*%REC*	*1*	*03-Nov-2020 21:07*
Surr: Toluene-d8	*101*			**0**	*89-112*	*%REC*	*1*	*03-Nov-2020 21:07*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	29-Oct-2020 18:36

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

ALS Houston, US

Date: 10-Nov-20

Client:	Aptim Environmental & Infrastucture, Inc.	**ANALYTICAL REPORT**
Project:	LHAAP 16 October 2020	WorkOrder:HS20101123
Sample ID:	16RW11-201021-FD	Lab ID:HS20101123-03
Collection Date:	21-Oct-2020 08:45	Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Nov-2020 21:28
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Nov-2020 21:28
1,2-Dichloroethane	**0.91**	J	**0.20**	**0.50**	**1.0**	**UG/L**	1	03-Nov-2020 21:28
cis-1,2-Dichloroethene	**3.3**		**0.20**	**0.50**	**1.0**	**UG/L**	1	03-Nov-2020 21:28
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	03-Nov-2020 21:28
Trichloroethene	**3.3**		**0.20**	**0.50**	**1.0**	**UG/L**	1	03-Nov-2020 21:28
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	03-Nov-2020 21:28
Surr: 1,2-Dichloroethane-d4	*88.1*			**0**	*81-118*	*%REC*	*1*	*03-Nov-2020 21:28*
Surr: 4-Bromofluorobenzene	*95.1*			**0**	*85-114*	*%REC*	*1*	*03-Nov-2020 21:28*
Surr: Dibromofluoromethane	*87.9*			**0**	*80-119*	*%REC*	*1*	*03-Nov-2020 21:28*
Surr: Toluene-d8	*98.6*			**0**	*89-112*	*%REC*	*1*	*03-Nov-2020 21:28*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	29-Oct-2020 18:36

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

ALS Houston, US Date: 10-Nov-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
Sample ID: 16IW20-201021
Collection Date: 21-Oct-2020 09:30

ANALYTICAL REPORT
WorkOrder:HS20101123
Lab ID:HS20101123-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	UG/L	1	03-Nov-2020 21:49
1,1-Dichloroethene	**1.6**		**0.20**	**0.50**	**1.0**	**UG/L**	1	03-Nov-2020 21:49
1,2-Dichloroethane	**2.7**		**0.20**	**0.50**	**1.0**	**UG/L**	1	03-Nov-2020 21:49
cis-1,2-Dichloroethene	**170**		**0.20**	**0.50**	**1.0**	**UG/L**	1	03-Nov-2020 21:49
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	03-Nov-2020 21:49
Trichloroethene	**130**		**0.20**	**0.50**	**1.0**	**UG/L**	1	03-Nov-2020 21:49
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	03-Nov-2020 21:49
Surr: 1,2-Dichloroethane-d4	*88.4*			**0**	*81-118*	*%REC*	*1*	*03-Nov-2020 21:49*
Surr: 4-Bromofluorobenzene	*93.8*			**0**	*85-114*	*%REC*	*1*	*03-Nov-2020 21:49*
Surr: Dibromofluoromethane	*85.3*			**0**	*80-119*	*%REC*	*1*	*03-Nov-2020 21:49*
Surr: Toluene-d8	*103*			**0**	*89-112*	*%REC*	*1*	*03-Nov-2020 21:49*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PVL
Ethane	**0.00400**		**0.000144**	**0.000250**	**0.00100**	**mg/L**	1	26-Oct-2020 15:03
Ethene	**0.0309**		**0.000234**	**0.000500**	**0.00100**	**mg/L**	1	26-Oct-2020 15:03
Methane	**2.40**		**0.0107**	**0.0250**	**0.0500**	**mg/L**	100	26-Oct-2020 15:21
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: TH
Alkalinity, Total (As CaCO3)	**877**	a	**5.00**	**5.00**	**5.00**	**mg/L**	1	23-Oct-2020 02:34
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**34.9**		**0.300**	**1.00**	**1.00**	**mg/L**	10	03-Nov-2020 02:19
Nitrogen, Nitrate (As N)	0.100	U	0.0300	0.100	0.100	mg/L	1	22-Oct-2020 21:21
Sulfate	**165**		**2.00**	**5.00**	**5.00**	**mg/L**	10	03-Nov-2020 02:19
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	29-Oct-2020 18:36
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	09-Nov-2020 20:25

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

ALS Houston, US Date: 10-Nov-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
Sample ID: 16WW40-201021
Collection Date: 21-Oct-2020 10:15

ANALYTICAL REPORT
WorkOrder:HS20101123
Lab ID:HS20101123-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	2.5	U	1.5	2.5	5.0	UG/L	5	04-Nov-2020 02:22
1,1-Dichloroethene	**7.5**		**1.0**	**2.5**	**5.0**	**UG/L**	5	04-Nov-2020 02:22
1,2-Dichloroethane	**6.0**		**1.0**	**2.5**	**5.0**	**UG/L**	5	04-Nov-2020 02:22
cis-1,2-Dichloroethene	**230**		**1.0**	**2.5**	**5.0**	**UG/L**	5	04-Nov-2020 02:22
Methylene chloride	5.0	U	2.0	5.0	10	UG/L	5	04-Nov-2020 02:22
Trichloroethene	**1,700**		**5.0**	**12**	**25**	**UG/L**	25	04-Nov-2020 02:43
Vinyl chloride	**6.3**		**1.0**	**2.5**	**5.0**	**UG/L**	5	04-Nov-2020 02:22
Surr: 1,2-Dichloroethane-d4	*86.3*			**0**	*81-118*	*%REC*	*5*	*04-Nov-2020 02:22*
Surr: 1,2-Dichloroethane-d4	*85.2*			**0**	*81-118*	*%REC*	*25*	*04-Nov-2020 02:43*
Surr: 4-Bromofluorobenzene	*92.8*			**0**	*85-114*	*%REC*	*5*	*04-Nov-2020 02:22*
Surr: 4-Bromofluorobenzene	*94.4*			**0**	*85-114*	*%REC*	*25*	*04-Nov-2020 02:43*
Surr: Dibromofluoromethane	*85.4*			**0**	*80-119*	*%REC*	*5*	*04-Nov-2020 02:22*
Surr: Dibromofluoromethane	*85.6*			**0**	*80-119*	*%REC*	*25*	*04-Nov-2020 02:43*
Surr: Toluene-d8	*103*			**0**	*89-112*	*%REC*	*5*	*04-Nov-2020 02:22*
Surr: Toluene-d8	*104*			**0**	*89-112*	*%REC*	*25*	*04-Nov-2020 02:43*
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**6.97**		**0.0600**	**0.200**	**0.200**	**mg/L**	2	04-Nov-2020 09:00
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	29-Oct-2020 18:36
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	09-Nov-2020 20:25

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

ALS Houston, US Date: 10-Nov-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
Sample ID: 16WW12-201021
Collection Date: 21-Oct-2020 11:00

ANALYTICAL REPORT
WorkOrder:HS20101123
Lab ID:HS20101123-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	5.0	U	1.5	5.0	5.0	UG/L	5	04-Nov-2020 06:14
1,1-Dichloroethene	**3.8**	J	**1.0**	**2.5**	**5.0**	**UG/L**	5	04-Nov-2020 06:14
1,2-Dichloroethane	**5.5**		**1.0**	**2.5**	**5.0**	**UG/L**	5	04-Nov-2020 06:14
cis-1,2-Dichloroethene	**67**		**1.0**	**2.5**	**5.0**	**UG/L**	5	04-Nov-2020 06:14
Methylene chloride	5.0	U	2.0	5.0	10	UG/L	5	04-Nov-2020 06:14
Trichloroethene	**1,500**		**5.0**	**12**	**25**	**UG/L**	25	04-Nov-2020 06:35
Vinyl chloride	**5.8**		**1.0**	**2.5**	**5.0**	**UG/L**	5	04-Nov-2020 06:14
Surr: 1,2-Dichloroethane-d4	*87.0*			**0**	*81-118*	*%REC*	*5*	*04-Nov-2020 06:14*
Surr: 1,2-Dichloroethane-d4	*89.0*			**0**	*81-118*	*%REC*	*25*	*04-Nov-2020 06:35*
Surr: 4-Bromofluorobenzene	*90.8*			**0**	*85-114*	*%REC*	*25*	*04-Nov-2020 06:35*
Surr: 4-Bromofluorobenzene	*91.8*			**0**	*85-114*	*%REC*	*5*	*04-Nov-2020 06:14*
Surr: Dibromofluoromethane	*84.0*			**0**	*80-119*	*%REC*	*5*	*04-Nov-2020 06:14*
Surr: Dibromofluoromethane	*85.0*			**0**	*80-119*	*%REC*	*25*	*04-Nov-2020 06:35*
Surr: Toluene-d8	*103*			**0**	*89-112*	*%REC*	*5*	*04-Nov-2020 06:14*
Surr: Toluene-d8	*103*			**0**	*89-112*	*%REC*	*25*	*04-Nov-2020 06:35*
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**5.76**		**0.0600**	**0.200**	**0.200**	**mg/L**	2	04-Nov-2020 09:18
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	29-Oct-2020 18:36
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	09-Nov-2020 20:25

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

ALS Houston, US Date: 10-Nov-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
Sample ID: 16RW04-201021
Collection Date: 21-Oct-2020 11:45

ANALYTICAL REPORT
WorkOrder:HS20101123
Lab ID:HS20101123-07
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	2.5	U	1.5	2.5	5.0	UG/L	5	04-Nov-2020 06:56
1,1-Dichloroethene	**4.1**	J	**1.0**	**2.5**	**5.0**	**UG/L**	5	04-Nov-2020 06:56
1,2-Dichloroethane	2.5	U	1.0	2.5	5.0	UG/L	5	04-Nov-2020 06:56
cis-1,2-Dichloroethene	**140**		**1.0**	**2.5**	**5.0**	**UG/L**	5	04-Nov-2020 06:56
Methylene chloride	5.0	U	2.0	5.0	10	UG/L	5	04-Nov-2020 06:56
Trichloroethene	**3,400**		**10**	**25**	**50**	**UG/L**	50	04-Nov-2020 07:17
Vinyl chloride	**5.3**		**1.0**	**2.5**	**5.0**	**UG/L**	5	04-Nov-2020 06:56
Surr: 1,2-Dichloroethane-d4	*88.1*			**0**	*81-118*	*%REC*	*5*	*04-Nov-2020 06:56*
Surr: 1,2-Dichloroethane-d4	*84.8*			**0**	*81-118*	*%REC*	*50*	*04-Nov-2020 07:17*
Surr: 4-Bromofluorobenzene	*90.2*			**0**	*85-114*	*%REC*	*5*	*04-Nov-2020 06:56*
Surr: 4-Bromofluorobenzene	*91.1*			**0**	*85-114*	*%REC*	*50*	*04-Nov-2020 07:17*
Surr: Dibromofluoromethane	*83.5*			**0**	*80-119*	*%REC*	*5*	*04-Nov-2020 06:56*
Surr: Dibromofluoromethane	*86.6*			**0**	*80-119*	*%REC*	*50*	*04-Nov-2020 07:17*
Surr: Toluene-d8	*104*			**0**	*89-112*	*%REC*	*5*	*04-Nov-2020 06:56*
Surr: Toluene-d8	*105*			**0**	*89-112*	*%REC*	*50*	*04-Nov-2020 07:17*
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**1.21**		**0.0300**	**0.100**	**0.100**	**mg/L**	1	04-Nov-2020 09:36
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	29-Oct-2020 18:36
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	09-Nov-2020 20:25

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

ALS Houston, US Date: 10-Nov-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
Sample ID: 16RW04-201021-FD
Collection Date: 21-Oct-2020 11:45

ANALYTICAL REPORT
WorkOrder:HS20101123
Lab ID:HS20101123-08
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	5.0	U	1.5	5.0	5.0	UG/L	5	04-Nov-2020 07:38
1,1-Dichloroethene	**3.2**	J	**1.0**	**2.5**	**5.0**	**UG/L**	5	04-Nov-2020 07:38
1,2-Dichloroethane	2.5	U	1.0	2.5	5.0	UG/L	5	04-Nov-2020 07:38
cis-1,2-Dichloroethene	**140**		**1.0**	**2.5**	**5.0**	**UG/L**	5	04-Nov-2020 07:38
Methylene chloride	5.0	U	2.0	5.0	10	UG/L	5	04-Nov-2020 07:38
Trichloroethene	**3,600**		**10**	**25**	**50**	**UG/L**	50	04-Nov-2020 07:59
Vinyl chloride	**5.6**		**1.0**	**2.5**	**5.0**	**UG/L**	5	04-Nov-2020 07:38
Surr: 1,2-Dichloroethane-d4	*85.9*			**0**	*81-118*	*%REC*	*5*	*04-Nov-2020 07:38*
Surr: 1,2-Dichloroethane-d4	*85.1*			**0**	*81-118*	*%REC*	*50*	*04-Nov-2020 07:59*
Surr: 4-Bromofluorobenzene	*92.6*			**0**	*85-114*	*%REC*	*5*	*04-Nov-2020 07:38*
Surr: 4-Bromofluorobenzene	*89.5*			**0**	*85-114*	*%REC*	*50*	*04-Nov-2020 07:59*
Surr: Dibromofluoromethane	*82.5*			**0**	*80-119*	*%REC*	*5*	*04-Nov-2020 07:38*
Surr: Dibromofluoromethane	*83.3*			**0**	*80-119*	*%REC*	*50*	*04-Nov-2020 07:59*
Surr: Toluene-d8	*103*			**0**	*89-112*	*%REC*	*5*	*04-Nov-2020 07:38*
Surr: Toluene-d8	*101*			**0**	*89-112*	*%REC*	*50*	*04-Nov-2020 07:59*
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**1.19**		**0.0300**	**0.100**	**0.100**	**mg/L**	1	04-Nov-2020 12:37
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	29-Oct-2020 18:36
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	09-Nov-2020 20:25

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

ALS Houston, US Date: 10-Nov-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
Sample ID: 16EW02-201021
Collection Date: 21-Oct-2020 12:35

ANALYTICAL REPORT
WorkOrder:HS20101123
Lab ID:HS20101123-09
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	25	U	15	25	50	UG/L	50	04-Nov-2020 08:20
1,1-Dichloroethene	**110**		**10**	**25**	**50**	**UG/L**	50	04-Nov-2020 08:20
1,2-Dichloroethane	**48**	J	**10**	**25**	**50**	**UG/L**	50	04-Nov-2020 08:20
cis-1,2-Dichloroethene	**26,000**		**100**	**250**	**500**	**UG/L**	500	04-Nov-2020 08:41
Methylene chloride	50	U	20	50	100	UG/L	50	04-Nov-2020 08:20
Trichloroethene	**26,000**		**100**	**250**	**500**	**UG/L**	500	04-Nov-2020 08:41
Vinyl chloride	**51**		**10**	**25**	**50**	**UG/L**	50	04-Nov-2020 08:20
Surr: 1,2-Dichloroethane-d4	*89.2*			**0**	*81-118*	*%REC*	*500*	*04-Nov-2020 08:41*
Surr: 1,2-Dichloroethane-d4	*89.5*			**0**	*81-118*	*%REC*	*50*	*04-Nov-2020 08:20*
Surr: 4-Bromofluorobenzene	*89.5*			**0**	*85-114*	*%REC*	*50*	*04-Nov-2020 08:20*
Surr: 4-Bromofluorobenzene	*90.8*			**0**	*85-114*	*%REC*	*500*	*04-Nov-2020 08:41*
Surr: Dibromofluoromethane	*86.2*			**0**	*80-119*	*%REC*	*50*	*04-Nov-2020 08:20*
Surr: Dibromofluoromethane	*86.2*			**0**	*80-119*	*%REC*	*500*	*04-Nov-2020 08:41*
Surr: Toluene-d8	*103*			**0**	*89-112*	*%REC*	*50*	*04-Nov-2020 08:20*
Surr: Toluene-d8	*102*			**0**	*89-112*	*%REC*	*500*	*04-Nov-2020 08:41*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PVL
Ethane	0.000250	U	0.000144	0.000250	0.00100	mg/L	1	26-Oct-2020 15:12
Ethene	**0.00154**		**0.000234**	**0.000500**	**0.00100**	**mg/L**	1	26-Oct-2020 15:12
Methane	**0.00939**		**0.000107**	**0.000250**	**0.000500**	**mg/L**	1	26-Oct-2020 15:12
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: TH
Alkalinity, Total (As CaCO3)	**328**	a	**5.00**	**5.00**	**5.00**	**mg/L**	1	23-Oct-2020 02:57
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**6.87**		**0.150**	**0.500**	**0.500**	**mg/L**	5	22-Oct-2020 21:39
Nitrogen, Nitrate (As N)	0.500	U	0.150	0.500	0.500	mg/L	5	22-Oct-2020 21:39
Sulfate	**1,380**		**10.0**	**25.0**	**25.0**	**mg/L**	50	03-Nov-2020 02:37
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	29-Oct-2020 18:36
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	09-Nov-2020 20:25

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

ALS Houston, US

Date: 10-Nov-20

Client:	Aptim Environmental & Infrastucture, Inc.	**ANALYTICAL REPORT**
Project:	LHAAP 16 October 2020	WorkOrder:HS20101123
Sample ID:	16EW06-201021	Lab ID:HS20101123-10
Collection Date:	21-Oct-2020 13:30	Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	250	U	150	250	500	UG/L	500	04-Nov-2020 01:19
1,1-Dichloroethene	250	U	100	250	500	UG/L	500	04-Nov-2020 01:19
1,2-Dichloroethane	250	U	100	250	500	UG/L	500	04-Nov-2020 01:19
cis-1,2-Dichloroethene	**750**		**100**	**250**	**500**	**UG/L**	500	04-Nov-2020 01:19
Methylene chloride	500	U	200	500	1000	UG/L	500	04-Nov-2020 01:19
Trichloroethene	250	U	100	250	500	UG/L	500	04-Nov-2020 01:19
Vinyl chloride	**510**		**100**	**250**	**500**	**UG/L**	500	04-Nov-2020 01:19
Surr: 1,2-Dichloroethane-d4	*87.2*			**0**	*81-118*	*%REC*	*500*	*04-Nov-2020 01:19*
Surr: 4-Bromofluorobenzene	*89.8*			**0**	*85-114*	*%REC*	*500*	*04-Nov-2020 01:19*
Surr: Dibromofluoromethane	*85.6*			**0**	*80-119*	*%REC*	*500*	*04-Nov-2020 01:19*
Surr: Toluene-d8	*98.9*			**0**	*89-112*	*%REC*	*500*	*04-Nov-2020 01:19*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	29-Oct-2020 18:36

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

ALS Houston, US Date: 10-Nov-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
Sample ID: 16EW06-201021-FD
Collection Date: 21-Oct-2020 13:30

ANALYTICAL REPORT
WorkOrder:HS20101123
Lab ID:HS20101123-11
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	500	U	150	500	500	UG/L	500	04-Nov-2020 01:40
1,1-Dichloroethene	250	U	100	250	500	UG/L	500	04-Nov-2020 01:40
1,2-Dichloroethane	250	U	100	250	500	UG/L	500	04-Nov-2020 01:40
cis-1,2-Dichloroethene	**520**		**100**	**250**	**500**	**UG/L**	500	04-Nov-2020 01:40
Methylene chloride	500	U	200	500	1000	UG/L	500	04-Nov-2020 01:40
Trichloroethene	250	U	100	250	500	UG/L	500	04-Nov-2020 01:40
Vinyl chloride	250	U	100	250	500	UG/L	500	04-Nov-2020 01:40
Surr: 1,2-Dichloroethane-d4	*86.9*			**0**	*81-118*	*%REC*	*500*	*04-Nov-2020 01:40*
Surr: 4-Bromofluorobenzene	*92.9*			**0**	*85-114*	*%REC*	*500*	*04-Nov-2020 01:40*
Surr: Dibromofluoromethane	*86.4*			**0**	*80-119*	*%REC*	*500*	*04-Nov-2020 01:40*
Surr: Toluene-d8	*101*			**0**	*89-112*	*%REC*	*500*	*04-Nov-2020 01:40*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	29-Oct-2020 18:36

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

ALS Houston, US

Date: 10-Nov-20

Client:	Aptim Environmental & Infrastucture, Inc.	**ANALYTICAL REPORT**
Project:	LHAAP 16 October 2020	WorkOrder:HS20101123
Sample ID:	Trip Blank-201021	Lab ID:HS20101123-12
Collection Date:	21-Oct-2020 00:00	Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	UG/L	1	03-Nov-2020 19:21
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Nov-2020 19:21
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Nov-2020 19:21
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Nov-2020 19:21
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	03-Nov-2020 19:21
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Nov-2020 19:21
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	03-Nov-2020 19:21
Surr: 1,2-Dichloroethane-d4	*87.0*			**0**	*81-118*	*%REC*	*1*	*03-Nov-2020 19:21*
Surr: 4-Bromofluorobenzene	*95.2*			**0**	*85-114*	*%REC*	*1*	*03-Nov-2020 19:21*
Surr: Dibromofluoromethane	*85.2*			**0**	*80-119*	*%REC*	*1*	*03-Nov-2020 19:21*
Surr: Toluene-d8	*101*			**0**	*89-112*	*%REC*	*1*	*03-Nov-2020 19:21*

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

ALS Houston, US Date: 10-Nov-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
WorkOrder: HS20101123

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R371123 (0)	**Test Name :** ALKALINITY BY SM2320B				**Matrix:** Groundwater	
HS20101123-01	16WW56-201021	21 Oct 2020 07:50			23 Oct 2020 02:20	1
HS20101123-04	16IW20-201021	21 Oct 2020 09:30			23 Oct 2020 02:34	1
HS20101123-09	16EW02-201021	21 Oct 2020 12:35			23 Oct 2020 02:57	1
Batch ID: R371188 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Groundwater	
HS20101123-01	16WW56-201021	21 Oct 2020 07:50			22 Oct 2020 21:03	1
HS20101123-04	16IW20-201021	21 Oct 2020 09:30			22 Oct 2020 21:21	1
HS20101123-09	16EW02-201021	21 Oct 2020 12:35			22 Oct 2020 21:39	5
Batch ID: R371594 (0)	**Test Name :** DISSOLVED GASES BY RSK-175				**Matrix:** Groundwater	
HS20101123-01	16WW56-201021	21 Oct 2020 07:50			26 Oct 2020 14:23	1
HS20101123-04	16IW20-201021	21 Oct 2020 09:30			26 Oct 2020 15:21	100
HS20101123-04	16IW20-201021	21 Oct 2020 09:30			26 Oct 2020 15:03	1
HS20101123-09	16EW02-201021	21 Oct 2020 12:35			26 Oct 2020 15:12	1
Batch ID: R371600 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** Groundwater	
HS20101123-01	16WW56-201021	21 Oct 2020 07:50			29 Oct 2020 18:36	1
HS20101123-02	16RW11-201021	21 Oct 2020 08:45			29 Oct 2020 18:36	1
HS20101123-03	16RW11-201021-FD	21 Oct 2020 08:45			29 Oct 2020 18:36	1
HS20101123-04	16IW20-201021	21 Oct 2020 09:30			29 Oct 2020 18:36	1
HS20101123-05	16WW40-201021	21 Oct 2020 10:15			29 Oct 2020 18:36	1
HS20101123-06	16WW12-201021	21 Oct 2020 11:00			29 Oct 2020 18:36	1
HS20101123-07	16RW04-201021	21 Oct 2020 11:45			29 Oct 2020 18:36	1
HS20101123-08	16RW04-201021-FD	21 Oct 2020 11:45			29 Oct 2020 18:36	1
HS20101123-09	16EW02-201021	21 Oct 2020 12:35			29 Oct 2020 18:36	1
HS20101123-10	16EW06-201021	21 Oct 2020 13:30			29 Oct 2020 18:36	1
HS20101123-11	16EW06-201021-FD	21 Oct 2020 13:30			29 Oct 2020 18:36	1
Batch ID: R371917 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Groundwater	
HS20101123-01	16WW56-201021	21 Oct 2020 07:50			03 Nov 2020 02:01	100
HS20101123-04	16IW20-201021	21 Oct 2020 09:30			03 Nov 2020 02:19	10
HS20101123-09	16EW02-201021	21 Oct 2020 12:35			03 Nov 2020 02:37	50
Batch ID: R371935 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS20101123-12	Trip Blank-201021	21 Oct 2020 00:00			03 Nov 2020 19:21	1
Batch ID: R371935 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS20101123-01	16WW56-201021	21 Oct 2020 07:50			03 Nov 2020 20:46	5
HS20101123-01	16WW56-201021	21 Oct 2020 07:50			03 Nov 2020 19:42	1
HS20101123-02	16RW11-201021	21 Oct 2020 08:45			03 Nov 2020 21:07	1
HS20101123-03	16RW11-201021-FD	21 Oct 2020 08:45			03 Nov 2020 21:28	1
HS20101123-04	16IW20-201021	21 Oct 2020 09:30			03 Nov 2020 21:49	1

ALS Houston, US Date: 10-Nov-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
WorkOrder: HS20101123

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R371939 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS20101123-05	16WW40-201021	21 Oct 2020 10:15			04 Nov 2020 02:43	25
HS20101123-05	16WW40-201021	21 Oct 2020 10:15			04 Nov 2020 02:22	5
HS20101123-06	16WW12-201021	21 Oct 2020 11:00			04 Nov 2020 06:35	25
HS20101123-06	16WW12-201021	21 Oct 2020 11:00			04 Nov 2020 06:14	5
HS20101123-07	16RW04-201021	21 Oct 2020 11:45			04 Nov 2020 07:17	50
HS20101123-07	16RW04-201021	21 Oct 2020 11:45			04 Nov 2020 06:56	5
HS20101123-08	16RW04-201021-FD	21 Oct 2020 11:45			04 Nov 2020 07:59	50
HS20101123-08	16RW04-201021-FD	21 Oct 2020 11:45			04 Nov 2020 07:38	5
HS20101123-09	16EW02-201021	21 Oct 2020 12:35			04 Nov 2020 08:41	500
HS20101123-09	16EW02-201021	21 Oct 2020 12:35			04 Nov 2020 08:20	50
HS20101123-10	16EW06-201021	21 Oct 2020 13:30			04 Nov 2020 01:19	500
HS20101123-11	16EW06-201021-FD	21 Oct 2020 13:30			04 Nov 2020 01:40	500
Batch ID: R372041 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Groundwater	
HS20101123-05	16WW40-201021	21 Oct 2020 10:15			04 Nov 2020 09:00	2
HS20101123-06	16WW12-201021	21 Oct 2020 11:00			04 Nov 2020 09:18	2
HS20101123-07	16RW04-201021	21 Oct 2020 11:45			04 Nov 2020 09:36	1
HS20101123-08	16RW04-201021-FD	21 Oct 2020 11:45			04 Nov 2020 12:37	1
Batch ID: R372266 (0)	**Test Name :** SUBCONTRACT ANALYSIS - TOC ANALYSIS				**Matrix:** Groundwater	
HS20101123-01	16WW56-201021	21 Oct 2020 07:50			09 Nov 2020 20:25	1
HS20101123-04	16IW20-201021	21 Oct 2020 09:30			09 Nov 2020 20:25	1
HS20101123-05	16WW40-201021	21 Oct 2020 10:15			09 Nov 2020 20:25	1
HS20101123-06	16WW12-201021	21 Oct 2020 11:00			09 Nov 2020 20:25	1
HS20101123-07	16RW04-201021	21 Oct 2020 11:45			09 Nov 2020 20:25	1
HS20101123-08	16RW04-201021-FD	21 Oct 2020 11:45			09 Nov 2020 20:25	1
HS20101123-09	16EW02-201021	21 Oct 2020 12:35			09 Nov 2020 20:25	1

ALS Houston, US Date: 10-Nov-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
WorkOrder: HS20101123

QC BATCH REPORT

Batch ID: R371594 (0) **Instrument:** FID-4 **Method:** DISSOLVED GASES BY RSK-175

MBLK Sample ID: **MBLK-201026** Units: **mg/L** Analysis Date: **26-Oct-2020 10:00**
Client ID: Run ID: **FID-4_371594** SeqNo: **5807445** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.000250	0.00100								U
Ethene	0.000500	0.00100								U
Methane	0.000250	0.000500								U

LCS Sample ID: **LCS-201026** Units: **mg/L** Analysis Date: **26-Oct-2020 10:08**
Client ID: Run ID: **FID-4_371594** SeqNo: **5807446** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0204	0.00100	0.01804	0	113	75 - 125				
Ethene	0.0186	0.00100	0.0168	0	111	75 - 125				
Methane	0.00935	0.000500	0.009647	0	96.9	75 - 125				

LCSD Sample ID: **LCSD-201026** Units: **mg/L** Analysis Date: **26-Oct-2020 10:19**
Client ID: Run ID: **FID-4_371594** SeqNo: **5807447** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0200	0.00100	0.01804	0	111	75 - 125	0.02037	1.7	30	
Ethene	0.0179	0.00100	0.0168	0	107	75 - 125	0.01859	3.66	30	
Methane	0.0105	0.000500	0.009647	0	109	75 - 125	0.009349	11.8	30	

MS Sample ID: **HS20101123-01MS** Units: **mg/L** Analysis Date: **26-Oct-2020 14:31**
Client ID: **16WW56-201021** Run ID: **FID-4_371594** SeqNo: **5807468** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0245	0.00100	0.01804	0	136	75 - 125				S
Ethene	0.0261	0.00100	0.0168	0.002009	144	75 - 125				S
Methane	0.0131	0.000500	0.009647	0.001258	123	75 - 125				

ALS Houston, US Date: 10-Nov-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
WorkOrder: HS20101123

QC BATCH REPORT

Batch ID: R371594 (0) **Instrument:** FID-4 **Method:** DISSOLVED GASES BY RSK-175

MS Sample ID: **HS20101079-03MS** Units: **mg/L** Analysis Date: **26-Oct-2020 13:16**
Client ID: Run ID: **FID-4_371594** SeqNo: **5807463** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0111	0.00100	0.01804	0	61.4	75 - 125				S
Ethene	0.0124	0.00100	0.0168	0.001226	66.7	75 - 125				S
Methane	0.00691	0.000500	0.009647	0.003527	35.1	75 - 125				S

MSD Sample ID: **HS20101123-01MSD** Units: **mg/L** Analysis Date: **26-Oct-2020 14:49**
Client ID: **16WW56-201021** Run ID: **FID-4_371594** SeqNo: **5807469** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0251	0.00100	0.01804	0	139	75 - 125	0.02450	2.53	30	S
Ethene	0.0267	0.00100	0.0168	0.002009	147	75 - 125	0.02614	2.06	30	S
Methane	0.0123	0.000500	0.009647	0.001258	114	75 - 125	0.01312	6.57	30	

MSD Sample ID: **HS20101079-03MSD** Units: **mg/L** Analysis Date: **26-Oct-2020 13:34**
Client ID: Run ID: **FID-4_371594** SeqNo: **5807464** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0261	0.00100	0.01804	0	144	75 - 125	0.01109	80.6	30	SR
Ethene	0.0261	0.00100	0.0168	0.001226	148	75 - 125	0.01244	71	30	SR
Methane	0.0133	0.000500	0.009647	0.003527	102	75 - 125	0.006909	63.5	30	R

The following samples were analyzed in this batch: HS20101123-01 HS20101123-04 HS20101123-09

ALS Houston, US Date: 10-Nov-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
WorkOrder: HS20101123

QC BATCH REPORT

Batch ID: R371935 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-201103** Units: **UG/L** Analysis Date: **03-Nov-2020 18:18**
Client ID: Run ID: **VOA6_371935** SeqNo: **5815257** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	0.50	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
Methylene chloride	1.0	2.0								U
Trichloroethene	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*43.1*	*1.0*	*50*	*0*	*86.2*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*45.11*	*1.0*	*50*	*0*	*90.2*	*85 - 114*				
Surr: Dibromofluoromethane	*41.82*	*1.0*	*50*	*0*	*83.6*	*80 - 119*				
Surr: Toluene-d8	*50.18*	*1.0*	*50*	*0*	*100*	*89 - 112*				

LCS Sample ID: **VLCSW-201103** Units: **UG/L** Analysis Date: **03-Nov-2020 17:15**
Client ID: Run ID: **VOA6_371935** SeqNo: **5815256** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	19.19	1.0	20	0	96.0	80 - 119				
1,1-Dichloroethene	19.03	1.0	20	0	95.2	71 - 131				
1,2-Dichloroethane	19.48	1.0	20	0	97.4	73 - 128				
cis-1,2-Dichloroethene	17.85	1.0	20	0	89.3	78 - 123				
Methylene chloride	17.33	2.0	20	0	86.6	74 - 124				
Trichloroethene	19.91	1.0	20	0	99.6	79 - 123				
Vinyl chloride	19.48	1.0	20	0	97.4	58 - 137				
Surr: 1,2-Dichloroethane-d4	*50.1*	*1.0*	*50*	*0*	*100*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*49.89*	*1.0*	*50*	*0*	*99.8*	*85 - 114*				
Surr: Dibromofluoromethane	*47.06*	*1.0*	*50*	*0*	*94.1*	*80 - 119*				
Surr: Toluene-d8	*47.74*	*1.0*	*50*	*0*	*95.5*	*89 - 112*				

ALS Houston, US Date: 10-Nov-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
WorkOrder: HS20101123

QC BATCH REPORT

Batch ID: R371935 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS20101123-01MS** Units: **UG/L** Analysis Date: **03-Nov-2020 20:04**
Client ID: **16WW56-201021** Run ID: **VOA6_371935** SeqNo: **5815262** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	25.37	1.0	20	0	127	80 - 119				S
1,1-Dichloroethene	24.98	1.0	20	1.516	117	71 - 131				
1,2-Dichloroethane	24.02	1.0	20	0.663	117	73 - 128				
cis-1,2-Dichloroethene	71.36	1.0	20	19.57	259	78 - 123				S
Methylene chloride	20.14	2.0	20	0	101	74 - 124				
Trichloroethene	405	1.0	20	216.9	940	79 - 123				SEO
Vinyl chloride	29.58	1.0	20	2.82	134	58 - 137				
Surr: 1,2-Dichloroethane-d4	*45.67*	*1.0*	*50*	*0*	*91.3*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*47.28*	*1.0*	*50*	*0*	*94.6*	*85 - 114*				
Surr: Dibromofluoromethane	*44.14*	*1.0*	*50*	*0*	*88.3*	*80 - 119*				
Surr: Toluene-d8	*50.31*	*1.0*	*50*	*0*	*101*	*89 - 112*				

MSD Sample ID: **HS20101123-01MSD** Units: **UG/L** Analysis Date: **03-Nov-2020 20:25**
Client ID: **16WW56-201021** Run ID: **VOA6_371935** SeqNo: **5815263** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	23.7	1.0	20	0	118	80 - 119	25.37	6.84	20	
1,1-Dichloroethene	23.91	1.0	20	1.516	112	71 - 131	24.98	4.4	20	
1,2-Dichloroethane	24.09	1.0	20	0.663	117	73 - 128	24.02	0.278	20	
cis-1,2-Dichloroethene	72.84	1.0	20	19.57	266	78 - 123	71.36	2.06	20	S
Methylene chloride	20.25	2.0	20	0	101	74 - 124	20.14	0.534	20	
Trichloroethene	383.9	1.0	20	216.9	835	79 - 123	405	5.36	20	SEO
Vinyl chloride	29.23	1.0	20	2.82	132	58 - 137	29.58	1.19	20	
Surr: 1,2-Dichloroethane-d4	*45.21*	*1.0*	*50*	*0*	*90.4*	*81 - 118*	*45.67*	*1.01*	*20*	
Surr: 4-Bromofluorobenzene	*47.96*	*1.0*	*50*	*0*	*95.9*	*85 - 114*	*47.28*	*1.43*	*20*	
Surr: Dibromofluoromethane	*45.21*	*1.0*	*50*	*0*	*90.4*	*80 - 119*	*44.14*	*2.39*	*20*	
Surr: Toluene-d8	*49.84*	*1.0*	*50*	*0*	*99.7*	*89 - 112*	*50.31*	*0.939*	*20*	

The following samples were analyzed in this batch: HS20101123-01 HS20101123-02 HS20101123-03 HS20101123-04 HS20101123-12

ALS Houston, US Date: 10-Nov-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
WorkOrder: HS20101123

QC BATCH REPORT

Batch ID: R371939 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-201103** Units: **UG/L** Analysis Date: **04-Nov-2020 00:37**
Client ID: Run ID: **VOA6_371939** SeqNo: **5815463** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	0.50	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
Methylene chloride	1.0	2.0								U
Trichloroethene	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*43.55*	*1.0*	*50*	*0*	*87.1*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*45.35*	*1.0*	*50*	*0*	*90.7*	*85 - 114*				
Surr: Dibromofluoromethane	*42.78*	*1.0*	*50*	*0*	*85.6*	*80 - 119*				
Surr: Toluene-d8	*50.97*	*1.0*	*50*	*0*	*102*	*89 - 112*				

LCS Sample ID: **VLCSW-201103** Units: **UG/L** Analysis Date: **03-Nov-2020 23:55**
Client ID: Run ID: **VOA6_371939** SeqNo: **5815462** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	19.11	1.0	20	0	95.6	80 - 119				
1,1-Dichloroethene	19.02	1.0	20	0	95.1	71 - 131				
1,2-Dichloroethane	18.08	1.0	20	0	90.4	73 - 128				
cis-1,2-Dichloroethene	18.12	1.0	20	0	90.6	78 - 123				
Methylene chloride	17.62	2.0	20	0	88.1	74 - 124				
Trichloroethene	17.96	1.0	20	0	89.8	79 - 123				
Vinyl chloride	17.9	1.0	20	0	89.5	58 - 137				
Surr: 1,2-Dichloroethane-d4	*53.2*	*1.0*	*50*	*0*	*106*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*49.13*	*1.0*	*50*	*0*	*98.3*	*85 - 114*				
Surr: Dibromofluoromethane	*49.1*	*1.0*	*50*	*0*	*98.2*	*80 - 119*				
Surr: Toluene-d8	*48.72*	*1.0*	*50*	*0*	*97.4*	*89 - 112*				

ALS Houston, US Date: 10-Nov-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
WorkOrder: HS20101123

QC BATCH REPORT

Batch ID: R371939 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS20101123-05MS** Units: **UG/L** Analysis Date: **04-Nov-2020 03:04**
Client ID: **16WW40-201021** Run ID: **VOA6_371939** SeqNo: **5815470** PrepDate: DF: **25**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	553.9	25	500	0	111	80 - 119				
1,1-Dichloroethene	599.3	25	500	0	120	71 - 131				
1,2-Dichloroethane	508.3	25	500	0	102	73 - 128				
cis-1,2-Dichloroethene	765.8	25	500	239.8	105	78 - 123				
Methylene chloride	500.5	50	500	0	100	74 - 124				
Trichloroethene	2239	25	500	1724	103	79 - 123				
Vinyl chloride	650.7	25	500	0	130	58 - 137				
Surr: 1,2-Dichloroethane-d4	*1104*	*25*	*1250*	*0*	*88.3*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*1183*	*25*	*1250*	*0*	*94.6*	*85 - 114*				
Surr: Dibromofluoromethane	*1124*	*25*	*1250*	*0*	*89.9*	*80 - 119*				
Surr: Toluene-d8	*1251*	*25*	*1250*	*0*	*100*	*89 - 112*				

MSD Sample ID: **HS20101123-05MSD** Units: **UG/L** Analysis Date: **04-Nov-2020 03:25**
Client ID: **16WW40-201021** Run ID: **VOA6_371939** SeqNo: **5815471** PrepDate: DF: **25**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	554.7	25	500	0	111	80 - 119	553.9	0.148	20	
1,1-Dichloroethene	551.9	25	500	0	110	71 - 131	599.3	8.24	20	
1,2-Dichloroethane	565.3	25	500	0	113	73 - 128	508.3	10.6	20	
cis-1,2-Dichloroethene	721.8	25	500	239.8	96.4	78 - 123	765.8	5.91	20	
Methylene chloride	470.7	50	500	0	94.1	74 - 124	500.5	6.15	20	
Trichloroethene	2193	25	500	1724	93.8	79 - 123	2239	2.1	20	
Vinyl chloride	578.2	25	500	0	116	58 - 137	650.7	11.8	20	
Surr: 1,2-Dichloroethane-d4	*1128*	*25*	*1250*	*0*	*90.3*	*81 - 118*	*1104*	*2.17*	*20*	
Surr: 4-Bromofluorobenzene	*1180*	*25*	*1250*	*0*	*94.4*	*85 - 114*	*1183*	*0.206*	*20*	
Surr: Dibromofluoromethane	*1079*	*25*	*1250*	*0*	*86.3*	*80 - 119*	*1124*	*4.11*	*20*	
Surr: Toluene-d8	*1231*	*25*	*1250*	*0*	*98.5*	*89 - 112*	*1251*	*1.65*	*20*	

The following samples were analyzed in this batch: HS20101123-05 HS20101123-06 HS20101123-07 HS20101123-08 HS20101123-09 HS20101123-10 HS20101123-11

ALS Houston, US Date: 10-Nov-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
WorkOrder: HS20101123

QC BATCH REPORT

Batch ID: R371123 (0) **Instrument: ManTech01** **Method: ALKALINITY BY SM2320B**

MBLK Sample ID: **WBLKW3-201022** Units: **mg/L** Analysis Date: **23-Oct-2020 01:56**
Client ID: Run ID: **ManTech01_371123** SeqNo: **5796162** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	5.00	5.00								U

LCS Sample ID: **LCS3-201022** Units: **mg/L** Analysis Date: **23-Oct-2020 02:04**
Client ID: Run ID: **ManTech01_371123** SeqNo: **5796163** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	1019	5.00	1000	0	102	85 - 115				

LCSD Sample ID: **LCSD3-201022** Units: **mg/L** Analysis Date: **23-Oct-2020 02:14**
Client ID: Run ID: **ManTech01_371123** SeqNo: **5796164** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	1010	5.00	1000	0	101	85 - 115	1019	0.838	20	

DUP Sample ID: **HS20101123-01DUP** Units: **mg/L** Analysis Date: **23-Oct-2020 02:26**
Client ID: **16WW56-201021** Run ID: **ManTech01_371123** SeqNo: **5796166** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	235.3	5.00					232.9	0.995	20	

The following samples were analyzed in this batch: HS20101123-01 HS20101123-04 HS20101123-09

ALS Houston, US Date: 10-Nov-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
WorkOrder: HS20101123

QC BATCH REPORT

Batch ID: R371188 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY SW9056A**

MBLK Sample ID: **MBLK-102220** Units: **mg/L** Analysis Date: **22-Oct-2020 23:45**
Client ID: Run ID: **ICS-Integrion_371188** SeqNo: **5797283** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	0.100	0.100								U
Nitrogen, Nitrate (As N)	0.100	0.100								U

LCS Sample ID: **LCS-102220** Units: **mg/L** Analysis Date: **23-Oct-2020 00:03**
Client ID: Run ID: **ICS-Integrion_371188** SeqNo: **5797284** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.991	0.100	4	0	99.8	80 - 120				
Nitrogen, Nitrate (As N)	4.133	0.100	4	0	103	80 - 120				

MS Sample ID: **HS20101123-01MS** Units: **mg/L** Analysis Date: **22-Oct-2020 21:57**
Client ID: **16WW56-201021** Run ID: **ICS-Integrion_371188** SeqNo: **5797279** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	6.38	0.100	2	3.955	121	80 - 120				S
Nitrogen, Nitrate (As N)	3.169	0.100	2	0	158	80 - 120				S

MSD Sample ID: **HS20101123-01MSD** Units: **mg/L** Analysis Date: **22-Oct-2020 22:15**
Client ID: **16WW56-201021** Run ID: **ICS-Integrion_371188** SeqNo: **5797280** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	6.364	0.100	2	3.955	120	80 - 120	6.38	0.256	20	S
Nitrogen, Nitrate (As N)	2.904	0.100	2	0	145	80 - 120	3.169	8.7	20	S

The following samples were analyzed in this batch: HS20101123-01 HS20101123-04 HS20101123-09

ALS Houston, US Date: 10-Nov-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
WorkOrder: HS20101123

QC BATCH REPORT

Batch ID: R371917 (0) **Instrument:** ICS-Integrion **Method:** ANIONS BY SW9056A

MBLK Sample ID: **MBLK-110220** Units: **mg/L** Analysis Date: **02-Nov-2020 11:19**
Client ID: Run ID: **ICS-Integrion_371917** SeqNo: **5814879** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	0.100	0.100								U
Sulfate	0.500	0.500								U

LCS Sample ID: **LCS-110220** Units: **mg/L** Analysis Date: **02-Nov-2020 11:37**
Client ID: Run ID: **ICS-Integrion_371917** SeqNo: **5814880** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.828	0.100	4	0	95.7	80 - 120				
Sulfate	18.37	0.500	20	0	91.8	80 - 120				

MS Sample ID: **HS20101310-11MS** Units: **mg/L** Analysis Date: **03-Nov-2020 06:49**
Client ID: Run ID: **ICS-Integrion_371917** SeqNo: **5814901** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.111	0.100	2	1.274	91.9	80 - 120				
Sulfate	137.5	0.500	10	128.6	89.3	80 - 120				EO

MSD Sample ID: **HS20101310-11MSD** Units: **mg/L** Analysis Date: **03-Nov-2020 07:07**
Client ID: Run ID: **ICS-Integrion_371917** SeqNo: **5814902** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.191	0.100	2	1.274	95.9	80 - 120	3.111	2.53	20	
Sulfate	135.3	0.500	10	128.6	66.7	80 - 120	137.5	1.66	20	SEO

The following samples were analyzed in this batch: HS20101123-01 HS20101123-04 HS20101123-09

ALS Houston, US Date: 10-Nov-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
WorkOrder: HS20101123

QC BATCH REPORT

Batch ID: R372041 (0) **Instrument:** ICS-Integrion **Method:** ANIONS BY SW9056A

MBLK Sample ID: **MBLK-110320** Units: **mg/L** Analysis Date: **03-Nov-2020 13:46**
Client ID: Run ID: **ICS-Integrion_372041** SeqNo: **5817805** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	0.100	0.100								U

LCS Sample ID: **LCS-110320** Units: **mg/L** Analysis Date: **03-Nov-2020 14:04**
Client ID: Run ID: **ICS-Integrion_372041** SeqNo: **5817806** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.905	0.100	4	0	97.6	80 - 120				

MS Sample ID: **HS20110128-11MS** Units: **mg/L** Analysis Date: **04-Nov-2020 19:14**
Client ID: Run ID: **ICS-Integrion_372041** SeqNo: **5817837** PrepDate: DF: **2**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	9.856	0.200	4	6.126	93.2	80 - 120				

MSD Sample ID: **HS20110128-11MSD** Units: **mg/L** Analysis Date: **04-Nov-2020 19:32**
Client ID: Run ID: **ICS-Integrion_372041** SeqNo: **5817838** PrepDate: DF: **2**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	11.23	0.200	4	6.126	127	80 - 120	9.856	13	20	S

The following samples were analyzed in this batch: HS20101123-05 HS20101123-06 HS20101123-07 HS20101123-08

ALS Houston, US Date: 10-Nov-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
WorkOrder: **HS20101123**

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: 10-Nov-20

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	20-030-0	26-Mar-2021
California	2919, 2020-2021	30-Apr-2021
Dept of Defense	PJLA L20-507	22-Dec-2021
Florida	E87611-30-07/01/2020	30-Jun-2021
Illinois	2000322020-4	09-May-2021
Kansas	E-10352 2020-2021	31-Jul-2021
Kentucky	123043, 2020-2021	30-Apr-2021
Louisiana	03087, 2020-2021	30-Jun-2021
North Carolina	624-2020	31-Dec-2020
North Dakota	R-193 2020-2021	30-Apr-2021
Texas	T104704231-20-26	30-Apr-2021

ALS Houston, US Date: 10-Nov-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
Work Order: HS20101123

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS20101123-01	16WW56-201021	Login	10/22/2020 12:31:24 PM	PMG	Sub
HS20101123-01	16WW56-201021	Login	10/22/2020 12:31:24 PM	PMG	WET209
HS20101123-01	16WW56-201021	Login	10/22/2020 12:31:24 PM	PMG	VOA091
HS20101123-01	16WW56-201021	Login	10/22/2020 12:31:24 PM	PMG	RSK008
HS20101123-01	16WW56-201021	Login	10/22/2020 12:31:24 PM	PMG	Sub

ALS Houston, US Date: 10-Nov-20

Sample Receipt Checklist

Work Order ID: HS20101123 **Date/Time Received:** **22-Oct-2020 09:10**

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

Completed By: /S/ Paresh M. Giga (eSignature) 22-Oct-2020 12:58 (Date/Time) **Reviewed by:** /S/ RJ Modashia (eSignature) 22-Oct-2020 19:41 (Date/Time)

Matrices: **GW/Water** Carrier name: **FedEx**

	Yes	No	Not Present
Shipping container/cooler in good condition?	☑	☐	☐
Custody seals intact on shipping container/cooler?	☑	☐	☐
Custody seals intact on sample bottles?	☐	☐	☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	☐	☐	☑
Chain of custody present?	☑	☐	2 Page(s)
Chain of custody signed when relinquished and received?	☑	☐	COC IDs:None
Samplers name present on COC?	☐	☑	
Chain of custody agrees with sample labels?	☑	☐	
Samples in proper container/bottle?	☑	☐	
Sample containers intact?	☑	☐	
Sufficient sample volume for indicated test?	☑	☐	
All samples received within holding time?	☑	☐	
Container/Temp Blank temperature in compliance?	☑	☐	

Temperature(s)/Thermometer(s):	2.1C U/C	IR31
Cooler(s)/Kit(s):	44257	
Date/Time sample(s) sent to storage:	10/22/2020 13:20	

	Yes	No	
Water - VOA vials have zero headspace?	☐	☑	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	☐	☐	N/A ☑
pH adjusted?	☐	☐	N/A ☑

pH adjusted by:

Login Notes:
Head space
16RW11-201021 All vials
16RW11-201021-FD Vials 2 & 3

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

01085607

CHAIN OF CUSTODY

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

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

Project No. 501032

Job: LHAAP 16 October 2020

Prepared By: Scott Beesinger

P.O. Number

Analyses

Field Sample I.D. Time	Sample Matrix	Date /	MS / MSD	No. OF CONTAINERS	VOC by SW 8260B	TOC by SM5310C	MEE by RSK 175	Anions (bromide, sulfate, nitrate) by SW9056 and Alkalinity by SM2320	Bromide by SW9056	Perchlorate by SW6850	Metals (arsenic, chromium, manganese, nickel, thallium) by SW6020				Remarks (Preservatives, etc.)
16WW56-201021	WG	10/21/20/0750		10	X	X	X	X	X	X					
16WW56-201021-MS	WG	10/21/20/0750		10	X	X	X	X	X	X					
16WW56-201021-MSD	WG	10/21/20/0750		10	X	X	X	X	X	X					
16RW11-201021	WG	10/21/20/0845		4	X					X					
16RW11-201021-FD	WG	10/21/20/0845		4	X					X					
16IW20-201021	WG	10/21/20/0930		10	X	X	X	X	X	X					
16WW40-201021	WG	10/21/20/1015		7	X	X			X	X					
16WW12-201021	WG	10/21/20/1100		7	X	X			X	X					

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

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	10/21/20	1430									

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition
J. [illegible]	10/22/20	09:10							

Remarks: Cooler 44257 1431
Temp 2.1°C CFU

Aptim Environmental & Infrastructure, Inc.
LHAAP 16 October 2020

HS20101123

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

01085608

CHAIN OF CUSTODY

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

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

Project No. 511032

Job: **LHAAP 16 October 2020**

Prepared By: Scott Beesinger

P.O. Number

Analyses

Field Sample I.D. Time	Sample Matrix	Date /	MS / MSD	No. OF CONTAINERS	VOC by SW 8260B	TOC by SM5310C	MEE by RSK 175	Anions (bromide, sulfate, nitrate) by SW9056 and Alkalinity by SM2320	Bromide by SW9056	Perchlorate by SW6850	Metals (arsenic, chromium, manganese, nickel, thallium) by SW6020				Remarks (Preservatives, etc.)
16RW04-201021	WG	10/21/20/1145		7	X	X			X	X					
16RW04-201021-FD	WG	10/21/20/1145		7	X	X			X	X					
16EW02-201021	WG	10/21/20/1235		10	X	X	X	X	X	X					
16EW06-201021	WG	10/21/20/1330		4	X					X					
16EW06-201021-FD	WG	10/21/20/1330		4	X					X					
TRIP BLANK-201021	W	10/21/20		2	X										

Aptim Environmental & Infrastucture, Inc.
LHAAP 16 October 2020

HS20101123

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

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	10/21/20	1430									

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition
S. [illegible]	10/22/20	09:10							

Remarks:

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

01085609

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

44257

CUSTODY SEAL

Date: 10/22/20 Time: 1430
Name: Scott Beesinger
Company: BHMT

Seal Broken By: SM
Date: 10/22/20

44257 OCT 2 1 '20

Must Deliver Next Business Day
Time and Tempature Sensitive!

44257

ORIGIN ID:SGRA (903) 930-8193
SCOTT BEESINGER
APTIM
1203-B EAST GRAND AVE.
PMB202
MARSHALL, TX 75670
UNITED STATES US

SHIP DATE: 29SEP20
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 16-BO 74064-RJ

RMA:

FedEx Express

FedEx
TRK# 1891 8880 8733
0221

THU - 22 OCT 10:30A
PRIORITY OVERNIGHT

AB SGRA

77099
TX-US IAH

#475872 10/21 SEBJ2/R27E/8766

October 29, 2020

Service Request No:E2001035

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

Laboratory Results for: HS20101123

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory October 22, 2020
For your reference, these analyses have been assigned our service request number **E2001035.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current TNI standards, where applicable, and except as noted in the laboratory case narrative provided. All results are intended to be considered in their entirety and ALS Environmental is not responsible for use of less than the complete final report. Results apply only to the items submitted to the laboratory, as received for analysis. In accordance with the current TNI Standard, a statement on the estimated uncertainty of measurement of any quantitative analysis will be supplied upon request.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Corey Grandits
Project Manager

ADDRESS 10450 Stancliff Rd., Suite 210, Houston, TX 77099
PHONE +1 281 530 5656 | FAX +1 281 530 5887
ALS Group USA, Corp.
dba ALS Environmental

Certificate of Analysis

ALS Environmental - Houston HRMS
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

ALS Environmental

Client:	ALS Houston	**Service Request No.:**	E2001035
Project:	HS20101123	**Date Received:**	10/22/20
Sample Matrix:	L		

CASE NARRATIVE

All analyses were performed in adherence to the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier IV. When appropriate to the method, method blank results have been reported with each analytical test.

Sample Receipt

Eleven samples were received for analysis at ALS Environmental in Houston on 10/22/20.

The samples were received in good condition and are consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

Due to the sample matrix, samples E2001035-010/011 had to be prepped as solids (samples viscous).

Data Validation Notes and Discussion

Precision and Accuracy:

EQ2000537: Laboratory Control Spike/Duplicate Laboratory Control Spike (LCS/DLCS) samples were analyzed and reported in addition to a MS/MSD for this extraction batch. The LCS, DLCS, MS, & DMS recoveries are within QC limits.

EQ2000548: Laboratory Control Spike/Duplicate Laboratory Control Spike (LCS/DLCS) samples were analyzed and reported in addition to a MS/MSD for this extraction batch. The LCS and DLCS recoveries are within QC limits.

DoD Certification is held for the method/matrix/analytes provided in this report.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.

Use of ALS group USA Corp dba ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.

Client: ALS Environmental - US **Service Request:**E2001035
Project: HS20101123

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
E2001035-001	16WW56-201021	10/21/2020	0750
E2001035-002	16RW11-201021	10/21/2020	0845
E2001035-003	16RW11-201021-FD	10/21/2020	0845
E2001035-004	16IW20-201021	10/21/2020	0930
E2001035-005	16WW40-201021	10/21/2020	1015
E2001035-006	16WW12-201021	10/21/2020	1100
E2001035-007	16RW04-201021	10/21/2020	1145
E2001035-008	16RW04-201021-FD	10/21/2020	1145
E2001035-009	16EW02-201021	10/21/2020	1235
E2001035-010	16EW06-201021	10/21/2020	1330
E2001035-011	16EW06-201021-FD	10/21/2020	1330

Service Request Summary

Folder #: **E2001035**
Client Name: ALS Environmental - US
Project Name: HS20101123
Project Number:

Report To: RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Houston, TX 77099-4338
USA
Phone Number: 281-530-5656
Cell Number:
Fax Number: 281-530-5887
E-mail: rj.modashia@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 10/22/20
Internal Due Date: 11/5/2020
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS20101123
EDD: No EDD Specified

11 250 mL-Plastic Bottle HDPE WM CLEAR Unpreserved
Location: EHRMS-WIC 10B
Pressure Gas:

Lab Samp No.	Client Samp No	Matrix	Collected	HOUSTON CIO4 DOD/6850
E2001035-001	16WW56-201021	Ground Water	10/21/20 0750	**IV**
E2001035-002	16RW11-201021	Ground Water	10/21/20 0845	**IV**
E2001035-003	16RW11-201021-FD	Ground Water	10/21/20 0845	**IV**
E2001035-004	16IW20-201021	Ground Water	10/21/20 0930	**IV**
E2001035-005	16WW40-201021	Ground Water	10/21/20 1015	**IV**
E2001035-006	16WW12-201021	Ground Water	10/21/20 1100	**IV**
E2001035-007	16RW04-201021	Ground Water	10/21/20 1145	**IV**
E2001035-008	16RW04-201021-FD	Ground Water	10/21/20 1145	**IV**
E2001035-009	16EW02-201021	Ground Water	10/21/20 1235	**IV**
E2001035-010	16EW06-201021	Misc. Solid	10/21/20 1330	**IV**
E2001035-011	16EW06-201021-FD	Misc. Solid	10/21/20 1330	**IV**

Service Request Summary

Folder #:	**E2001035**
Client Name:	ALS Environmental - US
Project Name:	HS20101123
Project Number:	
Report To:	RJ Modashia ALS Laboratory Group 10450 Stancliff Road Houston, TX 77099-4338 USA
Phone Number:	281-530-5656
Cell Number:	
Fax Number:	281-530-5887
E-mail:	rj.modashia@alsglobal.com

Project Chemist:	Corey Grandits
Originating Lab:	HOUSTON
Logged By:	CGRANDITS
Date Received:	10/22/20
Internal Due Date:	11/5/2020
QAP:	LAB QAP
Qualifier Set:	Lab Standard
Formset:	Lab Standard
Merged?:	Y
Report to MDL?:	Y
P.O. Number:	HS20101123
EDD:	No EDD Specified

11 250 mL-Plastic Bottle HDPE WM CLEAR Unpreserved

Location: EHRMS-WIC 10B

Pressure Gas:

Test Comments:

Group	Test/Method	Samples	Comments
Semivoa GCMS	ClO4 DOD/6850	1	MS/MSD

Data Qualifiers

Lab Standard

+	Possible Tedlar bag artifact.
A	TIC is a suspected aldol-condensation product
B	Analyte found in the associated method blank as well as in the sample.
BC	Reported results are not blank corrected.
BH	The back section of the tube yielded higher results than the front.
BT	Results indicated possible breakthrough; back section >=10% front section.
C	Result identification confirmed.
D	Compound identified in an analysis at a secondary dilution factor
D	Spike was diluted out
DE	Reported results are corrected for desorption efficiency.
E	Estimated value. Concentration above calibration range
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
H1	Sample analysis performed past holding time. See case narrative.
H2	Initial analysis within holding time. Reanalysis for the required dilution was past holding time.
H3	Sample was received and analyzed past holding time.
H4	Sample was extracted past required extraction holding time, but analyzed within analysis holding time. See case narrative.
I	Internal standard not within the specified limits. See case narrative.
J	Estimated Value. Concentration found below MRL.
K	A deflection in the QC ion may indicate interference with the quantitation of this ion. The concentration of this analyte should be considered as an estimate.
K	Analyte was detected above the method reporting limit prior to normalization.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
L1	Laboratory control sample recovery outside the specified limits; results may be biased high.
L2	Laboratory control sample recovery outside the specified limits; results may be biased low.
L3	Laboratory control sample recovery outside the specified limits.
M	Matrix interference; results may be biased high.
M	The duplicate injection precision not met.
M1	Matrix interference due to coelution with a non-target compound; results may be biased high.
N	Presumptive evidence of a compound for TICs that have been identified based on a mass spectral library search.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.

Data Qualifiers

Lab Standard

P	Indicates chlorodiphenyl ether interference present at the retention time of the target compound.
P	Pesticide/Aroclor target analyte > 40% difference for detected concentrations between GC columns
Q	Indicates as estimated value because the P and P + 2 theoretical abundance ratio does not meet method criteria.
R	Duplicate Precision not met.
R1	Duplicate precision not within the specified limits; however, the results are below the MRL and considered estimated.
S	Surrogate recovery not within specified limits.
S	The reported value was determined by the Method of Standard Additions (MSA).
T	Analyte is a tentatively identified compound, result is estimated.
U	Compound was analyzed for, but was not detected (ND).
V1	The continuing calibration verification standard was outside (biased high) the specified limits for this compound.
V2	The continuing calibration verification standard was outside (biased low) the specified limits for this compound.
W	Result quantified, but the corresponding peak was detected outside the generated retention time window.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
X	See case narrative.
Y	Recovery outside limits
Y	The chromatogram resembles a petroleum product but does not match the calibration standard.
Z	The chromatogram does not resemble a petroleum product.
i	The MRL/MDL has been elevated due to a matrix interference.

ALS Laboratory Group

Acronyms

Cal	Calibration
Conc	CONCentration
Dioxin(s)	Polychlorinated dibenzo-p-dioxin(s)
EDL	Estimated Detection Limit
EMPC	Estimated Maximum Possible Concentration
Flags	Data qualifiers
Furan(s)	Polychlorinated dibenzofuran(s)
g	Grams
ICAL	Initial CALibration
ID	IDentifier
Ions	Masses monitored for the analyte during data acquisition
L	Liter (s)
LCS	Laboratory Control Sample
DLCS	Duplicate Laboratory Control Sample
MB	Method Blank
MCL	Method Calibration Limit
MDL	Method Detection Limit
mL	Milliliters
MS	Matrix Spiked sample
DMS	Duplicate Matrix Spiked sample
NO	Number of peaks meeting all identification criteria
PCDD(s)	Polychlorinated dibenzo-p-dioxin(s)
PCDF(s)	Polychlorinated dibenzofuran(s)
ppb	Parts per billion
ppm	Parts per million
ppq	Parts per quadrillion
ppt	Parts per trillion
QA	Quality Assurance
QC	Quality Control
Ratio	Ratio of areas from monitored ions for an analyte
% Rec.	Percent recovery
RPD	Relative Percent Difference
RRF	Relative Response Factor
RT	Retention Time
SDG	Sample Delivery Group
S/N	Signal-to-noise ratio
TEF	Toxicity Equivalence Factor
TEQ	Toxicity Equivalence Quotient

10450 Stancliff Rd, Houston, TX 77099 | 281-530-5656 | www.alsglobal.com

ALS Environmental

State Certifications, Accreditations, and Licenses

Agency	Number	Expire Date
American Association for Laboratory Accreditation	2897.01 2020	11/30/2021
Arizona Department of Health Services	AZ0793-2020	5/27/2021
Arkansas Department of Environmental Quality	20-030-0	3/26/2021
California Department of Health Services	2919-2020	4/30/2021
Department of Defense	A2LA 2897.01	11/30/2021
Florida Department of Health	E87611-2020	6/30/2021
Hawaii Department of Health	2020	4/30/2021
Illinois Environmental Protection Agency	2000322020-4	5/9/2021
Kansas Department of Health and Environment	E-10352-2020	7/31/2021
Louisiana Department of Environmental Quality	03087-2020	6/30/2021
Louisiana Department of Health and Hospitals	LA028-2020	12/31/2020
Maine Department of Health and Human Services	2020016	6/5/2022
Maryland Department of the Environment	343-2020	6/30/2021
Michigan Depratment of Environmental Quality	9971-2020	4/30/2021
Minnesota Department of Health	1785988	12/31/2020
Nebraska Department of Health and Human Services	NE-OS-25-13 (2020)	4/30/2021
Nevada Department of Concervation and Natural Resources	TX026932021-1	7/31/2021
New Hampshire Environmental Laboratory Accreditation Program	209420	4/24/2021
New Jersey Department of Environmental Protection	TX008	6/30/2021
New York Department of Health	11707	3/31/2021
Oklahoma Department of Environmental Quality	2020-123	8/31/2021
Pennsylvania Department of Environmental Protection	014	6/30/2021
Tennessee Department of Environment and Concervation	04016-2020	4/30/2021
Texas Commision on Environmental Quality	T104704231-20-26	4/30/2021
United States Department of Agriculture	P330-19-00299	10/10/2022
Washington Department of Health	C819	11/14/2020

Chain of Custody

ALS Environmental - Houston HRMS
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID: 14995**

SUBCONTRACT TO:

ALS Environmental
10450 Stancliff RoadSuite 210
Houston, TX 77084 **Phone:** +1 281 530 5656

CUSTOMER INFORMATION:

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

INVOICE INFORMATION:

Company: ALS Houston
Contact: Accounts Payable
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Reference: HS20101123
TSR: Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS20101123-01**	**16WW56-201021**	**Groundwater**	**21 Oct 2020 07:50**
	SUB_Perch-6850			05 Nov 2020
2.	**HS20101123-02**	**16RW11-201021**	**Groundwater**	**21 Oct 2020 08:45**
	SUB_Perch-6850			05 Nov 2020
3.	**HS20101123-03**	**16RW11-201021-FD**	**Groundwater**	**21 Oct 2020 08:45**
	SUB_Perch-6850			05 Nov 2020
4.	**HS20101123-04**	**16IW20-201021**	**Groundwater**	**21 Oct 2020 09:30**
	SUB_Perch-6850			05 Nov 2020
5.	**HS20101123-05**	**16WW40-201021**	**Groundwater**	**21 Oct 2020 10:15**
	SUB_Perch-6850			05 Nov 2020
6.	**HS20101123-06**	**16WW12-201021**	**Groundwater**	**21 Oct 2020 11:00**
	SUB_Perch-6850			05 Nov 2020
7.	**HS20101123-07**	**16RW04-201021**	**Groundwater**	**21 Oct 2020 11:45**
	SUB_Perch-6850			05 Nov 2020
8.	**HS20101123-08**	**16RW04-201021-FD**	**Groundwater**	**21 Oct 2020 11:45**
	SUB_Perch-6850			05 Nov 2020
9.	**HS20101123-09**	**16EW02-201021**	**Groundwater**	**21 Oct 2020 12:35**

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID: 14995**

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
	SUB_Perch-6850			05 Nov 2020
10.	**HS20101123-10**	**16EW06-201021**	**Groundwater**	**21 Oct 2020 13:30**
	SUB_Perch-6850			05 Nov 2020
11.	**HS20101123-11**	**16EW06-201021-FD**	**Groundwater**	**21 Oct 2020 13:30**
	SUB_Perch-6850			05 Nov 2020

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.
HS20101123-01 = MS/MSD

QC Level: DOD IV (DoD Data Package)

Relinquished By:		Date/Time:	
Received By:		Date/Time:	10/22/20 1645
Cooler ID(s):		Temperature(s):	

ALS Environmental

Cooler Receipt Form

Project Chemist: CH

Client/Project: ALS-H

Thermometer ID: 1824

Date/Time Received: 10/22/20

Initials: CH

Date/Time Logged in: 10/22/20

Initials: CH

1. Method of delivery: ○ US Mail ○ Fed Ex ○ UPS ○ DHL ✓ Courier (A14) ○ Client
2. Samples received in: ✓ Cooler ○ Box ○ Envelope ○ Other
3. Were custody seals on coolers? ○ Yes ✓ No
   Were they intact? ○ Yes ○ No ✓ N/A
   Were they signed and dated? ○ Yes ○ No ✓ N/A
   If yes, how many and where?
4. Packing Material: ○ Inserts ✓ Baggies ○ Bubble Wrap ○ Gel Packs ✓ Wet Ice ○ Sleeves ○ Other
5. Foreign or Regulated Soil? ○ Yes ○ No Location of Sampling:

Cooler Tracking Number	COC ID	Date Opened	Time Opened	Opened By	Temp. °C	Temp Blank?
–		10/22/20	1645	CH	3.3	☒
						☐
						☐
						☐

6. Were custody papers properly filled out (ink, signed, dated, etc)? ✓ Yes ○ No
7. Did all bottles arrive in good condition (not broken, no signs of leakage)? ✓ Yes ○ No
8. Were all sample labels complete (i.e., sample ID, analysis, preservation, etc)? ✓ Yes ○ No
9. Were appropriate bottles/containers and volumes received for the requested tests? ✓ Yes ○ No
10. Did sample labels and tags agree with custody documents? ✓ Yes ○ No

Notes, Discrepancies, & Resolutions:

Service request Label:

HS-HRMSCoolerReceipt R1.0

ALS Environmental - Houston HRMS

10450 Stancliff Rd., Suite 210
Houston, TX 77099
T: +1 713 266 1599
F: +1 713 266 1599
www.alsglobal.com

SAMPLE ACCEPTANCE POLICY

This policy outlines the criteria samples must meet to be accepted by ALS Environmental – Houston HRMS.

Cooler Custody Seals (desirable, mandatory if specified in SAP):

- ✓ Intact on outside of cooler, signed and dated

Chain-of-Custody (COC) documentation (mandatory):

The following is required on each COC:

- ✓ Sample ID, the location, date and time of collection, collector's name, preservation type, sample type, and any other special remarks concerning the sampleThe COC must be completed in ink.
- ✓ Signature and date of relinquishing party.

In the absence of a COC at sample receipt, the COC will be requested from the client.

Sample Integrity (mandatory):

Samples are inspected upon arrival to ensure that sample integrity was not compromised during transfer to the laboratory.

- ✓ Sample containers must arrive in good condition (not broken or leaking).
- ✓ Samples must be labeled appropriately, including Sample IDs, and requested test using durable labels and indelible ink.
- ✓ The correct type of sample bottle must be used for the method requested.
- ✓ An appropriate sample volume, or weight, must be received.
- ✓ Sample IDs and number of containers must reconcile with the COC.
- ✓ Samples must be received within the method defined holding time.

Temperature Requirement (varies by sample matrix):

- ✓ Aqueous and Non-aqueous samples must be shipped and stored cold, at 0 to 6ºC.
- ✓ Tissue samples must be shipped and stored frozen, at -20 to -10ºC.
- ✓ Air samples are shipped and stored cold, at 0 to 6ºC
- ✓ The sample temperature must be recorded on the COC

All cooler inspections are documented on the Cooler Receipt Form (CRF). A separate CRF is completed for each service request. Any samples not meeting the above criteria are noted on the CRF and the Project Manager notified. The Project Manager must resolve any sample integrity issues with the client prior to proceeding with the analysis. Such resolutions are documented in writing and filed with the project folder. Data associated with samples received outside of this acceptance policy will be qualified on the case narrative of the final report

Preparation Information Benchsheets

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

Preparation Information Benchsheet

Prep Run#: 368462 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
Team: Semivoa GCMS/GRIVERA **Prep Method:** **Prep Date/Time:** 10/26/20 14:30

#	Lab Code	Client ID	B#	Method /Test	pH	Cl	Matrix	Amt. Ext.	Sample Description
1	E2001035-001	16WW56-201021	.01	6850/ClO4 DOD			Ground Water	10mL	
2	E2001035-002	16RW11-201021	.01	6850/ClO4 DOD			Ground Water	10mL	
3	E2001035-003	16RW11-201021-FD	.01	6850/ClO4 DOD			Ground Water	10mL	
4	E2001035-004	16IW20-201021	.01	6850/ClO4 DOD			Ground Water	10mL	
5	E2001035-005	16WW40-201021	.01	6850/ClO4 DOD			Ground Water	10mL	
6	E2001035-006	16WW12-201021	.01	6850/ClO4 DOD			Ground Water	10mL	
7	E2001035-007	16RW04-201021	.01	6850/ClO4 DOD			Ground Water	10mL	
8	E2001035-008	16RW04-201021-FD	.01	6850/ClO4 DOD			Ground Water	10mL	
9	E2001035-009	16EW02-201021	.01	6850/ClO4 DOD			Ground Water	10mL	
10	E2001036-001	16WW27-201022	.01	6850/ClO4 DOD			Ground Water	10mL	
11	E2001036-002	16WW27-201022-FD	.01	6850/ClO4 DOD			Ground Water	10mL	
12	E2001036-003	16WW43-201022	.01	6850/ClO4 DOD			Ground Water	10mL	
13	E2001036-004	16WW13-201022	.01	6850/ClO4 DOD			Ground Water	10mL	
14	E2001036-005	16WW42-201022	.01	6850/ClO4 DOD			Ground Water	10mL	
15	E2001036-006	16RW02-201022	.01	6850/ClO4 DOD			Ground Water	10mL	
16	E2001036-007	16RW05-201022	.01	6850/ClO4 DOD			Ground Water	10mL	
17	E2001036-008	16EW03-201022	.01	6850/ClO4 DOD			Ground Water	10mL	
18	EQ2000537-01	MB		6850/ClO4 DOD			Liquid	10mL	
19	EQ2000537-02	LCS		6850/ClO4 DOD			Liquid	10mL	
20	EQ2000537-03	DLCS		6850/ClO4 DOD			Liquid	10mL	
21	EQ2000537-04	16WW56-201021 MS	.01	6850/ClO4 DOD			Liquid	10mL	
22	EQ2000537-05	16WW56-201021 DMS	.01	6850/ClO4 DOD			Liquid	10mL	

Spiking Solutions

Name: Perchlorate Intermediate Stock1 Inventory ID 209764 Logbook Ref: Perchlorate Int. Stock1 51820 Expires On: 11/18/2020

EQ2000537-02	1.00µL	EQ2000537-03	1.00µL	EQ2000537-04	1.00µL	EQ2000537-05	1.00µL

Name: Sodium Perchlorate 1 ug/mL (IS) (18-O) as CLO4 Inventory ID 212340 Logbook Ref: Sodium Perchlorate Expires On: 07/13/2022

E2001035-001	100.00µL	E2001035-002	100.00µL	E2001035-003	100.00µL	E2001035-004	100.00µL	E2001035-005	100.00µL	E2001035-006	100.00µL
E2001035-007	100.00µL	E2001035-008	100.00µL	E2001035-009	100.00µL	E2001036-001	100.00µL	E2001036-002	100.00µL	E2001036-003	100.00µL
E2001036-004	100.00µL	E2001036-005	100.00µL	E2001036-006	100.00µL	E2001036-007	100.00µL	E2001036-008	100.00µL	EQ2000537-01	100.00µL
EQ2000537-02	100.00µL	EQ2000537-03	100.00µL	EQ2000537-04	100.00µL	EQ2000537-05	100.00µL				

Preparation Information Benchsheet

Prep Run#: 368462 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
Team: Semivoa GCMS/GRIVERA **Prep Method:** **Prep Date/Time:** 10/26/20 14:30

Preparation Steps

Step: Preparation
Started: 10/26/20 14:30
Finished: 10/26/20 15:00
By: GRIVERA
Comments

Comments:

Reviewed By: GR Date: 10/27/2020

Chain of Custody

Relinquished By: Date:
Received By: Date:

Extracts Examined
Yes No

Preparation Information Benchsheet

Prep Run#: 368660 **Prep WorkFlow:** Gen CLO4 **Status:** Prepped
Team: Semivoa GCMS/GRIVERA **Prep Method:** Method **Prep Date/Time:** 10/28/20 14:30

#	Lab Code	Client ID	B#	Method /Test	pH	Cl	Matrix	Amt. Ext.	Sample Description
1	E2001025-001	2020-BH-1-1	.01	6850/ClO4			Soil	1.006g	
2	E2001025-002	2020-BH-1-7	.01	6850/ClO4			Soil	1.040g	
3	E2001035-010	16EW06-201021	.02	6850/ClO4 DOD			Misc. Solid	1.003g	
4	E2001035-011	16EW06-201021-FD	.02	6850/ClO4 DOD			Misc. Solid	1.066g	
5	E2001036-009	16EW07-201022	.02	6850/ClO4 DOD			Misc. Solid	1.070g	
6	EQ2000548-01	MB		6850/ClO4 DOD			Solid	1.047g	
7	EQ2000548-02	LCS		6850/ClO4 DOD			Solid	0.980g	
8	EQ2000548-03	DLCS		6850/ClO4 DOD			Solid	0.977g	
9	EQ2000548-04	2020-BH-1-1 MS	.01	6850/ClO4			Solid	0.994g	
10	EQ2000548-05	2020-BH-1-1 DMS	.01	6850/ClO4			Solid	0.985g	

Spiking Solutions

Name: Perchlorate Intermediate Stock1 Inventory ID 209764 Logbook Ref: Perchlorate Int. Stock1 51820 Expires On: 11/18/2020

EQ2000548-02	100.00µL	EQ2000548-02	100.00µL	EQ2000548-03	100.00µL	EQ2000548-03	100.00µL	EQ2000548-04	100.00µL	EQ2000548-05	100.00µL

Name: Sodium Perchlorate 1 ug/mL (IS) (18-O) as CLO4 Inventory ID 212340 Logbook Ref: Sodium Perchlorate Expires On: 07/13/2022

E2001025-001	100.00µL	E2001025-002	100.00µL	E2001035-010	100.00µL	E2001035-011	100.00µL	E2001036-009	100.00µL	EQ2000548-01	100.00µL
EQ2000548-01	100.00µL	EQ2000548-02	100.00µL	EQ2000548-02	100.00µL	EQ2000548-03	100.00µL	EQ2000548-03	100.00µL	EQ2000548-04	100.00µL
EQ2000548-05	100.00µL										

Preparation Steps

Step: Extraction
Started: 10/28/20 14:30
Finished: 10/28/20 15:30
By: GRIVERA
Comments

Comments: _____

Reviewed By: GR Date: 10/29/2020

Preparation Information Benchsheet

Prep Run#: 368660
Team: Semivoa GCMS/GRIVERA

Prep WorkFlow: Gen CLO4
Prep Method: Method

Status: Prepped
Prep Date/Time: 10/28/20 14:30

Chain of Custody

Relinquished By:	_____	Date:	_____	Extracts Examined
Received By:	_____	Date:	_____	Yes No

Analytical Results

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2001035
Project:	HS20101123	**Date Collected:**	10/21/20 0750
Sample Matrix:	Ground Water	**Date Received:**	10/22/20
Sample Name:	16WW56-201021	**Units:**	µg/L
Lab Code:	E2001035-001	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.309**		0.100	0.0500	0.0250	1	10/26/20	10/26/20 14:43	368462	701198	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2001035
Project:	HS20101123	**Date Collected:**	10/21/20 0845
Sample Matrix:	Ground Water	**Date Received:**	10/22/20
Sample Name:	16RW11-201021	**Units:**	µg/L
Lab Code:	E2001035-002	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	10/26/20	10/26/20 14:51	368462	701198	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2001035
Project:	HS20101123	**Date Collected:**	10/21/20 0845
Sample Matrix:	Ground Water	**Date Received:**	10/22/20
Sample Name:	16RW11-201021-FD	**Units:**	µg/L
Lab Code:	E2001035-003	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	10/26/20	10/26/20 14:59	368462	701198	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2001035
Project:	HS20101123	**Date Collected:**	10/21/20 0930
Sample Matrix:	Ground Water	**Date Received:**	10/22/20
Sample Name:	16IW20-201021	**Units:**	µg/L
Lab Code:	E2001035-004	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	10/26/20	10/28/20 13:29	368462	701198	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2001035
Project:	HS20101123	**Date Collected:**	10/21/20 1015
Sample Matrix:	Ground Water	**Date Received:**	10/22/20
Sample Name:	16WW40-201021	**Units:**	µg/L
Lab Code:	E2001035-005	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.240**		0.100	0.0500	0.0250	1	10/26/20	10/26/20 15:23	368462	701198	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2001035
Project:	HS20101123	**Date Collected:**	10/21/20 1100
Sample Matrix:	Ground Water	**Date Received:**	10/22/20
Sample Name:	16WW12-201021	**Units:**	µg/L
Lab Code:	E2001035-006	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**18.5**		0.100	0.0500	0.0250	1	10/26/20	10/26/20 15:31	368462	701198	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2001035
Project:	HS20101123	**Date Collected:**	10/21/20 1145
Sample Matrix:	Ground Water	**Date Received:**	10/22/20
Sample Name:	16RW04-201021	**Units:**	µg/L
Lab Code:	E2001035-007	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	10/26/20	10/26/20 15:38	368462	701198	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2001035
Project:	HS20101123	**Date Collected:**	10/21/20 1145
Sample Matrix:	Ground Water	**Date Received:**	10/22/20
Sample Name:	16RW04-201021-FD	**Units:**	µg/L
Lab Code:	E2001035-008	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	10/26/20	10/26/20 15:46	368462	701198	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2001035
Project:	HS20101123	**Date Collected:**	10/21/20 1235
Sample Matrix:	Ground Water	**Date Received:**	10/22/20
Sample Name:	16EW02-201021	**Units:**	µg/L
Lab Code:	E2001035-009	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	10/26/20	10/26/20 15:54	368462	701198	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2001035
Project:	HS20101123	**Date Collected:**	10/21/20 1330
Sample Matrix:	Misc. Solid	**Date Received:**	10/22/20
Sample Name:	16EW06-201021	**Units:**	µg/Kg
Lab Code:	E2001035-010	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.997	0.750	0.300	1	10/28/20	10/28/20 18:09	368660	701275	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2001035
Project:	HS20101123	**Date Collected:**	10/21/20 1330
Sample Matrix:	Misc. Solid	**Date Received:**	10/22/20
Sample Name:	16EW06-201021-FD	**Units:**	µg/Kg
Lab Code:	E2001035-011	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.938	0.750	0.300	1	10/28/20	10/28/20 18:17	368660	701275	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2001035
Project:	HS20101123	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	µg/L
Lab Code:	EQ2000537-01	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	10/26/20	10/26/20 14:04	368462	701198	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2001035
Project:	HS20101123	**Date Collected:**	NA
Sample Matrix:	Misc. Solid	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	µg/Kg
Lab Code:	EQ2000548-01	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.955	0.750	0.300	1	10/28/20	10/28/20 17:14	368660	701275	

Accuracy & Precision

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2001035
Project:	HS20101123	**Date Analyzed:**	10/26/20
Sample Matrix:	Ground Water		

Lab Control Sample Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method:	6850	**Units:**	µg/L
Prep Method:	Method	**Basis:**	As Received
		Extraction Lot:	368462

	Lab Control Sample EQ2000537-02			Duplicate Lab Control Sample EQ2000537-03					
Analyte Name	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Perchlorate	0.101	0.100	101	0.104	0.100	104	84 - 119	3	15

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

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

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2001035
Project:	HS20101123	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2000537-02	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.101**		0.100	0.0500	0.0250	1	10/26/20	10/26/20 14:12	368462	701198	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2001035
Project:	HS20101123	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Duplicate Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2000537-03	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.104**		0.100	0.0500	0.0250	1	10/26/20	10/26/20 14:20	368462	701198	

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2001035
Project:	HS20101123	**Date Analyzed:**	10/28/20
Sample Matrix:	Misc. Solid		

Lab Control Sample Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method:	6850	**Units:**	µg/Kg
Prep Method:	Method	**Basis:**	As Received
		Extraction Lot:	368660

	Lab Control Sample EQ2000548-02			Duplicate Lab Control Sample EQ2000548-03					
Analyte Name	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Perchlorate	103	102	101	109	102	106	84 - 121	5	15

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

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

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2001035
Project:	HS20101123	**Date Collected:**	NA
Sample Matrix:	Misc. Solid	**Date Received:**	NA
Sample Name:	Lab Control Sample	**Units:**	µg/Kg
Lab Code:	EQ2000548-02	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**103**		1.02	0.765	0.307	1	10/28/20	10/28/20 17:22	368660	701275	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2001035
Project:	HS20101123	**Date Collected:**	NA
Sample Matrix:	Misc. Solid	**Date Received:**	NA
Sample Name:	Duplicate Lab Control Sample	**Units:**	µg/Kg
Lab Code:	EQ2000548-03	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**109**		1.02	0.768	0.308	1	10/28/20	10/28/20 17:30	368660	701275	

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2001035
Project:	HS20101123	**Date Collected:**	10/21/20
Sample Matrix:	Ground Water	**Date Received:**	10/22/20
		Date Analyzed:	10/26/20

Matrix Spike Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Sample Name:	16WW56-201021	**Units:**	µg/L
Lab Code:	E2001035-001	**Basis:**	As Received

Analytical Method: 6850

		16WW56-201021MS				16WW56-201021DMS					
		Matrix Spike				**Duplicate Matrix Spike**					
		EQ2000537-04				EQ2000537-05					
Analyte Name	**Sample Result**	**Result**	**Spike Amount**	**% Rec**		**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Perchlorate	0.309	0.407	0.100	98		0.407	0.100	98	84 - 119	<1	15

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

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

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

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2001035
Project:	HS20101123	**Date Collected:**	10/21/20 0750
Sample Matrix:	Ground Water	**Date Received:**	10/22/20
Sample Name:	16WW56-201021	**Units:**	µg/L
Lab Code:	EQ2000537-04	**Basis:**	As Received
Run Type:	Matrix Spike		

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.407**		0.100	0.0500	0.0250	1	10/26/20	10/26/20 14:28	368462	701198	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2001035
Project:	HS20101123	**Date Collected:**	10/21/20 0750
Sample Matrix:	Ground Water	**Date Received:**	10/22/20
Sample Name:	16WW56-201021	**Units:**	µg/L
Lab Code:	EQ2000537-05	**Basis:**	As Received
Run Type:	Duplicate Matrix Spike		

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.407**		0.100	0.0500	0.0250	1	10/26/20	10/26/20 14:35	368462	701198	

Initial Calibration

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

20201020

1st Review: Grivera
2nd Review: Kneir

Injection Log
LCMS01 -Shimadzu 8050

ICAL Date: 9/20/2020
Cal. Std. xp: 11/18/2020
ICAL ID: **EC2000045**

Mobile Phases **A:** 0.75% Formic Acid/Water 3100807-09 **B:** MeOH 3100802-01

			File Name	Acquisition Method	Dilution	R	Comments	Date/Time
1	PERCHLORATE1		20201020_009	Perchlorate6850b.lcm	1x	☒	3100806-05	10/20/2020 17:02
2	PERCHLORATE2		20201020_011	Perchlorate6850b.lcm	1x	☒	3100806-07	10/20/2020 17:18
3	PERCHLORATE3		20201020_012	Perchlorate6850b.lcm	1x	☒	3100807-01	10/20/2020 17:26
4	PERCHLORATE4		20201020_013	Perchlorate6850b.lcm	1x	☒	3100807-02	10/20/2020 17:34
5	PERCHLORATE5		20201020_014	Perchlorate6850b.lcm	1x	☒	3100807-03	10/20/2020 17:42
6	PERCHLORATE6		20201020_015	Perchlorate6850b.lcm	1x	☒	3100807-04	10/20/2020 17:50
7	PERCHLORATE7		20201020_016	Perchlorate6850b.lcm	1x	☒	3100807-05	10/20/2020 17:58
8	PERCHLORATE8		20201020_017	Perchlorate6850b.lcm	1x	☒	3100807-06	10/20/2020 18:06
9	PERCHLORATE9		20201020_018	Perchlorate6850b.lcm	1x	☒	3100807-07	10/20/2020 18:14
10	PERCHLORATEICV		20201020_019	Perchlorate6850b.lcm	1x	☒	3100807-08	10/20/2020 18:21
11	IB		20201020_020	Perchlorate6850b.lcm	1x	☒		10/20/2020 18:29
12	LODV		20201020_021	Perchlorate6850b.lcm	1x	☒		10/20/2020 18:37
13	ICS		20201020_022	Perchlorate6850b.lcm	1x	☒		10/20/2020 18:45
14	PERCHLORATE7		20201020_023	Perchlorate6850b.lcm	1x	☒	3100807-05	10/20/2020 18:53
15	EQ2000512-03RR		20201020_024	Perchlorate6850b.lcm	1x	☒		10/20/2020 19:01
16	E2000965-005X2		20201020_025	Perchlorate6850b.lcm	2x	☒		10/20/2020 19:09
17	E2000966-002X2		20201020_026	Perchlorate6850b.lcm	2x	☒		10/20/2020 19:17
18	E2000971-001X2		20201020_027	Perchlorate6850b.lcm	2x	☒		10/20/2020 19:25
19	E2000971-003X2		20201020_028	Perchlorate6850b.lcm	2x	☒		10/20/2020 19:33
20	E2000971-004X2		20201020_029	Perchlorate6850b.lcm	2x	☒		10/20/2020 19:40
21	E2000971-005X10		20201020_030	Perchlorate6850b.lcm	10x	☒		10/20/2020 19:48
22	PERCHLORATE7		20201020_031	Perchlorate6850b.lcm	1x	☒	3100807-05	10/20/2020 19:56
23	EQ2000513-02RR		20201020_032	Perchlorate6850b.lcm	1x	☒		10/20/2020 20:04
24	EQ2000513-03RR		20201020_033	Perchlorate6850b.lcm	1x	☒		10/20/2020 20:12
25	EQ2000513-04RR		20201020_034	Perchlorate6850b.lcm	1x	☒		10/20/2020 20:20
26	EQ2000513-05RR		20201020_035	Perchlorate6850b.lcm	1x	☒		10/20/2020 20:28
27	E2000981-001X2		20201020_036	Perchlorate6850b.lcm	2x	☒		10/20/2020 20:36
28	E2000982-001X200		20201020_037	Perchlorate6850b.lcm	200x	☒		10/20/2020 20:44
29	E2000984-001X2		20201020_038	Perchlorate6850b.lcm	2x	☒		10/20/2020 20:51
30	E2000985-002X20		20201020_039	Perchlorate6850b.lcm	20x	☒		10/20/2020 20:59
31	E2000985-003X2		20201020_040	Perchlorate6850b.lcm	2x	☒		10/20/2020 21:07
32	E2000985-004X10		20201020_041	Perchlorate6850b.lcm	10x	☒		10/20/2020 21:15
33	PERCHLORATE7		20201020_042	Perchlorate6850b.lcm	1x	☒	3100807-05	10/20/2020 21:23
34	E2000985-006X10		20201020_043	Perchlorate6850b.lcm	10x	☒		10/20/2020 21:31
35	E2000996-003X2		20201020_044	Perchlorate6850b.lcm	2x	☒		10/20/2020 21:39
36	E2000996-005X2		20201020_045	Perchlorate6850b.lcm	2x	☒		10/20/2020 21:47
37	E2000996-006X5		20201020_046	Perchlorate6850b.lcm	5x	☒		10/20/2020 21:55
38	E2000996-009X5		20201020_047	Perchlorate6850b.lcm	5x	☒		10/20/2020 22:02
39	PERCHLORATE7		20201020_048	Perchlorate6850b.lcm	1x	☒	3100807-05	10/20/2020 22:10
40	null		20201020_049	Perchlorate6850b.lcm	1x	☒		10/20/2020 22:15
41	null		20201020_050	Perchlorate6850b.lcm	1x	☒		10/20/2020 22:20
42								
43								

Initial Calibration - Detailed Report

Calibration ID: EC2000045 **Instrument ID:** E-LCMS-01
Column Name: 1

#	Lab Code	Sample Name	File Location	Aquisition Date
01	EC2000045-01	PERCHLORATE1	20201020_009	10/20/2020 17:02
02	EC2000045-02	PERCHLORATE2	20201020_011	10/20/2020 17:18
03	EC2000045-03	PERCHLORATE3	20201020_012	10/20/2020 17:26
04	EC2000045-04	PERCHLORATE4	20201020_013	10/20/2020 17:34
05	EC2000045-05	PERCHLORATE5	20201020_014	10/20/2020 17:42
06	EC2000045-06	PERCHLORATE6	20201020_015	10/20/2020 17:50
07	EC2000045-07	PERCHLORATE7	20201020_016	10/20/2020 17:58
08	EC2000045-08	PERCHLORATE8	20201020_017	10/20/2020 18:06
09	EC2000045-09	PERCHLORATE9	20201020_018	10/20/2020 18:14

Analyte	Curve Fit	Weighting		
Perchlorate	**Linear**	**Equal**	**R2 = 0.9997655579102110**	**Y=0.09298 X+0.005025**

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.1000	0.1448	02	0.7000	0.09763	03	1.0000	0.1037	04	2.0000	0.09831
05	5.0000	0.0959	06	10.0000	0.08798	07	20.0000	0.09511	08	30.0000	0.09343
09	50.0000	0.09287									

Analyte

Perchlorate

#	Amount	Calculated Conc	%D	#	Amount	Calculated Conc	%D	#	Amount	Calculated Conc	%D
01	0.1000	0.102	1.6	02	0.7000	0.681	-2.7	03	1.0000	1.06	6.1
04	2.0000	2.06	3.0	05	5.0000	5.10	2.1	06	10.0000	9.41	-5.9
07	20.0000	20.4	2.0	08	30.0000	30.1	0.3	09	50.0000	49.9	-0.2

Initial Calibration Verification Summary Report

Calibration ID:	EC2000045	**Instrument ID:**	E-LCMS-01
Datafile ID:	20201020_019	**Column Name:**	1

Analyte	Lab Code	Type	Curve Fit	True Value	Calc Conc	Units	Result	Criteria
Perchlorate	EC2000045-10	T	Linear	10	10.013	ng/mL	0.1	<= 15

ALS Group Houston

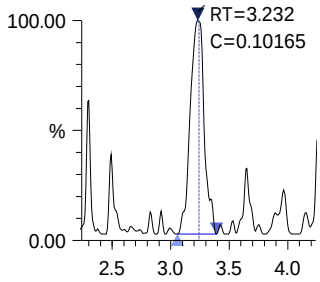
PERCHLORATE1

Date acquired: 10/20/2020 5:02:55 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20201020\20201020_009.lcd
Vial: 5 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE1	10/20/2020 5:02:55 PM	3205	0.10165	20201020_009	3.232	25.0000	1.0000	5
Sodium Perchlorate-18O4_IS	PERCHLORATE1	10/20/2020 5:02:55 PM	221415	1.00000	20201020_009	3.222	25.0000	1.0000	5

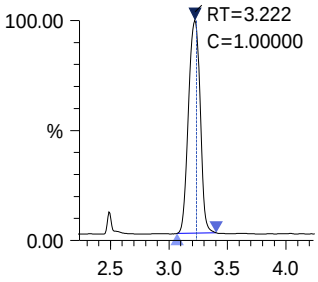
Perchlorate

Conc 0.10165
Area 3205
Q 99.00>83.00 (-) 3.87e2



Sodium Perchlorate-18O4 _IS

Conc 1.00000
Area 221415
ISTD 107.00>89.00 (-) 3.20e4



ALS Group Houston

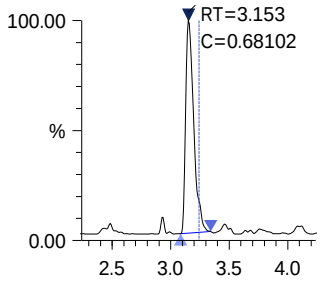
PERCHLORATE2

Date acquired: 10/20/2020 5:18:44 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20201020\20201020_011.lcd
Vial: 7 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE2	10/20/2020 5:18:44 PM	12196	0.68102	20201020_011	3.153	25.0000	1.0000	7
Sodium Perchlorate-18O4_IS	PERCHLORATE2	10/20/2020 5:18:44 PM	178459	1.00000	20201020_011	3.151	25.0000	1.0000	7

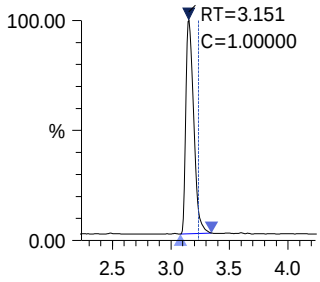
Perchlorate

Conc 0.68102
Area 12196
Q 99.00>83.00 (-) 2.52e3



Sodium Perchlorate-18O4 _IS

Conc 1.00000
Area 178459
ISTD 107.00>89.00 (-) 3.74e4



ALS Group Houston

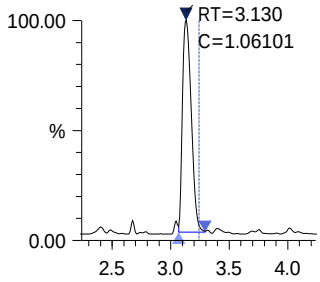
PERCHLORATE3

Date acquired: 10/20/2020 5:26:37 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20201020\20201020_012.lcd
Vial: 8 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE3	10/20/2020 5:26:37 PM	17953	1.06101	20201020_012	3.130	25.0000	1.0000	8
Sodium Perchlorate-18O4_IS	PERCHLORATE3	10/20/2020 5:26:37 PM	173169	1.00000	20201020_012	3.123	25.0000	1.0000	8

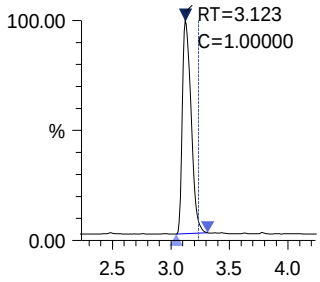
Perchlorate

Conc 1.06101
Area 17953
Q 99.00>83.00 (-) 3.39e3



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 173169
ISTD 107.00>89.00 (-) 3.29e4



ALS Group Houston

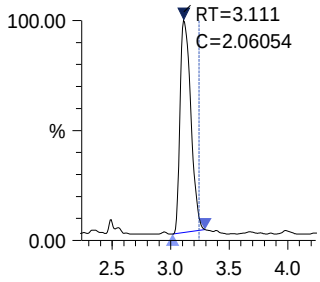
PERCHLORATE4

Date acquired: 10/20/2020 5:34:30 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20201020\20201020_013.lcd
Vial: 9 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE4	10/20/2020 5:34:30 PM	36954	2.06054	20201020_013	3.111	25.0000	1.0000	9
Sodium Perchlorate-18O4_IS	PERCHLORATE4	10/20/2020 5:34:30 PM	187954	1.00000	20201020_013	3.113	25.0000	1.0000	9

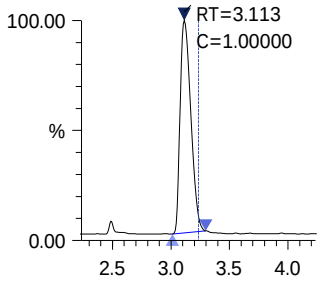
Perchlorate

Conc 2.06054
Area 36954
Q 99.00>83.00 (-) 5.74e3



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 187954
ISTD 107.00>89.00 (-) 2.97e4



ALS Group Houston

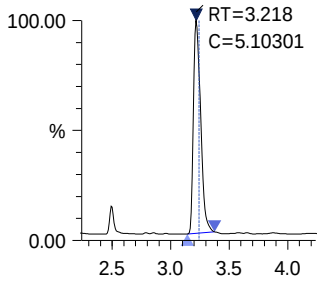
PERCHLORATE5

Date acquired: 10/20/2020 5:42:26 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20201020\20201020_014.lcd
Vial: 10 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE5	10/20/2020 5:42:26 PM	79828	5.10301	20201020_014	3.218	25.0000	1.0000	10
Sodium Perchlorate-18O4_IS	PERCHLORATE5	10/20/2020 5:42:26 PM	166486	1.00000	20201020_014	3.217	25.0000	1.0000	10

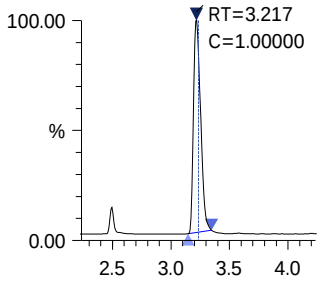
Perchlorate

Conc 5.10301
Area 79828
Q 99.00>83.00 (-) 1.88e4



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 166486
ISTD 107.00>89.00 (-) 3.98e4



ALS Group Houston

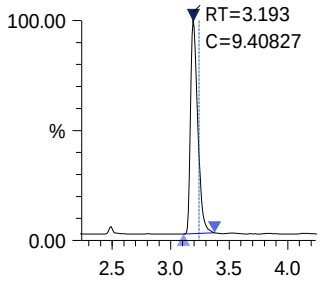
PERCHLORATE6

Date acquired: 10/20/2020 5:50:19 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20201020\20201020_015.lcd
Vial: 4 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE6	10/20/2020 5:50:19 PM	136097	9.40827	20201020_015	3.193	25.0000	1.0000	4
Sodium Perchlorate-18O4_IS	PERCHLORATE6	10/20/2020 5:50:19 PM	154693	1.00000	20201020_015	3.190	25.0000	1.0000	4

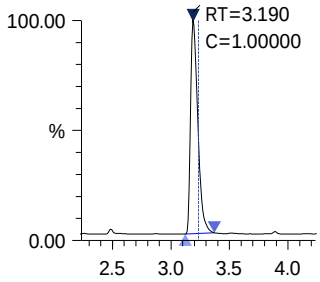
Perchlorate

Conc 9.40827
Area 136097
Q 99.00>83.00 (-) 3.16e4



Sodium Perchlorate-18O4 _IS

Conc 1.00000
Area 154693
ISTD 107.00>89.00 (-) 3.55e4



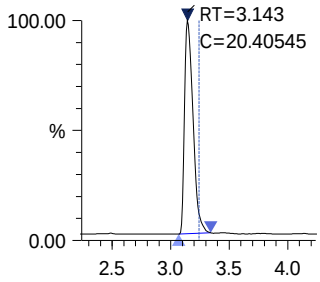
PERCHLORATE7

Date acquired: 10/20/2020 5:58:14 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20201020\20201020_016.lcd
Vial: 11 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE7	10/20/2020 5:58:14 PM	286302	20.40545	20201020_016	3.143	25.0000	1.0000	11
Sodium Perchlorate-18O4_IS	PERCHLORATE7	10/20/2020 5:58:14 PM	150504	1.00000	20201020_016	3.142	25.0000	1.0000	11

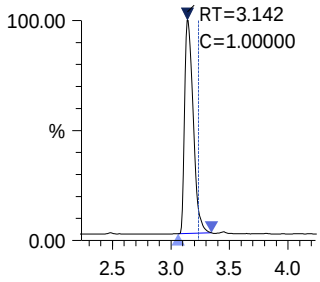
Perchlorate

Conc 20.40545
Area 286302
Q 99.00>83.00 (-) 5.58e4



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 150504
ISTD 107.00>89.00 (-) 2.89e4



ALS Group Houston

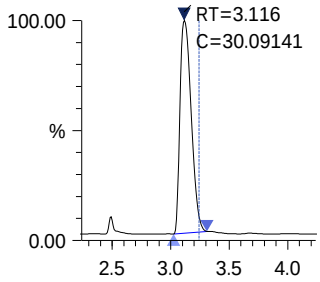
PERCHLORATE8

Date acquired: 10/20/2020 6:06:08 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20201020\20201020_017.lcd
Vial: 12 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE8	10/20/2020 6:06:08 PM	429904	30.09141	20201020_017	3.116	25.0000	1.0000	12
Sodium Perchlorate-18O4_IS	PERCHLORATE8	10/20/2020 6:06:08 PM	153380	1.00000	20201020_017	3.115	25.0000	1.0000	12

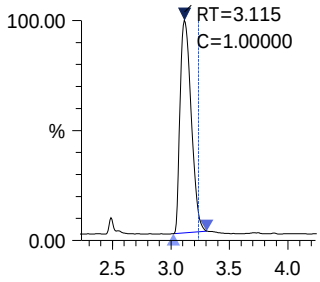
Perchlorate

Conc 30.09141
Area 429904
Q 99.00>83.00 (-) 6.42e4



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 153380
ISTD 107.00>89.00 (-) 2.32e4



ALS Group Houston

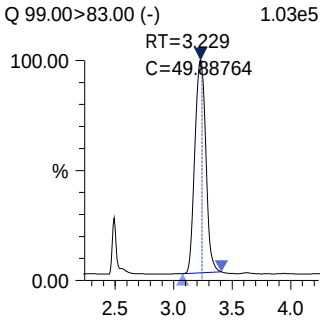
PERCHLORATE9

Date acquired: 10/20/2020 6:14:02 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20201020\20201020_018.lcd
Vial: 13 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE9	10/20/2020 6:14:02 PM	663959	49.88764	20201020_018	3.229	25.0000	1.0000	13
Sodium Perchlorate-18O4_IS	PERCHLORATE9	10/20/2020 6:14:02 PM	142988	1.00000	20201020_018	3.226	25.0000	1.0000	13

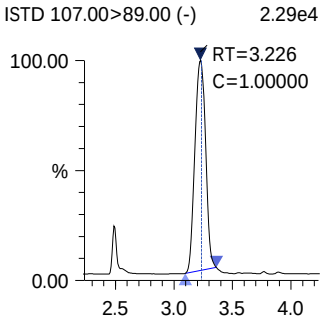
Perchlorate

Conc 49.88764
Area 663959



Sodium Perchlorate-18O4 _IS

Conc 1.00000
Area 142988



ALS Group Houston

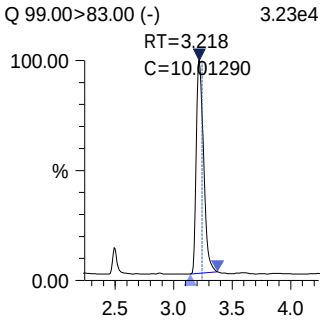
PERCHLORATEICV

Date acquired: 10/20/2020 6:21:55 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20201020\20201020_019.lcd
Vial: 14 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATEICV	10/20/2020 6:21:55 PM	138426	10.01290	20201020_019	3.218	25.0000	1.0000	14
Sodium Perchlorate-18O4_IS	PERCHLORATEICV	10/20/2020 6:21:55 PM	147890	1.00000	20201020_019	3.215	25.0000	1.0000	14

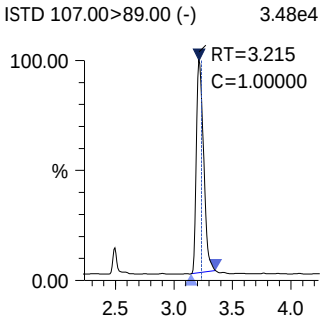
Perchlorate

Conc 10.01290
Area 138426



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 147890



Chromatograms and Selected Ion Monitoring

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 320, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

20201026

1st Review: Grivera
2nd Review: Kneir

Injection Log
LCMS01 -Shimadzu 8050

ICAL Date: 9/20/2020
Cal. Std. xp: 11/18/2020
ICAL ID: **EC2000045**

Mobile Phases **A:** 0.75% Formic Acid/Water 3100807-09 **B:** MeOH 3100802-01

			File Name	Acquisition Method	Dilution	R	Comments	Date/Time
1	null		20201026_001	Perchlorate6850b.lcm	1x	☒		10/26/2020 9:44
2	null		20201026_002	Perchlorate6850b.lcm	1x	☒		10/26/2020 9:49
3	IB		20201026_003	Perchlorate6850b.lcm	1x	☒		10/26/2020 9:55
4	IB		20201026_004	Perchlorate6850b.lcm	1x	☒		10/26/2020 10:02
5	ICS		20201026_006	Perchlorate6850b.lcm	1x	☒		10/26/2020 10:18
6	PERCHLORATE7		20201026_007	Perchlorate6850b.lcm	1x	☒	3100807-05	10/26/2020 10:26
7	E2001003-002		20201026_008	Perchlorate6850b.lcm	1x	☒		10/26/2020 10:34
8	E2001014-001		20201026_009	Perchlorate6850b.lcm	1x	☒		10/26/2020 10:42
9	E2001015-001		20201026_010	Perchlorate6850b.lcm	1x	☒		10/26/2020 10:50
10	E2001015-002		20201026_011	Perchlorate6850b.lcm	1x	☒		10/26/2020 10:58
11	EQ2000533-01		20201026_012	Perchlorate6850b.lcm	1x	☒		10/26/2020 11:06
12	EQ2000533-02		20201026_013	Perchlorate6850b.lcm	1x	☒		10/26/2020 11:13
13	EQ2000533-03		20201026_014	Perchlorate6850b.lcm	1x	☒		10/26/2020 11:21
14	PERCHLORATE7		20201026_015	Perchlorate6850b.lcm	1x	☒	3100807-05	10/26/2020 11:29
15	LODV		20201026_016	Perchlorate6850b.lcm	1x	☒		10/26/2020 11:44
16	E2001003-001X500		20201026_017	Perchlorate6850b.lcm	500x	☒		10/26/2020 11:52
17	E2001003-003X100		20201026_018	Perchlorate6850b.lcm	100x	☒		10/26/2020 12:00
18	E2001003-004X1000		20201026_019	Perchlorate6850b.lcm	1000x	☒		10/26/2020 12:08
19	EQ2000533-04X10		20201026_020	Perchlorate6850b.lcm	10x	☒		10/26/2020 12:16
20	EQ2000533-05X10		20201026_021	Perchlorate6850b.lcm	10x	☒		10/26/2020 12:24
21	E2001014-002X2		20201026_022	Perchlorate6850b.lcm	2x	☒		10/26/2020 12:31
22	E2001015-003X10		20201026_023	Perchlorate6850b.lcm	10x	☒		10/26/2020 12:39
23	PERCHLORATE7		20201026_024	Perchlorate6850b.lcm	1x	☒	3100807-05	10/26/2020 12:47
24	E2001014-002		20201026_025	Perchlorate6850b.lcm	1x	☒		10/26/2020 12:59
25	PERCHLORATE7		20201026_026	Perchlorate6850b.lcm	1x	☒	3100807-05	10/26/2020 13:07
26	E2000949-001		20201026_027	Perchlorate6850b.lcm	1x	☒		10/26/2020 13:48
27	E2000949-002		20201026_028	Perchlorate6850b.lcm	1x	☒		10/26/2020 13:56
28	EQ2000537-01		20201026_029	Perchlorate6850b.lcm	1x	☒		10/26/2020 14:04
29	EQ2000537-02		20201026_030	Perchlorate6850b.lcm	1x	☒		10/26/2020 14:12
30	EQ2000537-03		20201026_031	Perchlorate6850b.lcm	1x	☒		10/26/2020 14:20
31	EQ2000537-04		20201026_032	Perchlorate6850b.lcm	1x	☒		10/26/2020 14:28
32	EQ2000537-05		20201026_033	Perchlorate6850b.lcm	1x	☒		10/26/2020 14:35
33	E2001035-001		20201026_034	Perchlorate6850b.lcm	1x	☒		10/26/2020 14:43
34	E2001035-002		20201026_035	Perchlorate6850b.lcm	1x	☒		10/26/2020 14:51
35	E2001035-003		20201026_036	Perchlorate6850b.lcm	1x	☒		10/26/2020 14:59
36	PERCHLORATE7		20201026_037	Perchlorate6850b.lcm	1x	☒	3100807-05	10/26/2020 15:07
37	E2001035-004		20201026_038	Perchlorate6850b.lcm	1x	☒		10/26/2020 15:15
38	E2001035-005		20201026_039	Perchlorate6850b.lcm	1x	☒		10/26/2020 15:23
39	E2001035-006		20201026_040	Perchlorate6850b.lcm	1x	☒		10/26/2020 15:31
40	E2001035-007		20201026_041	Perchlorate6850b.lcm	1x	☒		10/26/2020 15:38
41	E2001035-008		20201026_042	Perchlorate6850b.lcm	1x	☒		10/26/2020 15:46
42	E2001035-009		20201026_043	Perchlorate6850b.lcm	1x	☒		10/26/2020 15:54
43	E2001036-001		20201026_044	Perchlorate6850b.lcm	1x	☒		10/26/2020 16:02
44	E2001036-002		20201026_045	Perchlorate6850b.lcm	1x	☒		10/26/2020 16:10
45	E2001036-003		20201026_046	Perchlorate6850b.lcm	1x	☒		10/26/2020 16:18
46	E2001036-004		20201026_047	Perchlorate6850b.lcm	1x	☒		10/26/2020 16:26
47	PERCHLORATE7		20201026_048	Perchlorate6850b.lcm	1x	☒	3100807-05	10/26/2020 16:34
48	E2001036-005		20201026_049	Perchlorate6850b.lcm	1x	☒		10/26/2020 16:42
49	E2001036-006		20201026_050	Perchlorate6850b.lcm	1x	☒		10/26/2020 16:49
50	E2001036-007		20201026_051	Perchlorate6850b.lcm	1x	☒		10/26/2020 16:57
51	E2001036-008		20201026_052	Perchlorate6850b.lcm	1x	☒		10/26/2020 17:05
52	PERCHLORATE7		20201026_053	Perchlorate6850b.lcm	1x	☒	3100807-05	10/26/2020 17:13
53	EQ2000538-01		20201026_054	Perchlorate6850b.lcm	1x	☒		10/26/2020 17:21
54	EQ2000538-02		20201026_055	Perchlorate6850b.lcm	1x	☒		10/26/2020 17:29
55	EQ2000538-03		20201026_056	Perchlorate6850b.lcm	1x	☒		10/26/2020 17:37
56	E2001028-001		20201026_057	Perchlorate6850b.lcm	1x	☒		10/26/2020 17:45
57	E2001028-002		20201026_058	Perchlorate6850b.lcm	1x	☒		10/26/2020 17:52
58	E2001028-003		20201026_059	Perchlorate6850b.lcm	1x	☒		10/26/2020 18:00
59	E2001028-004		20201026_060	Perchlorate6850b.lcm	1x	☒		10/26/2020 18:08
60	E2001028-005		20201026_061	Perchlorate6850b.lcm	1x	☒		10/26/2020 18:16
61	E2001028-006		20201026_062	Perchlorate6850b.lcm	1x	☒		10/26/2020 18:24

20201026

1st Review: Grivera
2nd Review: Kneir

Injection Log
LCMS01 -Shimadzu 8050

ICAL Date: 9/20/2020
Cal. Std. xp: 11/18/2020
ICAL ID: **EC2000045**

Mobile Phases **A:** 0.75% Formic Acid/Water 3100807-09 **B:** MeOH 3100802-01

			File Name	Acquisition Method	Dilution	R	Comments	Date/Time
62	E2001028-007		20201026_063	Perchlorate6850b.lcm	1x	☒		10/26/2020 18:32
63	PERCHLORATE7		20201026_064	Perchlorate6850b.lcm	1x	☒	3100807-05	10/26/2020 18:40
64	E2001028-008		20201026_065	Perchlorate6850b.lcm	1x	☒		10/26/2020 18:48
65	E2001028-009		20201026_066	Perchlorate6850b.lcm	1x	☒		10/26/2020 18:55
66	E2001028-010		20201026_067	Perchlorate6850b.lcm	1x	☒		10/26/2020 19:03
67	E2001028-011		20201026_068	Perchlorate6850b.lcm	1x	☒		10/26/2020 19:11
68	E2001028-012		20201026_069	Perchlorate6850b.lcm	1x	☒		10/26/2020 19:19
69	E2001028-013		20201026_070	Perchlorate6850b.lcm	1x	☒		10/26/2020 19:27
70	E2001028-014		20201026_071	Perchlorate6850b.lcm	1x	☒		10/26/2020 19:35
71	E2001028-015		20201026_072	Perchlorate6850b.lcm	1x	☒		10/26/2020 19:43
72	E2001034-014		20201026_073	Perchlorate6850b.lcm	1x	☒		10/26/2020 19:51
73	PERCHLORATE7		20201026_074	Perchlorate6850b.lcm	1x	☒	3100807-05	10/26/2020 19:59
74								
75								
76								

20201028

1st Review: Grivera
2nd Review: Kneir

Injection Log
LCMS01 -Shimadzu 8050

ICAL Date: 9/20/2020
Cal. Std. xp: 11/18/2020
ICAL ID: **EC2000045**

Mobile Phases **A:** 0.75% Formic Acid/Water 3100807-09 **B:** MeOH 3100802-01

			File Name	Acquisition Method	Dilution	R	Comments	Date/Time
1	null		20201028_001	Perchlorate6850b.lcm	1x	☒		10/28/2020 9:12
2	null		20201028_002	Perchlorate6850b.lcm	1x	☒		10/28/2020 9:17
3	IB		20201028_003	Perchlorate6850b.lcm	1x	☒		10/28/2020 9:23
4	IB		20201028_004	Perchlorate6850b.lcm	1x	☒		10/28/2020 9:31
5	LODV		20201028_005	Perchlorate6850b.lcm	1x	☒		10/28/2020 9:38
6	ICS		20201028_006	Perchlorate6850b.lcm	1x	☒		10/28/2020 9:46
7	PERCHLORATE7		20201028_007	Perchlorate6850b.lcm	1x	☒	3100807-05	10/28/2020 9:54
8	E2001035-004X2		20201028_008	Perchlorate6850b.lcm	x2	☒		10/28/2020 11:19
9	E2001036-008X2		20201028_009	Perchlorate6850b.lcm	x2	☒		10/28/2020 11:27
10	E2001028-009X100		20201028_010	Perchlorate6850b.lcm	x100	☒		10/28/2020 11:35
11	E2001028-010X50		20201028_011	Perchlorate6850b.lcm	x50	☒		10/28/2020 11:43
12	E2001028-011X100		20201028_012	Perchlorate6850b.lcm	x100	☒		10/28/2020 11:51
13	E2001028-013X100		20201028_014	Perchlorate6850b.lcm	x100	☒		10/28/2020 12:06
14	PERCHLORATE7		20201028_015	Perchlorate6850b.lcm	1x	☒	3100807-05	10/28/2020 12:14
15	E2000949-002X2		20201028_017	Perchlorate6850b.lcm	x2	☒		10/28/2020 12:57
16	E2001028-011X200		20201028_018	Perchlorate6850b.lcm	x200	☒		10/28/2020 13:05
17	E2001028-012X100		20201028_019	Perchlorate6850b.lcm	x100	☒		10/28/2020 13:13
18	PERCHLORATE7		20201028_020	Perchlorate6850b.lcm	1x	☒	3100807-05	10/28/2020 13:21
19	E2001035-004		20201028_021	Perchlorate6850b.lcm	1x	☒		10/28/2020 13:29
20	PERCHLORATE7		20201028_022	Perchlorate6850b.lcm	1x	☒	3100807-05	10/28/2020 13:37
21	PERCHLORATE7		20201028_023	Perchlorate6850b.lcm	1x	☒	3100807-05	10/28/2020 17:06
22	EQ2000548-01		20201028_024	Perchlorate6850b.lcm	1x	☒		10/28/2020 17:14
23	EQ2000548-02		20201028_025	Perchlorate6850b.lcm	1x	☒		10/28/2020 17:22
24	EQ2000548-03		20201028_026	Perchlorate6850b.lcm	1x	☒		10/28/2020 17:30
25	EQ2000548-04		20201028_027	Perchlorate6850b.lcm	1x	☒		10/28/2020 17:38
26	EQ2000548-05		20201028_028	Perchlorate6850b.lcm	1x	☒		10/28/2020 17:46
27	E2001025-001		20201028_029	Perchlorate6850b.lcm	1x	☒		10/28/2020 17:53
28	E2001025-002		20201028_030	Perchlorate6850b.lcm	1x	☒		10/28/2020 18:01
29	E2001035-010		20201028_031	Perchlorate6850b.lcm	1x	☒		10/28/2020 18:09
30	E2001035-011		20201028_032	Perchlorate6850b.lcm	1x	☒		10/28/2020 18:17
31	E2001036-009		20201028_033	Perchlorate6850b.lcm	1x	☒		10/28/2020 18:25
32	PERCHLORATE7		20201028_034	Perchlorate6850b.lcm	1x	☒	3100807-05	10/28/2020 18:33
33								
34								
35								

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2001035
Project:	HS20101123	**Date Analyzed:**	10/26/20

Continuing Calibration Verification Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method:	6850	**Calibration Date:**	10/20/20
File ID:	I:\LCMS01\DATA\20201026\20201026_026	**Calibration ID:**	EC2000045
		Analysis Lot:	701198
		Units:	ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Perchlorate	10.0	9.37	NA	NA	NA	-6.3	± 15 %	Linear

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS20101123

Service Request: E2001035
Date Analyzed: 10/26/20

Continuing Calibration Verification Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
File ID: I:\LCMS01\DATA\20201026\20201026_037

Calibration Date: 10/20/20
Calibration ID: EC2000045
Analysis Lot: 701198
Units: ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Perchlorate	10.0	10.4	NA	NA	NA	4.4	± 15 %	Linear

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS20101123

Service Request: E2001035
Date Analyzed: 10/26/20

Continuing Calibration Verification Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
File ID: I:\LCMS01\DATA\20201026\20201026_048

Calibration Date: 10/20/20
Calibration ID: EC2000045
Analysis Lot: 701198
Units: ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Perchlorate	10.0	9.44	NA	NA	NA	-5.6	± 15 %	Linear

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS20101123

Service Request: E2001035
Date Analyzed: 10/26/20

Continuing Calibration Verification Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
File ID: I:\LCMS01\DATA\20201026\20201026_053

Calibration Date: 10/20/20
Calibration ID: EC2000045
Analysis Lot: 701198
Units: ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Perchlorate	10.0	9.52	NA	NA	NA	-4.8	± 15 %	Linear

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS20101123

Service Request: E2001035
Date Analyzed: 10/28/20

Continuing Calibration Verification Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
File ID: I:\LCMS01\DATA\20201028\20201028_007

Calibration Date: 10/20/20
Calibration ID: EC2000045
Analysis Lot: 701198
Units: ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Perchlorate	10.0	9.80	NA	NA	NA	-2.0	± 15 %	Linear

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS20101123

Service Request: E2001035
Date Analyzed: 10/28/20

Continuing Calibration Verification Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
File ID: I:\LCMS01\DATA\20201028\20201028_015

Calibration Date: 10/20/20
Calibration ID: EC2000045
Analysis Lot: 701198
Units: ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Perchlorate	10.0	9.76	NA	NA	NA	-2.4	± 15 %	Linear

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS20101123

Service Request: E2001035
Date Analyzed: 10/28/20

Continuing Calibration Verification Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
File ID: I:\LCMS01\DATA\20201028\20201028_020

Calibration Date: 10/20/20
Calibration ID: EC2000045
Analysis Lot: 701198
Units: ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Perchlorate	10.0	9.76	NA	NA	NA	-2.4	± 15 %	Linear

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS20101123

Service Request: E2001035
Date Analyzed: 10/28/20

Continuing Calibration Verification Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
File ID: I:\LCMS01\DATA\20201028\20201028_022

Calibration Date: 10/20/20
Calibration ID: EC2000045
Analysis Lot: 701198
Units: ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Perchlorate	10.0	9.44	NA	NA	NA	-5.6	± 15 %	Linear

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS20101123

Service Request: E2001035
Date Analyzed: 10/28/20

Continuing Calibration Verification Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
File ID: I:\LCMS01\DATA\20201028\20201028_023

Calibration Date: 10/20/20
Calibration ID: EC2000045
Analysis Lot: 701275
Units: ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Perchlorate	10.0	9.93	NA	NA	NA	-0.7	± 15 %	Linear

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS20101123

Service Request: E2001035
Date Analyzed: 10/28/20

Continuing Calibration Verification Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
File ID: I:\LCMS01\DATA\20201028\20201028_034

Calibration Date: 10/20/20
Calibration ID: EC2000045
Analysis Lot: 701275
Units: ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Perchlorate	10.0	9.49	NA	NA	NA	-5.1	± 15 %	Linear

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2001035
Project:	HS20101123	**Date Analyzed:**	10/26/20 13:07

Internal Standard Area and RT Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

File ID:	I:\LCMS01\DATA\20201026\20201026_026	**Lab Code:**	EQ2000550-01
Instrument ID:	E-LCMS-01	**Analysis Lot:**	701198
Analytical Method:	6850	**Signal ID:**	1

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	169,894	3.17
	Upper Limit ==>	254,841	5.17
	Lower Limit ==>	84,947	1.17
Associated Analyses			
Continuing Calibration Verification	EQ2000550-01	230,699	3.07
Method Blank	EQ2000537-01	251,836	3.06
Lab Control Sample	EQ2000537-02	252,875	3.06
Duplicate Lab Control Sample	EQ2000537-03	250,027	3.06
16WW56-201021MS	EQ2000537-04	114,572	3.04
16WW56-201021DMS	EQ2000537-05	116,922	3.04
16WW56-201021	E2001035-001	119,976	3.03
16RW11-201021	E2001035-002	85,003	3.05
16RW11-201021-FD	E2001035-003	85,286	3.04

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

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2001035
Project:	HS20101123	**Date Analyzed:**	10/26/20 15:07

Internal Standard Area and RT Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

File ID:	I:\LCMS01\DATA\20201026\20201026_037	**Lab Code:**	EQ2000550-02
Instrument ID:	E-LCMS-01	**Analysis Lot:**	701198
Analytical Method:	6850	**Signal ID:**	1

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	169,894	3.17
	Upper Limit ==>	254,841	5.17
	Lower Limit ==>	84,947	1.17
Associated Analyses			
Continuing Calibration Verification	EQ2000550-02	253,082	3.06
16WW40-201021	E2001035-005	107,556	3.04
16WW12-201021	E2001035-006	113,227	3.04
16RW04-201021	E2001035-007	204,476	3.04
16RW04-201021-FD	E2001035-008	222,558	3.04
16EW02-201021	E2001035-009	142,354	3.04

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

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2001035
Project:	HS20101123	**Date Analyzed:**	10/26/20 16:34

Internal Standard Area and RT Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

File ID:	I:\LCMS01\DATA\20201026\20201026_048	**Lab Code:**	EQ2000550-03
Instrument ID:	E-LCMS-01	**Analysis Lot:**	701198
Analytical Method:	6850	**Signal ID:**	1

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	169,894	3.17
	Upper Limit ==>	254,841	5.17
	Lower Limit ==>	84,947	1.17
Associated Analyses			
Continuing Calibration Verification	EQ2000550-03	240,567	3.06

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

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2001035
Project:	HS20101123	**Date Analyzed:**	10/26/20 17:13

Internal Standard Area and RT Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

File ID:	I:\LCMS01\DATA\20201026\20201026_053	**Lab Code:**	EQ2000550-04
Instrument ID:	E-LCMS-01	**Analysis Lot:**	701198
Analytical Method:	6850	**Signal ID:**	1

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	169,894	3.17
	Upper Limit ==>	254,841	5.17
	Lower Limit ==>	84,947	1.17
Associated Analyses			
Continuing Calibration Verification	EQ2000550-04	244,513	3.06

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

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2001035
Project:	HS20101123	**Date Analyzed:**	10/28/20 09:54

Internal Standard Area and RT Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

File ID:	I:\LCMS01\DATA\20201028\20201028_007	**Lab Code:**	EQ2000550-05
Instrument ID:	E-LCMS-01	**Analysis Lot:**	701198
Analytical Method:	6850	**Signal ID:**	1

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	169,894	3.17
	Upper Limit ==>	254,841	5.17
	Lower Limit ==>	84,947	1.17
Associated Analyses			
Continuing Calibration Verification	EQ2000550-05	188,253	3.06

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

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2001035
Project:	HS20101123	**Date Analyzed:**	10/28/20 12:14

Internal Standard Area and RT Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

File ID:	I:\LCMS01\DATA\20201028\20201028_015	**Lab Code:**	EQ2000550-06
Instrument ID:	E-LCMS-01	**Analysis Lot:**	701198
Analytical Method:	6850	**Signal ID:**	1

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	169,894	3.17
	Upper Limit ==>	254,841	5.17
	Lower Limit ==>	84,947	1.17
Associated Analyses			
Continuing Calibration Verification	EQ2000550-06	198,091	3.04

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

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2001035
Project:	HS20101123	**Date Analyzed:**	10/28/20 13:21

Internal Standard Area and RT Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

File ID:	I:\LCMS01\DATA\20201028\20201028_020	**Lab Code:**	EQ2000550-07
Instrument ID:	E-LCMS-01	**Analysis Lot:**	701198
Analytical Method:	6850	**Signal ID:**	1

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	169,894	3.17
	Upper Limit ==>	254,841	5.17
	Lower Limit ==>	84,947	1.17
Associated Analyses			
Continuing Calibration Verification	EQ2000550-07	206,211	3.05
16IW20-201021	E2001035-004	142,110	2.97

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

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2001035
Project:	HS20101123	**Date Analyzed:**	10/28/20 13:37

Internal Standard Area and RT Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

File ID:	I:\LCMS01\DATA\20201028\20201028_022	**Lab Code:**	EQ2000550-08
Instrument ID:	E-LCMS-01	**Analysis Lot:**	701198
Analytical Method:	6850	**Signal ID:**	1

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	169,894	3.17
	Upper Limit ==>	254,841	5.17
	Lower Limit ==>	84,947	1.17
Associated Analyses			
Continuing Calibration Verification	EQ2000550-08	217,130	3.05

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

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2001035
Project:	HS20101123	**Date Analyzed:**	10/28/20 17:06

Internal Standard Area and RT Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

File ID:	I:\LCMS01\DATA\20201028\20201028_023	**Lab Code:**	EQ2000551-01
Instrument ID:	E-LCMS-01	**Analysis Lot:**	701275
Analytical Method:	6850	**Signal ID:**	1

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	169,894	3.17
	Upper Limit ==>	254,841	5.17
	Lower Limit ==>	84,947	1.17
Associated Analyses			
Continuing Calibration Verification	EQ2000551-01	228,962	2.99
Method Blank	EQ2000548-01	237,056	3.05
Lab Control Sample	EQ2000548-02	212,794	3.05
Duplicate Lab Control Sample	EQ2000548-03	206,721	3.05
16EW06-201021	E2001035-010	161,544	3.05
16EW06-201021-FD	E2001035-011	150,930	3.05

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

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2001035
Project:	HS20101123	**Date Analyzed:**	10/28/20 18:33

Internal Standard Area and RT Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

File ID:	I:\LCMS01\DATA\20201028\20201028_034	**Lab Code:**	EQ2000551-02
Instrument ID:	E-LCMS-01	**Analysis Lot:**	701275
Analytical Method:	6850	**Signal ID:**	1

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	169,894	3.17
	Upper Limit ==>	254,841	5.17
	Lower Limit ==>	84,947	1.17
Associated Analyses			
Continuing Calibration Verification	EQ2000551-02	225,202	3.05

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

ALS Group Houston

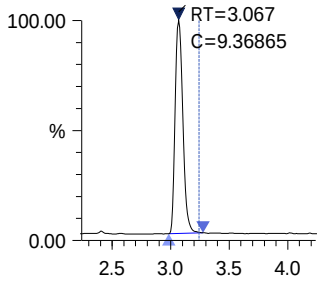
PERCHLORATE7

Date acquired: 10/26/2020 1:07:32 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20201026\20201026_026.lcd
Vial: 4 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE7	10/26/2020 1:07:32 PM	202116	9.36865	20201026_026	3.067	25.0000	1.0000	4
Sodium Perchlorate-18O4_IS	PERCHLORATE7	10/26/2020 1:07:32 PM	230699	1.00000	20201026_026	3.065	25.0000	1.0000	4

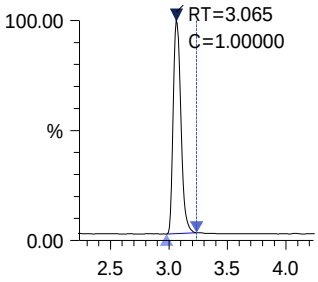
Perchlorate

Conc 9.36865
Area 202116
Q 99.00>83.00 (-) 4.48e4



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 230699
ISTD 107.00>89.00 (-) 5.11e4



ALS Group Houston

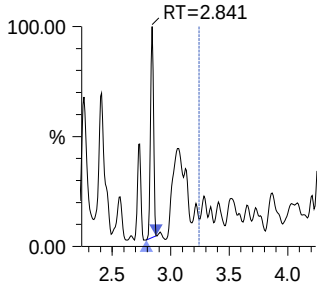
EQ2000537-01

Date acquired: 10/26/2020 2:04:29 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20201026\20201026_029.lcd
Vial: 3 | Inj. Volume: 25.0000uL | Tray: 5

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	EQ2000537-01	10/26/2020 2:04:29 PM	----	----	20201026_029	----	25.0000	1.0000	3
Sodium Perchlorate-18O4_IS	EQ2000537-01	10/26/2020 2:04:29 PM	251836	1.00000	20201026_029	3.057	25.0000	1.0000	3

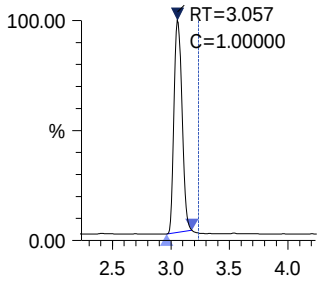
Perchlorate

Conc ----
Area ----
Q 99.00>83.00 (-) 4.04e2



Sodium Perchlorate-18O4 _IS

Conc 1.00000
Area 251836
ISTD 107.00>89.00 (-) 5.34e4



ALS Group Houston

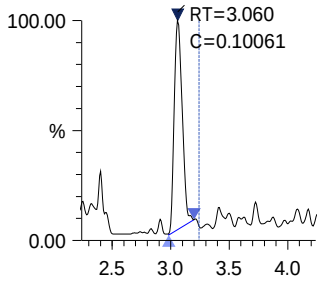
EQ2000537-02

Date acquired: 10/26/2020 2:12:23 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20201026\20201026_030.lcd
Vial: 4 | Inj. Volume: 25.0000uL | Tray: 5

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	EQ2000537-02	10/26/2020 2:12:23 PM	3636	0.10061	20201026_030	3.060	25.0000	1.0000	4
Sodium Perchlorate-18O4_IS	EQ2000537-02	10/26/2020 2:12:23 PM	252875	1.00000	20201026_030	3.056	25.0000	1.0000	4

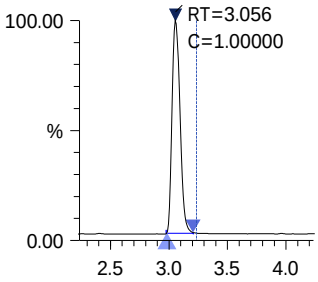
Perchlorate

Conc 0.10061
Area 3636
Q 99.00>83.00 (-) 7.92e2



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 252875
ISTD 107.00>89.00 (-) 5.81e4



ALS Group Houston

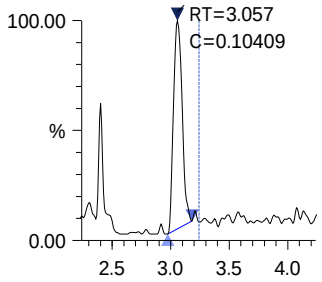
EQ2000537-03

Date acquired: 10/26/2020 2:20:15 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20201026\20201026_031.lcd
Vial: 5 | Inj. Volume: 25.0000uL | Tray: 5

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	EQ2000537-03	10/26/2020 2:20:15 PM	3676	0.10409	20201026_031	3.057	25.0000	1.0000	5
Sodium Perchlorate-18O4_IS	EQ2000537-03	10/26/2020 2:20:15 PM	250027	1.00000	20201026_031	3.057	25.0000	1.0000	5

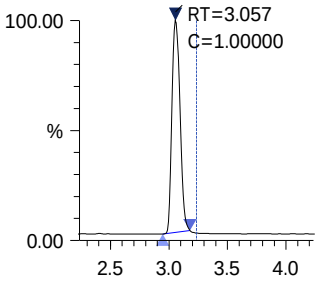
Perchlorate

Conc 0.10409
Area 3676
Q 99.00>83.00 (-) 7.41e2



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 250027
ISTD 107.00>89.00 (-) 5.29e4



ALS Group Houston

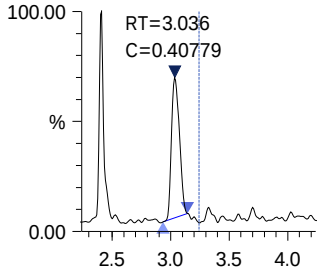
EQ2000537-04

Date acquired: 10/26/2020 2:28:05 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20201026\20201026_032.lcd
Vial: 6 | Inj. Volume: 25.0000uL | Tray: 5

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	EQ2000537-04	10/26/2020 2:28:05 PM	4964	0.40779	20201026_032	3.036	25.0000	1.0000	6
Sodium Perchlorate-18O4_IS	EQ2000537-04	10/26/2020 2:28:05 PM	115604	1.00000	20201026_032	3.037	25.0000	1.0000	6

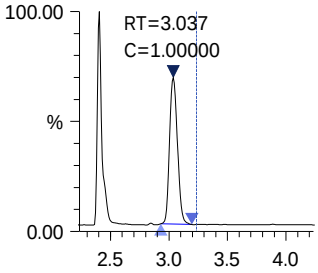
Perchlorate

Conc 0.40779
Area 4964
Q 99.00>83.00 (-) 1.61e3



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 115604
ISTD 107.00>89.00 (-) 3.60e4



ALS Group Houston

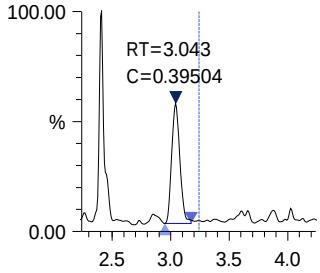
EQ2000537-05

Date acquired: 10/26/2020 2:35:56 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20201026\20201026_033.lcd
Vial: 7 | Inj. Volume: 25.0000uL | Tray: 5

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	EQ2000537-05	10/26/2020 2:35:56 PM	4922	0.39504	20201026_033	3.043	25.0000	1.0000	7
Sodium Perchlorate-18O4_IS	EQ2000537-05	10/26/2020 2:35:56 PM	117876	1.00000	20201026_033	3.038	25.0000	1.0000	7

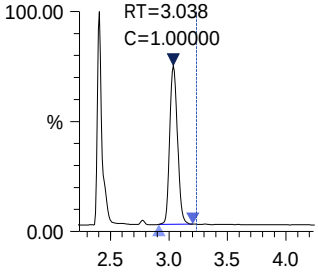
Perchlorate

Conc 0.39504
Area 4922
Q 99.00>83.00 (-) 1.82e3



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 117876
ISTD 107.00>89.00 (-) 3.44e4



ALS Group Houston

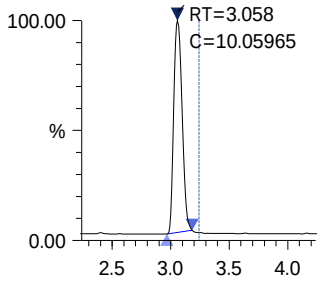
PERCHLORATE7

Date acquired: 10/26/2020 3:07:28 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20201026\20201026_037.lcd
Vial: 4 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE7	10/26/2020 3:07:28 PM	246952	10.05965	20201026_037	3.058	25.0000	1.0000	4
Sodium Perchlorate-18O4_IS	PERCHLORATE7	10/26/2020 3:07:28 PM	262617	1.00000	20201026_037	3.057	25.0000	1.0000	4

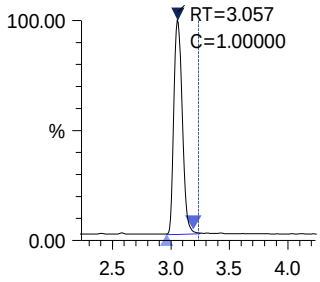
Perchlorate

Conc 10.05965
Area 246952
Q 99.00>83.00 (-) 5.08e4



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 262617
ISTD 107.00>89.00 (-) 5.74e4



ALS Group Houston

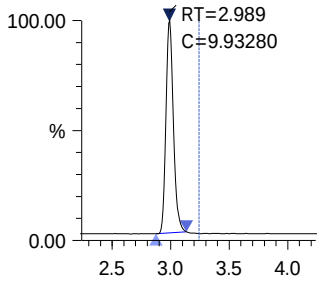
PERCHLORATE7

Date acquired: 10/28/2020 5:06:37 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20201028\20201028_023.lcd
Vial: 4 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE7	10/28/2020 5:06:37 PM	212604	9.93280	20201028_023	2.989	25.0000	1.0000	4
Sodium Perchlorate-18O4_IS	PERCHLORATE7	10/28/2020 5:06:37 PM	228962	1.00000	20201028_023	2.986	25.0000	1.0000	4

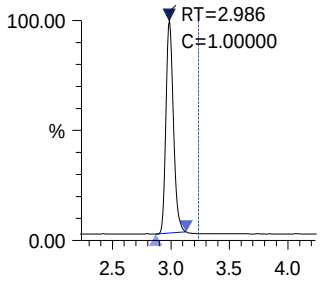
Perchlorate

Conc 9.93280
Area 212604
Q 99.00>83.00 (-) 4.79e4



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 228962
ISTD 107.00>89.00 (-) 5.11e4



ALS Group Houston

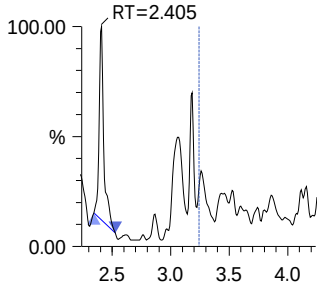
EQ2000548-01

Date acquired: 10/28/2020 5:14:30 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20201028\20201028_024.lcd
Vial: 45 | Inj. Volume: 25.0000uL | Tray: 5

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	EQ2000548-01	10/28/2020 5:14:30 PM	----	----	20201028_024	----	25.0000	1.0000	45
Sodium Perchlorate-18O4_IS	EQ2000548-01	10/28/2020 5:14:30 PM	237056	1.00000	20201028_024	3.052	25.0000	1.0000	45

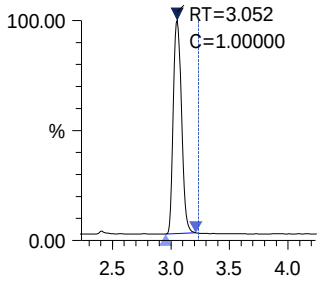
Perchlorate

Conc ----
Area ----
Q 99.00>83.00 (-) 3.39e2



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 237056
ISTD 107.00>89.00 (-) 4.88e4



ALS Group Houston

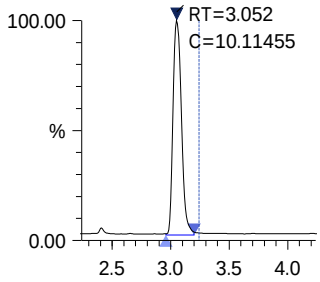
EQ2000548-02

Date acquired: 10/28/2020 5:22:24 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20201028\20201028_025.lcd
Vial: 46 | Inj. Volume: 25.0000uL | Tray: 5

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	EQ2000548-02	10/28/2020 5:22:24 PM	201186	10.11455	20201028_025	3.052	25.0000	1.0000	46
Sodium Perchlorate-18O4_IS	EQ2000548-02	10/28/2020 5:22:24 PM	212794	1.00000	20201028_025	3.049	25.0000	1.0000	46

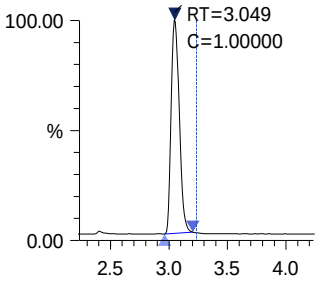
Perchlorate

Conc 10.11455
Area 201186
Q 99.00>83.00 (-) 4.04e4



Sodium Perchlorate-18O4 _IS

Conc 1.00000
Area 212794
ISTD 107.00>89.00 (-) 4.43e4



ALS Group Houston

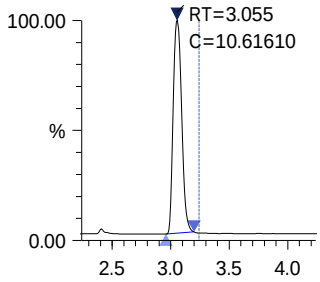
EQ2000548-03

Date acquired: 10/28/2020 5:30:17 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20201028\20201028_026.lcd
Vial: 47 | Inj. Volume: 25.0000uL | Tray: 5

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	EQ2000548-03	10/28/2020 5:30:17 PM	205086	10.61610	20201028_026	3.055	25.0000	1.0000	47
Sodium Perchlorate-18O4_IS	EQ2000548-03	10/28/2020 5:30:17 PM	206721	1.00000	20201028_026	3.052	25.0000	1.0000	47

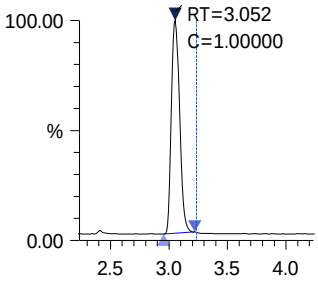
Perchlorate

Conc 10.61610
Area 205086
Q 99.00>83.00 (-) 4.15e4



Sodium Perchlorate-18O4 _IS

Conc 1.00000
Area 206721
ISTD 107.00>89.00 (-) 4.26e4



ALS Group Houston

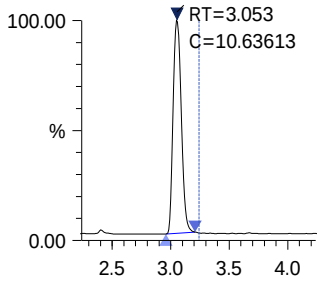
EQ2000548-04

Date acquired: 10/28/2020 5:38:09 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20201028\20201028_027.lcd
Vial: 48 | Inj. Volume: 25.0000uL | Tray: 5

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	EQ2000548-04	10/28/2020 5:38:09 PM	148600	10.63613	20201028_027	3.053	25.0000	1.0000	48
Sodium Perchlorate-18O4_IS	EQ2000548-04	10/28/2020 5:38:09 PM	149504	1.00000	20201028_027	3.050	25.0000	1.0000	48

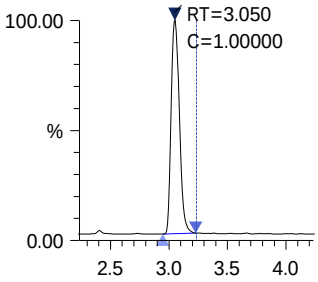
Perchlorate

Conc 10.63613
Area 148600
Q 99.00>83.00 (-) 3.10e4



Sodium Perchlorate-18O4 _IS

Conc 1.00000
Area 149504
ISTD 107.00>89.00 (-) 3.07e4



ALS Group Houston

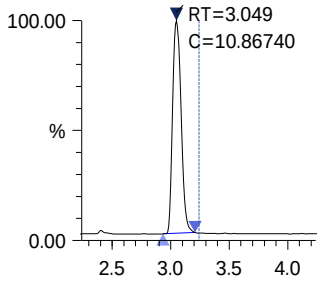
EQ2000548-05

Date acquired: 10/28/2020 5:46:02 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20201028\20201028_028.lcd
Vial: 49 | Inj. Volume: 25.0000uL | Tray: 5

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	EQ2000548-05	10/28/2020 5:46:02 PM	188229	10.86740	20201028_028	3.049	25.0000	1.0000	49
Sodium Perchlorate-18O4_IS	EQ2000548-05	10/28/2020 5:46:02 PM	185364	1.00000	20201028_028	3.046	25.0000	1.0000	49

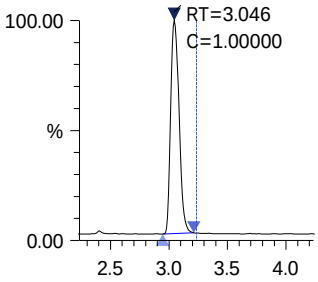
Perchlorate

Conc 10.86740
Area 188229
Q 99.00>83.00 (-) 3.78e4



Sodium Perchlorate-18O4 _IS

Conc 1.00000
Area 185364
ISTD 107.00>89.00 (-) 3.75e4



ALS Group Houston

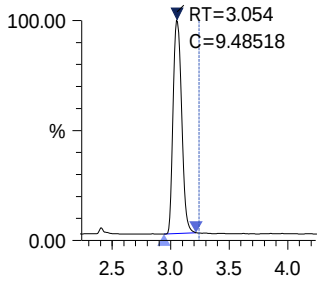
PERCHLORATE7

Date acquired: 10/28/2020 6:33:19 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20201028\20201028_034.lcd
Vial: 4 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE7	10/28/2020 6:33:19 PM	199740	9.48518	20201028_034	3.054	25.0000	1.0000	4
Sodium Perchlorate-18O4_IS	PERCHLORATE7	10/28/2020 6:33:19 PM	225202	1.00000	20201028_034	3.051	25.0000	1.0000	4

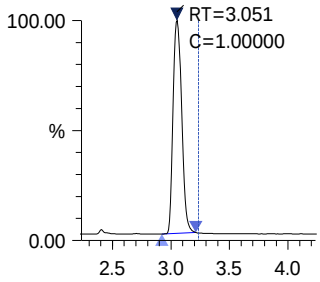
Perchlorate

Conc 9.48518
Area 199740
Q 99.00>83.00 (-) 3.98e4



Sodium Perchlorate-18O4 _IS

Conc 1.00000
Area 225202
ISTD 107.00>89.00 (-) 4.43e4



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

November 06, 2020

Analytical Report for Service Request No: K2009641

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

RE: ALS Houston DOD TOC

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory October 23, 2020
For your reference, these analyses have been assigned our service request number **K2009641.**

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

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
Qualifiers
State Certifications, Accreditations, And Licenses
Case Narrative
Chain of Custody
General Chemistry
Raw Data
    General Chemistry

Acronyms

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

Inorganic Data Qualifiers

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

Metals Data Qualifiers

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

Organic Data Qualifiers

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

Additional Petroleum Hydrocarbon Specific Qualifiers

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

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

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

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

Case Narrative

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

1317 South 13th Ave, Kelso, WA 98626 | 1-360-577-7222 | www.alsglobal.com

ALS Environmental

Client: ALS Environmental - US
Project: ALS Houston DOD TOC
Sample Matrix: Ground Water

Service Request: K2009641
Date Received: 10/23/2020

CASE NARRATIVE

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

Sample Receipt:

Seven ground water samples were received for analysis at ALS Environmental on 10/23/2020. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The samples were stored at minimum in accordance with the analytical method requirements.

General Chemistry:

No significant anomalies were noted with this analysis.

Approved by Kelley Lovejoy Date 11/06/2020

Chain of Custody

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

K20096041

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID:** **14994**

SUBCONTRACT TO:

ALS Environmental Kelso
1317 S. 13th Avenue
Kelso, WA 98626 **Phone:** +1 360 501 3312

CUSTOMER INFORMATION:

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

INVOICE INFORMATION:

Company: ALS Houston
Contact: Accounts Payable
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Reference: HS20101123
TSR: Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS20101123-01**	**16WW56-201021**	**Groundwater**	**21 Oct 2020 07:50**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			05 Nov 2020
2.	**HS20101123-04**	**16IW20-201021**	**Groundwater**	**21 Oct 2020 09:30**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			05 Nov 2020
3.	**HS20101123-05**	**16WW40-201021**	**Groundwater**	**21 Oct 2020 10:15**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			05 Nov 2020
4.	**HS20101123-06**	**16WW12-201021**	**Groundwater**	**21 Oct 2020 11:00**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			05 Nov 2020
5.	**HS20101123-07**	**16RW04-201021**	**Groundwater**	**21 Oct 2020 11:45**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			05 Nov 2020
6.	**HS20101123-08**	**16RW04-201021-FD**	**Groundwater**	**21 Oct 2020 11:45**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			05 Nov 2020
7.	**HS20101123-09**	**16EW02-201021**	**Groundwater**	**21 Oct 2020 12:35**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			05 Nov 2020

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.
HS20101123-01 = MS/MSD

K2009641

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID:** **14994**

QC Level: DOD IV (DoD Data Package)

Relinquished By:		Date/Time:	10/22/2020 1800.
Received By:		Date/Time:	10/23/20 0945
Cooler ID(s):		Temperature(s):	

PM KL

Cooler Receipt and Preservation Form

Client ARS - Houston Service Request K20 09641

Received: 10/23/20 Opened: 10/23/20 By: BR Unloaded: 10/23/20 By: BR

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
4. Was a Temperature Blank present in cooler? NA Y N If yes, notate the temperature in the appropriate column below:
   If no, take the temperature of a representative sample bottle contained within the cooler; notate in the column "Sample Temp":
5. Were samples received within the method specified temperature ranges? NA Y N
   If no, were they received on ice and same day as collected? If not, notate the cooler # below and notify the PM. NA Y N

If applicable, tissue samples were received: *Frozen* *Partially Thawed* *Thawed*

Temp Blank	Sample Temp	IR Gun	Cooler #/COC ID / NA	Out of temp indicate with "X"	PM Notified If out of temp	Tracking Number NA	Filed
MH	3.4	1202				189188818907	

6. Packing material: *Inserts* *Baggies* *Bubble Wrap* *Gel Packs* *Wet Ice* *Dry Ice* *Sleeves* _____
7. Were custody papers properly filled out (ink, signed, etc.)? NA Y N
8. Were samples received in good condition (unbroken) NA Y N
9. Were all sample labels complete (ie, analysis, preservation, etc.)? NA Y N
10. Did all sample labels and tags agree with custody papers? NA Y N
11. Were appropriate bottles/containers and volumes received for the tests indicated? NA Y N
12. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* NA Y N
13. Were VOA vials received without headspace? *Indicate in the table below.* NA Y N
14. Was C12/Res negative? NA Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count Bottle Type	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:**	K2009641
Project:	ALS Houston DOD TOC	**Date Collected:**	10/21/20
Sample Matrix:	Ground Water	**Date Received:**	10/23/20
Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA

Carbon, Total Organic

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
16WW56-201021	K2009641-001	**0.72**	0.50	0.20	0.07	1	11/03/20 11:36	
16IW20-201021	K2009641-002	**14.4**	0.50	0.20	0.07	1	11/03/20 11:36	
16WW40-201021	K2009641-003	**7.35**	0.50	0.20	0.07	1	11/03/20 11:36	
16WW12-201021	K2009641-004	**3.98**	0.50	0.20	0.07	1	11/03/20 11:36	
16RW04-201021	K2009641-005	**2.70**	0.50	0.20	0.07	1	11/03/20 11:36	
16RW04-201021-FD	K2009641-006	**2.67**	0.50	0.20	0.07	1	11/03/20 11:36	
16EW02-201021	K2009641-007	**7.36**	0.50	0.20	0.07	1	11/03/20 11:36	
Method Blank	K2009641-MB	ND	0.50	0.20	0.07	1	11/03/20 11:36	U

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K2009641
Project	ALS Houston DOD TOC	**Date Collected:**	10/21/20
Sample Matrix:	Ground Water	**Date Received:**	10/23/20
		Date Analyzed:	11/03/20

Replicate Sample Summary
General Chemistry Parameters

Sample Name:	16WW56-201021	**Units:**	mg/L
Lab Code:	K2009641-001	**Basis:**	NA

Analyte Name	Analysis Method	LOQ	LOD	MDL	Sample Result	Duplicate Sample K2009641-001DUP Result	Average	RPD	RPD Limit
Carbon, Total Organic	SM 5310 C	0.50	0.20	0.07	0.72	1.99	1.35	94 #	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:**	K2009641
Project:	ALS Houston DOD TOC	**Date Collected:**	10/21/20
Sample Matrix:	Ground Water	**Date Received:**	10/23/20
		Date Analyzed:	11/3/20
		Date Extracted:	NA

Matrix Spike Summary
Carbon, Total Organic

Sample Name:	16WW56-201021	**Units:**	mg/L
Lab Code:	K2009641-001	**Basis:**	NA
Analysis Method:	SM 5310 C		
Prep Method:	None		

Matrix Spike
K2009641-001MS

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Carbon, Total Organic	0.72	26.3	25.0	102	83-117

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

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

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

Matrix Spike and Matrix Spike Duplicate Data is presented for information purposes only. The matrix may or may not be relevant to samples reported in this report. The laboratory evaluates system performance based on the LCS and LCSD control limits.

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K2009641
Project:	ALS Houston DOD TOC	**Date Analyzed:**	11/03/20
Sample Matrix:	Ground Water	**Date Extracted:**	NA

Lab Control Sample Summary
Carbon, Total Organic

Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA
		Analysis Lot:	701641

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K2009641-LCS	24.0	25.0	96	83-117

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US **Service Request:** K2009641
Project: ALS Houston DOD TOC

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	701641	KQ2017240-01	11/03/20 11:36	25.0	25.7	103	90-110
CCV2	701641	KQ2017240-02	11/03/20 11:36	25.0	26.1	104	90-110
CCV3	701641	KQ2017240-03	11/03/20 11:36	25.0	25.8	103	90-110
CCV4	701641	KQ2017240-04	11/03/20 11:36	25.0	25.9	103	90-110
CCV5	701641	KQ2017240-16	11/03/20 11:36	25.0	25.8	103	90-110
CCV6	701641	KQ2017240-18	11/03/20 11:36	25.0	25.9	103	90-110

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: ALS Houston DOD TOC

Service Request:K2009641

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	701641	KQ2017240-05	11/03/20 11:36	0.50	0.20	0.07	ND	U
CCB2	701641	KQ2017240-06	11/03/20 11:36	0.50	0.20	0.07	ND	U
CCB3	701641	KQ2017240-07	11/03/20 11:36	0.50	0.20	0.07	ND	U
CCB4	701641	KQ2017240-08	11/03/20 11:36	0.50	0.20	0.07	ND	U
CCB5	701641	KQ2017240-15	11/03/20 11:36	0.50	0.20	0.07	ND	U
CCB6	701641	KQ2017240-17	11/03/20 11:36	0.50	0.20	0.07	ND	U

Raw Data

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

General Chemistry

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

Work Request # Original ( ) K2009134, 9255, 9599, 9641, 9670

Tier: II II IV IV II

Date Analyzed: 11.3.20

Analyst: MAS

Run # 701641

Analysis: SM 5310C/TOCT

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:

-Rpd between source & dup sample is high but both results are below 5x the MRL

Final Approved by: [signature] Date: 11/5/20

DQREPORT

Analytical Results Summary

Instrument Name: K-TOC-01 **Analyst:** MSPECHT **Analysis Lot:** 701641 **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
K2009134-002	Carbon, Total Organic	N/A		Water	0.64 mg/L	10 mL	64 mg/L	100	7	50			11/3/20 11:36:00	N	II
K2009134-003	Carbon, Total Organic	N/A		Water	0.36 mg/L	10 mL	50 mg/L U	100	7	50			11/3/20 11:36:00	N	II
K2009134-004	Carbon, Total Organic	N/A		Water	0.00 mg/L	10 mL	50 mg/L U	100	7	50			11/3/20 11:36:00	N	II
K2009255-001	Carbon, Total Organic	N/A		Ground Water	31.28 mg/L	10 mL	31.3 mg/L	1	0.07	0.50			11/3/20 11:36:00	N	II
K2009255-002	Carbon, Total Organic	N/A		Ground Water	14.47 mg/L	10 mL	14.5 mg/L	1	0.07	0.50			11/3/20 11:36:00	N	II
K2009255-003	Carbon, Total Organic	N/A		Ground Water	14.31 mg/L	10 mL	14.3 mg/L	1	0.07	0.50			11/3/20 11:36:00	N	II
K2009599-001	Carbon, Total Organic	N/A		Ground Water	14.38 mg/L	10 mL	14.4 mg/L	1	0.07	0.50			11/3/20 11:36:00	N	IV
K2009599-002	Carbon, Total Organic	N/A		Ground Water	3.74 mg/L	10 mL	3.74 mg/L	1	0.07	0.50			11/3/20 11:36:00	N	IV
K2009599-003	Carbon, Total Organic	N/A		Ground Water	8.44 mg/L	10 mL	8.44 mg/L	1	0.07	0.50			11/3/20 11:36:00	Y	IV
K2009599-004	Carbon, Total Organic	N/A		Ground Water	4.52 mg/L	10 mL	4.52 mg/L	1	0.07	0.50			11/3/20 11:36:00	N	IV
K2009599-005	Carbon, Total Organic	N/A		Ground Water	33.24 mg/L	10 mL	332 mg/L	10	0.7	5.0			11/3/20 11:36:00	N	IV
K2009641-001	Carbon, Total Organic	N/A		Ground Water	0.72 mg/L	10 mL	0.72 mg/L	1	0.07	0.50			11/3/20 11:36:00	Y	IV
K2009641-002	Carbon, Total Organic	N/A		Ground Water	14.39 mg/L	10 mL	14.4 mg/L	1	0.07	0.50			11/3/20 11:36:00	N	IV
K2009641-003	Carbon, Total Organic	N/A		Ground Water	7.35 mg/L	10 mL	7.35 mg/L	1	0.07	0.50			11/3/20 11:36:00	N	IV
K2009641-004	Carbon, Total Organic	N/A		Ground Water	3.98 mg/L	10 mL	3.98 mg/L	1	0.07	0.50			11/3/20 11:36:00	N	IV
K2009641-005	Carbon, Total Organic	N/A		Ground Water	2.70 mg/L	10 mL	2.70 mg/L	1	0.07	0.50			11/3/20 11:36:00	N	IV
K2009641-006	Carbon, Total Organic	N/A		Ground Water	2.67 mg/L	10 mL	2.67 mg/L	1	0.07	0.50			11/3/20 11:36:00	N	IV
K2009641-007	Carbon, Total Organic	N/A		Ground Water	7.36 mg/L	10 mL	7.36 mg/L	1	0.07	0.50			11/3/20 11:36:00	N	IV
K2009670-001	Carbon, Total Organic	N/A		Water	12.78 mg/L	10 mL	12.8 mg/L	1	0.07	0.50			11/3/20 11:36:00	N	II
KQ2017240-01	Carbon, Total Organic	CCV		Water	25.74 mg/L	10 mL	25.7 mg/L	1					11/3/20 11:36:00	N	II
KQ2017240-02	Carbon, Total Organic	CCV		Water	26.06 mg/L	10 mL	26.1 mg/L	1					11/3/20 11:36:00	N	II
KQ2017240-03	Carbon, Total Organic	CCV		Water	25.82 mg/L	10 mL	25.8 mg/L	1					11/3/20 11:36:00	N	II
KQ2017240-04	Carbon, Total Organic	CCV		Water	25.86 mg/L	10 mL	25.9 mg/L	1					11/3/20 11:36:00	N	II
KQ2017240-05	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/3/20 11:36:00	N	II
KQ2017240-06	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/3/20 11:36:00	N	II
KQ2017240-07	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/3/20 11:36:00	N	II
KQ2017240-08	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/3/20 11:36:00	N	II
KQ2017240-09	Carbon, Total Organic	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/3/20 11:36:00	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-01 **Analyst:** MSPECHT **Analysis Lot:** 701641 **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
KQ2017240-10	Carbon, Total Organic	LCS		Water	24.00 mg/L	10 mL	24.0 mg/L	1	0.07	0.50	96		11/3/20 11:36:00	N	II
KQ2017240-11	Carbon, Total Organic	MS	K2009641-001	Ground Water	26.31 mg/L	10 mL	26.3 mg/L	1	0.07	0.50	102		11/3/20 11:36:00	N	IV
KQ2017240-12	Carbon, Total Organic	DUP	K2009641-001	Ground Water	1.99 mg/L	10 mL	1.99 mg/L	1	0.07	0.50		94*	11/3/20 11:36:00	N	IV
KQ2017240-13	Carbon, Total Organic	MS	K2009599-003	Ground Water	30.52 mg/L	10 mL	30.5 mg/L	1	0.07	0.50	88		11/3/20 11:36:00	N	IV
KQ2017240-14	Carbon, Total Organic	DUP	K2009599-003	Ground Water	8.47 mg/L	10 mL	8.47 mg/L	1	0.07	0.50		<1	11/3/20 11:36:00	N	IV
KQ2017240-15	Carbon, Total Organic	CCB		Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/3/20 11:36:00	N	II
KQ2017240-16	Carbon, Total Organic	CCV		Ground Water	25.81 mg/L	10 mL	25.8 mg/L	1					11/3/20 11:36:00	N	II
KQ2017240-17	Carbon, Total Organic	CCB		Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/3/20 11:36:00	N	II
KQ2017240-18	Carbon, Total Organic	CCV		Ground Water	25.87 mg/L	10 mL	25.9 mg/L	1					11/3/20 11:36:00	N	II

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

Fusion Report - 11032020
Tuesday, November 03, 2020 11:36 AM

(View - Reps, Unused Reps, Meta-Data, Signature, History)
Printed on 2020/11/04 11:20 - Wednesday

Report Summary Information

Company Location:	Gen Chem Lab		
Schedule Name:	11032020	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

Sample Type: Clean — From Schedule Version 1

	Pos	Analysis Type	Sample ID	Start Time
◈	(clean)		Clean	2020/11/03 11:36

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	13.77	29.98	16.21	49.60	05:24
2	TC Clean	39.08	52.21	13.13	50.34	04:05
3	TC Clean	8.61	21.95	13.34	50.36	03:51
4	TC Clean	10.08	23.09	13.01	50.34	03:51

Sample Type: Clean — From Schedule Version 1

	Pos	Analysis Type	Sample ID	Start Time
◈	(clean)		Clean	2020/11/03 11:58

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	0.19	13.34	13.15	49.82	05:24
2	TC Clean	12.57	25.54	12.97	50.09	04:01
3	TC Clean	5.95	18.94	12.99	50.33	03:49
4	TC Clean	8.24	21.10	12.85	50.24	03:47

Sample Type: Clean From Schedule Version 1

	Pos	Analysis Type	Sample ID	Start Time
◈	(clean)		Clean	2020/11/03 12:20

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	0.36	13.22	12.86	49.50	05:11
2	TC Clean	11.19	24.11	12.92	50.30	04:04
3	TC Clean	5.27	18.13	12.86	50.08	03:46
4	TC Clean	8.34	21.24	12.90	50.07	03:45

Sample Type: Blank (Creating v1471) From Schedule Version 2

	Pos	Analysis Type	Sample ID	Start Time
◈	(blank)		Reagent/Acid Blank	2020/11/03 12:49

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	9.46	22.30	12.83	49.38	05:13
2	TC Clean	11.94	24.85	12.91	50.24	04:06
3	TC Clean	8.41	21.21	12.79	50.08	03:56
4	TC Clean	8.14	20.76	12.62	50.22	03:56
5	Reagent Blank	13.63	26.37	12.75	50.10	05:06
6	Acid Blank	0.79	13.42	12.63	49.86	05:30

Sample Type: Sample From Schedule Version 2

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	D	TOC	RB	0.1929 ppm	0.0000 ppm	0.0000%	2020/11/03 13:23

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.1929	1.9285	11.16	23.76	12.59	50.53	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.8112 (IC) (v1471)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 2

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	26.0291 ppm (PASS)	0.0000 ppm	0%	2020/11/03 13:37

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	26.0291	260.2915	192.48	205.17	12.69	50.55	10:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)	50 ppmC

Sample Type: Check Standard --> CCB From Schedule Version 2

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2020/11/03 13:52

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	8.44	21.27	12.82	50.57	10:33

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)	0 ppmC

Sample Type: Sample From Schedule Version 2

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	1	TOC	MB1	0.0000 ppm	0.0000 ppm	0.0000%	2020/11/03 14:07

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.45	21.04	12.59	50.53	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.8112 (IC) (v1471)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

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 [25.0 ppm]	0 / infinity (NA / NA)	24.3615 ppm (PASS)	0.0000 ppm	0%	2020/11/03 14:22

Pos	Base Analysis	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time

	Type									
C	TOC	25.0 ppm	1	24.3615	243.6154	180.78	193.55	12.77	50.51	10:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)	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	0.3202 ppm	0.0000 ppm	0.0000%	2020/11/03 14:36

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.3202	3.2015	12.06	24.80	12.74	50.46	10:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.8112 (IC) (v1471)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	3	TOC	K2009468-008 DOC	0.7621 ppm	0.0319 ppm	4.1800%	2020/11/03 14:51

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.7396	7.3955	15.00	27.80	12.80	50.44	10:26
2	TOC	0.7846	7.8460	15.32	27.92	12.60	50.56	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.8112 (IC) (v1471)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	4	TOC	K2009501-001 DOC	10.6458 ppm	0.0354 ppm	0.3300%	2020/11/03 15:19

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	10.6708	106.7080	84.66	97.52	12.85	50.50	10:26
2	TOC	10.6208	106.2076	84.31	97.01	12.69	50.48	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.8112 (IC) (v1471)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	5	TOC	K2009501-003 DOC 4x	17.4630 ppm	0.0816 ppm	0.4700%	2020/11/03 15:47

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	17.4053	174.0525	131.91	144.74	12.83	50.51	10:27
2	TOC	17.5207	175.2072	132.72	145.57	12.86	50.46	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.8112 (IC)	CAS_salt_010711	CAS_salt_010711

(v1471) (v4) (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	6	TOC	K2009501-003DUP DOC 4x	17.0412 ppm	0.0286 ppm	0.1700%	2020/11/03 16:15

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	17.0614	170.6141	129.49	141.95	12.45	50.38	10:29
2	TOC	17.0209	170.2092	129.21	141.96	12.75	50.51	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.8112 (IC) (v1471)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	7	TOC	K2009501-003MS DOC 5x	40.6505 ppm	0.1104 ppm	0.2700%	2020/11/03 16:43

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	40.5725	405.7247	294.42	307.16	12.74	50.46	10:25
2	TOC	40.7286	407.2857	295.52	308.25	12.74	50.41	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.8112 (IC) (v1471)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	8	TOC	K2009560-001 DOC	1.7795 ppm	0.0095 ppm	0.5300%	2020/11/03 17:11

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.7862	17.8619	22.34	35.19	12.85	50.34	10:28
2	TOC	1.7728	17.7279	22.25	34.85	12.60	50.48	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.8112 (IC) (v1471)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	9	TOC	K2009560-002 DOC	0.4700 ppm	0.0203 ppm	4.3100%	2020/11/03 17:39

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.4557	4.5572	13.01	25.84	12.83	50.43	10:28
2	TOC	0.4844	4.8438	13.21	26.02	12.81	50.39	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.8112 (IC) (v1471)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 2

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	25.7386 ppm (PASS)	0.0000 ppm	0%	2020/11/03 18:07

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	25.7386	257.3862	190.44	203.18	12.73	50.37	10:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)	50 ppmC

Sample Type: Check Standard --> CCB From Schedule Version 2

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2020/11/03 18:22

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	7.77	20.63	12.85	50.36	10:29

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)	0 ppmC

Sample Type: Sample From Schedule Version 2

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	10	TOC	K2009560-004 DOC	1.1781 ppm	0.0266 ppm	2.2600%	2020/11/03 18:37

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.1592	11.5923	17.94	30.81	12.87	50.40	10:30
2	TOC	1.1969	11.9687	18.21	30.97	12.76	50.55	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.8112 (IC) (v1471)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	11	TOC	K2009560-005 DOC	0.9729 ppm	0.0276 ppm	2.8400%	2020/11/03 19:05

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.9924	9.9244	16.77	29.26	12.49	50.48	10:28
2	TOC	0.9534	9.5338	16.50	29.20	12.71	50.43	10:26

Dilution	Blank Contribution	Method	Calibration

1:10	(TC) 9.8112 (IC) (v1471)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	12	TOC	K2009560-006 DOC	0.7008 ppm	0.0281 ppm	4.0100%	2020/11/03 19:33

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.6810	6.8096	14.59	27.49	12.90	50.41	10:27
2	TOC	0.7207	7.2073	14.87	27.57	12.70	50.40	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.8112 (IC) (v1471)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	13	TOC	K2009560-007 DOC	0.8376 ppm	0.0023 ppm	0.2800%	2020/11/03 20:01

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.8359	8.3592	15.68	28.40	12.73	50.37	10:26
2	TOC	0.8392	8.3920	15.70	28.31	12.61	50.38	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.8112 (IC) (v1471)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	14	TOC	K2009560-008 DOC	0.5497 ppm	0.0073 ppm	1.3200%	2020/11/03 20:29

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5548	5.5480	13.70	26.46	12.75	50.39	10:25
2	TOC	0.5445	5.4453	13.63	26.56	12.93	50.36	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.8112 (IC) (v1471)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	15	TOC	K2009560-009 DOC	0.7137 ppm	0.0290 ppm	4.0700%	2020/11/03 20:57

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.6932	6.9322	14.67	27.47	12.80	50.36	10:27
2	TOC	0.7343	7.3428	14.96	27.64	12.68	50.34	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.8112 (IC) (v1471)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	16	TOC	K2009599-001	14.3778 ppm	0.1881 ppm	1.3100%	2020/11/03 21:25

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	14.5108	145.1081	111.60	124.25	12.65	50.36	10:30
2	TOC	14.2448	142.4480	109.74	122.50	12.76	50.38	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.8112 (IC) (v1471)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	17	TOC	K2009599-002	3.7353 ppm	0.0174 ppm	0.4700%	2020/11/03 21:54

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.7476	37.4761	36.10	48.70	12.60	50.34	10:27
2	TOC	3.7229	37.2295	35.93	48.72	12.79	50.36	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.8112 (IC) (v1471)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	18	TOC	K2009599-003	8.4434 ppm	0.2066 ppm	2.4500%	2020/11/03 22:22

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	8.5895	85.8950	70.06	82.63	12.56	50.38	10:27
2	TOC	8.2973	82.9726	68.02	80.93	12.91	50.37	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.8112 (IC) (v1471)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	19	TOC	K2009599-003DUP	8.4682 ppm	0.1266 ppm	1.5000%	2020/11/03 22:50

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	8.5577	85.5771	69.84	82.73	12.89	50.38	10:28
2	TOC	8.3787	83.7866	68.59	81.35	12.77	50.38	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.8112 (IC) (v1471)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 2

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	26.0569 ppm (PASS)	0.0000 ppm	0%	2020/11/03 23:18

Pos	Base Analysis	ID	Rep	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run

	Type		#							Time
B	TOC	25 ppm	1	26.0569	260.5694	192.68	205.51	12.83	50.37	10:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)	50 ppmC

Sample Type: Check Standard --> CCB From Schedule Version 2

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2020/11/03 23:32

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	8.05	20.73	12.69	50.35	10:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)	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%	2020/11/03 23:47

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.49	20.24	12.75	50.34	10:33

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.8112 (IC) (v1471)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

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 [25.0 ppm]	0 / infinity (NA / NA)	24.0002 ppm (PASS)	0.0000 ppm	0%	2020/11/04 00:02

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	24.0002	240.0016	178.25	191.05	12.80	50.33	10:33

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)	25 ppmC

Sample Type: Sample From Schedule Version 2

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	21	TOC	K2009599-003MS	30.5199 ppm	0.2792 ppm	0.9100%	2020/11/04 00:16

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	30.7173	307.1734	225.29	237.88	12.59	50.33	10:29
2	TOC	30.3225	303.2246	222.52	235.37	12.85	50.33	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.8112 (IC) (v1471)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	22	TOC	K2009599-004	4.5248 ppm	0.1496 ppm	3.3100%	2020/11/04 00:44

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.6306	46.3059	42.29	55.23	12.93	50.33	10:26
2	TOC	4.4190	44.1904	40.81	53.60	12.79	50.33	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.8112 (IC) (v1471)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	23	TOC	K2009599-005 10x	33.2444 ppm	0.4726 ppm	1.4200%	2020/11/04 01:12

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	32.9103	329.1027	240.67	253.38	12.71	50.32	10:27
2	TOC	33.5786	335.7857	245.36	258.09	12.73	50.29	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.8112 (IC) (v1471)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	24	TOC	K2009641-001	5.3742 ppm	0.2819 ppm	5.2500%	2020/11/04 01:40

-NH carry over

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	5.5736	55.7360	48.91	61.56	12.66	50.29	10:31
2	TOC	5.1749	51.7487	46.11	59.07	12.95	50.30	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.8112 (IC) (v1471)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	25	TOC	K2009641-001DUP	1.9856 ppm	0.0348 ppm	1.7500%	2020/11/04 02:09

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time

1	TOC	2.0101	20.1014	23.91	36.68	12.77	50.31	10:28
2	TOC	1.9610	19.6096	23.57	36.34	12.78	50.31	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.8112 (IC) (v1471)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	26	TOC	K2009641-001MS	26.3108 ppm	0.0841 ppm	0.3200%	2020/11/04 02:37

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	26.3703	263.7026	194.79	207.61	12.82	50.26	10:31
2	TOC	26.2514	262.5137	193.96	207.12	13.16	50.27	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.8112 (IC) (v1471)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	27	TOC	K2009641-002	14.3894 ppm	0.3804 ppm	2.6400%	2020/11/04 03:05

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	14.6584	146.5836	112.64	125.62	12.99	50.28	10:27
2	TOC	14.1204	141.2035	108.86	121.75	12.89	50.27	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.8112 (IC) (v1471)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	28	TOC	K2009641-003	7.3487 ppm	0.0012 ppm	0.0200%	2020/11/04 03:33

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	7.3496	73.4955	61.37	74.32	12.95	50.27	10:30
2	TOC	7.3478	73.4784	61.36	74.16	12.81	50.28	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.8112 (IC) (v1471)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	29	TOC	K2009641-004	3.9775 ppm	0.0623 ppm	1.5700%	2020/11/04 04:01

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.0216	40.2160	38.02	50.81	12.78	50.28	10:30
2	TOC	3.9335	39.3350	37.40	50.11	12.71	50.27	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.8112 (IC) (v1471)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	30	TOC	K2009641-005	2.7030 ppm	0.0247 ppm	0.9100%	2020/11/04 04:29

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.6856	26.8557	28.65	41.18	12.53	50.25	10:26
2	TOC	2.7205	27.2050	28.90	41.84	12.95	50.26	10:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.8112 (IC) (v1471)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	31	TOC	K2009641-006	2.6683 ppm	0.0241 ppm	0.9000%	2020/11/04 04:57

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.6853	26.8529	28.65	41.25	12.61	50.25	10:25
2	TOC	2.6512	26.5122	28.41	41.25	12.84	50.27	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.8112 (IC) (v1471)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	32	TOC	K2009641-007	7.3631 ppm	0.0302 ppm	0.4100%	2020/11/04 05:25

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	7.3417	73.4171	61.31	74.17	12.86	50.27	10:28
2	TOC	7.3845	73.8448	61.61	74.50	12.88	50.25	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.8112 (IC) (v1471)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 2

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	25.8156 ppm (PASS)	0.0000 ppm	0%	2020/11/04 05:53

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	25.8156	258.1560	190.98	203.77	12.79	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 (v38)	50 ppmC

Sample Type: Check Standard --> CCB From Schedule Version 2

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2020/11/04 06:08

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	7.53	20.42	12.89	50.24	10:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)	0 ppmC

Sample Type: Sample From Schedule Version 2

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	33	TOC	K2009670-001	12.7753 ppm	0.0369 ppm	0.2900%	2020/11/04 06:22

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	12.7493	127.4926	99.24	112.12	12.88	50.22	10:26
2	TOC	12.8014	128.0143	99.61	112.45	12.84	50.19	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.8112 (IC) (v1471)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	34	TOC	K2009255-001	31.2797 ppm	0.5426 ppm	1.7300%	2020/11/04 06:51

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	30.8960	308.9596	226.54	239.32	12.78	50.19	10:27
2	TOC	31.6633	316.6334	231.92	244.59	12.66	50.28	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.8112 (IC) (v1471)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	35	TOC	K2009255-002	14.4665 ppm	0.3169 ppm	2.1900%	2020/11/04 07:19

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	14.6906	146.9057	112.86	125.76	12.90	50.28	10:27
2	TOC	14.2424	142.4238	109.72	122.66	12.95	50.32	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.8112 (IC) (v1471)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

		Analysis			Std. Dev.		

	Pos	Type	Sample ID	Result (ppmC)	(ppmC)	RSD	Start Time
◈	36	TOC	K2009255-003	14.3057 ppm	0.2508 ppm	1.7500%	2020/11/04 07:47

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	14.4830	144.8301	111.41	124.15	12.74	50.45	10:31
2	TOC	14.1283	141.2833	108.92	121.82	12.90	50.31	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.8112 (IC) (v1471)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	37	TOC	K2009134-002 100X	0.6368 ppm	0.0439 ppm	6.9000%	2020/11/04 08:15

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.6678	6.6785	14.50	27.19	12.69	50.33	10:30
2	TOC	0.6057	6.0569	14.06	27.05	12.99	50.46	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.8112 (IC) (v1471)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	38	TOC	K2009134-003 100X	0.3611 ppm	0.0127 ppm	3.5200%	2020/11/04 08:43

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.3521	3.5209	12.28	25.08	12.79	50.33	10:32
2	TOC	0.3700	3.7005	12.41	25.02	12.61	50.33	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.8112 (IC) (v1471)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	39	TOC	K2009134-004 100X	0.0000 ppm	0.0000 ppm	0.0000%	2020/11/04 09:11

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.36	21.09	12.73	50.35	10:30
2	TOC	0.0000	0.0000	8.59	21.35	12.76	50.29	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.8112 (IC) (v1471)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	D	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2020/11/04 09:39

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.84	19.67	12.84	50.36	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.8112 (IC) (v1471)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	D	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2020/11/04 09:54

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.78	19.55	12.77	50.32	10:34

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.8112 (IC) (v1471)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

Meta Data Used in this Report

Blanks

Version	Reagent (Abs)	Acid (Abs)	DI IC (Abs)	DI TC (Abs)	DI TOC (Abs)	Save Time	Operator
v1470	1.6077	0.0460	0.0000	0.0000	0.0000	2020/10/30 19:52	Fusion1 (Fusion1)
v1471	4.5417	0.7860	0.0000	0.0000	0.0000	2020/11/03 13:23	Fusion1 (Fusion1)

Calibrations

Name: CAS_salt_010711 (TOC)

Version:	v38	Calibration curve formula:	TOC: y = 7.015x + 9.892
Ver Creation:	2020/06/13 16:40	r^2 value:	TOC: r^2 = 0.99974
Comment:			
Operator:	Fusion1 (Fusion1)		
Basic Analysis Type	TOC		

Basic Analysis Type: TOC

Sample ID	Y Raw Value	X Expected	Message	End Time
DI Water	9.5750	0.0000		2020/06/13 15:13
0.500 ppm	12.9010	0.5000		2020/06/13 15:28
1.0 ppm	15.6320	1.0000		2020/06/13 15:42
5.0 ppm	43.2510	5.0000		2020/06/13 15:56
10 ppm	82.4040	10.0000		2020/06/13 16:11
25 ppm	188.6880	25.0000		2020/06/13 16:25
50 ppm	358.6500	50.0000		2020/06/13 16:39

Methods

Name: CAS_salt_010711 (TOC)

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

Parameter	Value
SampleVolume	10.0 mL
Dilution	1:10
AcidVolume	0.5 ml
ReagentVolume	2.0 ml
UVReactorPrerinse	Off
UVReactorPrerinseVolume	5.0
NumberOfUVReactorPrerinses	1
ICSpargeTime	1.00 mins
DetectorSweepFlow	500 ml/min
PreSpargeTime	2.00 mins
SystemFlow	500 ml/min

Advanced Parameter	Value
NeedleRinseVolume	5.0 ml
VialPrimeVolume	2.0 ml
ICSamplePrimeVolume	2.0 ml
ICSpargeRinseVolume	12.0 ml
BaselineStabilizeTime	0.70 min
DetectorPressureFlow	150 ml/min
SyringeSpeedWaste	10
SyringeSpeedAcid	7
SyringeSpeedReagent	7
SyringeSpeedDIWater	7
NDIRPressurization	60 psig
SyringeSpeedSampleDispense	5
SyringeSpeedSampleAspirate	4
SyringeSpeedUVDispense	5
SyringeSpeedUVAspirate	5
SyringeSpeedICDispense	5
SyringeSpeedICAspirate	5
NDIRPressureStabilize	1.75 min
SampleMixing	Off
SampleMixingCycles	1
SampleMixingVolume	10.0
LowLevelFilterNDIR	Off

Acceptance / Approval

Electronic Signatures

Report Version	User Name	Acceptance	Reason	Date

Report History

Report History

Report Version	User Name	System Reason	User Reason	Date
1	Fusion1 (Fusion1)	Schedule completed	Schedule completed	2020/11/04 10:09

Fusion Report - 11032020
Wednesday, November 04, 2020 10:34 AM

(View - Reps, Unused Reps, Meta-Data, Signature, History)
Printed on 2020/11/04 11:20 - Wednesday

Report Summary Information

Company Location:	Gen Chem Lab		
Schedule Name:	11032020	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) (v6)		
Comment:			

Report Results

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

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	25.8577 ppm (PASS)	0.0000 ppm	0%	2020/11/04 10:34

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	25.8577	258.5765	191.28	204.17	12.89	50.35	10:27

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)	50 ppmC

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

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2020/11/04 10:49

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	7.67	20.68	13.01	50.21	10:33

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria	Do Nothing	CAS_salt_010711	CAS_salt_010711	0 ppmC

met.	(v4)	(v38)

Meta Data Used in this Report

Blanks

Version	Reagent (Abs)	Acid (Abs)	DI IC (Abs)	DI TC (Abs)	DI TOC (Abs)	Save Time	Operator
v1471	4.5417	0.7860	0.0000	0.0000	0.0000	2020/11/03 13:23	Fusion1 (Fusion1)

Calibrations

Name: CAS_salt_010711 (TOC)

Version: v38

Ver Creation: 2020/06/13 16:40

Comment:

Operator: Fusion1 (Fusion1)

Basic Analysis Type: TOC

Calibration curve formula: TOC: y = 7.015x + 9.892

r^2 value: TOC: r^2 = 0.99974

Basic Analysis Type: TOC

Sample ID	Y Raw Value	X Expected	Message	End Time
DI Water	9.5750	0.0000		2020/06/13 15:13
0.500 ppm	12.9010	0.5000		2020/06/13 15:28
1.0 ppm	15.6320	1.0000		2020/06/13 15:42
5.0 ppm	43.2510	5.0000		2020/06/13 15:56
10 ppm	82.4040	10.0000		2020/06/13 16:11
25 ppm	188.6880	25.0000		2020/06/13 16:25
50 ppm	358.6500	50.0000		2020/06/13 16:39

Methods

Name: CAS_salt_010711 (TOC)

Version: v4

Ver Creation: 2019/02/21 17:57

Comment:

Operator: Fusion1 (Fusion1)

Parameter	Value	Advanced Parameter	Value
SampleVolume	10.0 mL	NeedleRinseVolume	5.0 ml
Dilution	1:10	VialPrimeVolume	2.0 ml
AcidVolume	0.5 ml	ICSamplePrimeVolume	2.0 ml
ReagentVolume	2.0 ml	ICSpargeRinseVolume	12.0 ml

UVReactorPrerinse	Off
UVReactorPrerinseVolume	5.0
NumberOfUVReactorPrerinses	1
ICSpargeTime	1.00 mins
DetectorSweepFlow	500 ml/min
PreSpargeTime	2.00 mins
SystemFlow	500 ml/min

BaselineStabilizeTime	0.70 min
DetectorPressureFlow	150 ml/min
SyringeSpeedWaste	10
SyringeSpeedAcid	7
SyringeSpeedReagent	7
SyringeSpeedDIWater	7
NDIRPressurization	60 psig
SyringeSpeedSampleDispense	5
SyringeSpeedSampleAspirate	4
SyringeSpeedUVDispense	5
SyringeSpeedUVAspirate	5
SyringeSpeedICDispense	5
SyringeSpeedICAspirate	5
NDIRPressureStabilize	1.75 min
SampleMixing	Off
SampleMixingCycles	1
SampleMixingVolume	10.0
LowLevelFilterNDIR	Off

Acceptance / Approval

Electronic Signatures

Report Version	User Name	Acceptance	Reason	Date

Report History

Report History

Report Version	User Name	System Reason	User Reason	Date
1	Fusion1 (Fusion1)	Schedule completed	Schedule completed	2020/11/04 11:04

Fusion Report - 11042020A
Wednesday, November 04, 2020 12:16 PM

(View - Reps, Unused Reps, Meta-Data, Signature, History)
Printed on 2020/11/04 14:04 - Wednesday

Report Summary Information

Company Location:	Gen Chem Lab		
Schedule Name:	11042020A	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)		
Comment:			

Report Results

Sample Type: Sample — From Schedule Version 1

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	D	TOC	RB	0.1022 ppm	0.0000 ppm	0.0000%	2020/11/04 12:16

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.1022	1.0219	10.53	23.56	13.03	50.56	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.8112 (IC) (v1471)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

Sample Type: Check Standard --> CCV 25 ppm — From Schedule Version 1

	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)	25.8736 ppm (PASS)	0.0000 ppm	0%	2020/11/04 12:31

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	25.8736	258.7362	191.39	204.35	12.96	50.46	10:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)	50 ppmC

Sample Type: Check Standard --> CCB From Schedule Version 1

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2020/11/04 12:45

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	8.05	20.94	12.89	50.39	10:29

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)	0 ppmC

Sample Type: Sample From Schedule Version 1

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	3	TOC	K2009641-001	0.7150 ppm	0.0316 ppm	4.4100%	2020/11/04 13:00

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.7373	7.3727	14.98	27.58	12.60	50.37	10:25
2	TOC	0.6926	6.9265	14.67	27.62	12.95	50.37	10:25

-Reported Value w/o carry over

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.8112 (IC) (v1471)	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 1

	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)	25.8075 ppm (PASS)	0.0000 ppm	0%	2020/11/04 13:28

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	25.8075	258.0747	190.93	203.88	12.96	50.42	10:29

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)	50 ppmC

Sample Type: Check Standard --> CCB From Schedule Version 1

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2020/11/04 13:43

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	8.16	20.83	12.67	50.28	10:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v38)	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
v1471	4.5417	0.7860	0.0000	0.0000	0.0000	2020/11/03 13:23	Fusion1 (Fusion1)

Calibrations

Name: CAS_salt_010711 (TOC)

Version: v38

Ver Creation: 2020/06/13 16:40

Comment:

Operator: Fusion1 (Fusion1)

Basic Analysis Type: TOC

Calibration curve formula: TOC: y = 7.015x + 9.892

r^2 value: TOC: r^2 = 0.99974

Basic Analysis Type: TOC

Sample ID	Y Raw Value	X Expected	Message	End Time
DI Water	9.5750	0.0000		2020/06/13 15:13
0.500 ppm	12.9010	0.5000		2020/06/13 15:28
1.0 ppm	15.6320	1.0000		2020/06/13 15:42
5.0 ppm	43.2510	5.0000		2020/06/13 15:56
10 ppm	82.4040	10.0000		2020/06/13 16:11
25 ppm	188.6880	25.0000		2020/06/13 16:25
50 ppm	358.6500	50.0000		2020/06/13 16:39

Methods

Name: CAS_salt_010711 (TOC)

Version: v4

Ver Creation: 2019/02/21 17:57

Comment:

Operator: Fusion1 (Fusion1)

Parameter	Value
SampleVolume	10.0 mL
Dilution	1:10
AcidVolume	0.5 ml
ReagentVolume	2.0 ml
UVReactorPrerinse	Off
UVReactorPrerinseVolume	5.0
NumberOfUVReactorPrerinses	1
ICSpargeTime	1.00 mins
DetectorSweepFlow	500 ml/min
PreSpargeTime	2.00 mins
SystemFlow	500 ml/min

Advanced Parameter	Value
NeedleRinseVolume	5.0 ml
VialPrimeVolume	2.0 ml
ICSamplePrimeVolume	2.0 ml
ICSpargeRinseVolume	12.0 ml
BaselineStabilizeTime	0.70 min
DetectorPressureFlow	150 ml/min
SyringeSpeedWaste	10
SyringeSpeedAcid	7
SyringeSpeedReagent	7
SyringeSpeedDIWater	7
NDIRPressurization	60 psig
SyringeSpeedSampleDispense	5
SyringeSpeedSampleAspirate	4
SyringeSpeedUVDispense	5
SyringeSpeedUVAspirate	5
SyringeSpeedICDispense	5
SyringeSpeedICAspirate	5
NDIRPressureStabilize	1.75 min
SampleMixing	Off
SampleMixingCycles	1
SampleMixingVolume	10.0
LowLevelFilterNDIR	Off

Acceptance / Approval

Electronic Signatures

Report Version	User Name	Acceptance	Reason	Date

Report History

Report History

Report Version	User Name	System Reason	User Reason	Date
1	Fusion1 (Fusion1)	Schedule completed	Schedule completed	2020/11/04 13:58

ALS Environmental

StarLIMS Run: 701641

Analysis: DOC/TOC

Method: SM 5310 C, 9060A, 415.1, 9060

CCV: 19-GEN-8-55J 50 ppm LCS: 19-GEN-8-41K 25.0 ppm

ICAL Date: 6/16/2020

ICAL ID: 19-GEN-8-22-G

ICS ID: 19-GEN-8-35-K

ICS TV: 25.0 ppm ICS % R < 1

Spike ID: 19-GEN-8-55I 0.05 ml of 5000 ppm stock ---> 10.0 ml = 25.0 ppm x dilution factor

Sodium Persulfate: 19-GEN-08-55K

21 % H3PO4: 19-GEN-08-55L

Equipment ID: K-TOC-03

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

FILTER ID: 16967789

Analyzed By: MAS	Date Analyzed: 11/3/2020
Reviewed By:	Date Reviewed: 11/5/20

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

November 12, 2020

Susan Huang
Aptim Environmental & Infrastucture, Inc.
2500 City West Blvd., Suite 1700
Houston, TX 77042

Work Order: **HS20101240**

Laboratory Results for: **LHAAP 16 October 2020**

Dear Susan Huang,

ALS Environmental received 10 sample(s) on Oct 23, 2020 for the analysis presented in the following report.

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

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

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

Sincerely,

Generated By: JUMOKE.LAWAL

RJ Modashia
Project Manager

ALS Houston, US Date: 12-Nov-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
Work Order: HS20101240

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS20101240-01	16WW27-201022	Groundwater		22-Oct-2020 07:45	23-Oct-2020 09:25	☐
HS20101240-02	16WW27-201022-FD	Groundwater		22-Oct-2020 07:45	23-Oct-2020 09:25	☐
HS20101240-03	16WW43-201022	Groundwater		22-Oct-2020 08:30	23-Oct-2020 09:25	☐
HS20101240-04	16WW13-201022	Groundwater		22-Oct-2020 09:15	23-Oct-2020 09:25	☐
HS20101240-05	16WW42-201022	Groundwater		22-Oct-2020 10:00	23-Oct-2020 09:25	☐
HS20101240-06	16RW02-201022	Groundwater		22-Oct-2020 10:45	23-Oct-2020 09:25	☐
HS20101240-07	16RW05-201022	Groundwater		22-Oct-2020 11:30	23-Oct-2020 09:25	☐
HS20101240-08	16EW03-201022	Groundwater		22-Oct-2020 12:25	23-Oct-2020 09:25	☐
HS20101240-09	16EW07-201022	Groundwater		22-Oct-2020 13:10	23-Oct-2020 09:25	☐
HS20101240-10	Trip Blank -201022	Water		22-Oct-2020 00:00	23-Oct-2020 09:25	☐

ALS Houston, US Date: 12-Nov-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
Work Order: HS20101240

CASE NARRATIVE

Work Order Comments

- The analysis for Perchlorate was subcontracted our ALS Houston TX, High Resolution Lab. Final report attached.

  The analysis for TOC was subcontracted to ALS Kelso, WA. Final report attached.

GCMS Volatiles by Method SW8260

Batch ID: R371939

Sample ID: 16EW07-201022 (HS20101240-09)

- Lowest practical dilution for sample HS20101240-09 due to matrix.

Batch ID: R372017

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

WetChemistry by Method SW9056

Batch ID: R372143,R372517

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

ALS Houston, US Date: 12-Nov-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
Sample ID: 16WW27-201022
Collection Date: 22-Oct-2020 07:45

ANALYTICAL REPORT
WorkOrder:HS20101240
Lab ID:HS20101240-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Nov-2020 04:07
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Nov-2020 04:07
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Nov-2020 04:07
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Nov-2020 04:07
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	04-Nov-2020 04:07
Trichloroethene	**1.2**		**0.20**	**0.50**	**1.0**	**UG/L**	1	04-Nov-2020 04:07
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	04-Nov-2020 04:07
Surr: 1,2-Dichloroethane-d4	*83.8*			**0**	*81-118*	*%REC*	*1*	*04-Nov-2020 04:07*
Surr: 4-Bromofluorobenzene	*95.2*			**0**	*85-114*	*%REC*	*1*	*04-Nov-2020 04:07*
Surr: Dibromofluoromethane	*83.7*			**0**	*80-119*	*%REC*	*1*	*04-Nov-2020 04:07*
Surr: Toluene-d8	*98.6*			**0**	*89-112*	*%REC*	*1*	*04-Nov-2020 04:07*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	29-Oct-2020 18:36

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

ALS Houston, US Date: 12-Nov-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
Sample ID: 16WW27-201022-FD
Collection Date: 22-Oct-2020 07:45

ANALYTICAL REPORT
WorkOrder:HS20101240
Lab ID:HS20101240-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Nov-2020 04:29
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Nov-2020 04:29
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Nov-2020 04:29
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Nov-2020 04:29
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	04-Nov-2020 04:29
Trichloroethene	**1.1**		**0.20**	**0.50**	**1.0**	**UG/L**	1	04-Nov-2020 04:29
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	04-Nov-2020 04:29
Surr: 1,2-Dichloroethane-d4	*86.0*			**0**	*81-118*	*%REC*	*1*	*04-Nov-2020 04:29*
Surr: 4-Bromofluorobenzene	*91.5*			**0**	*85-114*	*%REC*	*1*	*04-Nov-2020 04:29*
Surr: Dibromofluoromethane	*85.4*			**0**	*80-119*	*%REC*	*1*	*04-Nov-2020 04:29*
Surr: Toluene-d8	*99.8*			**0**	*89-112*	*%REC*	*1*	*04-Nov-2020 04:29*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	29-Oct-2020 18:36

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

ALS Houston, US Date: 12-Nov-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
Sample ID: 16WW43-201022
Collection Date: 22-Oct-2020 08:30

ANALYTICAL REPORT
WorkOrder:HS20101240
Lab ID:HS20101240-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	UG/L	1	04-Nov-2020 04:50
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Nov-2020 04:50
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Nov-2020 04:50
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Nov-2020 04:50
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	04-Nov-2020 04:50
Trichloroethene	**0.94**	J	**0.20**	**0.50**	**1.0**	**UG/L**	1	04-Nov-2020 04:50
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	04-Nov-2020 04:50
Surr: 1,2-Dichloroethane-d4	*83.7*			**0**	*81-118*	*%REC*	*1*	*04-Nov-2020 04:50*
Surr: 4-Bromofluorobenzene	*90.5*			**0**	*85-114*	*%REC*	*1*	*04-Nov-2020 04:50*
Surr: Dibromofluoromethane	*83.0*			**0**	*80-119*	*%REC*	*1*	*04-Nov-2020 04:50*
Surr: Toluene-d8	*101*			**0**	*89-112*	*%REC*	*1*	*04-Nov-2020 04:50*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	29-Oct-2020 18:36

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

ALS Houston, US Date: 12-Nov-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
Sample ID: 16WW13-201022
Collection Date: 22-Oct-2020 09:15

ANALYTICAL REPORT
WorkOrder:HS20101240
Lab ID:HS20101240-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Nov-2020 05:32
1,1-Dichloroethene	**1.3**		**0.20**	**0.50**	**1.0**	**UG/L**	1	04-Nov-2020 05:32
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Nov-2020 05:32
cis-1,2-Dichloroethene	**620**		**2.0**	**5.0**	**10**	**UG/L**	10	04-Nov-2020 05:53
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	04-Nov-2020 05:32
Trichloroethene	**1,100**		**2.0**	**5.0**	**10**	**UG/L**	10	04-Nov-2020 05:53
Vinyl chloride	**8.8**		**0.20**	**0.50**	**1.0**	**UG/L**	1	04-Nov-2020 05:32
Surr: 1,2-Dichloroethane-d4	*84.4*			**0**	*81-118*	*%REC*	*1*	*04-Nov-2020 05:32*
Surr: 1,2-Dichloroethane-d4	*86.7*			**0**	*81-118*	*%REC*	*10*	*04-Nov-2020 05:53*
Surr: 4-Bromofluorobenzene	*89.8*			**0**	*85-114*	*%REC*	*1*	*04-Nov-2020 05:32*
Surr: 4-Bromofluorobenzene	*88.4*			**0**	*85-114*	*%REC*	*10*	*04-Nov-2020 05:53*
Surr: Dibromofluoromethane	*82.8*			**0**	*80-119*	*%REC*	*1*	*04-Nov-2020 05:32*
Surr: Dibromofluoromethane	*83.2*			**0**	*80-119*	*%REC*	*10*	*04-Nov-2020 05:53*
Surr: Toluene-d8	*98.5*			**0**	*89-112*	*%REC*	*1*	*04-Nov-2020 05:32*
Surr: Toluene-d8	*101*			**0**	*89-112*	*%REC*	*10*	*04-Nov-2020 05:53*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	29-Oct-2020 18:36

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

ALS Houston, US Date: 12-Nov-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
Sample ID: 16WW42-201022
Collection Date: 22-Oct-2020 10:00

ANALYTICAL REPORT
WorkOrder:HS20101240
Lab ID:HS20101240-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Nov-2020 13:44
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Nov-2020 13:44
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Nov-2020 13:44
cis-1,2-Dichloroethene	**180**		**1.0**	**2.5**	**5.0**	**UG/L**	5	04-Nov-2020 16:12
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	04-Nov-2020 13:44
Trichloroethene	**3.2**		**0.20**	**0.50**	**1.0**	**UG/L**	1	04-Nov-2020 13:44
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	04-Nov-2020 13:44
Surr: 1,2-Dichloroethane-d4	*84.7*			**0**	*81-118*	*%REC*	*5*	*04-Nov-2020 16:12*
Surr: 1,2-Dichloroethane-d4	*87.4*			**0**	*81-118*	*%REC*	*1*	*04-Nov-2020 13:44*
Surr: 4-Bromofluorobenzene	*90.9*			**0**	*85-114*	*%REC*	*1*	*04-Nov-2020 13:44*
Surr: 4-Bromofluorobenzene	*91.6*			**0**	*85-114*	*%REC*	*5*	*04-Nov-2020 16:12*
Surr: Dibromofluoromethane	*84.1*			**0**	*80-119*	*%REC*	*1*	*04-Nov-2020 13:44*
Surr: Dibromofluoromethane	*84.0*			**0**	*80-119*	*%REC*	*5*	*04-Nov-2020 16:12*
Surr: Toluene-d8	*98.4*			**0**	*89-112*	*%REC*	*1*	*04-Nov-2020 13:44*
Surr: Toluene-d8	*102*			**0**	*89-112*	*%REC*	*5*	*04-Nov-2020 16:12*
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**2.74**		**0.0300**	**0.100**	**0.100**	**mg/L**	1	06-Nov-2020 03:45
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	29-Oct-2020 18:36
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	09-Nov-2020 20:25

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

ALS Houston, US Date: 12-Nov-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
Sample ID: 16RW02-201022
Collection Date: 22-Oct-2020 10:45

ANALYTICAL REPORT
WorkOrder:HS20101240
Lab ID:HS20101240-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Nov-2020 05:11
1,1-Dichloroethene	**0.65**	J	**0.20**	**0.50**	**1.0**	**UG/L**	1	04-Nov-2020 05:11
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Nov-2020 05:11
cis-1,2-Dichloroethene	**1.5**		**0.20**	**0.50**	**1.0**	**UG/L**	1	04-Nov-2020 05:11
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	04-Nov-2020 05:11
Trichloroethene	**6.7**		**0.20**	**0.50**	**1.0**	**UG/L**	1	04-Nov-2020 05:11
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	04-Nov-2020 05:11
Surr: 1,2-Dichloroethane-d4	*87.3*			**0**	*81-118*	*%REC*	*1*	*04-Nov-2020 05:11*
Surr: 4-Bromofluorobenzene	*90.4*			**0**	*85-114*	*%REC*	*1*	*04-Nov-2020 05:11*
Surr: Dibromofluoromethane	*83.7*			**0**	*80-119*	*%REC*	*1*	*04-Nov-2020 05:11*
Surr: Toluene-d8	*102*			**0**	*89-112*	*%REC*	*1*	*04-Nov-2020 05:11*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	29-Oct-2020 18:36

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

ALS Houston, US Date: 12-Nov-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
Sample ID: 16RW05-201022
Collection Date: 22-Oct-2020 11:30

ANALYTICAL REPORT
WorkOrder:HS20101240
Lab ID:HS20101240-07
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Nov-2020 13:23
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Nov-2020 13:23
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Nov-2020 13:23
cis-1,2-Dichloroethene	**9.3**		**0.20**	**0.50**	**1.0**	**UG/L**	1	04-Nov-2020 13:23
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	04-Nov-2020 13:23
Trichloroethene	**0.89**	J	**0.20**	**0.50**	**1.0**	**UG/L**	1	04-Nov-2020 13:23
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	04-Nov-2020 13:23
Surr: 1,2-Dichloroethane-d4	*86.8*			**0**	*81-118*	*%REC*	*1*	*04-Nov-2020 13:23*
Surr: 4-Bromofluorobenzene	*90.0*			**0**	*85-114*	*%REC*	*1*	*04-Nov-2020 13:23*
Surr: Dibromofluoromethane	*86.5*			**0**	*80-119*	*%REC*	*1*	*04-Nov-2020 13:23*
Surr: Toluene-d8	*99.0*			**0**	*89-112*	*%REC*	*1*	*04-Nov-2020 13:23*
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**44.0**		**0.300**	**1.00**	**1.00**	**mg/L**	10	11-Nov-2020 22:36
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	29-Oct-2020 18:36
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	09-Nov-2020 20:25

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

ALS Houston, US Date: 12-Nov-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
Sample ID: 16EW03-201022
Collection Date: 22-Oct-2020 12:25

ANALYTICAL REPORT
WorkOrder:HS20101240
Lab ID:HS20101240-08
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	**1.3**		**0.30**	**1.0**	**1.0**	**UG/L**	1	04-Nov-2020 14:06
1,1-Dichloroethene	**1.2**		**0.20**	**0.50**	**1.0**	**UG/L**	1	04-Nov-2020 14:06
1,2-Dichloroethane	**3.4**		**0.20**	**0.50**	**1.0**	**UG/L**	1	04-Nov-2020 14:06
cis-1,2-Dichloroethene	**1,400**		**5.0**	**12**	**25**	**UG/L**	25	04-Nov-2020 15:51
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	04-Nov-2020 14:06
Trichloroethene	**130**		**0.20**	**0.50**	**1.0**	**UG/L**	1	04-Nov-2020 14:06
Vinyl chloride	**200**		**0.20**	**0.50**	**1.0**	**UG/L**	1	04-Nov-2020 14:06
Surr: 1,2-Dichloroethane-d4	*89.4*			**0**	*81-118*	*%REC*	*1*	*04-Nov-2020 14:06*
Surr: 1,2-Dichloroethane-d4	*85.3*			**0**	*81-118*	*%REC*	*25*	*04-Nov-2020 15:51*
Surr: 4-Bromofluorobenzene	*91.8*			**0**	*85-114*	*%REC*	*25*	*04-Nov-2020 15:51*
Surr: 4-Bromofluorobenzene	*92.5*			**0**	*85-114*	*%REC*	*1*	*04-Nov-2020 14:06*
Surr: Dibromofluoromethane	*84.5*			**0**	*80-119*	*%REC*	*1*	*04-Nov-2020 14:06*
Surr: Dibromofluoromethane	*84.5*			**0**	*80-119*	*%REC*	*25*	*04-Nov-2020 15:51*
Surr: Toluene-d8	*104*			**0**	*89-112*	*%REC*	*1*	*04-Nov-2020 14:06*
Surr: Toluene-d8	*100*			**0**	*89-112*	*%REC*	*25*	*04-Nov-2020 15:51*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	29-Oct-2020 18:36

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

ALS Houston, US Date: 12-Nov-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
Sample ID: 16EW07-201022
Collection Date: 22-Oct-2020 13:10

ANALYTICAL REPORT
WorkOrder:HS20101240
Lab ID:HS20101240-09
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	500	U	150	500	500	UG/L	500	04-Nov-2020 02:01
1,1-Dichloroethene	250	U	100	250	500	UG/L	500	04-Nov-2020 02:01
1,2-Dichloroethane	250	U	100	250	500	UG/L	500	04-Nov-2020 02:01
cis-1,2-Dichloroethene	250	U	100	250	500	UG/L	500	04-Nov-2020 02:01
Methylene chloride	500	U	200	500	1000	UG/L	500	04-Nov-2020 02:01
Trichloroethene	**490**	J	**100**	**250**	**500**	**UG/L**	500	04-Nov-2020 02:01
Vinyl chloride	250	U	100	250	500	UG/L	500	04-Nov-2020 02:01
Surr: 1,2-Dichloroethane-d4	*85.5*			**0**	*81-118*	*%REC*	*500*	*04-Nov-2020 02:01*
Surr: 4-Bromofluorobenzene	*93.6*			**0**	*85-114*	*%REC*	*500*	*04-Nov-2020 02:01*
Surr: Dibromofluoromethane	*85.1*			**0**	*80-119*	*%REC*	*500*	*04-Nov-2020 02:01*
Surr: Toluene-d8	*100*			**0**	*89-112*	*%REC*	*500*	*04-Nov-2020 02:01*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	29-Oct-2020 18:36

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

ALS Houston, US Date: 12-Nov-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
Sample ID: Trip Blank -201022
Collection Date: 22-Oct-2020 00:00

ANALYTICAL REPORT
WorkOrder:HS20101240
Lab ID:HS20101240-10
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Nov-2020 00:58
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Nov-2020 00:58
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Nov-2020 00:58
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Nov-2020 00:58
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	04-Nov-2020 00:58
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Nov-2020 00:58
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	04-Nov-2020 00:58
Surr: 1,2-Dichloroethane-d4	*85.1*			**0**	*81-118*	*%REC*	*1*	*04-Nov-2020 00:58*
Surr: 4-Bromofluorobenzene	*88.4*			**0**	*85-114*	*%REC*	*1*	*04-Nov-2020 00:58*
Surr: Dibromofluoromethane	*84.8*			**0**	*80-119*	*%REC*	*1*	*04-Nov-2020 00:58*
Surr: Toluene-d8	*99.9*			**0**	*89-112*	*%REC*	*1*	*04-Nov-2020 00:58*

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

ALS Houston, US Date: 12-Nov-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
WorkOrder: HS20101240

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R371600 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** Groundwater	
HS20101240-01	16WW27-201022	22 Oct 2020 07:45			29 Oct 2020 18:36	1
HS20101240-02	16WW27-201022-FD	22 Oct 2020 07:45			29 Oct 2020 18:36	1
HS20101240-03	16WW43-201022	22 Oct 2020 08:30			29 Oct 2020 18:36	1
HS20101240-04	16WW13-201022	22 Oct 2020 09:15			29 Oct 2020 18:36	1
HS20101240-05	16WW42-201022	22 Oct 2020 10:00			29 Oct 2020 18:36	1
HS20101240-06	16RW02-201022	22 Oct 2020 10:45			29 Oct 2020 18:36	1
HS20101240-07	16RW05-201022	22 Oct 2020 11:30			29 Oct 2020 18:36	1
HS20101240-08	16EW03-201022	22 Oct 2020 12:25			29 Oct 2020 18:36	1
HS20101240-09	16EW07-201022	22 Oct 2020 13:10			29 Oct 2020 18:36	1
Batch ID: R371939 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS20101240-10	Trip Blank -201022	22 Oct 2020 00:00			04 Nov 2020 00:58	1
Batch ID: R371939 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS20101240-01	16WW27-201022	22 Oct 2020 07:45			04 Nov 2020 04:07	1
HS20101240-02	16WW27-201022-FD	22 Oct 2020 07:45			04 Nov 2020 04:29	1
HS20101240-03	16WW43-201022	22 Oct 2020 08:30			04 Nov 2020 04:50	1
HS20101240-04	16WW13-201022	22 Oct 2020 09:15			04 Nov 2020 05:53	10
HS20101240-04	16WW13-201022	22 Oct 2020 09:15			04 Nov 2020 05:32	1
HS20101240-06	16RW02-201022	22 Oct 2020 10:45			04 Nov 2020 05:11	1
HS20101240-09	16EW07-201022	22 Oct 2020 13:10			04 Nov 2020 02:01	500
Batch ID: R372017 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS20101240-05	16WW42-201022	22 Oct 2020 10:00			04 Nov 2020 16:12	5
HS20101240-05	16WW42-201022	22 Oct 2020 10:00			04 Nov 2020 13:44	1
HS20101240-07	16RW05-201022	22 Oct 2020 11:30			04 Nov 2020 13:23	1
HS20101240-08	16EW03-201022	22 Oct 2020 12:25			04 Nov 2020 15:51	25
HS20101240-08	16EW03-201022	22 Oct 2020 12:25			04 Nov 2020 14:06	1
Batch ID: R372143 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Groundwater	
HS20101240-05	16WW42-201022	22 Oct 2020 10:00			06 Nov 2020 03:45	1
Batch ID: R372266 (0)	**Test Name :** SUBCONTRACT ANALYSIS - TOC ANALYSIS				**Matrix:** Groundwater	
HS20101240-05	16WW42-201022	22 Oct 2020 10:00			09 Nov 2020 20:25	1
HS20101240-07	16RW05-201022	22 Oct 2020 11:30			09 Nov 2020 20:25	1
Batch ID: R372517 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Groundwater	
HS20101240-07	16RW05-201022	22 Oct 2020 11:30			11 Nov 2020 22:36	10

ALS Houston, US Date: 12-Nov-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
WorkOrder: HS20101240

QC BATCH REPORT

Batch ID: R371939 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-201103** Units: **UG/L** Analysis Date: **04-Nov-2020 00:37**
Client ID: Run ID: **VOA6_371939** SeqNo: **5815463** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	0.50	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
Methylene chloride	1.0	2.0								U
Trichloroethene	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*43.55*	*1.0*	*50*	*0*	*87.1*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*45.35*	*1.0*	*50*	*0*	*90.7*	*85 - 114*				
Surr: Dibromofluoromethane	*42.78*	*1.0*	*50*	*0*	*85.6*	*80 - 119*				
Surr: Toluene-d8	*50.97*	*1.0*	*50*	*0*	*102*	*89 - 112*				

LCS Sample ID: **VLCSW-201103** Units: **UG/L** Analysis Date: **03-Nov-2020 23:55**
Client ID: Run ID: **VOA6_371939** SeqNo: **5815462** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	19.11	1.0	20	0	95.6	80 - 119				
1,1-Dichloroethene	19.02	1.0	20	0	95.1	71 - 131				
1,2-Dichloroethane	18.08	1.0	20	0	90.4	73 - 128				
cis-1,2-Dichloroethene	18.12	1.0	20	0	90.6	78 - 123				
Methylene chloride	17.62	2.0	20	0	88.1	74 - 124				
Trichloroethene	17.96	1.0	20	0	89.8	79 - 123				
Vinyl chloride	17.9	1.0	20	0	89.5	58 - 137				
Surr: 1,2-Dichloroethane-d4	*53.2*	*1.0*	*50*	*0*	*106*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*49.13*	*1.0*	*50*	*0*	*98.3*	*85 - 114*				
Surr: Dibromofluoromethane	*49.1*	*1.0*	*50*	*0*	*98.2*	*80 - 119*				
Surr: Toluene-d8	*48.72*	*1.0*	*50*	*0*	*97.4*	*89 - 112*				

ALS Houston, US Date: 12-Nov-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
WorkOrder: HS20101240

QC BATCH REPORT

Batch ID: R371939 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS20101123-05MS** Units: **UG/L** Analysis Date: **04-Nov-2020 03:04**
Client ID: Run ID: **VOA6_371939** SeqNo: **5815470** PrepDate: DF: **25**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	553.9	25	500	0	111	80 - 119				
1,1-Dichloroethene	599.3	25	500	0	120	71 - 131				
1,2-Dichloroethane	508.3	25	500	0	102	73 - 128				
cis-1,2-Dichloroethene	765.8	25	500	239.8	105	78 - 123				
Methylene chloride	500.5	50	500	0	100	74 - 124				
Trichloroethene	2239	25	500	1724	103	79 - 123				
Vinyl chloride	650.7	25	500	0	130	58 - 137				
Surr: 1,2-Dichloroethane-d4	*1104*	*25*	*1250*	*0*	*88.3*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*1183*	*25*	*1250*	*0*	*94.6*	*85 - 114*				
Surr: Dibromofluoromethane	*1124*	*25*	*1250*	*0*	*89.9*	*80 - 119*				
Surr: Toluene-d8	*1251*	*25*	*1250*	*0*	*100*	*89 - 112*				

MSD Sample ID: **HS20101123-05MSD** Units: **UG/L** Analysis Date: **04-Nov-2020 03:25**
Client ID: Run ID: **VOA6_371939** SeqNo: **5815471** PrepDate: DF: **25**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	554.7	25	500	0	111	80 - 119	553.9	0.148	20	
1,1-Dichloroethene	551.9	25	500	0	110	71 - 131	599.3	8.24	20	
1,2-Dichloroethane	565.3	25	500	0	113	73 - 128	508.3	10.6	20	
cis-1,2-Dichloroethene	721.8	25	500	239.8	96.4	78 - 123	765.8	5.91	20	
Methylene chloride	470.7	50	500	0	94.1	74 - 124	500.5	6.15	20	
Trichloroethene	2193	25	500	1724	93.8	79 - 123	2239	2.1	20	
Vinyl chloride	578.2	25	500	0	116	58 - 137	650.7	11.8	20	
Surr: 1,2-Dichloroethane-d4	*1128*	*25*	*1250*	*0*	*90.3*	*81 - 118*	*1104*	*2.17*	*20*	
Surr: 4-Bromofluorobenzene	*1180*	*25*	*1250*	*0*	*94.4*	*85 - 114*	*1183*	*0.206*	*20*	
Surr: Dibromofluoromethane	*1079*	*25*	*1250*	*0*	*86.3*	*80 - 119*	*1124*	*4.11*	*20*	
Surr: Toluene-d8	*1231*	*25*	*1250*	*0*	*98.5*	*89 - 112*	*1251*	*1.65*	*20*	

The following samples were analyzed in this batch: HS20101240-01 HS20101240-02 HS20101240-03 HS20101240-04 HS20101240-06 HS20101240-09 HS20101240-10

ALS Houston, US Date: 12-Nov-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
WorkOrder: HS20101240

QC BATCH REPORT

Batch ID: R372017 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-201104** Units: **UG/L** Analysis Date: **04-Nov-2020 11:59**
Client ID: Run ID: **VOA6_372017** SeqNo: **5817374** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	1.0	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
Methylene chloride	1.0	2.0								U
Trichloroethene	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*43.13*	*1.0*	*50*	*0*	*86.3*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*47.57*	*1.0*	*50*	*0*	*95.1*	*85 - 114*				
Surr: Dibromofluoromethane	*43.83*	*1.0*	*50*	*0*	*87.7*	*80 - 119*				
Surr: Toluene-d8	*51.54*	*1.0*	*50*	*0*	*103*	*89 - 112*				

LCS Sample ID: **VLCSW-201104** Units: **UG/L** Analysis Date: **04-Nov-2020 11:17**
Client ID: Run ID: **VOA6_372017** SeqNo: **5817373** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	18.77	1.0	20	0	93.9	80 - 119				
1,1-Dichloroethene	19.59	1.0	20	0	98.0	71 - 131				
1,2-Dichloroethane	17.71	1.0	20	0	88.6	73 - 128				
cis-1,2-Dichloroethene	17.8	1.0	20	0	89.0	78 - 123				
Methylene chloride	17.81	2.0	20	0	89.1	74 - 124				
Trichloroethene	18.05	1.0	20	0	90.3	79 - 123				
Vinyl chloride	18.62	1.0	20	0	93.1	58 - 137				
Surr: 1,2-Dichloroethane-d4	*52.73*	*1.0*	*50*	*0*	*105*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.55*	*1.0*	*50*	*0*	*101*	*85 - 114*				
Surr: Dibromofluoromethane	*49.34*	*1.0*	*50*	*0*	*98.7*	*80 - 119*				
Surr: Toluene-d8	*48.52*	*1.0*	*50*	*0*	*97.0*	*89 - 112*				

ALS Houston, US Date: 12-Nov-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
WorkOrder: HS20101240

QC BATCH REPORT

Batch ID: R372017 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS20101419-01MS** Units: **UG/L** Analysis Date: **04-Nov-2020 15:09**
Client ID: Run ID: **VOA6_372017** SeqNo: **5817383** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	207.3	10	200	0	104	80 - 119				
1,1-Dichloroethene	256.8	10	200	7.216	125	71 - 131				
1,2-Dichloroethane	219.2	10	200	0	110	73 - 128				
cis-1,2-Dichloroethene	490.9	10	200	293.3	98.8	78 - 123				
Methylene chloride	199	20	200	0	99.5	74 - 124				
Trichloroethene	1214	10	200	981.1	116	79 - 123				O
Vinyl chloride	277.1	10	200	33.28	122	58 - 137				
Surr: 1,2-Dichloroethane-d4	*443.7*	*10*	*500*	*0*	*88.7*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*482*	*10*	*500*	*0*	*96.4*	*85 - 114*				
Surr: Dibromofluoromethane	*448.9*	*10*	*500*	*0*	*89.8*	*80 - 119*				
Surr: Toluene-d8	*482.4*	*10*	*500*	*0*	*96.5*	*89 - 112*				

MSD Sample ID: **HS20101419-01MSD** Units: **UG/L** Analysis Date: **04-Nov-2020 15:30**
Client ID: Run ID: **VOA6_372017** SeqNo: **5817384** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	232.4	10	200	0	116	80 - 119	207.3	11.4	20	
1,1-Dichloroethene	240.5	10	200	7.216	117	71 - 131	256.8	6.54	20	
1,2-Dichloroethane	214	10	200	0	107	73 - 128	219.2	2.36	20	
cis-1,2-Dichloroethene	481.8	10	200	293.3	94.3	78 - 123	490.9	1.87	20	
Methylene chloride	194.4	20	200	0	97.2	74 - 124	199	2.32	20	
Trichloroethene	1188	10	200	981.1	103	79 - 123	1214	2.14	20	O
Vinyl chloride	256.1	10	200	33.28	111	58 - 137	277.1	7.86	20	
Surr: 1,2-Dichloroethane-d4	*428.8*	*10*	*500*	*0*	*85.8*	*81 - 118*	*443.7*	*3.43*	*20*	
Surr: 4-Bromofluorobenzene	*476.3*	*10*	*500*	*0*	*95.3*	*85 - 114*	*482*	*1.2*	*20*	
Surr: Dibromofluoromethane	*438.1*	*10*	*500*	*0*	*87.6*	*80 - 119*	*448.9*	*2.43*	*20*	
Surr: Toluene-d8	*492.8*	*10*	*500*	*0*	*98.6*	*89 - 112*	*482.4*	*2.13*	*20*	

The following samples were analyzed in this batch: HS20101240-05 HS20101240-07 HS20101240-08

ALS Houston, US Date: 12-Nov-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
WorkOrder: HS20101240

QC BATCH REPORT

Batch ID: R372143 (0) **Instrument:** ICS-Integrion **Method:** ANIONS BY SW9056A

MBLK Sample ID: **MBLK-110520** Units: **mg/L** Analysis Date: **05-Nov-2020 10:39**
Client ID: Run ID: **ICS-Integrion_372143** SeqNo: **5820234** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	0.100	0.100								U

LCS Sample ID: **LCS-110520** Units: **mg/L** Analysis Date: **05-Nov-2020 10:57**
Client ID: Run ID: **ICS-Integrion_372143** SeqNo: **5820235** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.906	0.100	4	0	97.7	80 - 120				

MS Sample ID: **HS20110194-01MS** Units: **mg/L** Analysis Date: **05-Nov-2020 16:02**
Client ID: Run ID: **ICS-Integrion_372143** SeqNo: **5820239** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	19.4	1.00	20	0	97.0	80 - 120				

MSD Sample ID: **HS20110194-01MSD** Units: **mg/L** Analysis Date: **05-Nov-2020 16:20**
Client ID: Run ID: **ICS-Integrion_372143** SeqNo: **5820240** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	19.42	1.00	20	0	97.1	80 - 120	19.4	0.0928	20	

The following samples were analyzed in this batch: HS20101240-05

ALS Houston, US Date: 12-Nov-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
WorkOrder: HS20101240

QC BATCH REPORT

Batch ID: R372517 (0) **Instrument:** ICS-Integrion **Method:** ANIONS BY SW9056A

MBLK Sample ID: **MBLK-111120** Units: **mg/L** Analysis Date: **11-Nov-2020 18:24**
Client ID: Run ID: **ICS-Integrion_372517** SeqNo: **5829719** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	0.100	0.100								U

LCS Sample ID: **LCS-111120** Units: **mg/L** Analysis Date: **11-Nov-2020 18:42**
Client ID: Run ID: **ICS-Integrion_372517** SeqNo: **5829720** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.8	0.100	4	0	95.0	80 - 120				

MS Sample ID: **HS20101419-01MS** Units: **mg/L** Analysis Date: **12-Nov-2020 00:24**
Client ID: Run ID: **ICS-Integrion_372517** SeqNo: **5829733** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	7.436	0.100	2	5.377	103	80 - 120				

MSD Sample ID: **HS20101419-01MSD** Units: **mg/L** Analysis Date: **12-Nov-2020 00:42**
Client ID: Run ID: **ICS-Integrion_372517** SeqNo: **5829734** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	7.445	0.100	2	5.377	103	80 - 120	7.436	0.121	20	

The following samples were analyzed in this batch: HS20101240-07

ALS Houston, US Date: 12-Nov-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
WorkOrder: **HS20101240**

QUALIFIERS, ACRONYMS, UNITS

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

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

ALS Houston, US Date: 12-Nov-20

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	20-030-0	26-Mar-2021
California	2919, 2020-2021	30-Apr-2021
Dept of Defense	PJLA L20-507	22-Dec-2021
Florida	E87611-30-07/01/2020	30-Jun-2021
Illinois	2000322020-4	09-May-2021
Kansas	E-10352 2020-2021	31-Jul-2021
Kentucky	123043, 2020-2021	30-Apr-2021
Louisiana	03087, 2020-2021	30-Jun-2021
North Carolina	624-2020	31-Dec-2020
North Dakota	R-193 2020-2021	30-Apr-2021
Texas	T104704231-20-26	30-Apr-2021

ALS Houston, US Date: 12-Nov-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
Work Order: HS20101240

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS20101240-01	16WW27-201022	Login	10/23/2020 4:19:24 PM	NDR	Sub
HS20101240-01	16WW27-201022	Login	10/23/2020 4:19:24 PM	NDR	VOA091

ALS Houston, US Date: 12-Nov-20

Sample Receipt Checklist

Work Order ID: HS20101240 **Date/Time Received:** **23-Oct-2020 09:25**

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

Completed By: /S/ Nilesh D. Ranchod (eSignature) 23-Oct-2020 16:34 (Date/Time) **Reviewed by:** /S/ RJ Modashia (eSignature) 25-Oct-2020 19:48 (Date/Time)

Matrices: **GW/Water** Carrier name: **FedEx**

	Yes	No	
Shipping container/cooler in good condition?	☑	☐	Not Present ☐
Custody seals intact on shipping container/cooler?	☑	☐	Not Present ☐
Custody seals intact on sample bottles?	☐	☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	☐	☐	Not Present ☑
Chain of custody present?	☑	☐	1 Page(s)
Chain of custody signed when relinquished and received?	☑	☐	COC IDs:None
Samplers name present on COC?	☑	☐	
Chain of custody agrees with sample labels?	☑	☐	
Samples in proper container/bottle?	☑	☐	
Sample containers intact?	☑	☐	
Sufficient sample volume for indicated test?	☑	☐	
All samples received within holding time?	☑	☐	
Container/Temp Blank temperature in compliance?	☑	☐	

Temperature(s)/Thermometer(s):	2.4C U/c	IR25
Cooler(s)/Kit(s):	46420	
Date/Time sample(s) sent to storage:	10/23/2020 14:55	

	Yes	No	
Water - VOA vials have zero headspace?	☐	☑	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	☐	☐	N/A ☑
pH adjusted?	☐	☐	N/A ☑
pH adjusted by:			

Login Notes: Sample 16RW05-201022 Vials 2 of 2 and 3 of 3 have head space greater than 6mm

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 Hodashia

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

Project No. 501032

Job: LHAAP 16 October 2020

Prepared By: Scott Beesinger

P.O. Number

Analyses

Field Sample I.D. Time	Sample Matrix	Date /	MS / MSD	No. OF CONTAINERS	VOC by SW 8260B	TOC by SM5310C	MEE by RSK 175	Anions (bromide, sulfate, nitrate) by SW9056 and Alkalinity by SM2320	Bromide by SW9056	Perchlorate by SW6850	Metals (arsenic, chromium, manganese, nickel, thallium) by SW6020				Remarks (Preservatives, etc.)
16WW27-201022	WG	10/22/20/0745		4	X					X					
16WW27-201022-FD	WG	10/22/20/0745		4	X					X					
16WW43-201022	WG	10/22/20/0830		4	X					X					
16WW13-201022	WG	10/22/20/0915		4	X					X					
16WW42-201022	WG	10/22/20/1000		7	X	X			X	X					
16RW02-201022	WG	10/22/20/1045		4	X					X					
16RW05-201022	WG	10/22/20/1130		7	X	X			X	X					
16EW03-201022	WG	10/22/20/1225		4	X					X					

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

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	10/22/20	1430	PM	10/23/20	9:25am						

For Lab Use Only

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

Remarks:

46420 2.4C 1R25

Aptim Environmental & Infrastucture, Inc.
LHAAP 16 October 2020

HS20101240

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

CHAIN OF CUSTODY

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

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

Project No. 501032

Job: LHAAP 16 October 2020

Prepared By: Scott Beesinger

P.O. Number

Field Sample I.D. Time	Sample Matrix	Date /	MS / MSD	No. OF CONTAINERS	VOC by SW 8260B	TOC by SM5310C	MEE by RSK 175	Anions (bromide, sulfate, nitrate) by SW9056 and Alkalinity by SM2320	Bromide by SW9056	Perchlorate by SW6850	Metals (arsenic, chromium, manganese, nickel, thallium) by SW6020				Remarks (Preservatives etc.)
16 EW07-201022	WG	10/22/20/1310		4	X					X					
TRIP BLANK-201022	W	10/22/20		2	X										

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

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	10/22/20	1430									

For Lab Use Only

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

Remarks:

Aptim Environmental & Infrastucture, Inc.
LHAAP 16 October 2020
HS20101240

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

46420

CUSTODY SEAL
Date: 10/22/20 Time: 1430
Name: Scott Beesinger
Company: SGRA

Seal Broken By: SMM
Date: 10/23/20

46420

Must Deli A 10:30 1 B03
Time ar 917

46420

ORIGIN ID:SGRA (903) 930-6193
SCOTT BEESINGER
APTIM
1203-B EAST GRAND AVE.
PM8202
MARSHALL, TX 75670
UNITED STATES US

SHIP DATE: 29SEP20
ACTWGT: 1.00 LB MAN
CAD: 309130/CAFE3211
DIMS: 26x14x14 IN

TO CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099
(281) 530-5656
REF: LHAAP 16 – BO 74064 – RJ

RMA:

FedEx Express

FedEx
TRK# 0221 1891 8880 8696

FRI - 23 OCT AA
PRIORITY OVERNIGHT

AB SGRA

77099
TX-US
IAH

October 29, 2020

Service Request No:E2001036

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

Laboratory Results for: HS20101240

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory October 26, 2020
For your reference, these analyses have been assigned our service request number **E2001036.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current TNI standards, where applicable, and except as noted in the laboratory case narrative provided. All results are intended to be considered in their entirety and ALS Environmental is not responsible for use of less than the complete final report. Results apply only to the items submitted to the laboratory, as received for analysis. In accordance with the current TNI Standard, a statement on the estimated uncertainty of measurement of any quantitative analysis will be supplied upon request.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Corey Grandits
Project Manager

ADDRESS 10450 Stancliff Rd., Suite 210, Houston, TX 77099
PHONE +1 281 530 5656 | FAX +1 281 530 5887
ALS Group USA, Corp.
dba ALS Environmental

Certificate of Analysis

ALS Environmental - Houston HRMS
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

ALS Environmental

Client:	ALS Houston	**Service Request No.:**	E2001036
Project:	HS20101240	**Date Received:**	10/26/20
Sample Matrix:	L		

CASE NARRATIVE

All analyses were performed in adherence to the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier II. When appropriate to the method, method blank results have been reported with each analytical test.

Sample Receipt

Nine samples were received for analysis at ALS Environmental in Houston on 10/26/20.

The samples were received in good condition and are consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

Due to the sample matrix, sample E2001036-009 had to be prepped as a solid (samples viscous).

Data Validation Notes and Discussion

Precision and Accuracy:

EQ2000537: Laboratory Control Spike/Duplicate Laboratory Control Spike (LCS/DLCS) samples were analyzed and reported in addition to a MS/MSD for this extraction batch. The LCS & DLCS recoveries are within QC limits.

EQ2000548: Laboratory Control Spike/Duplicate Laboratory Control Spike (LCS/DLCS) samples were analyzed and reported in addition to a MS/MSD for this extraction batch. The LCS and DLCS recoveries are within QC limits.

DoD Certification is held for the method/matrix/analytes provided in this report.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.

Use of ALS group USA Corp dba ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.

Client: ALS Environmental - US **Service Request:**E2001036
Project: HS20101240

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
E2001036-001	16WW27-201022	10/22/2020	0745
E2001036-002	16WW27-201022-FD	10/22/2020	0745
E2001036-003	16WW43-201022	10/22/2020	0830
E2001036-004	16WW13-201022	10/22/2020	0915
E2001036-005	16WW42-201022	10/22/2020	1000
E2001036-006	16RW02-201022	10/22/2020	1045
E2001036-007	16RW05-201022	10/22/2020	1130
E2001036-008	16EW03-201022	10/22/2020	1225
E2001036-009	16EW07-201022	10/22/2020	1310

Service Request Summary

Folder #: **E2001036**
Client Name: ALS Environmental - US
Project Name: HS20101240
Project Number:

Report To: RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Houston, TX 77099-4338
USA
Phone Number: 281-530-5656
Cell Number:
Fax Number: 281-530-5887
E-mail: rj.modashia@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 10/26/20
Internal Due Date: 11/6/2020
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS20101240
EDD: No EDD Specified

9 250 mL-Plastic Bottle HDPE WM CLEAR Unpreserved
Location: EHRMS-WIC 10B
Pressure Gas:

Lab Samp No.	Client Samp No	Matrix	Collected	HOUSTON CIO4 DOD/6850
E2001036-001	16WW27-201022	Ground Water	10/22/20 0745	**IV**
E2001036-002	16WW27-201022-FD	Ground Water	10/22/20 0745	**IV**
E2001036-003	16WW43-201022	Ground Water	10/22/20 0830	**IV**
E2001036-004	16WW13-201022	Ground Water	10/22/20 0915	**IV**
E2001036-005	16WW42-201022	Ground Water	10/22/20 1000	**IV**
E2001036-006	16RW02-201022	Ground Water	10/22/20 1045	**IV**
E2001036-007	16RW05-201022	Ground Water	10/22/20 1130	**IV**
E2001036-008	16EW03-201022	Ground Water	10/22/20 1225	**IV**
E2001036-009	16EW07-201022	Misc. Solid	10/22/20 1310	**IV**

Service Request Summary

Folder #:	**E2001036**
Client Name:	ALS Environmental - US
Project Name:	HS20101240
Project Number:	
Report To:	RJ Modashia ALS Laboratory Group 10450 Stancliff Road Houston, TX 77099-4338 USA
Phone Number:	281-530-5656
Cell Number:	
Fax Number:	281-530-5887
E-mail:	rj.modashia@alsglobal.com

Project Chemist:	Corey Grandits
Originating Lab:	HOUSTON
Logged By:	CGRANDITS
Date Received:	10/26/20
Internal Due Date:	11/6/2020
QAP:	LAB QAP
Qualifier Set:	Lab Standard
Formset:	Lab Standard
Merged?:	Y
Report to MDL?:	Y
P.O. Number:	HS20101240
EDD:	No EDD Specified

9 250 mL-Plastic Bottle HDPE WM CLEAR Unpreserved

Location: EHRMS-WIC 10B

Pressure Gas:

Data Qualifiers

Lab Standard

+	Possible Tedlar bag artifact.
A	TIC is a suspected aldol-condensation product
B	Analyte found in the associated method blank as well as in the sample.
BC	Reported results are not blank corrected.
BH	The back section of the tube yielded higher results than the front.
BT	Results indicated possible breakthrough; back section >=10% front section.
C	Result identification confirmed.
D	Compound identified in an analysis at a secondary dilution factor
D	Spike was diluted out
DE	Reported results are corrected for desorption efficiency.
E	Estimated value. Concentration above calibration range
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
H1	Sample analysis performed past holding time. See case narrative.
H2	Initial analysis within holding time. Reanalysis for the required dilution was past holding time.
H3	Sample was received and analyzed past holding time.
H4	Sample was extracted past required extraction holding time, but analyzed within analysis holding time. See case narrative.
I	Internal standard not within the specified limits. See case narrative.
J	Estimated Value. Concentration found below MRL.
K	A deflection in the QC ion may indicate interference with the quantitation of this ion. The concentration of this analyte should be considered as an estimate.
K	Analyte was detected above the method reporting limit prior to normalization.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
L1	Laboratory control sample recovery outside the specified limits; results may be biased high.
L2	Laboratory control sample recovery outside the specified limits; results may be biased low.
L3	Laboratory control sample recovery outside the specified limits.
M	Matrix interference; results may be biased high.
M	The duplicate injection precision not met.
M1	Matrix interference due to coelution with a non-target compound; results may be biased high.
N	Presumptive evidence of a compound for TICs that have been identified based on a mass spectral library search.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.

Data Qualifiers

Lab Standard

P	Indicates chlorodiphenyl ether interference present at the retention time of the target compound.
P	Pesticide/Aroclor target analyte > 40% difference for detected concentrations between GC columns
Q	Indicates as estimated value because the P and P + 2 theoretical abundance ratio does not meet method criteria.
R	Duplicate Precision not met.
R1	Duplicate precision not within the specified limits; however, the results are below the MRL and considered estimated.
S	Surrogate recovery not within specified limits.
S	The reported value was determined by the Method of Standard Additions (MSA).
T	Analyte is a tentatively identified compound, result is estimated.
U	Compound was analyzed for, but was not detected (ND).
V1	The continuing calibration verification standard was outside (biased high) the specified limits for this compound.
V2	The continuing calibration verification standard was outside (biased low) the specified limits for this compound.
W	Result quantified, but the corresponding peak was detected outside the generated retention time window.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
X	See case narrative.
Y	Recovery outside limits
Y	The chromatogram resembles a petroleum product but does not match the calibration standard.
Z	The chromatogram does not resemble a petroleum product.
i	The MRL/MDL has been elevated due to a matrix interference.

ALS Laboratory Group

Acronyms

Cal	Calibration
Conc	CONCentration
Dioxin(s)	Polychlorinated dibenzo-p-dioxin(s)
EDL	Estimated Detection Limit
EMPC	Estimated Maximum Possible Concentration
Flags	Data qualifiers
Furan(s)	Polychlorinated dibenzofuran(s)
g	Grams
ICAL	Initial CALibration
ID	IDentifier
Ions	Masses monitored for the analyte during data acquisition
L	Liter (s)
LCS	Laboratory Control Sample
DLCS	Duplicate Laboratory Control Sample
MB	Method Blank
MCL	Method Calibration Limit
MDL	Method Detection Limit
mL	Milliliters
MS	Matrix Spiked sample
DMS	Duplicate Matrix Spiked sample
NO	Number of peaks meeting all identification criteria
PCDD(s)	Polychlorinated dibenzo-p-dioxin(s)
PCDF(s)	Polychlorinated dibenzofuran(s)
ppb	Parts per billion
ppm	Parts per million
ppq	Parts per quadrillion
ppt	Parts per trillion
QA	Quality Assurance
QC	Quality Control
Ratio	Ratio of areas from monitored ions for an analyte
% Rec.	Percent recovery
RPD	Relative Percent Difference
RRF	Relative Response Factor
RT	Retention Time
SDG	Sample Delivery Group
S/N	Signal-to-noise ratio
TEF	Toxicity Equivalence Factor
TEQ	Toxicity Equivalence Quotient

10450 Stancliff Rd, Houston, TX 77099 | 281-530-5656 | www.alsglobal.com

ALS Environmental

State Certifications, Accreditations, and Licenses

Agency	Number	Expire Date
American Association for Laboratory Accreditation	2897.01 2020	11/30/2021
Arizona Department of Health Services	AZ0793-2020	5/27/2021
Arkansas Department of Environmental Quality	20-030-0	3/26/2021
California Department of Health Services	2919-2020	4/30/2021
Department of Defense	A2LA 2897.01	11/30/2021
Florida Department of Health	E87611-2020	6/30/2021
Hawaii Department of Health	2020	4/30/2021
Illinois Environmental Protection Agency	2000322020-4	5/9/2021
Kansas Department of Health and Environment	E-10352-2020	7/31/2021
Louisiana Department of Environmental Quality	03087-2020	6/30/2021
Louisiana Department of Health and Hospitals	LA028-2020	12/31/2020
Maine Department of Health and Human Services	2020016	6/5/2022
Maryland Department of the Environment	343-2020	6/30/2021
Michigan Depratment of Environmental Quality	9971-2020	4/30/2021
Minnesota Department of Health	1785988	12/31/2020
Nebraska Department of Health and Human Services	NE-OS-25-13 (2020)	4/30/2021
Nevada Department of Concervation and Natural Resources	TX026932021-1	7/31/2021
New Hampshire Environmental Laboratory Accreditation Program	209420	4/24/2021
New Jersey Department of Environmental Protection	TX008	6/30/2021
New York Department of Health	11707	3/31/2021
Oklahoma Department of Environmental Quality	2020-123	8/31/2021
Pennsylvania Department of Environmental Protection	014	6/30/2021
Tennessee Department of Environment and Concervation	04016-2020	4/30/2021
Texas Commision on Environmental Quality	T104704231-20-26	4/30/2021
United States Department of Agriculture	P330-19-00299	10/10/2022
Washington Department of Health	C819	11/14/2020

Chain of Custody

ALS Environmental - Houston HRMS
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID: 15007**

SUBCONTRACT TO:

ALS Environmental
10450 Stancliff RoadSuite 210
Houston, TX 77084 **Phone:** +1 281 530 5656

CUSTOMER INFORMATION:

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

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS20101240
TSR:	Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS20101240-01**	**16WW27-201022**	**Groundwater**	**22 Oct 2020 07:45**
	SUB_Perch-6850			06 Nov 2020
2.	**HS20101240-02**	**16WW27-201022-FD**	**Groundwater**	**22 Oct 2020 07:45**
	SUB_Perch-6850			06 Nov 2020
3.	**HS20101240-03**	**16WW43-201022**	**Groundwater**	**22 Oct 2020 08:30**
	SUB_Perch-6850			06 Nov 2020
4.	**HS20101240-04**	**16WW13-201022**	**Groundwater**	**22 Oct 2020 09:15**
	SUB_Perch-6850			06 Nov 2020
5.	**HS20101240-05**	**16WW42-201022**	**Groundwater**	**22 Oct 2020 10:00**
	SUB_Perch-6850			06 Nov 2020
6.	**HS20101240-06**	**16RW02-201022**	**Groundwater**	**22 Oct 2020 10:45**
	SUB_Perch-6850			06 Nov 2020
7.	**HS20101240-07**	**16RW05-201022**	**Groundwater**	**22 Oct 2020 11:30**
	SUB_Perch-6850			06 Nov 2020
8.	**HS20101240-08**	**16EW03-201022**	**Groundwater**	**22 Oct 2020 12:25**
	SUB_Perch-6850			06 Nov 2020
9.	**HS20101240-09**	**16EW07-201022**	**Groundwater**	**22 Oct 2020 13:10**

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID: 15007**

LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
ANALYSIS REQUESTED			DUE DATE
SUB_Perch-6850			06 Nov 2020

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

QC Level: DOD IV (DoD Data Package)

Relinquished By: _____ Date/Time: _____

Received By: _____ Date/Time: 10/26/20 1020

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

ALS Environmental

Cooler Receipt Form

Project Chemist: CK

Client/Project: ALK-H

Thermometer ID: 1231

Date/Time Received: 10/26/20

Initials: CK

Date/Time Logged in: 10/26/20

Initials: CK

1. Method of delivery: ○ US Mail ○ Fed Ex ○ UPS ○ DHL ☑ ALS Courier ○ Client
2. Samples received in: ☑ Cooler ○ Box ○ Envelope ○ Other
3. Were custody seals on coolers? ○ Yes ☑ No
   Were they intact? ○ Yes ○ No ☑ N/A
   Were they signed and dated? ○ Yes ○ No ☑ N/A
   If yes, how many and where?
4. Packing Material: ○ Inserts ☑ Baggies ○ Bubble Wrap ○ Gel Packs ☒ Wet Ice ○ Sleeves ○ Other
5. Foreign or Regulated Soil? ○ Yes ☒ No Location of Sampling:

Cooler Tracking Number	COC ID	Date Opened	Time Opened	Opened By	Temp. °C	Temp Blank?
NA		10/26/20	1020	CK	3.5	☒
						☐
						☐
						☐

6. Were custody papers properly filled out (ink, signed, dated, etc)? ☑ Yes ○ No
7. Did all bottles arrive in good condition (not broken, no signs of leakage)? ☑ Yes ○ No
8. Were all sample labels complete (i.e., sample ID, analysis, preservation, etc)? ☑ Yes ○ No
9. Were appropriate bottles/containers and volumes received for the requested tests? ☑ Yes ○ No
10. Did sample labels and tags agree with custody documents? ☑ Yes ○ No

Notes, Discrepancies, & Resolutions:

Service request Label:

10450 Stancliff Rd., Suite 210
Houston, TX 77099
T: +1 713 266 1599
F: +1 713 266 1599
www.alsglobal.com

SAMPLE ACCEPTANCE POLICY

This policy outlines the criteria samples must meet to be accepted by ALS Environmental – Houston HRMS.

Cooler Custody Seals (desirable, mandatory if specified in SAP):

- ✓ Intact on outside of cooler, signed and dated

Chain-of-Custody (COC) documentation (mandatory):

The following is required on each COC:

- ✓ Sample ID, the location, date and time of collection, collector's name, preservation type, sample type, and any other special remarks concerning the sampleThe COC must be completed in ink.
- ✓ Signature and date of relinquishing party.

In the absence of a COC at sample receipt, the COC will be requested from the client.

Sample Integrity (mandatory):

Samples are inspected upon arrival to ensure that sample integrity was not compromised during transfer to the laboratory.

- ✓ Sample containers must arrive in good condition (not broken or leaking).
- ✓ Samples must be labeled appropriately, including Sample IDs, and requested test using durable labels and indelible ink.
- ✓ The correct type of sample bottle must be used for the method requested.
- ✓ An appropriate sample volume, or weight, must be received.
- ✓ Sample IDs and number of containers must reconcile with the COC.
- ✓ Samples must be received within the method defined holding time.

Temperature Requirement (varies by sample matrix):

- ✓ Aqueous and Non-aqueous samples must be shipped and stored cold, at 0 to 6ºC.
- ✓ Tissue samples must be shipped and stored frozen, at -20 to -10ºC.
- ✓ Air samples are shipped and stored cold, at 0 to 6ºC
- ✓ The sample temperature must be recorded on the COC

All cooler inspections are documented on the Cooler Receipt Form (CRF). A separate CRF is completed for each service request. Any samples not meeting the above criteria are noted on the CRF and the Project Manager notified. The Project Manager must resolve any sample integrity issues with the client prior to proceeding with the analysis. Such resolutions are documented in writing and filed with the project folder. Data associated with samples received outside of this acceptance policy will be qualified on the case narrative of the final report

Preparation Information Benchsheets

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

Preparation Information Benchsheet

Prep Run#: 368462 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
Team: Semivoa GCMS/GRIVERA **Prep Method:** **Prep Date/Time:** 10/26/20 14:30

#	Lab Code	Client ID	B#	Method /Test	pH	Cl	Matrix	Amt. Ext.	Sample Description
1	E2001035-001	16WW56-201021	.01	6850/ClO4 DOD			Ground Water	10mL	
2	E2001035-002	16RW11-201021	.01	6850/ClO4 DOD			Ground Water	10mL	
3	E2001035-003	16RW11-201021-FD	.01	6850/ClO4 DOD			Ground Water	10mL	
4	E2001035-004	16IW20-201021	.01	6850/ClO4 DOD			Ground Water	10mL	
5	E2001035-005	16WW40-201021	.01	6850/ClO4 DOD			Ground Water	10mL	
6	E2001035-006	16WW12-201021	.01	6850/ClO4 DOD			Ground Water	10mL	
7	E2001035-007	16RW04-201021	.01	6850/ClO4 DOD			Ground Water	10mL	
8	E2001035-008	16RW04-201021-FD	.01	6850/ClO4 DOD			Ground Water	10mL	
9	E2001035-009	16EW02-201021	.01	6850/ClO4 DOD			Ground Water	10mL	
10	E2001036-001	16WW27-201022	.01	6850/ClO4 DOD			Ground Water	10mL	
11	E2001036-002	16WW27-201022-FD	.01	6850/ClO4 DOD			Ground Water	10mL	
12	E2001036-003	16WW43-201022	.01	6850/ClO4 DOD			Ground Water	10mL	
13	E2001036-004	16WW13-201022	.01	6850/ClO4 DOD			Ground Water	10mL	
14	E2001036-005	16WW42-201022	.01	6850/ClO4 DOD			Ground Water	10mL	
15	E2001036-006	16RW02-201022	.01	6850/ClO4 DOD			Ground Water	10mL	
16	E2001036-007	16RW05-201022	.01	6850/ClO4 DOD			Ground Water	10mL	
17	E2001036-008	16EW03-201022	.01	6850/ClO4 DOD			Ground Water	10mL	
18	EQ2000537-01	MB		6850/ClO4 DOD			Liquid	10mL	
19	EQ2000537-02	LCS		6850/ClO4 DOD			Liquid	10mL	
20	EQ2000537-03	DLCS		6850/ClO4 DOD			Liquid	10mL	
21	EQ2000537-04	16WW56-201021 MS	.01	6850/ClO4 DOD			Liquid	10mL	
22	EQ2000537-05	16WW56-201021 DMS	.01	6850/ClO4 DOD			Liquid	10mL	

Spiking Solutions

Name: Perchlorate Intermediate Stock1 Inventory ID 209764 Logbook Ref: Perchlorate Int. Stock1 51820 Expires On: 11/18/2020

EQ2000537-02	1.00µL	EQ2000537-03	1.00µL	EQ2000537-04	1.00µL	EQ2000537-05	1.00µL

Name: Sodium Perchlorate 1 ug/mL (IS) (18-O) as CLO4 Inventory ID 212340 Logbook Ref: Sodium Perchlorate Expires On: 07/13/2022

E2001035-001	100.00µL	E2001035-002	100.00µL	E2001035-003	100.00µL	E2001035-004	100.00µL	E2001035-005	100.00µL	E2001035-006	100.00µL
E2001035-007	100.00µL	E2001035-008	100.00µL	E2001035-009	100.00µL	E2001036-001	100.00µL	E2001036-002	100.00µL	E2001036-003	100.00µL
E2001036-004	100.00µL	E2001036-005	100.00µL	E2001036-006	100.00µL	E2001036-007	100.00µL	E2001036-008	100.00µL	EQ2000537-01	100.00µL
EQ2000537-02	100.00µL	EQ2000537-03	100.00µL	EQ2000537-04	100.00µL	EQ2000537-05	100.00µL				

Preparation Information Benchsheet

Prep Run#: 368462 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
Team: Semivoa GCMS/GRIVERA **Prep Method:** **Prep Date/Time:** 10/26/20 14:30

Preparation Steps

Step: Preparation
Started: 10/26/20 14:30
Finished: 10/26/20 15:00
By: GRIVERA
Comments

Comments: _____

Reviewed By: GR Date: 10/27/2020

Chain of Custody

Relinquished By: _____ Date: _____ Extracts Examined
Received By: _____ Date: _____ Yes No

Preparation Information Benchsheet

Prep Run#: 368660 **Prep WorkFlow:** Gen CLO4 **Status:** Prepped
Team: Semivoa GCMS/GRIVERA **Prep Method:** Method **Prep Date/Time:** 10/28/20 14:30

#	Lab Code	Client ID	B#	Method /Test	pH	Cl	Matrix	Amt. Ext.	Sample Description
1	E2001025-001	2020-BH-1-1	.01	6850/ClO4			Soil	1.006g	
2	E2001025-002	2020-BH-1-7	.01	6850/ClO4			Soil	1.040g	
3	E2001035-010	16EW06-201021	.02	6850/ClO4 DOD			Misc. Solid	1.003g	
4	E2001035-011	16EW06-201021-FD	.02	6850/ClO4 DOD			Misc. Solid	1.066g	
5	E2001036-009	16EW07-201022	.02	6850/ClO4 DOD			Misc. Solid	1.070g	
6	EQ2000548-01	MB		6850/ClO4 DOD			Solid	1.047g	
7	EQ2000548-02	LCS		6850/ClO4 DOD			Solid	0.980g	
8	EQ2000548-03	DLCS		6850/ClO4 DOD			Solid	0.977g	
9	EQ2000548-04	2020-BH-1-1 MS	.01	6850/ClO4			Solid	0.994g	
10	EQ2000548-05	2020-BH-1-1 DMS	.01	6850/ClO4			Solid	0.985g	

Spiking Solutions

Name: Perchlorate Intermediate Stock1 Inventory ID 209764 Logbook Ref: Perchlorate Int. Stock1 51820 Expires On: 11/18/2020

EQ2000548-02	100.00µL	EQ2000548-02	100.00µL	EQ2000548-03	100.00µL	EQ2000548-03	100.00µL	EQ2000548-04	100.00µL	EQ2000548-05	100.00µL

Name: Sodium Perchlorate 1 ug/mL (IS) (18-O) as CLO4 Inventory ID 212340 Logbook Ref: Sodium Perchlorate Expires On: 07/13/2022

E2001025-001	100.00µL	E2001025-002	100.00µL	E2001035-010	100.00µL	E2001035-011	100.00µL	E2001036-009	100.00µL	EQ2000548-01	100.00µL
EQ2000548-01	100.00µL	EQ2000548-02	100.00µL	EQ2000548-02	100.00µL	EQ2000548-03	100.00µL	EQ2000548-03	100.00µL	EQ2000548-04	100.00µL
EQ2000548-05	100.00µL										

Preparation Steps

Step: Extraction
Started: 10/28/20 14:30
Finished: 10/28/20 15:30
By: GRIVERA
Comments

Comments: _____

Reviewed By: GR Date: 10/29/2020

Preparation Information Benchsheet

Prep Run#: 368660
Team: Semivoa GCMS/GRIVERA

Prep WorkFlow: Gen CLO4
Prep Method: Method

Status: Prepped
Prep Date/Time: 10/28/20 14:30

Chain of Custody

Relinquished By:	_____	Date:	_____	Extracts Examined
Received By:	_____	Date:	_____	Yes No

Analytical Results

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2001036
Project:	HS20101240	**Date Collected:**	10/22/20 0745
Sample Matrix:	Ground Water	**Date Received:**	10/26/20
Sample Name:	16WW27-201022	**Units:**	µg/L
Lab Code:	E2001036-001	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	10/26/20	10/26/20 16:02	368462	701198	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2001036
Project:	HS20101240	**Date Collected:**	10/22/20 0745
Sample Matrix:	Ground Water	**Date Received:**	10/26/20
Sample Name:	16WW27-201022-FD	**Units:**	µg/L
Lab Code:	E2001036-002	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	10/26/20	10/26/20 16:10	368462	701198	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2001036
Project:	HS20101240	**Date Collected:**	10/22/20 0830
Sample Matrix:	Ground Water	**Date Received:**	10/26/20
Sample Name:	16WW43-201022	**Units:**	µg/L
Lab Code:	E2001036-003	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	10/26/20	10/26/20 16:18	368462	701198	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2001036
Project:	HS20101240	**Date Collected:**	10/22/20 0915
Sample Matrix:	Ground Water	**Date Received:**	10/26/20
Sample Name:	16WW13-201022	**Units:**	µg/L
Lab Code:	E2001036-004	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	10/26/20	10/26/20 16:26	368462	701198	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2001036
Project:	HS20101240	**Date Collected:**	10/22/20 1000
Sample Matrix:	Ground Water	**Date Received:**	10/26/20
Sample Name:	16WW42-201022	**Units:**	µg/L
Lab Code:	E2001036-005	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	10/26/20	10/26/20 16:42	368462	701198	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2001036
Project:	HS20101240	**Date Collected:**	10/22/20 1045
Sample Matrix:	Ground Water	**Date Received:**	10/26/20
Sample Name:	16RW02-201022	**Units:**	µg/L
Lab Code:	E2001036-006	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	10/26/20	10/26/20 16:49	368462	701198	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2001036
Project:	HS20101240	**Date Collected:**	10/22/20 1130
Sample Matrix:	Ground Water	**Date Received:**	10/26/20
Sample Name:	16RW05-201022	**Units:**	µg/L
Lab Code:	E2001036-007	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	10/26/20	10/26/20 16:57	368462	701198	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2001036
Project:	HS20101240	**Date Collected:**	10/22/20 1225
Sample Matrix:	Ground Water	**Date Received:**	10/26/20
Sample Name:	16EW03-201022	**Units:**	µg/L
Lab Code:	E2001036-008	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.200	0.100	0.0500	2	10/26/20	10/28/20 11:27	368462	701198	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2001036
Project:	HS20101240	**Date Collected:**	10/22/20 1310
Sample Matrix:	Misc. Solid	**Date Received:**	10/26/20
Sample Name:	16EW07-201022	**Units:**	µg/Kg
Lab Code:	E2001036-009	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.935	0.750	0.300	1	10/28/20	10/28/20 18:25	368660	701275	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2001036
Project:	HS20101240	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	µg/L
Lab Code:	EQ2000537-01	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	10/26/20	10/26/20 14:04	368462	701198	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2001036
Project:	HS20101240	**Date Collected:**	NA
Sample Matrix:	Misc. Solid	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	µg/Kg
Lab Code:	EQ2000548-01	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.955	0.750	0.300	1	10/28/20	10/28/20 17:14	368660	701275	

Accuracy & Precision

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2001036
Project:	HS20101240	**Date Analyzed:**	10/26/20
Sample Matrix:	Ground Water		

Lab Control Sample Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method:	6850	**Units:**	µg/L
Prep Method:	Method	**Basis:**	As Received
		Extraction Lot:	368462

	Lab Control Sample EQ2000537-02			Duplicate Lab Control Sample EQ2000537-03					
Analyte Name	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Perchlorate	0.101	0.100	101	0.104	0.100	104	84 - 119	3	15

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

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

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2001036
Project:	HS20101240	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2000537-02	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.101**		0.100	0.0500	0.0250	1	10/26/20	10/26/20 14:12	368462	701198	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2001036
Project:	HS20101240	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Duplicate Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2000537-03	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.104**		0.100	0.0500	0.0250	1	10/26/20	10/26/20 14:20	368462	701198	

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2001036
Project:	HS20101240	**Date Analyzed:**	10/28/20
Sample Matrix:	Misc. Solid		

Lab Control Sample Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method:	6850	**Units:**	µg/Kg
Prep Method:	Method	**Basis:**	As Received
		Extraction Lot:	368660

	Lab Control Sample EQ2000548-02			Duplicate Lab Control Sample EQ2000548-03					
Analyte Name	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Perchlorate	103	102	101	109	102	106	84 - 121	5	15

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

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

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2001036
Project:	HS20101240	**Date Collected:**	NA
Sample Matrix:	Misc. Solid	**Date Received:**	NA
Sample Name:	Lab Control Sample	**Units:**	µg/Kg
Lab Code:	EQ2000548-02	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**103**		1.02	0.765	0.307	1	10/28/20	10/28/20 17:22	368660	701275	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2001036
Project:	HS20101240	**Date Collected:**	NA
Sample Matrix:	Misc. Solid	**Date Received:**	NA
Sample Name:	Duplicate Lab Control Sample	**Units:**	µg/Kg
Lab Code:	EQ2000548-03	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**109**		1.02	0.768	0.308	1	10/28/20	10/28/20 17:30	368660	701275	

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

November 09, 2020

Analytical Report for Service Request No: K2009736

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

RE: ALS Houston DOD TOC / HS20101240

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory October 27, 2020
For your reference, these analyses have been assigned our service request number **K2009736.**

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
Qualifiers
State Certifications, Accreditations, And Licenses
Case Narrative
Chain of Custody
General Chemistry
Raw Data
    General Chemistry

Acronyms

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

Inorganic Data Qualifiers

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

Metals Data Qualifiers

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

Organic Data Qualifiers

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

Additional Petroleum Hydrocarbon Specific Qualifiers

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

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

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

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

Case Narrative

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

1317 South 13th Ave, Kelso, WA 98626 | 1-360-577-7222 | www.alsglobal.com

ALS Environmental

Client: ALS Environmental - US
Project: ALS Houston DOD TOC
Sample Matrix: Ground Water

Service Request: K2009736
Date Received: 10/27/2020

CASE NARRATIVE

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

Sample Receipt:

Two ground water samples were received for analysis at ALS Environmental on 10/27/2020. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The samples were stored at minimum in accordance with the analytical method requirements.

General Chemistry:

No significant anomalies were noted with this analysis.

Approved by Kelley Lovejoy Date 11/09/2020

Chain of Custody

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

K2009736

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID: 15006**

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:	HS20101240
TSR:	Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS20101240-05**	**16WW42-201022**	**Groundwater**	**22 Oct 2020 10:00**
	TOC: Provide Level II & DOD Level IV/EQuIS APTIM EDD			06 Nov 2020
2.	**HS20101240-07**	**16RW05-201022**	**Groundwater**	**22 Oct 2020 11:30**
	TOC: Provide Level II & DOD Level IV/EQuIS APTIM EDD			06 Nov 2020

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

QC Level: DOD IV (DoD Data Package)

Relinquished By: _____ Date/Time: 10/26/2020 1800

Received By: _____ Date/Time: 10/27/20 0930

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

PM VU

Cooler Receipt and Preservation Form

Client ALS / Houston Service Request K20 09736

Received: 10/27/20 Opened: 10/27/20 By: [illegible] Unloaded: 10/27/20 By: [illegible]

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
4. Was a Temperature Blank present in cooler? NA Y N If yes, notate the temperature in the appropriate column below:
   If no, take the temperature of a representative sample bottle contained within the cooler; notate in the column "Sample Temp":
5. Were samples received within the method specified temperature ranges? NA Y N
   If no, were they received on ice and same day as collected? If not, notate the cooler # below and notify the PM. NA Y N

If applicable, tissue samples were received: *Frozen* *Partially Thawed* *Thawed*

Temp Blank	Sample Temp	IR Gun	Cooler #/COC ID / NA	Out of temp indicate with "X"	PM Notified If out of temp	Tracking Number NA	Filed
0.5	—	IR02	15006			1891 8882 0366	

6. Packing material: *Inserts* *Baggies* *Bubble Wrap* *Gel Packs* *Wet Ice* *Dry Ice* *Sleeves* _____
7. Were custody papers properly filled out (ink, signed, etc.)? NA Y N
8. Were samples received in good condition (unbroken) NA Y N
9. Were all sample labels complete (ie, analysis, preservation, etc.)? NA Y N
10. Did all sample labels and tags agree with custody papers? NA Y N
11. Were appropriate bottles/containers and volumes received for the tests indicated? NA Y N
12. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* NA Y N
13. Were VOA vials received without headspace? *Indicate in the table below.* NA Y N
14. Was C12/Res negative? NA Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count Bottle Type	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:**	K2009736
Project:	ALS Houston DOD TOC/HS20101240	**Date Collected:**	10/22/20
Sample Matrix:	Ground Water	**Date Received:**	10/27/20
Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA

Carbon, Total Organic

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
16WW42-201022	K2009736-001	**4.31**	0.50	0.20	0.07	1	11/05/20 18:47	
16RW05-201022	K2009736-002	**117**	2.5	1.0	0.4	5	11/05/20 18:47	
Method Blank	K2009736-MB	ND U	0.50	0.20	0.07	1	11/05/20 18:47	

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K2009736
Project:	ALS Houston DOD TOC/HS20101240	**Date Analyzed:**	11/05/20
Sample Matrix:	Ground Water	**Date Extracted:**	NA

Lab Control Sample Summary
Carbon, Total Organic

Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA
		Analysis Lot:	702435

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K2009736-LCS	26.3	25.0	105	83-117

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

December 13, 2020

Susan Huang
Aptim Environmental & Infrastucture, Inc.
2500 City West Blvd., Suite 1700
Houston, TX 77042

Work Order: **HS20101419**

Laboratory Results for: **LHAAP 16 October 2020**

Dear Susan Huang,

ALS Environmental received 14 sample(s) on Oct 28, 2020 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: 13-Dec-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
Work Order: HS20101419

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS20101419-01	16RW09-201026	Groundwater		26-Oct-2020 07:50	28-Oct-2020 09:15	☐
HS20101419-02	16RW10-201026	Groundwater		26-Oct-2020 08:45	28-Oct-2020 09:15	☐
HS20101419-03	16RW06-201026	Groundwater		26-Oct-2020 09:30	28-Oct-2020 09:15	☐
HS20101419-04	16RW07-201026	Groundwater		26-Oct-2020 10:15	28-Oct-2020 09:15	☐
HS20101419-05	16PM14-201026	Groundwater		26-Oct-2020 11:00	28-Oct-2020 09:15	☐
HS20101419-06	16PM14-201026-FD	Groundwater		26-Oct-2020 11:00	28-Oct-2020 09:15	☐
HS20101419-07	16PM06-201026	Groundwater		26-Oct-2020 11:50	28-Oct-2020 09:15	☐
HS20101419-08	16PM09-201026	Groundwater		26-Oct-2020 12:35	28-Oct-2020 09:15	☐
HS20101419-09	16PM02-201026	Groundwater		26-Oct-2020 13:20	28-Oct-2020 09:15	☐
HS20101419-10	16PM03-201026	Groundwater		26-Oct-2020 14:05	28-Oct-2020 09:15	☐
HS20101419-11	16SW01-201026	Groundwater		26-Oct-2020 14:15	28-Oct-2020 09:15	☐
HS20101419-12	16SW02-201026	Groundwater		26-Oct-2020 14:35	28-Oct-2020 09:15	☐
HS20101419-13	16SW03-201026	Groundwater		26-Oct-2020 14:55	28-Oct-2020 09:15	☐
HS20101419-14	Trip Blank	Water	CG-100620-222	26-Oct-2020 00:00	28-Oct-2020 09:15	☐

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 13-Dec-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
Work Order: HS20101419

CASE NARRATIVE

Work Order Comments

- REV01: Revised to include Perchlorate revised report.
- The analysis for Methane, Methene, Ethane and CO2 by RSK175 was subcontracted to ALS Simi Valley, CA. Final report attached.
- The analysis for Perchlorate was subcontracted to ALS Salt Lake City, UT. Final report attached.

Work Order Comments

- The analysis for Perchlorate was subcontracted our ALS Houston TX, High Resolution Lab. Final report attached.

  The analysis for TOC was subcontracted to ALS Kelso, WA. Final report attached.

GCMS Volatiles by Method SW8260

Batch ID: R372017

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

Batch ID: R372113

Sample ID: HS20101564-08MS

- MS and MSD are for an unrelated sample

Batch ID: R372116

Sample ID: HS20110161-01MS

- MS is for an unrelated sample

Metals by Method SW6020

Batch ID: 159432

Sample ID: 16SW02-201026 (HS20101419-12MS)

- The MS and/or MSD recovery was outside of the control limits; however, the result in the parent sample is greater than 4x the spike amount. (Manganese)

WetChemistry by Method SW9056

Batch ID: R372517

Sample ID: 16PM06-201026 (HS20101419-07)

- Sample ran at 5X due to high concentration of Sulfate

Sample ID: 16PM14-201026 (HS20101419-05)

- Sample ran at 5X due to high concentration of Sulfate

Sample ID: 16PM14-201026-FD (HS20101419-06)

- Sample ran at 5X due to high concentration of Sulfate

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 13-Dec-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
Sample ID: 16RW09-201026
Collection Date: 26-Oct-2020 07:50

ANALYTICAL REPORT
WorkOrder:HS20101419
Lab ID:HS20101419-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Nov-2020 14:48
1,1-Dichloroethene	**7.5**		**0.20**	**0.50**	**1.0**	**UG/L**	1	04-Nov-2020 14:48
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Nov-2020 14:48
cis-1,2-Dichloroethene	**290**		**2.0**	**5.0**	**10**	**UG/L**	10	04-Nov-2020 14:27
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	04-Nov-2020 14:48
Trichloroethene	**980**		**2.0**	**5.0**	**10**	**UG/L**	10	04-Nov-2020 14:27
Vinyl chloride	**33**		**0.20**	**0.50**	**1.0**	**UG/L**	1	04-Nov-2020 14:48
Surr: 1,2-Dichloroethane-d4	*83.1*			**0**	*81-118*	*%REC*	*1*	*04-Nov-2020 14:48*
Surr: 1,2-Dichloroethane-d4	*87.6*			**0**	*81-118*	*%REC*	*10*	*04-Nov-2020 14:27*
Surr: 4-Bromofluorobenzene	*90.1*			**0**	*85-114*	*%REC*	*10*	*04-Nov-2020 14:27*
Surr: 4-Bromofluorobenzene	*87.1*			**0**	*85-114*	*%REC*	*1*	*04-Nov-2020 14:48*
Surr: Dibromofluoromethane	*81.6*			**0**	*80-119*	*%REC*	*1*	*04-Nov-2020 14:48*
Surr: Dibromofluoromethane	*85.9*			**0**	*80-119*	*%REC*	*10*	*04-Nov-2020 14:27*
Surr: Toluene-d8	*104*			**0**	*89-112*	*%REC*	*10*	*04-Nov-2020 14:27*
Surr: Toluene-d8	*103*			**0**	*89-112*	*%REC*	*1*	*04-Nov-2020 14:48*
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**5.38**		**0.0300**	**0.100**	**0.100**	**mg/L**	1	12-Nov-2020 00:06
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	06-Nov-2020 14:07
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	12-Nov-2020 14:11

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 13-Dec-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
Sample ID: 16RW10-201026
Collection Date: 26-Oct-2020 08:45

ANALYTICAL REPORT
WorkOrder:HS20101419
Lab ID:HS20101419-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	2.5	U	1.5	2.5	5.0	UG/L	5	05-Nov-2020 19:22
1,1-Dichloroethene	**21**		**1.0**	**2.5**	**5.0**	**UG/L**	5	05-Nov-2020 19:22
1,2-Dichloroethane	**4.6**	J	**1.0**	**2.5**	**5.0**	**UG/L**	5	05-Nov-2020 19:22
cis-1,2-Dichloroethene	**390**		**1.0**	**2.5**	**5.0**	**UG/L**	5	05-Nov-2020 19:22
Methylene chloride	**5.5**	J	**2.0**	**5.0**	**10**	**UG/L**	5	05-Nov-2020 19:22
Trichloroethene	**2,000**		**5.0**	**12**	**25**	**UG/L**	25	05-Nov-2020 19:43
Vinyl chloride	**100**		**1.0**	**2.5**	**5.0**	**UG/L**	5	05-Nov-2020 19:22
Surr: 1,2-Dichloroethane-d4	*88.7*			**0**	*81-118*	*%REC*	*5*	*05-Nov-2020 19:22*
Surr: 1,2-Dichloroethane-d4	*88.0*			**0**	*81-118*	*%REC*	*25*	*05-Nov-2020 19:43*
Surr: 4-Bromofluorobenzene	*93.7*			**0**	*85-114*	*%REC*	*25*	*05-Nov-2020 19:43*
Surr: 4-Bromofluorobenzene	*88.5*			**0**	*85-114*	*%REC*	*5*	*05-Nov-2020 19:22*
Surr: Dibromofluoromethane	*85.6*			**0**	*80-119*	*%REC*	*5*	*05-Nov-2020 19:22*
Surr: Dibromofluoromethane	*82.4*			**0**	*80-119*	*%REC*	*25*	*05-Nov-2020 19:43*
Surr: Toluene-d8	*101*			**0**	*89-112*	*%REC*	*5*	*05-Nov-2020 19:22*
Surr: Toluene-d8	*100*			**0**	*89-112*	*%REC*	*25*	*05-Nov-2020 19:43*
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	0.100	U	0.0300	0.100	0.100	mg/L	1	12-Nov-2020 01:00
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	06-Nov-2020 14:07
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	12-Nov-2020 14:11

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 13-Dec-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
Sample ID: 16RW06-201026
Collection Date: 26-Oct-2020 09:30

ANALYTICAL REPORT
WorkOrder:HS20101419
Lab ID:HS20101419-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Nov-2020 13:02
1,1-Dichloroethene	**1.3**		**0.20**	**0.50**	**1.0**	**UG/L**	1	04-Nov-2020 13:02
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Nov-2020 13:02
cis-1,2-Dichloroethene	**4.8**		**0.20**	**0.50**	**1.0**	**UG/L**	1	04-Nov-2020 13:02
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	04-Nov-2020 13:02
Trichloroethene	**110**		**0.20**	**0.50**	**1.0**	**UG/L**	1	04-Nov-2020 13:02
Vinyl chloride	**2.5**		**0.20**	**0.50**	**1.0**	**UG/L**	1	04-Nov-2020 13:02
Surr: 1,2-Dichloroethane-d4	*85.7*			**0**	*81-118*	*%REC*	*1*	*04-Nov-2020 13:02*
Surr: 4-Bromofluorobenzene	*89.5*			**0**	*85-114*	*%REC*	*1*	*04-Nov-2020 13:02*
Surr: Dibromofluoromethane	*87.9*			**0**	*80-119*	*%REC*	*1*	*04-Nov-2020 13:02*
Surr: Toluene-d8	*101*			**0**	*89-112*	*%REC*	*1*	*04-Nov-2020 13:02*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	06-Nov-2020 14:07

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 13-Dec-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
Sample ID: 16RW07-201026
Collection Date: 26-Oct-2020 10:15

ANALYTICAL REPORT
WorkOrder:HS20101419
Lab ID:HS20101419-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	05-Nov-2020 18:40
1,1-Dichloroethene	**6.4**		**0.20**	**0.50**	**1.0**	**UG/L**	1	05-Nov-2020 18:40
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	05-Nov-2020 18:40
cis-1,2-Dichloroethene	**38**		**0.20**	**0.50**	**1.0**	**UG/L**	1	05-Nov-2020 18:40
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	05-Nov-2020 18:40
Trichloroethene	**1,100**		**2.0**	**5.0**	**10**	**UG/L**	10	05-Nov-2020 19:01
Vinyl chloride	**28**		**0.20**	**0.50**	**1.0**	**UG/L**	1	05-Nov-2020 18:40
Surr: 1,2-Dichloroethane-d4	*88.7*			**0**	*81-118*	*%REC*	*1*	*05-Nov-2020 18:40*
Surr: 1,2-Dichloroethane-d4	*89.0*			**0**	*81-118*	*%REC*	*10*	*05-Nov-2020 19:01*
Surr: 4-Bromofluorobenzene	*90.7*			**0**	*85-114*	*%REC*	*1*	*05-Nov-2020 18:40*
Surr: 4-Bromofluorobenzene	*90.8*			**0**	*85-114*	*%REC*	*10*	*05-Nov-2020 19:01*
Surr: Dibromofluoromethane	*86.1*			**0**	*80-119*	*%REC*	*1*	*05-Nov-2020 18:40*
Surr: Dibromofluoromethane	*85.4*			**0**	*80-119*	*%REC*	*10*	*05-Nov-2020 19:01*
Surr: Toluene-d8	*103*			**0**	*89-112*	*%REC*	*10*	*05-Nov-2020 19:01*
Surr: Toluene-d8	*101*			**0**	*89-112*	*%REC*	*1*	*05-Nov-2020 18:40*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	06-Nov-2020 14:07

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 13-Dec-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
Sample ID: 16PM14-201026
Collection Date: 26-Oct-2020 11:00

ANALYTICAL REPORT
WorkOrder:HS20101419
Lab ID:HS20101419-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	10	U	3.0	10	10	UG/L	10	04-Nov-2020 18:18
1,1-Dichloroethene	**25**		**2.0**	**5.0**	**10**	**UG/L**	10	04-Nov-2020 18:18
1,2-Dichloroethane	**26**		**2.0**	**5.0**	**10**	**UG/L**	10	04-Nov-2020 18:18
cis-1,2-Dichloroethene	**3,200**		**20**	**50**	**100**	**UG/L**	100	04-Nov-2020 18:39
Methylene chloride	10	U	4.0	10	20	UG/L	10	04-Nov-2020 18:18
Trichloroethene	**5,400**		**20**	**50**	**100**	**UG/L**	100	04-Nov-2020 18:39
Vinyl chloride	**140**		**2.0**	**5.0**	**10**	**UG/L**	10	04-Nov-2020 18:18
Surr: 1,2-Dichloroethane-d4	*89.9*			**0**	*81-118*	*%REC*	*10*	*04-Nov-2020 18:18*
Surr: 1,2-Dichloroethane-d4	*89.0*			**0**	*81-118*	*%REC*	*100*	*04-Nov-2020 18:39*
Surr: 4-Bromofluorobenzene	*91.1*			**0**	*85-114*	*%REC*	*10*	*04-Nov-2020 18:18*
Surr: 4-Bromofluorobenzene	*92.7*			**0**	*85-114*	*%REC*	*100*	*04-Nov-2020 18:39*
Surr: Dibromofluoromethane	*83.9*			**0**	*80-119*	*%REC*	*10*	*04-Nov-2020 18:18*
Surr: Dibromofluoromethane	*84.7*			**0**	*80-119*	*%REC*	*100*	*04-Nov-2020 18:39*
Surr: Toluene-d8	*102*			**0**	*89-112*	*%REC*	*10*	*04-Nov-2020 18:18*
Surr: Toluene-d8	*104*			**0**	*89-112*	*%REC*	*100*	*04-Nov-2020 18:39*
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**2.01**		**0.150**	**0.500**	**0.500**	**mg/L**	5	12-Nov-2020 01:18
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	06-Nov-2020 14:07
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	12-Nov-2020 14:11

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 13-Dec-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
Sample ID: 16PM14-201026-FD
Collection Date: 26-Oct-2020 11:00

ANALYTICAL REPORT
WorkOrder:HS20101419
Lab ID:HS20101419-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	10	U	3.0	10	10	UG/L	10	04-Nov-2020 19:00
1,1-Dichloroethene	**22**		**2.0**	**5.0**	**10**	**UG/L**	10	04-Nov-2020 19:00
1,2-Dichloroethane	**25**		**2.0**	**5.0**	**10**	**UG/L**	10	04-Nov-2020 19:00
cis-1,2-Dichloroethene	**3,500**		**20**	**50**	**100**	**UG/L**	100	04-Nov-2020 19:22
Methylene chloride	10	U	4.0	10	20	UG/L	10	04-Nov-2020 19:00
Trichloroethene	**5,800**		**20**	**50**	**100**	**UG/L**	100	04-Nov-2020 19:22
Vinyl chloride	**140**		**2.0**	**5.0**	**10**	**UG/L**	10	04-Nov-2020 19:00
Surr: 1,2-Dichloroethane-d4	*86.6*			**0**	*81-118*	*%REC*	*10*	*04-Nov-2020 19:00*
Surr: 1,2-Dichloroethane-d4	*88.2*			**0**	*81-118*	*%REC*	*100*	*04-Nov-2020 19:22*
Surr: 4-Bromofluorobenzene	*87.8*			**0**	*85-114*	*%REC*	*10*	*04-Nov-2020 19:00*
Surr: 4-Bromofluorobenzene	*89.6*			**0**	*85-114*	*%REC*	*100*	*04-Nov-2020 19:22*
Surr: Dibromofluoromethane	*84.6*			**0**	*80-119*	*%REC*	*10*	*04-Nov-2020 19:00*
Surr: Dibromofluoromethane	*84.1*			**0**	*80-119*	*%REC*	*100*	*04-Nov-2020 19:22*
Surr: Toluene-d8	*101*			**0**	*89-112*	*%REC*	*10*	*04-Nov-2020 19:00*
Surr: Toluene-d8	*99.9*			**0**	*89-112*	*%REC*	*100*	*04-Nov-2020 19:22*
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**2.93**		**0.150**	**0.500**	**0.500**	**mg/L**	5	12-Nov-2020 01:36
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	06-Nov-2020 14:07
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	12-Nov-2020 14:11

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 13-Dec-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
Sample ID: 16PM06-201026
Collection Date: 26-Oct-2020 11:50

ANALYTICAL REPORT
WorkOrder:HS20101419
Lab ID:HS20101419-07
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	50	U	15	50	50	UG/L	50	05-Nov-2020 20:46
1,1-Dichloroethene	**140**		**10**	**25**	**50**	**UG/L**	50	05-Nov-2020 20:46
1,2-Dichloroethane	**55**		**10**	**25**	**50**	**UG/L**	50	05-Nov-2020 20:46
cis-1,2-Dichloroethene	**47,000**		**100**	**250**	**500**	**UG/L**	500	05-Nov-2020 21:07
Methylene chloride	50	U	20	50	100	UG/L	50	05-Nov-2020 20:46
Trichloroethene	**85,000**		**100**	**250**	**500**	**UG/L**	500	05-Nov-2020 21:07
Vinyl chloride	**1,800**		**10**	**25**	**50**	**UG/L**	50	05-Nov-2020 20:46
Surr: 1,2-Dichloroethane-d4	*88.9*			**0**	*81-118*	*%REC*	*50*	*05-Nov-2020 20:46*
Surr: 1,2-Dichloroethane-d4	*87.0*			**0**	*81-118*	*%REC*	*500*	*05-Nov-2020 21:07*
Surr: 4-Bromofluorobenzene	*93.2*			**0**	*85-114*	*%REC*	*50*	*05-Nov-2020 20:46*
Surr: 4-Bromofluorobenzene	*92.4*			**0**	*85-114*	*%REC*	*500*	*05-Nov-2020 21:07*
Surr: Dibromofluoromethane	*83.9*			**0**	*80-119*	*%REC*	*50*	*05-Nov-2020 20:46*
Surr: Dibromofluoromethane	*82.5*			**0**	*80-119*	*%REC*	*500*	*05-Nov-2020 21:07*
Surr: Toluene-d8	*101*			**0**	*89-112*	*%REC*	*500*	*05-Nov-2020 21:07*
Surr: Toluene-d8	*102*			**0**	*89-112*	*%REC*	*50*	*05-Nov-2020 20:46*
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**4.26**		**0.150**	**0.500**	**0.500**	**mg/L**	5	12-Nov-2020 01:54
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	06-Nov-2020 14:07
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	12-Nov-2020 14:11

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 13-Dec-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
Sample ID: 16PM09-201026
Collection Date: 26-Oct-2020 12:35

ANALYTICAL REPORT
WorkOrder:HS20101419
Lab ID:HS20101419-08
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	5.0	U	1.5	5.0	5.0	UG/L	5	05-Nov-2020 20:04
1,1-Dichloroethene	**50**		**1.0**	**2.5**	**5.0**	**UG/L**	5	05-Nov-2020 20:04
1,2-Dichloroethane	2.5	U	1.0	2.5	5.0	UG/L	5	05-Nov-2020 20:04
cis-1,2-Dichloroethene	**1,000**		**5.0**	**12**	**25**	**UG/L**	25	05-Nov-2020 20:25
Methylene chloride	5.0	U	2.0	5.0	10	UG/L	5	05-Nov-2020 20:04
Trichloroethene	**2,000**		**5.0**	**12**	**25**	**UG/L**	25	05-Nov-2020 20:25
Vinyl chloride	**47**		**1.0**	**2.5**	**5.0**	**UG/L**	5	05-Nov-2020 20:04
Surr: 1,2-Dichloroethane-d4	*87.1*			**0**	*81-118*	*%REC*	*5*	*05-Nov-2020 20:04*
Surr: 1,2-Dichloroethane-d4	*88.7*			**0**	*81-118*	*%REC*	*25*	*05-Nov-2020 20:25*
Surr: 4-Bromofluorobenzene	*90.9*			**0**	*85-114*	*%REC*	*5*	*05-Nov-2020 20:04*
Surr: 4-Bromofluorobenzene	*91.3*			**0**	*85-114*	*%REC*	*25*	*05-Nov-2020 20:25*
Surr: Dibromofluoromethane	*84.1*			**0**	*80-119*	*%REC*	*5*	*05-Nov-2020 20:04*
Surr: Dibromofluoromethane	*83.7*			**0**	*80-119*	*%REC*	*25*	*05-Nov-2020 20:25*
Surr: Toluene-d8	*98.0*			**0**	*89-112*	*%REC*	*5*	*05-Nov-2020 20:04*
Surr: Toluene-d8	*105*			**0**	*89-112*	*%REC*	*25*	*05-Nov-2020 20:25*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	06-Nov-2020 14:07

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 13-Dec-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
Sample ID: 16PM02-201026
Collection Date: 26-Oct-2020 13:20

ANALYTICAL REPORT
WorkOrder:HS20101419
Lab ID:HS20101419-09
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	50	U	15	50	50	UG/L	50	06-Nov-2020 02:44
1,1-Dichloroethene	**74**		**10**	**25**	**50**	**UG/L**	50	06-Nov-2020 02:44
1,2-Dichloroethane	**60**		**10**	**25**	**50**	**UG/L**	50	06-Nov-2020 02:44
cis-1,2-Dichloroethene	**8,800**		**10**	**25**	**50**	**UG/L**	50	06-Nov-2020 02:44
Methylene chloride	50	U	20	50	100	UG/L	50	06-Nov-2020 02:44
Trichloroethene	**65,000**		**100**	**250**	**500**	**UG/L**	500	06-Nov-2020 03:05
Vinyl chloride	**240**		**10**	**25**	**50**	**UG/L**	50	06-Nov-2020 02:44
Surr: 1,2-Dichloroethane-d4	*87.6*			**0**	*81-118*	*%REC*	*50*	*06-Nov-2020 02:44*
Surr: 1,2-Dichloroethane-d4	*85.8*			**0**	*81-118*	*%REC*	*500*	*06-Nov-2020 03:05*
Surr: 4-Bromofluorobenzene	*91.4*			**0**	*85-114*	*%REC*	*50*	*06-Nov-2020 02:44*
Surr: 4-Bromofluorobenzene	*91.9*			**0**	*85-114*	*%REC*	*500*	*06-Nov-2020 03:05*
Surr: Dibromofluoromethane	*84.1*			**0**	*80-119*	*%REC*	*50*	*06-Nov-2020 02:44*
Surr: Dibromofluoromethane	*83.8*			**0**	*80-119*	*%REC*	*500*	*06-Nov-2020 03:05*
Surr: Toluene-d8	*103*			**0**	*89-112*	*%REC*	*50*	*06-Nov-2020 02:44*
Surr: Toluene-d8	*101*			**0**	*89-112*	*%REC*	*500*	*06-Nov-2020 03:05*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	06-Nov-2020 14:07

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 13-Dec-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
Sample ID: 16PM03-201026
Collection Date: 26-Oct-2020 14:05

ANALYTICAL REPORT
WorkOrder:HS20101419
Lab ID:HS20101419-10
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	5.0	U	3.0	5.0	10	UG/L	10	06-Nov-2020 02:02
1,1-Dichloroethene	**40**		**2.0**	**5.0**	**10**	**UG/L**	10	06-Nov-2020 02:02
1,2-Dichloroethane	**23**		**2.0**	**5.0**	**10**	**UG/L**	10	06-Nov-2020 02:02
cis-1,2-Dichloroethene	**5,700**		**20**	**50**	**100**	**UG/L**	100	06-Nov-2020 02:23
Methylene chloride	**17**	J	**4.0**	**10**	**20**	**UG/L**	10	06-Nov-2020 02:02
Trichloroethene	**12,000**		**20**	**50**	**100**	**UG/L**	100	06-Nov-2020 02:23
Vinyl chloride	**370**		**2.0**	**5.0**	**10**	**UG/L**	10	06-Nov-2020 02:02
Surr: 1,2-Dichloroethane-d4	*88.3*			**0**	*81-118*	*%REC*	*10*	*06-Nov-2020 02:02*
Surr: 1,2-Dichloroethane-d4	*85.6*			**0**	*81-118*	*%REC*	*100*	*06-Nov-2020 02:23*
Surr: 4-Bromofluorobenzene	*91.5*			**0**	*85-114*	*%REC*	*10*	*06-Nov-2020 02:02*
Surr: 4-Bromofluorobenzene	*90.7*			**0**	*85-114*	*%REC*	*100*	*06-Nov-2020 02:23*
Surr: Dibromofluoromethane	*84.5*			**0**	*80-119*	*%REC*	*10*	*06-Nov-2020 02:02*
Surr: Dibromofluoromethane	*86.5*			**0**	*80-119*	*%REC*	*100*	*06-Nov-2020 02:23*
Surr: Toluene-d8	*103*			**0**	*89-112*	*%REC*	*10*	*06-Nov-2020 02:02*
Surr: Toluene-d8	*101*			**0**	*89-112*	*%REC*	*100*	*06-Nov-2020 02:23*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	06-Nov-2020 14:07

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 13-Dec-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
Sample ID: 16SW01-201026
Collection Date: 26-Oct-2020 14:15

ANALYTICAL REPORT
WorkOrder:HS20101419
Lab ID:HS20101419-11
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Nov-2020 17:15
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Nov-2020 17:15
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Nov-2020 17:15
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Nov-2020 17:15
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	04-Nov-2020 17:15
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Nov-2020 17:15
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	04-Nov-2020 17:15
Surr: 1,2-Dichloroethane-d4	*86.5*			**0**	*81-118*	*%REC*	*1*	*04-Nov-2020 17:15*
Surr: 4-Bromofluorobenzene	*95.0*			**0**	*85-114*	*%REC*	*1*	*04-Nov-2020 17:15*
Surr: Dibromofluoromethane	*84.9*			**0**	*80-119*	*%REC*	*1*	*04-Nov-2020 17:15*
Surr: Toluene-d8	*103*			**0**	*89-112*	*%REC*	*1*	*04-Nov-2020 17:15*
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 10-Nov-2020		Analyst: JHD
Arsenic	**0.00145**	J	**0.000400**	**0.00100**	**0.00500**	**mg/L**	1	11-Nov-2020 13:27
Chromium	**0.000543**	J	**0.000400**	**0.00100**	**0.00500**	**mg/L**	1	11-Nov-2020 13:27
Manganese	**1.21**		**0.000700**	**0.00250**	**0.00500**	**mg/L**	1	11-Nov-2020 13:27
Nickel	**0.00353**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	11-Nov-2020 13:27
Thallium	**0.000711**	J	**0.000200**	**0.000500**	**0.00200**	**mg/L**	1	11-Nov-2020 13:27
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	06-Nov-2020 14:07

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 13-Dec-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
Sample ID: 16SW02-201026
Collection Date: 26-Oct-2020 14:35

ANALYTICAL REPORT
WorkOrder:HS20101419
Lab ID:HS20101419-12
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	UG/L	1	04-Nov-2020 17:36
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Nov-2020 17:36
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Nov-2020 17:36
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Nov-2020 17:36
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	04-Nov-2020 17:36
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Nov-2020 17:36
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	04-Nov-2020 17:36
Surr: 1,2-Dichloroethane-d4	*89.7*			**0**	*81-118*	*%REC*	*1*	*04-Nov-2020 17:36*
Surr: 4-Bromofluorobenzene	*91.2*			**0**	*85-114*	*%REC*	*1*	*04-Nov-2020 17:36*
Surr: Dibromofluoromethane	*86.9*			**0**	*80-119*	*%REC*	*1*	*04-Nov-2020 17:36*
Surr: Toluene-d8	*104*			**0**	*89-112*	*%REC*	*1*	*04-Nov-2020 17:36*
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 10-Nov-2020		Analyst: JHD
Arsenic	**0.00225**	J	**0.000400**	**0.00100**	**0.00500**	**mg/L**	1	11-Nov-2020 13:29
Chromium	**0.00114**	J	**0.000400**	**0.00100**	**0.00500**	**mg/L**	1	11-Nov-2020 13:29
Manganese	**3.53**		**0.0140**	**0.0500**	**0.100**	**mg/L**	20	11-Nov-2020 14:40
Nickel	**0.00691**		**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	11-Nov-2020 13:29
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	11-Nov-2020 13:29
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	06-Nov-2020 14:07

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 13-Dec-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
Sample ID: 16SW03-201026
Collection Date: 26-Oct-2020 14:55

ANALYTICAL REPORT
WorkOrder:HS20101419
Lab ID:HS20101419-13
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	UG/L	1	04-Nov-2020 17:57
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Nov-2020 17:57
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Nov-2020 17:57
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Nov-2020 17:57
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	04-Nov-2020 17:57
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Nov-2020 17:57
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	04-Nov-2020 17:57
Surr: 1,2-Dichloroethane-d4	*87.4*			**0**	*81-118*	*%REC*	*1*	*04-Nov-2020 17:57*
Surr: 4-Bromofluorobenzene	*91.3*			**0**	*85-114*	*%REC*	*1*	*04-Nov-2020 17:57*
Surr: Dibromofluoromethane	*85.7*			**0**	*80-119*	*%REC*	*1*	*04-Nov-2020 17:57*
Surr: Toluene-d8	*98.2*			**0**	*89-112*	*%REC*	*1*	*04-Nov-2020 17:57*
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 10-Nov-2020		Analyst: JHD
Arsenic	**0.000970**	J	**0.000400**	**0.00100**	**0.00500**	**mg/L**	1	11-Nov-2020 13:39
Chromium	0.00100	U	0.000400	0.00100	0.00500	mg/L	1	11-Nov-2020 13:39
Manganese	**0.204**		**0.000700**	**0.00250**	**0.00500**	**mg/L**	1	11-Nov-2020 13:39
Nickel	**0.00205**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	11-Nov-2020 13:39
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	11-Nov-2020 13:39
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	06-Nov-2020 14:07

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 13-Dec-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
Sample ID: Trip Blank
Collection Date: 26-Oct-2020 00:00

ANALYTICAL REPORT
WorkOrder:HS20101419
Lab ID:HS20101419-14
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Nov-2020 12:41
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Nov-2020 12:41
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Nov-2020 12:41
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Nov-2020 12:41
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	04-Nov-2020 12:41
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Nov-2020 12:41
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	04-Nov-2020 12:41
Surr: 1,2-Dichloroethane-d4	*84.6*			**0**	*81-118*	*%REC*	*1*	*04-Nov-2020 12:41*
Surr: 4-Bromofluorobenzene	*87.7*			**0**	*85-114*	*%REC*	*1*	*04-Nov-2020 12:41*
Surr: Dibromofluoromethane	*82.2*			**0**	*80-119*	*%REC*	*1*	*04-Nov-2020 12:41*
Surr: Toluene-d8	*104*			**0**	*89-112*	*%REC*	*1*	*04-Nov-2020 12:41*

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

RIGHT SOLUTIONS | RIGHT PARTNER

Weight / Prep Log

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
WorkOrder: HS20101419

Batch ID: 159432 **Start Date:** 10 Nov 2020 10:00 **End Date:** 10 Nov 2020 14:00
Method: WATER - SW3010A **Prep Code:** 3010A

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS20101419-11		10 (mL)	10 (mL)	1
HS20101419-12		10 (mL)	10 (mL)	1
HS20101419-13		10 (mL)	10 (mL)	1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 13-Dec-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
WorkOrder: HS20101419

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: 159432 (0)	**Test Name :** METALS BY ICPMS BY SW6020A				**Matrix:** Groundwater	
HS20101419-11	16SW01-201026	26 Oct 2020 14:15		10 Nov 2020 14:00	11 Nov 2020 13:27	1
HS20101419-12	16SW02-201026	26 Oct 2020 14:35		10 Nov 2020 14:00	11 Nov 2020 14:40	20
HS20101419-12	16SW02-201026	26 Oct 2020 14:35		10 Nov 2020 14:00	11 Nov 2020 13:29	1
HS20101419-13	16SW03-201026	26 Oct 2020 14:55		10 Nov 2020 14:00	11 Nov 2020 13:39	1
Batch ID: R372017 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS20101419-14	Trip Blank	26 Oct 2020 00:00			04 Nov 2020 12:41	1
Batch ID: R372017 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS20101419-01	16RW09-201026	26 Oct 2020 07:50			04 Nov 2020 14:48	1
HS20101419-01	16RW09-201026	26 Oct 2020 07:50			04 Nov 2020 14:27	10
HS20101419-03	16RW06-201026	26 Oct 2020 09:30			04 Nov 2020 13:02	1
HS20101419-05	16PM14-201026	26 Oct 2020 11:00			04 Nov 2020 18:39	100
HS20101419-05	16PM14-201026	26 Oct 2020 11:00			04 Nov 2020 18:18	10
HS20101419-06	16PM14-201026-FD	26 Oct 2020 11:00			04 Nov 2020 19:22	100
HS20101419-06	16PM14-201026-FD	26 Oct 2020 11:00			04 Nov 2020 19:00	10
HS20101419-11	16SW01-201026	26 Oct 2020 14:15			04 Nov 2020 17:15	1
HS20101419-12	16SW02-201026	26 Oct 2020 14:35			04 Nov 2020 17:36	1
HS20101419-13	16SW03-201026	26 Oct 2020 14:55			04 Nov 2020 17:57	1
Batch ID: R372113 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS20101419-02	16RW10-201026	26 Oct 2020 08:45			05 Nov 2020 19:43	25
HS20101419-02	16RW10-201026	26 Oct 2020 08:45			05 Nov 2020 19:22	5
HS20101419-04	16RW07-201026	26 Oct 2020 10:15			05 Nov 2020 19:01	10
HS20101419-04	16RW07-201026	26 Oct 2020 10:15			05 Nov 2020 18:40	1
HS20101419-07	16PM06-201026	26 Oct 2020 11:50			05 Nov 2020 21:07	500
HS20101419-07	16PM06-201026	26 Oct 2020 11:50			05 Nov 2020 20:46	50
HS20101419-08	16PM09-201026	26 Oct 2020 12:35			05 Nov 2020 20:25	25
HS20101419-08	16PM09-201026	26 Oct 2020 12:35			05 Nov 2020 20:04	5
Batch ID: R372116 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS20101419-09	16PM02-201026	26 Oct 2020 13:20			06 Nov 2020 03:05	500
HS20101419-09	16PM02-201026	26 Oct 2020 13:20			06 Nov 2020 02:44	50
HS20101419-10	16PM03-201026	26 Oct 2020 14:05			06 Nov 2020 02:23	100
HS20101419-10	16PM03-201026	26 Oct 2020 14:05			06 Nov 2020 02:02	10

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 13-Dec-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
WorkOrder: HS20101419

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R372138 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** Groundwater	
HS20101419-01	16RW09-201026	26 Oct 2020 07:50			06 Nov 2020 14:07	1
HS20101419-02	16RW10-201026	26 Oct 2020 08:45			06 Nov 2020 14:07	1
HS20101419-03	16RW06-201026	26 Oct 2020 09:30			06 Nov 2020 14:07	1
HS20101419-04	16RW07-201026	26 Oct 2020 10:15			06 Nov 2020 14:07	1
HS20101419-05	16PM14-201026	26 Oct 2020 11:00			06 Nov 2020 14:07	1
HS20101419-06	16PM14-201026-FD	26 Oct 2020 11:00			06 Nov 2020 14:07	1
HS20101419-07	16PM06-201026	26 Oct 2020 11:50			06 Nov 2020 14:07	1
HS20101419-08	16PM09-201026	26 Oct 2020 12:35			06 Nov 2020 14:07	1
HS20101419-09	16PM02-201026	26 Oct 2020 13:20			06 Nov 2020 14:07	1
HS20101419-10	16PM03-201026	26 Oct 2020 14:05			06 Nov 2020 14:07	1
HS20101419-11	16SW01-201026	26 Oct 2020 14:15			06 Nov 2020 14:07	1
HS20101419-12	16SW02-201026	26 Oct 2020 14:35			06 Nov 2020 14:07	1
HS20101419-13	16SW03-201026	26 Oct 2020 14:55			06 Nov 2020 14:07	1
Batch ID: R372496 (0)	**Test Name :** SUBCONTRACT ANALYSIS - TOC ANALYSIS				**Matrix:** Groundwater	
HS20101419-01	16RW09-201026	26 Oct 2020 07:50			12 Nov 2020 14:11	1
HS20101419-02	16RW10-201026	26 Oct 2020 08:45			12 Nov 2020 14:11	1
HS20101419-05	16PM14-201026	26 Oct 2020 11:00			12 Nov 2020 14:11	1
HS20101419-06	16PM14-201026-FD	26 Oct 2020 11:00			12 Nov 2020 14:11	1
HS20101419-07	16PM06-201026	26 Oct 2020 11:50			12 Nov 2020 14:11	1
Batch ID: R372517 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Groundwater	
HS20101419-01	16RW09-201026	26 Oct 2020 07:50			12 Nov 2020 00:06	1
HS20101419-02	16RW10-201026	26 Oct 2020 08:45			12 Nov 2020 01:00	1
HS20101419-05	16PM14-201026	26 Oct 2020 11:00			12 Nov 2020 01:18	5
HS20101419-06	16PM14-201026-FD	26 Oct 2020 11:00			12 Nov 2020 01:36	5
HS20101419-07	16PM06-201026	26 Oct 2020 11:50			12 Nov 2020 01:54	5

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 13-Dec-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
WorkOrder: HS20101419

QC BATCH REPORT

Batch ID: 159432 (0) **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

MBLK Sample ID: **MBLK-159432** Units: **mg/L** Analysis Date: **11-Nov-2020 13:23**
Client ID: Run ID: **ICPMS06_372389** SeqNo: **5827121** PrepDate: **10-Nov-2020** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.00100	0.00500								U
Chromium	0.00100	0.00500								U
Manganese	0.00250	0.00500								U
Nickel	0.00100	0.00500								U
Thallium	0.000500	0.00200								U

LCS Sample ID: **LCS-159432** Units: **mg/L** Analysis Date: **11-Nov-2020 13:25**
Client ID: Run ID: **ICPMS06_372389** SeqNo: **5827122** PrepDate: **10-Nov-2020** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.05091	0.00500	0.05	0	102	84 - 116				
Chromium	0.04983	0.00500	0.05	0	99.7	85 - 116				
Manganese	0.0499	0.00500	0.05	0	99.8	87 - 115				
Nickel	0.05009	0.00500	0.05	0	100	85 - 117				
Thallium	0.04658	0.00200	0.05	0	93.2	82 - 116				

MS Sample ID: **HS20101419-12MS** Units: **mg/L** Analysis Date: **11-Nov-2020 13:33**
Client ID: **16SW02-201026** Run ID: **ICPMS06_372389** SeqNo: **5827126** PrepDate: **10-Nov-2020** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.0486	0.00500	0.05	0.002251	92.7	84 - 116				
Chromium	0.04672	0.00500	0.05	0.001143	91.2	85 - 116				
Manganese	3.749	0.00500	0.05	3.735	27.8	87 - 115				SEO
Nickel	0.05322	0.00500	0.05	0.006912	92.6	85 - 117				
Thallium	0.0458	0.00200	0.05	0.000058	91.5	82 - 116				

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 13-Dec-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
WorkOrder: HS20101419

QC BATCH REPORT

Batch ID: 159432 (0) **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

MSD Sample ID: **HS20101419-12MSD** Units: **mg/L** Analysis Date: **11-Nov-2020 13:35**
Client ID: **16SW02-201026** Run ID: **ICPMS06_372389** SeqNo: **5827127** PrepDate: **10-Nov-2020** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.05158	0.00500	0.05	0.002251	98.7	84 - 116	0.0486	5.94	20	
Chromium	0.04953	0.00500	0.05	0.001143	96.8	85 - 116	0.04672	5.84	20	
Manganese	3.421	0.00500	0.05	3.735	-628	87 - 115	3.749	9.15	20	SEO
Nickel	0.05503	0.00500	0.05	0.006912	96.2	85 - 117	0.05322	3.36	20	
Thallium	0.04943	0.00200	0.05	0.000058	98.8	82 - 116	0.0458	7.64	20	

PDS Sample ID: **HS20101419-12PDS** Units: **mg/L** Analysis Date: **11-Nov-2020 13:37**
Client ID: **16SW02-201026** Run ID: **ICPMS06_372389** SeqNo: **5827128** PrepDate: **10-Nov-2020** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.104	0.00500	0.1	0.002251	102	80 - 120				
Chromium	0.1018	0.00500	0.1	0.001143	101	80 - 120				
Nickel	0.1093	0.00500	0.1	0.006912	102	80 - 120				
Thallium	0.1078	0.00200	0.1	0.000058	108	80 - 120				

PDS Sample ID: **HS20101419-12PDS** Units: **mg/L** Analysis Date: **11-Nov-2020 14:44**
Client ID: **16SW02-201026** Run ID: **ICPMS06_372389** SeqNo: **5827136** PrepDate: **10-Nov-2020** DF: **20**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Manganese	5.157	0.100	2	3.527	81.5	80 - 120				

SD Sample ID: **HS20101419-12SD** Units: **mg/L** Analysis Date: **11-Nov-2020 13:31**
Client ID: **16SW02-201026** Run ID: **ICPMS06_372389** SeqNo: **5827125** PrepDate: **10-Nov-2020** DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Arsenic	0.0023	0.0250					0.002251	0	10	J
Chromium	0.00500	0.0250					0.001143	0	10	U
Nickel	0.006812	0.0250					0.006912	0	10	J
Thallium	0.00250	0.0100					0.000058	0	10	U

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 13-Dec-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
WorkOrder: HS20101419

QC BATCH REPORT

Batch ID: **159432 (0)** **Instrument:** **ICPMS06** **Method:** **METALS BY ICPMS BY SW6020A**

SD Sample ID: **HS20101419-12SD** Units: **mg/L** Analysis Date: **11-Nov-2020 14:42**
Client ID: **16SW02-201026** Run ID: **ICPMS06_372389** SeqNo: **5827135** PrepDate: **10-Nov-2020** DF: **100**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Manganese	3.707	0.500					3.527	5.11	10	

The following samples were analyzed in this batch: HS20101419-11 HS20101419-12 HS20101419-13

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 13-Dec-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
WorkOrder: HS20101419

QC BATCH REPORT

Batch ID: R372017 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-201104** Units: **UG/L** Analysis Date: **04-Nov-2020 11:59**
Client ID: Run ID: **VOA6_372017** SeqNo: **5817374** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	0.50	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
Methylene chloride	1.0	2.0								U
Trichloroethene	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*43.13*	*1.0*	*50*	*0*	*86.3*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*47.57*	*1.0*	*50*	*0*	*95.1*	*85 - 114*				
Surr: Dibromofluoromethane	*43.83*	*1.0*	*50*	*0*	*87.7*	*80 - 119*				
Surr: Toluene-d8	*51.54*	*1.0*	*50*	*0*	*103*	*89 - 112*				

LCS Sample ID: **VLCSW-201104** Units: **UG/L** Analysis Date: **04-Nov-2020 11:17**
Client ID: Run ID: **VOA6_372017** SeqNo: **5817373** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	18.77	1.0	20	0	93.9	80 - 119				
1,1-Dichloroethene	19.59	1.0	20	0	98.0	71 - 131				
1,2-Dichloroethane	17.71	1.0	20	0	88.6	73 - 128				
cis-1,2-Dichloroethene	17.8	1.0	20	0	89.0	78 - 123				
Methylene chloride	17.81	2.0	20	0	89.1	74 - 124				
Trichloroethene	18.05	1.0	20	0	90.3	79 - 123				
Vinyl chloride	18.62	1.0	20	0	93.1	58 - 137				
Surr: 1,2-Dichloroethane-d4	*52.73*	*1.0*	*50*	*0*	*105*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.55*	*1.0*	*50*	*0*	*101*	*85 - 114*				
Surr: Dibromofluoromethane	*49.34*	*1.0*	*50*	*0*	*98.7*	*80 - 119*				
Surr: Toluene-d8	*48.52*	*1.0*	*50*	*0*	*97.0*	*89 - 112*				

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 13-Dec-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
WorkOrder: HS20101419

QC BATCH REPORT

Batch ID: R372017 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS20101419-01MS** Units: **UG/L** Analysis Date: **04-Nov-2020 15:09**
Client ID: **16RW09-201026** Run ID: **VOA6_372017** SeqNo: **5817383** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	207.3	10	200	0	104	80 - 119				
1,1-Dichloroethene	256.8	10	200	7.216	125	71 - 131				
1,2-Dichloroethane	219.2	10	200	0	110	73 - 128				
cis-1,2-Dichloroethene	490.9	10	200	293.3	98.8	78 - 123				
Methylene chloride	199	20	200	0	99.5	74 - 124				
Trichloroethene	1214	10	200	981.1	116	79 - 123				O
Vinyl chloride	277.1	10	200	33.28	122	58 - 137				
Surr: 1,2-Dichloroethane-d4	*443.7*	*10*	*500*	*0*	*88.7*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*482*	*10*	*500*	*0*	*96.4*	*85 - 114*				
Surr: Dibromofluoromethane	*448.9*	*10*	*500*	*0*	*89.8*	*80 - 119*				
Surr: Toluene-d8	*482.4*	*10*	*500*	*0*	*96.5*	*89 - 112*				

MSD Sample ID: **HS20101419-01MSD** Units: **UG/L** Analysis Date: **04-Nov-2020 15:30**
Client ID: **16RW09-201026** Run ID: **VOA6_372017** SeqNo: **5817384** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	232.4	10	200	0	116	80 - 119	207.3	11.4	20	
1,1-Dichloroethene	240.5	10	200	7.216	117	71 - 131	256.8	6.54	20	
1,2-Dichloroethane	214	10	200	0	107	73 - 128	219.2	2.36	20	
cis-1,2-Dichloroethene	481.8	10	200	293.3	94.3	78 - 123	490.9	1.87	20	
Methylene chloride	194.4	20	200	0	97.2	74 - 124	199	2.32	20	
Trichloroethene	1188	10	200	981.1	103	79 - 123	1214	2.14	20	O
Vinyl chloride	256.1	10	200	33.28	111	58 - 137	277.1	7.86	20	
Surr: 1,2-Dichloroethane-d4	*428.8*	*10*	*500*	*0*	*85.8*	*81 - 118*	*443.7*	*3.43*	*20*	
Surr: 4-Bromofluorobenzene	*476.3*	*10*	*500*	*0*	*95.3*	*85 - 114*	*482*	*1.2*	*20*	
Surr: Dibromofluoromethane	*438.1*	*10*	*500*	*0*	*87.6*	*80 - 119*	*448.9*	*2.43*	*20*	
Surr: Toluene-d8	*492.8*	*10*	*500*	*0*	*98.6*	*89 - 112*	*482.4*	*2.13*	*20*	

The following samples were analyzed in this batch:

HS20101419-01	HS20101419-03	HS20101419-05	HS20101419-06
HS20101419-11	HS20101419-12	HS20101419-13	HS20101419-14

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 13-Dec-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
WorkOrder: HS20101419

QC BATCH REPORT

Batch ID: R372113 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-201105** Units: **UG/L** Analysis Date: **05-Nov-2020 13:24**
Client ID: Run ID: **VOA6_372113** SeqNo: **5819667** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	0.50	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
Methylene chloride	1.0	2.0								U
Trichloroethene	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*41.26*	*1.0*	*50*	*0*	*82.5*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*44.4*	*1.0*	*50*	*0*	*88.8*	*85 - 114*				
Surr: Dibromofluoromethane	*41.39*	*1.0*	*50*	*0*	*82.8*	*80 - 119*				
Surr: Toluene-d8	*50.28*	*1.0*	*50*	*0*	*101*	*89 - 112*				

LCS Sample ID: **VLCSW-201105** Units: **UG/L** Analysis Date: **05-Nov-2020 12:42**
Client ID: Run ID: **VOA6_372113** SeqNo: **5819666** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	20.13	1.0	20	0	101	80 - 119				
1,1-Dichloroethene	18.97	1.0	20	0	94.9	71 - 131				
1,2-Dichloroethane	20.5	1.0	20	0	103	73 - 128				
cis-1,2-Dichloroethene	19.58	1.0	20	0	97.9	78 - 123				
Methylene chloride	18.94	2.0	20	0	94.7	74 - 124				
Trichloroethene	20.36	1.0	20	0	102	79 - 123				
Vinyl chloride	19.83	1.0	20	0	99.2	58 - 137				
Surr: 1,2-Dichloroethane-d4	*50.38*	*1.0*	*50*	*0*	*101*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*47.27*	*1.0*	*50*	*0*	*94.5*	*85 - 114*				
Surr: Dibromofluoromethane	*48.03*	*1.0*	*50*	*0*	*96.1*	*80 - 119*				
Surr: Toluene-d8	*47.92*	*1.0*	*50*	*0*	*95.8*	*89 - 112*				

ALS Houston, US Date: 13-Dec-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
WorkOrder: HS20101419

QC BATCH REPORT

Batch ID: R372113 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS20101564-08MS** Units: **UG/L** Analysis Date: **05-Nov-2020 14:27**
Client ID: Run ID: **VOA6_372113** SeqNo: **5819670** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	23.69	1.0	20	0	118	80 - 119				
1,1-Dichloroethene	22.3	1.0	20	0	112	71 - 131				
1,2-Dichloroethane	22.61	1.0	20	0	113	73 - 128				
cis-1,2-Dichloroethene	185	1.0	20	173.7	56.1	78 - 123				SO
Methylene chloride	19.91	2.0	20	0	99.5	74 - 124				
Trichloroethene	79.79	1.0	20	56.9	114	79 - 123				
Vinyl chloride	21.22	1.0	20	0	106	58 - 137				
Surr: 1,2-Dichloroethane-d4	*43.93*	*1.0*	*50*	*0*	*87.9*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*46.48*	*1.0*	*50*	*0*	*93.0*	*85 - 114*				
Surr: Dibromofluoromethane	*44.27*	*1.0*	*50*	*0*	*88.5*	*80 - 119*				
Surr: Toluene-d8	*49.17*	*1.0*	*50*	*0*	*98.3*	*89 - 112*				

MSD Sample ID: **HS20101564-08MSD** Units: **UG/L** Analysis Date: **05-Nov-2020 14:48**
Client ID: Run ID: **VOA6_372113** SeqNo: **5819671** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	22.66	1.0	20	0	113	80 - 119	23.69	4.46	20	
1,1-Dichloroethene	22.15	1.0	20	0	111	71 - 131	22.3	0.659	20	
1,2-Dichloroethane	22.75	1.0	20	0	114	73 - 128	22.61	0.607	20	
cis-1,2-Dichloroethene	186	1.0	20	173.7	61.0	78 - 123	185	0.534	20	SO
Methylene chloride	19.92	2.0	20	0	99.6	74 - 124	19.91	0.0524	20	
Trichloroethene	82.17	1.0	20	56.9	126	79 - 123	79.79	2.94	20	S
Vinyl chloride	22.11	1.0	20	0	111	58 - 137	21.22	4.11	20	
Surr: 1,2-Dichloroethane-d4	*43.03*	*1.0*	*50*	*0*	*86.1*	*81 - 118*	*43.93*	*2.06*	*20*	
Surr: 4-Bromofluorobenzene	*46.32*	*1.0*	*50*	*0*	*92.6*	*85 - 114*	*46.48*	*0.357*	*20*	
Surr: Dibromofluoromethane	*43.42*	*1.0*	*50*	*0*	*86.8*	*80 - 119*	*44.27*	*1.94*	*20*	
Surr: Toluene-d8	*48.73*	*1.0*	*50*	*0*	*97.5*	*89 - 112*	*49.17*	*0.899*	*20*	

The following samples were analyzed in this batch: HS20101419-02 HS20101419-04 HS20101419-07 HS20101419-08

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 13-Dec-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
WorkOrder: HS20101419

QC BATCH REPORT

Batch ID: R372116 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-201105** Units: **UG/L** Analysis Date: **05-Nov-2020 23:55**
Client ID: Run ID: **VOA6_372116** SeqNo: **5819789** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	0.50	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
Methylene chloride	1.0	2.0								U
Trichloroethene	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*42.91*	*1.0*	*50*	*0*	*85.8*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*44.97*	*1.0*	*50*	*0*	*89.9*	*85 - 114*				
Surr: Dibromofluoromethane	*42.86*	*1.0*	*50*	*0*	*85.7*	*80 - 119*				
Surr: Toluene-d8	*51.23*	*1.0*	*50*	*0*	*102*	*89 - 112*				

LCS Sample ID: **VLCSW-201105** Units: **UG/L** Analysis Date: **05-Nov-2020 23:13**
Client ID: Run ID: **VOA6_372116** SeqNo: **5819788** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	19.45	1.0	20	0	97.3	80 - 119				
1,1-Dichloroethene	18.75	1.0	20	0	93.7	71 - 131				
1,2-Dichloroethane	17.75	1.0	20	0	88.7	73 - 128				
cis-1,2-Dichloroethene	19.29	1.0	20	0	96.5	78 - 123				
Methylene chloride	19.78	2.0	20	0	98.9	74 - 124				
Trichloroethene	18.92	1.0	20	0	94.6	79 - 123				
Vinyl chloride	18.87	1.0	20	0	94.4	58 - 137				
Surr: 1,2-Dichloroethane-d4	*52.74*	*1.0*	*50*	*0*	*105*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*49.32*	*1.0*	*50*	*0*	*98.6*	*85 - 114*				
Surr: Dibromofluoromethane	*50.58*	*1.0*	*50*	*0*	*101*	*80 - 119*				
Surr: Toluene-d8	*48.31*	*1.0*	*50*	*0*	*96.6*	*89 - 112*				

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 13-Dec-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
WorkOrder: HS20101419

QC BATCH REPORT

Batch ID: R372116 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS20110161-01MS** Units: **UG/L** Analysis Date: **06-Nov-2020 00:37**
Client ID: Run ID: **VOA6_372116** SeqNo: **5819791** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	21.9	1.0	20	0	110	80 - 119				
1,1-Dichloroethene	21.79	1.0	20	0	109	71 - 131				
1,2-Dichloroethane	22.4	1.0	20	0	112	73 - 128				
cis-1,2-Dichloroethene	21.05	1.0	20	0.7053	102	78 - 123				
Methylene chloride	21.84	2.0	20	0	109	74 - 124				
Trichloroethene	24.96	1.0	20	0	125	79 - 123				S
Vinyl chloride	22.52	1.0	20	0	113	58 - 137				
Surr: 1,2-Dichloroethane-d4	*43.29*	*1.0*	*50*	*0*	*86.6*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*48.03*	*1.0*	*50*	*0*	*96.1*	*85 - 114*				
Surr: Dibromofluoromethane	*42.78*	*1.0*	*50*	*0*	*85.6*	*80 - 119*				
Surr: Toluene-d8	*48.81*	*1.0*	*50*	*0*	*97.6*	*89 - 112*				

MSD Sample ID: **HS20110161-01MSD** Units: **UG/L** Analysis Date: **06-Nov-2020 00:59**
Client ID: Run ID: **VOA6_372116** SeqNo: **5819792** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	22.83	1.0	20	0	114	80 - 119	21.9	4.15	20	
1,1-Dichloroethene	20.73	1.0	20	0	104	71 - 131	21.79	4.99	20	
1,2-Dichloroethane	20.75	1.0	20	0	104	73 - 128	22.4	7.67	20	
cis-1,2-Dichloroethene	21.19	1.0	20	0.7053	102	78 - 123	21.05	0.659	20	
Methylene chloride	19.65	2.0	20	0	98.3	74 - 124	21.84	10.5	20	
Trichloroethene	22.95	1.0	20	0	115	79 - 123	24.96	8.38	20	
Vinyl chloride	21.37	1.0	20	0	107	58 - 137	22.52	5.24	20	
Surr: 1,2-Dichloroethane-d4	*44.67*	*1.0*	*50*	*0*	*89.3*	*81 - 118*	*43.29*	*3.14*	*20*	
Surr: 4-Bromofluorobenzene	*46.52*	*1.0*	*50*	*0*	*93.0*	*85 - 114*	*48.03*	*3.19*	*20*	
Surr: Dibromofluoromethane	*43.36*	*1.0*	*50*	*0*	*86.7*	*80 - 119*	*42.78*	*1.35*	*20*	
Surr: Toluene-d8	*48.6*	*1.0*	*50*	*0*	*97.2*	*89 - 112*	*48.81*	*0.421*	*20*	

The following samples were analyzed in this batch: HS20101419-09 HS20101419-10

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 13-Dec-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
WorkOrder: HS20101419

QC BATCH REPORT

Batch ID: R372517 (0) **Instrument:** ICS-Integrion **Method:** ANIONS BY SW9056A

MBLK Sample ID: **MBLK-111120** Units: **mg/L** Analysis Date: **11-Nov-2020 18:24**
Client ID: Run ID: **ICS-Integrion_372517** SeqNo: **5829719** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	0.100	0.100								U

LCS Sample ID: **LCS-111120** Units: **mg/L** Analysis Date: **11-Nov-2020 18:42**
Client ID: Run ID: **ICS-Integrion_372517** SeqNo: **5829720** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.8	0.100	4	0	95.0	80 - 120				

MS Sample ID: **HS20101419-01MS** Units: **mg/L** Analysis Date: **12-Nov-2020 00:24**
Client ID: **16RW09-201026** Run ID: **ICS-Integrion_372517** SeqNo: **5829733** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	7.436	0.100	2	5.377	103	80 - 120				

MSD Sample ID: **HS20101419-01MSD** Units: **mg/L** Analysis Date: **12-Nov-2020 00:42**
Client ID: **16RW09-201026** Run ID: **ICS-Integrion_372517** SeqNo: **5829734** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	7.445	0.100	2	5.377	103	80 - 120	7.436	0.121	20	

The following samples were analyzed in this batch: HS20101419-01 HS20101419-02 HS20101419-05 HS20101419-06 HS20101419-07

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 13-Dec-20

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 October 2020
WorkOrder: **HS20101419**

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

RIGHT SOLUTIONS | RIGHT PARTNER

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	20-030-0	26-Mar-2021
California	2919, 2020-2021	30-Apr-2021
Dept of Defense	PJLA L20-507	22-Dec-2021
Florida	E87611-30-07/01/2020	30-Jun-2021
Illinois	2000322020-4	09-May-2021
Kansas	E-10352 2020-2021	31-Jul-2021
Kentucky	123043, 2020-2021	30-Apr-2021
Louisiana	03087, 2020-2021	30-Jun-2021
North Carolina	624-2020	31-Dec-2020
North Dakota	R-193 2020-2021	30-Apr-2021
Oklahoma	2020-165	31-Aug-2021
Texas	T104704231-20-26	30-Apr-2021

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 13-Dec-20

Sample Receipt Checklist

Work Order ID: HS20101419 **Date/Time Received:** **28-Oct-2020 09:15**

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

Completed By: /S/ RJ Modashia (eSignature) 29-Oct-2020 09:36 (Date/Time) **Reviewed by:** /S/ RJ Modashia (eSignature) 29-Oct-2020 09:38 (Date/Time)

Matrices: **Water** Carrier name: **FedEx**

	Yes	No	Not Present
Shipping container/cooler in good condition?	☑	☐	☐
Custody seals intact on shipping container/cooler?	☑	☐	☐
Custody seals intact on sample bottles?	☐	☐	☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	☐	☐	☑
Chain of custody present?	☑	☐	1 Page(s)
Chain of custody signed when relinquished and received?	☑	☐	
Samplers name present on COC?	☑	☐	
Chain of custody agrees with sample labels?	☑	☐	
Samples in proper container/bottle?	☑	☐	
Sample containers intact?	☑	☐	
Sufficient sample volume for indicated test?	☑	☐	
All samples received within holding time?	☑	☐	
Container/Temp Blank temperature in compliance?	☑	☐	

Temperature(s)/Thermometer(s):	1.4 degree C	45928
Cooler(s)/Kit(s):	IR31	
Date/Time sample(s) sent to storage:	10/28/2020 4pm	

	Yes	No	
Water - VOA vials have zero headspace?	☑	☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	☑	☐	N/A ☐
pH adjusted?	☐	☐	N/A ☑

pH adjusted by:

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

RIGHT SOLUTIONS | RIGHT PARTNER

CHAIN OF CUSTODY

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

Page 1 of 1

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

Project No. 501032

Job: LHAAP 16 October 2020

Prepared By: Scott Beesinger

P.O. Number

Field Sample I.D. Time	Sample Matrix	Date /	MS / MSD	No. OF CONTAINERS	VOC by SW 8260B	TOC by SM5310C	MEE by RSK 175	Anions (bromide, sulfate, nitrate) by SW9056 and Alkalinity by SM2320	Bromide by SW9056	Perchlorate by SW6850	Metals (arsenic, chromium, manganese, nickel, thallium) by SW6020				Remarks (Preservatives, etc.)
16RW09-201026	WG	10/26/20/0750		7	X	X			X	X					
16RW09-201026-MS	WG	10/26/20/0750		7	X	X			X	X					
16RW09-201026-MSD	WG	10/26/20/0750		7	X	X			X	X					
16RW10-201026	WG	10/26/20/0845		7	X	X			X	X					
16RW06-201026	WG	10/26/20/0930		4	X					X					
16RW07-201026	WG	10/26/20/1015		4	X					X					
16PM14-201026	WG	10/26/20/1100		7	X	X			X	X					
16PM14-201026-FD	WG	10/26/20/1100		7	X	X			X	X					

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

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	10/27/20	1430									

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition
J. [illegible]	10/28/20	09:15							

Remarks: Cooler 45728 1023
Temp is 4°C CFO

Aptim Environmental & Infrastructure, Inc.
LHAAP 16 October 2020
HS20101419

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

RIGHT SOLUTIONS | RIGHT PARTNER

CHAIN OF CUSTODY

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

Page 1 of 1

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

Project No. 501032

Job: LHAAP 16 October 2020

Prepared By: Scott Beesinger

P.O. Number

Field Sample I.D. Time	Sample Matrix	Date /	MS / MSD	No. OF CONTAINERS	VOC by SW 8260B	TOC by SM5310C	MEE by RSK 175	Anions (bromide, sulfate, nitrate) by SW9056 and Alkalinity by SM2320	Bromide by SW9056	Perchlorate by SW6850	Metals (arsenic, chromium, manganese, nickel, thallium) by SW6020				Remarks (Preservatives, etc.)
16PM06-201026	WG	10/26/20/1150		7	X	X			X	X					
16PM09-201026	WG	10/26/20/1235		4	X					X					
16PM02-201026	WG	10/26/20/1320		4	X					X					
16PM03-201026	WG	10/26/20/1405		4	X					X					
16SW01-201026	WG	10/26/20/1415		5	X					X	X				
16SW02-201026	WG	10/26/20/1435		5	X					X	X				
16SW03-201026	WG	10/26/20/1455		5	X					X	X				
TRIPBLANK-201026	W	10/26/20		2	X										

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

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	10/27/20	1430									

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition
J. [illegible]	10/28/20	07:15							

Remarks:

Aptim Environmental & Infrastructure, Inc.
LHAAP 16 October 2020
HS201101419

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

RIGHT SOLUTIONS | RIGHT PARTNER

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

45928

CUSTODY SEAL

Date: 10/27/20 Time: 1430
Name: SCOTT BEESINGER
Company: BHMTG

Seal Broken By: SJ
Date: 10/28/20

45928

Must Deliver Next Business Day
Time and Tempature Sensitive!

45928

ORIGIN ID:SGRA (903) 930-6193
SCOTT BEESINGER
APTIM
1203-B EAST GRAND AVE.
PMB202
MARSHALL, TX 75670
UNITED STATES US

SHIP DATE: 29SEP20
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 16 - BO 74064 - RJ

RMA:

FedEx Express

FedEx
TRK# 0221 1891 8880 8711

WED - 28 OCT 10:30A
PRIORITY OVERNIGHT

AB SGRA

77099
TX-US IAH

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

November 11, 2020

Analytical Report for Service Request No: K2009924

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

RE: ALS Houston DOD TOC / HS20101419

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory October 30, 2020
For your reference, these analyses have been assigned our service request number **K2009924.**

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

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

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

for Kelley Lovejoy
Project Manager

RIGHT SOLUTIONS | RIGHT PARTNER

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
Qualifiers
State Certifications, Accreditations, And Licenses
Case Narrative
Chain of Custody
General Chemistry
Raw Data
    General Chemistry

RIGHT SOLUTIONS | RIGHT PARTNER

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.

RIGHT SOLUTIONS | RIGHT PARTNER

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.

RIGHT SOLUTIONS | RIGHT PARTNER

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.

RIGHT SOLUTIONS | RIGHT PARTNER

Case Narrative

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

RIGHT SOLUTIONS | RIGHT PARTNER

1317 South 13th Ave, Kelso, WA 98626 | 1-360-577-7222 | www.alsglobal.com

ALS Environmental

Client: ALS Environmental - US
Project: ALS Houston DOD TOC
Sample Matrix: Ground Water

Service Request: K2009924
Date Received: 10/30/2020

CASE NARRATIVE

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

Sample Receipt:

Five ground water samples were received for analysis at ALS Environmental on 10/30/2020. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The samples were stored at minimum in accordance with the analytical method requirements.

General Chemistry:

No significant anomalies were noted with this analysis.

Approved by Noe D. Daniel Date 11/11/2020

RIGHT SOLUTIONS | RIGHT PARTNER

Chain of Custody

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

RIGHT SOLUTIONS | RIGHT PARTNER

1200 4124

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID:** **15062**

SUBCONTRACT TO:

ALS Environmental Kelso
1317 S. 13th Avenue
Kelso, WA 98626 **Phone:** +1 360 501 3312

CUSTOMER INFORMATION:

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

INVOICE INFORMATION:

Company: ALS Houston
Contact: Accounts Payable
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Reference: HS20101419
TSR: Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS20101419-01**	**16RW09-201026**	**Groundwater**	**26 Oct 2020 07:50**
	TOC: Provide Level II & DOD Level IV/EQuIS APTIM EDD			11 Nov 2020
2.	**HS20101419-02**	**16RW10-201026**	**Groundwater**	**26 Oct 2020 08:45**
	TOC: Provide Level II & DOD Level IV/EQuIS APTIM EDD			11 Nov 2020
3.	**HS20101419-05**	**16PM14-201026**	**Groundwater**	**26 Oct 2020 11:00**
	TOC: Provide Level II & DOD Level IV/EQuIS APTIM EDD			11 Nov 2020
4.	**HS20101419-06**	**16PM14-201026-FD**	**Groundwater**	**26 Oct 2020 11:00**
	TOC: Provide Level II & DOD Level IV/EQuIS APTIM EDD			11 Nov 2020
5.	**HS20101419-07**	**16PM06-201026**	**Groundwater**	**26 Oct 2020 11:50**
	TOC: Provide Level II & DOD Level IV/EQuIS APTIM EDD			11 Nov 2020

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.
HS20101419-01 = MS/MSD

QC Level: DOD IV (DoD Data Package)

1L2009924

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID: 15062**

Relinquished By: _____ Date/Time: 10/29/2020 1800.

Received By: _____ Date/Time: 10/30/20 1000

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

RIGHT SOLUTIONS | RIGHT PARTNER

PM KK

Cooler Receipt and Preservation Form

Client ALS / Houston Service Request K20 09924

Received: 10/30/20 Opened: 10/30/20 By: Unloaded: 10/30/20 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
4. Was a Temperature Blank present in cooler? NA Y N If yes, notate the temperature in the appropriate column below:
   If no, take the temperature of a representative sample bottle contained within the cooler; notate in the column "Sample Temp":
5. Were samples received within the method specified temperature ranges? NA Y N
   If no, were they received on ice and same day as collected? If not, notate the cooler # below and notify the PM. NA Y N

If applicable, tissue samples were received: *Frozen* *Partially Thawed* *Thawed*

Temp Blank	Sample Temp	IR Gun	Cooler #/COC ID / NA	Out of temp indicate with "X"	PM Notified If out of temp	Tracking Number NA	Filed
1.3	—	IR01	15062	1		1891 8882 1535	
			15057				

6. Packing material: *Inserts* *Baggies* *Bubble Wrap* *Gel Packs* *Wet Ice* *Dry Ice* *Sleeves* _____
7. Were custody papers properly filled out (ink, signed, etc.)? NA Y N
8. Were samples received in good condition (unbroken) NA Y N
9. Were all sample labels complete (ie, analysis, preservation, etc.)? NA Y N
10. Did all sample labels and tags agree with custody papers? NA Y N
11. Were appropriate bottles/containers and volumes received for the tests indicated? NA Y N
12. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* NA Y N
13. Were VOA vials received without headspace? *Indicate in the table below.* NA Y N
14. Was C12/Res negative? NA Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

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

Notes, Discrepancies, Resolutions: _____

RIGHT SOLUTIONS | RIGHT PARTNER

General Chemistry

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	K2009924
Project:	ALS Houston DOD TOC/HS20101419	**Date Collected:**	10/26/20
Sample Matrix:	Ground Water	**Date Received:**	10/30/20
Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA

Carbon, Total Organic

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
16RW09-201026	K2009924-001	**1.58**	0.50	0.20	0.07	1	11/07/20 13:38	
16RW10-201026	K2009924-002	**4.10**	0.50	0.20	0.07	1	11/07/20 13:38	
16PM14-201026	K2009924-003	**8.93**	0.50	0.20	0.07	1	11/07/20 13:38	
16PM14-201026-FD	K2009924-004	**8.88**	0.50	0.20	0.07	1	11/07/20 13:38	
16PM06-201026	K2009924-005	**6.88**	0.50	0.20	0.07	1	11/07/20 13:38	
Method Blank	K2009924-MB	ND	0.50	0.20	0.07	1	11/07/20 13:38	U

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K2009924
Project	ALS Houston DOD TOC/HS20101419	**Date Collected:**	10/26/20
Sample Matrix:	Ground Water	**Date Received:**	10/30/20
		Date Analyzed:	11/07/20

Replicate Sample Summary
General Chemistry Parameters

Sample Name:	16RW09-201026	**Units:**	mg/L
Lab Code:	K2009924-001	**Basis:**	NA

Analyte Name	Analysis Method	LOQ	LOD	MDL	Sample Result	Duplicate Sample K2009924-001DUP Result	Average	RPD	RPD Limit
Carbon, Total Organic	SM 5310 C	0.50	0.20	0.07	1.58	1.44	1.51	9	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.

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K2009924
Project:	ALS Houston DOD TOC/HS20101419	**Date Collected:**	10/26/20
Sample Matrix:	Ground Water	**Date Received:**	10/30/20
		Date Analyzed:	11/7/20
		Date Extracted:	NA

Matrix Spike Summary
Carbon, Total Organic

Sample Name:	16RW09-201026	**Units:**	mg/L
Lab Code:	K2009924-001	**Basis:**	NA
Analysis Method:	SM 5310 C		
Prep Method:	None		

Matrix Spike
K2009924-001MS

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Carbon, Total Organic	1.58	23.9	25.0	89	83-117

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

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

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

Matrix Spike and Matrix Spike Duplicate Data is presented for information purposes only. The matrix may or may not be relevant to samples reported in this report. The laboratory evaluates system performance based on the LCS and LCSD control limits.

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K2009924
Project:	ALS Houston DOD TOC/HS20101419	**Date Analyzed:**	11/07/20
Sample Matrix:	Ground Water	**Date Extracted:**	NA

Lab Control Sample Summary
Carbon, Total Organic

Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA
		Analysis Lot:	702585

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K2009924-LCS	25.8	25.0	103	83-117

RIGHT SOLUTIONS | RIGHT PARTNER

December 11, 2020 Service Request No:E2001054

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

Laboratory Results for: HS20101419

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory October 29, 2020
For your reference, these analyses have been assigned our service request number **E2001054.**

Revision I - This report was revised to correct the sample IDs to reflex the chain of custody.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current TNI standards, where applicable, and except as noted in the laboratory case narrative provided. All results are intended to be considered in their entirety and ALS Environmental is not responsible for use of less than the complete final report. Results apply only to the items submitted to the laboratory, as received for analysis. In accordance with the current TNI Standard, a statement on the estimated uncertainty of measurement of any quantitative analysis will be supplied upon request.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Corey Grandits
Project Manager

ADDRESS 10450 Stancliff Rd., Suite 210, Houston, TX 77099
PHONE +1 281 530 5656 | FAX +1 281 530 5887
ALS Group USA, Corp.
dba ALS Environmental

Certificate of Analysis

ALS Environmental - Houston HRMS
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

ALS Environmental

Client:	ALS Houston	**Service Request No.:**	E2001054
Project:	HS20101419	**Date Received:**	10/29/20
Sample Matrix:	W		

CASE NARRATIVE

All analyses were performed in adherence to the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier II. When appropriate to the method, method blank results have been reported with each analytical test.

Sample Receipt

Thirteen samples were received for analysis at ALS Environmental in Houston on 10/29/20.

The samples were received in good condition and are consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

Data Validation Notes and Discussion

Precision and Accuracy:

EQ2000557: Laboratory Control Spike/Duplicate Laboratory Control Spike (LCS/DLCS) samples were analyzed and reported in addition to a MS/MSD for this extraction batch. The LCS, LCSD, MS, & MSD recoveries are within QC limits.

DoD Certification is held for the method/matrix/analytes provided in this report.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.

Use of ALS group USA Corp dba ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.

Client: ALS Environmental - US **Service Request:**E2001054
Project: HS20101419

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
E2001054-001	16RW09-201026	10/26/2020	0750
E2001054-002	16RW10-201026	10/26/2020	0845
E2001054-003	16RW06-201026	10/26/2020	0930
E2001054-004	16RW07-201026	10/26/2020	1015
E2001054-005	16PM14-201026	10/26/2020	1100
E2001054-006	16PM14-201026-FD	10/26/2020	1100
E2001054-007	16PM06-201026	10/26/2020	1150
E2001054-008	16PM09-201026	10/26/2020	1235
E2001054-009	16PM02-201026	10/26/2020	1320
E2001054-010	16PM03-201026	10/26/2020	1405
E2001054-011	16SW01-201026	10/26/2020	1415
E2001054-012	16SW02-201026	10/26/2020	1435
E2001054-013	16SW03-201026	10/26/2020	1455

Service Request Summary

Folder #: **E2001054**
Client Name: ALS Environmental - US
Project Name: HS20101419
Project Number:

Report To: RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Houston, TX 77099-4338
USA
Phone Number: 281-530-5656
Cell Number:
Fax Number: 281-530-5887
E-mail: rj.modashia@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 10/29/20
Internal Due Date: 11/11/2020
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS20101419
EDD: No EDD Specified

15 250 mL-Plastic Bottle HDPE WM CLEAR Unpreserved
Location: EHRMS-WIC 1E
Pressure Gas:

Lab Samp No.	Client Samp No	Matrix	Collected	HOUSTON ClO4 DOD/6850
E2001054-001	16RW09-201026	Ground Water	10/26/20 0750	**IV**
E2001054-002	16RW10-201026	Ground Water	10/26/20 0845	**IV**
E2001054-003	16RW06-201026	Ground Water	10/26/20 0930	**IV**
E2001054-004	16RW07-201026	Ground Water	10/26/20 1015	**IV**
E2001054-005	16PM14-201026	Ground Water	10/26/20 1100	**IV**
E2001054-006	16PM14-201026-FD	Ground Water	10/26/20 1100	**IV**
E2001054-007	16PM06-201026	Ground Water	10/26/20 1150	**IV**
E2001054-008	16PM09-201026	Ground Water	10/26/20 1235	**IV**
E2001054-009	16PM02-201026	Ground Water	10/26/20 1320	**IV**
E2001054-010	16PM03-201026	Ground Water	10/26/20 1405	**IV**
E2001054-011	16SW01-201026	Ground Water	10/26/20 1415	**IV**
E2001054-012	16SW02-201026	Ground Water	10/26/20 1435	**IV**
E2001054-013	16SW03-201026	Ground Water	10/26/20 1455	**IV**

RIGHT SOLUTIONS | RIGHT PARTNER

Service Request Summary

Folder #: **E2001054**
Client Name: ALS Environmental - US
Project Name: HS20101419
Project Number:

Report To: RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Houston, TX 77099-4338
USA
Phone Number: 281-530-5656
Cell Number:
Fax Number: 281-530-5887
E-mail: rj.modashia@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 10/29/20
Internal Due Date: 11/11/2020
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS20101419
EDD: No EDD Specified

15 250 mL-Plastic Bottle HDPE WM CLEAR Unpreserved
Location: EHRMS-WIC 1E
Pressure Gas:

Test Comments:

Group	Test/Method	Samples	Comments
Semivoa GCMS	ClO4 DOD/6850	12	Level II Due 11/11, level IV 11/18
Semivoa GCMS	ClO4 DOD/6850	1	MS/MSD

RIGHT SOLUTIONS | RIGHT PARTNER

Data Qualifiers

Lab Standard

+	Possible Tedlar bag artifact.
A	TIC is a suspected aldol-condensation product
B	Analyte found in the associated method blank as well as in the sample.
BC	Reported results are not blank corrected.
BH	The back section of the tube yielded higher results than the front.
BT	Results indicated possible breakthrough; back section >=10% front section.
C	Result identification confirmed.
D	Compound identified in an analysis at a secondary dilution factor
D	Spike was diluted out
DE	Reported results are corrected for desorption efficiency.
E	Estimated value. Concentration above calibration range
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
H1	Sample analysis performed past holding time. See case narrative.
H2	Initial analysis within holding time. Reanalysis for the required dilution was past holding time.
H3	Sample was received and analyzed past holding time.
H4	Sample was extracted past required extraction holding time, but analyzed within analysis holding time. See case narrative.
I	Internal standard not within the specified limits. See case narrative.
J	Estimated Value. Concentration found below MRL.
K	A deflection in the QC ion may indicate interference with the quantitation of this ion. The concentration of this analyte should be considered as an estimate.
K	Analyte was detected above the method reporting limit prior to normalization.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
L1	Laboratory control sample recovery outside the specified limits; results may be biased high.
L2	Laboratory control sample recovery outside the specified limits; results may be biased low.
L3	Laboratory control sample recovery outside the specified limits.
M	Matrix interference; results may be biased high.
M	The duplicate injection precision not met.
M1	Matrix interference due to coelution with a non-target compound; results may be biased high.
N	Presumptive evidence of a compound for TICs that have been identified based on a mass spectral library search.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.

RIGHT SOLUTIONS | RIGHT PARTNER

Data Qualifiers

Lab Standard

P	Indicates chlorodiphenyl ether interference present at the retention time of the target compound.
P	Pesticide/Aroclor target analyte > 40% difference for detected concentrations between GC columns
Q	Indicates as estimated value because the P and P + 2 theoretical abundance ratio does not meet method criteria.
R	Duplicate Precision not met.
R1	Duplicate precision not within the specified limits; however, the results are below the MRL and considered estimated.
S	Surrogate recovery not within specified limits.
S	The reported value was determined by the Method of Standard Additions (MSA).
T	Analyte is a tentatively identified compound, result is estimated.
U	Compound was analyzed for, but was not detected (ND).
V1	The continuing calibration verification standard was outside (biased high) the specified limits for this compound.
V2	The continuing calibration verification standard was outside (biased low) the specified limits for this compound.
W	Result quantified, but the corresponding peak was detected outside the generated retention time window.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
X	See case narrative.
Y	Recovery outside limits
Y	The chromatogram resembles a petroleum product but does not match the calibration standard.
Z	The chromatogram does not resemble a petroleum product.
i	The MRL/MDL has been elevated due to a matrix interference.

ALS Laboratory Group

Acronyms

Cal	Calibration
Conc	CONCentration
Dioxin(s)	Polychlorinated dibenzo-p-dioxin(s)
EDL	Estimated Detection Limit
EMPC	Estimated Maximum Possible Concentration
Flags	Data qualifiers
Furan(s)	Polychlorinated dibenzofuran(s)
g	Grams
ICAL	Initial CALibration
ID	IDentifier
Ions	Masses monitored for the analyte during data acquisition
L	Liter (s)
LCS	Laboratory Control Sample
DLCS	Duplicate Laboratory Control Sample
MB	Method Blank
MCL	Method Calibration Limit
MDL	Method Detection Limit
mL	Milliliters
MS	Matrix Spiked sample
DMS	Duplicate Matrix Spiked sample
NO	Number of peaks meeting all identification criteria
PCDD(s)	Polychlorinated dibenzo-p-dioxin(s)
PCDF(s)	Polychlorinated dibenzofuran(s)
ppb	Parts per billion
ppm	Parts per million
ppq	Parts per quadrillion
ppt	Parts per trillion
QA	Quality Assurance
QC	Quality Control
Ratio	Ratio of areas from monitored ions for an analyte
% Rec.	Percent recovery
RPD	Relative Percent Difference
RRF	Relative Response Factor
RT	Retention Time
SDG	Sample Delivery Group
S/N	Signal-to-noise ratio
TEF	Toxicity Equivalence Factor
TEQ	Toxicity Equivalence Quotient

10450 Stancliff Rd, Houston, TX 77099 | 281-530-5656 | www.alsglobal.com

ALS Environmental

State Certifications, Accreditations, and Licenses

Agency	Number	Expire Date
American Association for Laboratory Accreditation	2897.01 2020	11/30/2021
Arizona Department of Health Services	AZ0793-2020	5/27/2021
Arkansas Department of Environmental Quality	20-030-0	3/26/2021
California Department of Health Services	2919-2020	4/30/2021
Department of Defense	A2LA 2897.01	11/30/2021
Florida Department of Health	E87611-2020	6/30/2021
Hawaii Department of Health	2020	4/30/2021
Illinois Environmental Protection Agency	2000322020-4	5/9/2021
Kansas Department of Health and Environment	E-10352-2020	7/31/2021
Louisiana Department of Environmental Quality	03087-2020	6/30/2021
Louisiana Department of Health and Hospitals	LA028-2020	12/31/2020
Maine Department of Health and Human Services	2020016	6/5/2022
Maryland Department of the Environment	343-2020	6/30/2021
Michigan Depratment of Environmental Quality	9971-2020	4/30/2021
Minnesota Department of Health	1785988	12/31/2020
Nebraska Department of Health and Human Services	NE-OS-25-13 (2020)	4/30/2021
Nevada Department of Concervation and Natural Resources	TX026932021-1	7/31/2021
New Hampshire Environmental Laboratory Accreditation Program	209420	4/24/2021
New Jersey Department of Environmental Protection	TX008	6/30/2021
New York Department of Health	11707	3/31/2021
Oklahoma Department of Environmental Quality	2020-123	8/31/2021
Pennsylvania Department of Environmental Protection	014	6/30/2021
Tennessee Department of Environment and Concervation	04016-2020	4/30/2021
Texas Commision on Environmental Quality	T104704231-20-26	4/30/2021
United States Department of Agriculture	P330-19-00299	10/10/2022
Washington Department of Health	C819	11/14/2020

Chain of Custody

ALS Environmental - Houston HRMS
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID: 15063**

SUBCONTRACT TO:

ALS Environmental
10450 Stancliff RoadSuite 210
Houston, TX 77084 **Phone:** +1 281 530 5656

CUSTOMER INFORMATION:

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

INVOICE INFORMATION:

Company: ALS Houston
Contact: Accounts Payable
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Reference: HS20101419
TSR: Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	HS20101419-01	16RW09-201026	Groundwater	26 Oct 2020 07:50
	Provide Level II and Level IV reports on a seperate pdf.			11 Nov 2020
2.	HS20101419-02	16RW10-201026	Groundwater	26 Oct 2020 08:45
	Provide Level II and Level IV reports on a seperate pdf.			11 Nov 2020
3.	HS20101419-03	16RW06-201026	Groundwater	26 Oct 2020 09:30
	Provide Level II and Level IV reports on a seperate pdf.			11 Nov 2020
4.	HS20101419-04	16RW07-201026	Groundwater	26 Oct 2020 10:15
	Provide Level II and Level IV reports on a seperate pdf.			11 Nov 2020
5.	HS20101419-05	16PM14-201026	Groundwater	26 Oct 2020 11:00
	Provide Level II and Level IV reports on a seperate pdf.			11 Nov 2020
6.	HS20101419-06	16PM14-201026-FD	Groundwater	26 Oct 2020 11:00
	Provide Level II and Level IV reports on a seperate pdf.			11 Nov 2020
7.	HS20101419-07	16PM06-201026	Groundwater	26 Oct 2020 11:50
	Provide Level II and Level IV reports on a seperate pdf.			11 Nov 2020
8.	HS20101419-08	16PM09-201026	Groundwater	26 Oct 2020 12:35
	Provide Level II and Level IV reports on a seperate pdf.			11 Nov 2020
9.	HS20101419-09	16PM02-201026	Groundwater	26 Oct 2020 13:20

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID: 15063**

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
	Provide Level II and Level IV reports on a seperate pdf.			11 Nov 2020
10.	**HS20101419-10**	**16PM03-201026**	**Groundwater**	**26 Oct 2020 14:05**
	Provide Level II and Level IV reports on a seperate pdf.			11 Nov 2020
11.	**HS20101419-11**	**16SW01-201026**	**Groundwater**	**26 Oct 2020 14:15**
	Provide Level II and Level IV reports on a seperate pdf.			11 Nov 2020
12.	**HS20101419-12**	**16SW02-201026**	**Groundwater**	**26 Oct 2020 14:35**
	Provide Level II and Level IV reports on a seperate pdf.			11 Nov 2020
13.	**HS20101419-13**	**16SW03-201026**	**Groundwater**	**26 Oct 2020 14:55**
	Provide Level II and Level IV reports on a seperate pdf.			11 Nov 2020

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.
HS20101419-01 = MS/MSD

QC Level: DOD IV (DoD Data Package)

Relinquished By: J. Vincent Date/Time:

Received By: Corey G Date/Time: 10/29/20 1051

Cooler ID(s): Temperature(s):

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Environmental

Cooler Receipt Form

Project Chemist: CG

Client/Project: ALS-H

Thermometer ID: 1231

Date/Time Received: 10/24/20 Initials: CG Date/Time Logged in: 10/24/20 Initials: CG

1. Method of delivery: ○ US Mail ○ Fed Ex ○ UPS ○ DHL ☑ ALS Courier ○ Client
2. Samples received in: ☑ Cooler ○ Box ○ Envelope ○ Other
3. Were custody seals on coolers? ○ Yes ☑ No
   Were they intact? ○ Yes ○ No ☑ N/A
   Were they signed and dated? ○ Yes ○ No ☑ N/A
   If yes, how many and where?
4. Packing Material: ○ Inserts ☑ Baggies ○ Bubble Wrap ○ Gel Packs ☑ Wet Ice ○ Sleeves ○ Other
5. Foreign or Regulated Soil? ○ Yes ○ No Location of Sampling:

Cooler Tracking Number	COC ID	Date Opened	Time Opened	Opened By	Temp. °C	Temp Blank?
NA		10/24/20	1051	CG	4.2	☒
						☐
						☐
						☐

6. Were custody papers properly filled out (ink, signed, dated, etc)? ☑ Yes ○ No
7. Did all bottles arrive in good condition (not broken, no signs of leakage)? ☑ Yes ○ No
8. Were all sample labels complete (i.e., sample ID, analysis, preservation, etc)? ☑ Yes ○ No
9. Were appropriate bottles/containers and volumes received for the requested tests? ☑ Yes ○ No
10. Did sample labels and tags agree with custody documents? ☑ Yes ○ No

Notes, Discrepancies, & Resolutions:

Service request Label:

HS-HRMSCoolerReceipt R1.0

ALS Environmental - Houston HRMS

REV01

RIGHT SOLUTIONS | RIGHT PARTNER

10450 Stancliff Rd., Suite 210
Houston, TX 77099
T: +1 713 266 1599
F: +1 713 266 1599
www.alsglobal.com

SAMPLE ACCEPTANCE POLICY

This policy outlines the criteria samples must meet to be accepted by ALS Environmental – Houston HRMS.

Cooler Custody Seals (desirable, mandatory if specified in SAP):

- ✓ Intact on outside of cooler, signed and dated

Chain-of-Custody (COC) documentation (mandatory):

The following is required on each COC:

- ✓ Sample ID, the location, date and time of collection, collector's name, preservation type, sample type, and any other special remarks concerning the sampleThe COC must be completed in ink.
- ✓ Signature and date of relinquishing party.

In the absence of a COC at sample receipt, the COC will be requested from the client.

Sample Integrity (mandatory):

Samples are inspected upon arrival to ensure that sample integrity was not compromised during transfer to the laboratory.

- ✓ Sample containers must arrive in good condition (not broken or leaking).
- ✓ Samples must be labeled appropriately, including Sample IDs, and requested test using durable labels and indelible ink.
- ✓ The correct type of sample bottle must be used for the method requested.
- ✓ An appropriate sample volume, or weight, must be received.
- ✓ Sample IDs and number of containers must reconcile with the COC.
- ✓ Samples must be received within the method defined holding time.

Temperature Requirement (varies by sample matrix):

- ✓ Aqueous and Non-aqueous samples must be shipped and stored cold, at 0 to 6ºC.
- ✓ Tissue samples must be shipped and stored frozen, at -20 to -10ºC.
- ✓ Air samples are shipped and stored cold, at 0 to 6ºC
- ✓ The sample temperature must be recorded on the COC

All cooler inspections are documented on the Cooler Receipt Form (CRF). A separate CRF is completed for each service request. Any samples not meeting the above criteria are noted on the CRF and the Project Manager notified. The Project Manager must resolve any sample integrity issues with the client prior to proceeding with the analysis. Such resolutions are documented in writing and filed with the project folder. Data associated with samples received outside of this acceptance policy will be qualified on the case narrative of the final report

Preparation Information Benchsheets

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

Preparation Information Benchsheet

Prep Run#: 369061 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
Team: Semivoa GCMS/GRIVERA **Prep Method:** Method **Prep Date/Time:** 11/4/20 15:00

#	Lab Code	Client ID	B#	Method /Test	pH	Cl	Matrix	Amt. Ext.	Sample Description
1	E2000959-001	LOD Perchlorate Water	.01	6850/ClO4			Water	10mL	
2	E2000959-002	LOQ Perchlorate Water	.01	6850/ClO4			Water	10mL	
3	E2001050-001	LH18/24-SP650_102720-AIX	.01	6850/ClO4 DOD			Water	10mL	
4	E2001050-002	LH18/24-SP650_102720-Between	.01	6850/ClO4 DOD			Water	10mL	
5	E2001054-001	16RW09-201026	.01	6850/ClO4 DOD			Ground Water	10mL	
6	E2001054-002	16RW10-201026	.01	6850/ClO4 DOD			Ground Water	10mL	
7	E2001054-003	16RW06-201026	.01	6850/ClO4 DOD			Ground Water	10mL	
8	E2001054-004	16RW07-201026	.01	6850/ClO4 DOD			Ground Water	10mL	
9	E2001054-005	16PM14-201026	.01	6850/ClO4 DOD			Ground Water	10mL	
10	E2001054-006	16PM14-201026-FD	.01	6850/ClO4 DOD			Ground Water	10mL	
11	E2001054-007	16PM06-201026	.01	6850/ClO4 DOD			Ground Water	10mL	
12	E2001054-008	16PM09-201026	.01	6850/ClO4 DOD			Ground Water	10mL	
13	E2001054-009	16PM02-201026	.01	6850/ClO4 DOD			Ground Water	10mL	
14	E2001054-010	16PM03-201026	.01	6850/ClO4 DOD			Ground Water	10mL	
15	E2001054-011	16SW01-201026	.01	6850/ClO4 DOD			Ground Water	10mL	
16	E2001054-012	16SW02-201026	.01	6850/ClO4 DOD			Ground Water	10mL	
17	E2001054-013	16SW03-201026	.01	6850/ClO4 DOD			Ground Water	10mL	
18	EQ2000557-01	MB		6850/ClO4 DOD			Liquid	10mL	
19	EQ2000557-02	LCS		6850/ClO4 DOD			Liquid	10mL	
20	EQ2000557-03	DLCS		6850/ClO4 DOD			Liquid	10mL	
21	EQ2000557-04	16RW09-201026 MS	.01	6850/ClO4 DOD			Liquid	10mL	
22	EQ2000557-05	16RW09-201026 DMS	.01	6850/ClO4 DOD			Liquid	10mL	

Spiking Solutions

Name: Perchlorate Intermediate Stock1 Inventory ID 209764 Logbook Ref: Perchlorate Int. Stock1 51820 Expires On: 11/18/2020

EQ2000557-02	1.00µL	EQ2000557-02	1.00µL	EQ2000557-03	1.00µL	EQ2000557-03	1.00µL	EQ2000557-04	1.00µL	EQ2000557-05	1.00µL

Name: Sodium Perchlorate 1 ug/mL (IS) (18-O) as CLO4 Inventory ID 212340 Logbook Ref: Sodium Perchlorate Expires On: 07/13/2022

E2000959-001	100.00µL	E2000959-002	100.00µL	E2001050-001	100.00µL	E2001050-002	100.00µL	E2001054-001	100.00µL	E2001054-002	100.00µL
E2001054-003	100.00µL	E2001054-004	100.00µL	E2001054-005	100.00µL	E2001054-006	100.00µL	E2001054-007	100.00µL	E2001054-008	100.00µL
E2001054-009	100.00µL	E2001054-010	100.00µL	E2001054-011	100.00µL	E2001054-012	100.00µL	E2001054-013	100.00µL	EQ2000557-01	100.00µL
EQ2000557-01	100.00µL	EQ2000557-02	100.00µL	EQ2000557-02	100.00µL	EQ2000557-03	100.00µL	EQ2000557-03	100.00µL	EQ2000557-04	100.00µL
EQ2000557-05	100.00µL										

Preparation Information Benchsheet

Prep Run#: 369061
Team: Semivoa GCMS/GRIVERA

Prep WorkFlow: GenExt28Day
Prep Method: Method

Status: Prepped
Prep Date/Time: 11/4/20 15:00

Preparation Steps

Step: Preparation
Started: 11/4/20 15:00
Finished: 11/4/20 16:00
By: GRIVERA
Comments

Comments:

Reviewed By: GR Date: 11/4/2020

Chain of Custody

Relinquished By: Date:

Received By: Date:

Extracts Examined
Yes No

REV01
RIGHT SOLUTIONS | RIGHT PARTNER

Analytical Results

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2001054
Project:	HS20101419	**Date Collected:**	10/26/20 0750
Sample Matrix:	Ground Water	**Date Received:**	10/29/20
Sample Name:	16RW09-201026	**Units:**	µg/L
Lab Code:	E2001054-001	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.120**	J	0.200	0.100	0.0500	2	11/ 4/20	11/5/20 14:02	369061	702385	

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2001054
Project:	HS20101419	**Date Collected:**	10/26/20 0845
Sample Matrix:	Ground Water	**Date Received:**	10/29/20
Sample Name:	16RW10-201026	**Units:**	µg/L
Lab Code:	E2001054-002	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**8.11**		0.200	0.100	0.0500	2	11/ 4/20	11/5/20 16:06	369061	702385	

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2001054
Project:	HS20101419	**Date Collected:**	10/26/20 0930
Sample Matrix:	Ground Water	**Date Received:**	10/29/20
Sample Name:	16RW06-201026	**Units:**	µg/L
Lab Code:	E2001054-003	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.200	0.100	0.0500	2	11/ 4/20	11/5/20 15:01	369061	702385	

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2001054
Project:	HS20101419	**Date Collected:**	10/26/20 1015
Sample Matrix:	Ground Water	**Date Received:**	10/29/20
Sample Name:	16RW07-201026	**Units:**	µg/L
Lab Code:	E2001054-004	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.391**		0.100	0.0500	0.0250	1	11/ 4/20	11/4/20 19:31	369061	702183	

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2001054
Project:	HS20101419	**Date Collected:**	10/26/20 1100
Sample Matrix:	Ground Water	**Date Received:**	10/29/20
Sample Name:	16PM14-201026	**Units:**	µg/L
Lab Code:	E2001054-005	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.200	0.100	0.0500	2	11/ 4/20	11/5/20 15:09	369061	702385	

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2001054
Project:	HS20101419	**Date Collected:**	10/26/20 1100
Sample Matrix:	Ground Water	**Date Received:**	10/29/20
Sample Name:	16PM14-201026-FD	**Units:**	µg/L
Lab Code:	E2001054-006	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.200	0.100	0.0500	2	11/ 4/20	11/5/20 15:16	369061	702385	

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2001054
Project:	HS20101419	**Date Collected:**	10/26/20 1150
Sample Matrix:	Ground Water	**Date Received:**	10/29/20
Sample Name:	16PM06-201026	**Units:**	µg/L
Lab Code:	E2001054-007	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	11/ 4/20	11/4/20 19:54	369061	702183	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2001054
Project:	HS20101419	**Date Collected:**	10/26/20 1235
Sample Matrix:	Ground Water	**Date Received:**	10/29/20
Sample Name:	16PM09-201026	**Units:**	µg/L
Lab Code:	E2001054-008	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.0253**	J	0.100	0.0500	0.0250	1	11/ 4/20	11/4/20 20:02	369061	702183	

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2001054
Project:	HS20101419	**Date Collected:**	10/26/20 1320
Sample Matrix:	Ground Water	**Date Received:**	10/29/20
Sample Name:	16PM02-201026	**Units:**	µg/L
Lab Code:	E2001054-009	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	11/ 4/20	11/4/20 20:10	369061	702183	

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2001054
Project:	HS20101419	**Date Collected:**	10/26/20 1405
Sample Matrix:	Ground Water	**Date Received:**	10/29/20
Sample Name:	16PM03-201026	**Units:**	µg/L
Lab Code:	E2001054-010	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**360**		1.00	0.500	0.250	10	11/ 4/20	11/5/20 14:13	369061	702385	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2001054
Project:	HS20101419	**Date Collected:**	10/26/20 1415
Sample Matrix:	Ground Water	**Date Received:**	10/29/20
Sample Name:	16SW01-201026	**Units:**	µg/L
Lab Code:	E2001054-011	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	11/ 4/20	11/5/20 10:31	369061	702385	

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2001054
Project:	HS20101419	**Date Collected:**	10/26/20 1435
Sample Matrix:	Ground Water	**Date Received:**	10/29/20
Sample Name:	16SW02-201026	**Units:**	µg/L
Lab Code:	E2001054-012	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	11/ 4/20	11/4/20 20:42	369061	702183	

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2001054
Project:	HS20101419	**Date Collected:**	10/26/20 1455
Sample Matrix:	Ground Water	**Date Received:**	10/29/20
Sample Name:	16SW03-201026	**Units:**	µg/L
Lab Code:	E2001054-013	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	11/ 4/20	11/4/20 20:50	369061	702183	

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2001054
Project:	HS20101419	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	µg/L
Lab Code:	EQ2000557-01	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	11/ 4/20	11/4/20 17:48	369061	702183	

RIGHT SOLUTIONS | RIGHT PARTNER

Accuracy & Precision

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2001054
Project:	HS20101419	**Date Analyzed:**	11/ 4/20
Sample Matrix:	Ground Water		

Lab Control Sample Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method:	6850	**Units:**	µg/L
Prep Method:	Method	**Basis:**	As Received
		Extraction Lot:	369061

	Lab Control Sample EQ2000557-02			Duplicate Lab Control Sample EQ2000557-03					
Analyte Name	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Perchlorate	0.118	0.100	118	0.119	0.100	119	84 - 119	<1	15

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

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

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2001054
Project:	HS20101419	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2000557-02	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.118**		0.100	0.0500	0.0250	1	11/ 4/20	11/4/20 17:56	369061	702183	

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2001054
Project:	HS20101419	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Duplicate Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2000557-03	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.119**		0.100	0.0500	0.0250	1	11/ 4/20	11/4/20 18:04	369061	702183	

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2001054
Project:	HS20101419	**Date Collected:**	10/26/20
Sample Matrix:	Ground Water	**Date Received:**	10/29/20
		Date Analyzed:	11/ 5/20

Matrix Spike Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Sample Name:	16RW09-201026	**Units:**	µg/L
Lab Code:	E2001054-001	**Basis:**	As Received

Analytical Method: 6850
Prep Method: Method

		16RW09-201026MS				16RW09-201026DMS					
		Matrix Spike				**Duplicate Matrix Spike**					
		EQ2000557-04				EQ2000557-05					
Analyte Name	**Sample Result**	**Result**	**Spike Amount**	**% Rec**		**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Perchlorate	0.120	0.235	0.100	115		0.229	0.100	108	84 - 119	3	15

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

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

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

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2001054
Project:	HS20101419	**Date Collected:**	10/26/20 0750
Sample Matrix:	Ground Water	**Date Received:**	10/29/20
Sample Name:	16RW09-201026	**Units:**	µg/L
Lab Code:	EQ2000557-04	**Basis:**	As Received
Run Type:	Matrix Spike		

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.235**		0.200	0.100	0.0500	2	11/ 4/20	11/5/20 13:46	369061	702385	

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2001054
Project:	HS20101419	**Date Collected:**	10/26/20 0750
Sample Matrix:	Ground Water	**Date Received:**	10/29/20
Sample Name:	16RW09-201026	**Units:**	µg/L
Lab Code:	EQ2000557-05	**Basis:**	As Received
Run Type:	Duplicate Matrix Spike		

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.229**		0.200	0.100	0.0500	2	11/ 4/20	11/5/20 13:54	369061	702385	

RIGHT SOLUTIONS | RIGHT PARTNER

microbialinsights

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

ilac-MRA

ANAB
ANSI National Accreditation Board
ACCREDITED
ISO/IEC 17025
TESTING LABORATORY

Client: Susan Huang
APTIM
4005 Port Chicago Hwy
Concord, CA 94520

Phone: 925-288-2099

Fax:

Identifier: 045SA **Date Rec:** 01/21/2021 **Report Date:** 02/03/2021

Client Project #: 501032 **Client Project Name:** LHAAP 16 January 2021

Purchase Order #: 204818

Test results provided for: CENSUS

Reviewed By:

Casey Brown

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

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

MICROBIAL INSIGHTS, INC.

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

CENSUS

Client: **APTIM**
Project: LHAAP 16 January 2021

MI Project Number: **045SA**
Date Received: 01/21/2021

Sample Information

Client Sample ID:		**16WW16-210120**	**16WW35-210120**	**16WW36-210120**	**16WW55-210120**	**16WW25-210121**
Sample Date:		01/20/2021	01/20/2021	01/20/2021	01/20/2021	01/21/2021
Units:		cells/mL	cells/mL	cells/mL	cells/mL	cells/mL
Analyst/Reviewer:		HT/CB	HT/CB	HT/CB	HT/CB	HT/CB
Dechlorinating Bacteria						
Dehalococcoides	*DHC*	**1.10E+00**	**6.14E+01**	**7.90E+00**	**8.00E-01**	**7.00E+00**

Legend:
NA = Not Analyzed NS = Not Sampled J = Estimated gene copies below PQL but above LQL I = Inhibited
< = Result not detected

MICROBIAL INSIGHTS, INC.

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

CENSUS

Client: **APTIM**
Project: LHAAP 16 January 2021

MI Project Number: **045SA**
Date Received: 01/21/2021

Sample Information

Client Sample ID:		**16WW26-210121**	**16WW29-210121**	**16WW48-210121**	**16WW56-210125**	**16WW22-210125**
Sample Date:		01/21/2021	01/21/2021	01/21/2021	01/25/2021	01/25/2021
Units:		cells/mL	cells/mL	cells/mL	cells/mL	cells/mL
Analyst/Reviewer:		HT/CB	HT/CB	HT/CB	HT/CB	HT/CB
Dechlorinating Bacteria						
Dehalococcoides	*DHC*	**7.60E+00**	**7.20E+00**	**2.58E+01**	**6.53E+01**	**2.83E+01**

Legend:
NA = Not Analyzed NS = Not Sampled J = Estimated gene copies below PQL but above LQL I = Inhibited
< = Result not detected

MICROBIAL INSIGHTS, INC.

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

CENSUS

Client: **APTIM**
Project: LHAAP 16 January 2021

MI Project Number: **045SA**
Date Received: 01/21/2021

Sample Information

Client Sample ID:		**16WW41-210125**	**16EW01-210125**	**16EW02-210126**	**16IW03-210126**	**16IW10-210126**
Sample Date:		01/25/2021	01/25/2021	01/26/2021	01/26/2021	01/26/2021
Units:		cells/mL	cells/mL	cells/mL	cells/mL	cells/mL
Analyst/Reviewer:		HT/CB	HT/CB	HT/CB	HT/CB	HT/CB
Dechlorinating Bacteria						
Dehalococcoides	*DHC*	**3.00E-01 (J)**	**2.92E+02**	**3.60E+03**	**9.76E+02**	**3.70E+05**

Legend:
NA = Not Analyzed NS = Not Sampled J = Estimated gene copies below PQL but above LQL I = Inhibited
< = Result not detected

MICROBIAL INSIGHTS, INC.

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

CENSUS

Client: **APTIM**
Project: LHAAP 16 January 2021

MI Project Number: **045SA**
Date Received: 01/21/2021

Sample Information

Client Sample ID:		**16IW09-210126**	**16WW57-210127**	**16WW58-210127**	**16IW20-210127**
Sample Date:		01/26/2021	01/27/2021	01/27/2021	01/27/2021
Units:		cells/mL	cells/mL	cells/mL	cells/mL
Analyst/Reviewer:		HT/CB	HT/CB	HT/CB	HT/CB
Dechlorinating Bacteria					
Dehalococcoides	*DHC*	**2.90E+00**	**4.30E+00**	**2.80E+01**	**2.10E+03**

Legend:
NA = Not Analyzed NS = Not Sampled J = Estimated gene copies below PQL but above LQL I = Inhibited
< = Result not detected

Quality Assurance/Quality Control Data

Samples Received 1/21/2021

Component	Date Prepared	Date Analyzed	Arrival Temperature	Positive Control	Extraction Blank	Negative Control
DHC	01/21/2021	02/03/2021	1 °C	106%	non-detect	non-detect

Samples Received 1/22/2021

Component	Date Prepared	Date Analyzed	Arrival Temperature	Positive Control	Extraction Blank	Negative Control
DHC	01/22/2021	02/03/2021	0 °C	107%	non-detect	non-detect

Samples Received 1/26/2021

Component	Date Prepared	Date Analyzed	Arrival Temperature	Positive Control	Extraction Blank	Negative Control
DHC	01/26/2021	02/03/2021	0 °C	108%	non-detect	non-detect

Samples Received 1/27/2021

Component	Date Prepared	Date Analyzed	Arrival Temperature	Positive Control	Extraction Blank	Negative Control
DHC	01/27/2021	02/03/2021	0 °C	108%	non-detect	non-detect

Samples Received 1/28/2021

Component	Date Prepared	Date Analyzed	Arrival Temperature	Positive Control	Extraction Blank	Negative Control
DHC	01/28/2021	02/03/2021	0 °C	108%	non-detect	non-detect

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

March 01, 2021

Susan Huang
Aptim Environmental & Infrastucture, Inc.
2500 City West Blvd., Suite 1700
Houston, TX 77042

Work Order: **HS21010777**

Laboratory Results for: **LHAAP 16 January 2021**

Dear Susan Huang,

ALS Environmental received 10 sample(s) on Jan 21, 2021 for the analysis presented in the following report.

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

Regards,

Generated By: RJ.MODASHIA

RJ Modashia
Project Manager

ALS Houston, US Date: 01-Mar-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
Work Order: HS21010777

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS21010777-01	16LHAAP-210119-TB1	Water	CG-121520 -127	19-Jan-2021 11:30	21-Jan-2021 10:35	☐
HS21010777-02	16WW46-210119	Groundwater		19-Jan-2021 12:40	21-Jan-2021 10:35	☐
HS21010777-03	16WW31-210119	Groundwater		19-Jan-2021 15:10	21-Jan-2021 10:35	☐
HS21010777-04	16WW32-210119	Groundwater		19-Jan-2021 16:15	21-Jan-2021 10:35	☐
HS21010777-05	16WW16-210120	Groundwater		20-Jan-2021 08:40	21-Jan-2021 10:35	☐
HS21010777-06	16WW35-210120	Groundwater		20-Jan-2021 09:50	21-Jan-2021 10:35	☐
HS21010777-07	16WW36-210120	Groundwater		20-Jan-2021 10:33	21-Jan-2021 10:35	☐
HS21010777-08	16WW55-210120	Groundwater		20-Jan-2021 11:24	21-Jan-2021 10:35	☐
HS21010777-09	16WW38-210120	Groundwater		20-Jan-2021 12:23	21-Jan-2021 10:35	☐
HS21010777-10	16WW37-210120	Groundwater		20-Jan-2021 13:05	21-Jan-2021 10:35	☐

Revision:1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 01-Mar-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
Work Order: HS21010777

CASE NARRATIVE

Work Order Comments

- REV01: Revised to update sample IDs for Perchlorate report.
- The analysis for Methane, Methene, Ethane by RSK175 was subcontracted to ALS Simi Valley, CA. Final report attached.

  The analysis for Perchlorate was subcontracted to ALS Houston High-Res Lab. Final report attached.

  The analysis for TOC was subcontracted to ALS Kelso, WA. Final report attached.

Work Order Comments

- The analysis for Methane, Methene, Ethane by RSK175 was subcontracted to ALS Simi Valley, CA. Final report attached.

  The analysis for Perchlorate was subcontracted to ALS Houston High-Res Lab. Final report attached.

  The analysis for TOC was subcontracted to ALS Kelso, WA. Final report attached.

GCMS Volatiles by Method SW8260

Batch ID: R377067,R377130,R377206

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

WetChemistry by Method SM2320B

Batch ID: R376964

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

WetChemistry by Method SW9056

Batch ID: R376860

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

Batch ID: R376750

Sample ID: 16WW16-210120 (HS21010777-05)

- Sample ran at 2X due to high concentration of Chloride & Sulfate

Sample ID: 16WW35-210120 (HS21010777-06)

- Sample ran at 2X due to high concentration of Chloride & Sulfate

Sample ID: 16WW55-210120 (HS21010777-08)

- Sample ran at 2X due to high concentration of Chloride & Sulfate

Sample ID: HS21010780-03MS

- MS and MSD are for an unrelated sample (Bromide)

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 01-Mar-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
Sample ID: 16LHAAP-210119-TB1
Collection Date: 19-Jan-2021 11:30

ANALYTICAL REPORT
WorkOrder:HS21010777
Lab ID:HS21010777-01
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	27-Jan-2021 20:13
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jan-2021 20:13
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jan-2021 20:13
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jan-2021 20:13
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	27-Jan-2021 20:13
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jan-2021 20:13
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jan-2021 20:13
Surr: 1,2-Dichloroethane-d4	*102*			**0**	*81-118*	*%REC*	*1*	*27-Jan-2021 20:13*
Surr: 4-Bromofluorobenzene	*102*			**0**	*85-114*	*%REC*	*1*	*27-Jan-2021 20:13*
Surr: Dibromofluoromethane	*99.5*			**0**	*80-119*	*%REC*	*1*	*27-Jan-2021 20:13*
Surr: Toluene-d8	*105*			**0**	*89-112*	*%REC*	*1*	*27-Jan-2021 20:13*

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 01-Mar-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
Sample ID: 16WW46-210119
Collection Date: 19-Jan-2021 12:40

ANALYTICAL REPORT
WorkOrder:HS21010777
Lab ID:HS21010777-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	27-Jan-2021 20:34
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jan-2021 20:34
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jan-2021 20:34
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jan-2021 20:34
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	27-Jan-2021 20:34
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jan-2021 20:34
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jan-2021 20:34
Surr: 1,2-Dichloroethane-d4	*102*			**0**	*81-118*	*%REC*	*1*	*27-Jan-2021 20:34*
Surr: 4-Bromofluorobenzene	*109*			**0**	*85-114*	*%REC*	*1*	*27-Jan-2021 20:34*
Surr: Dibromofluoromethane	*99.4*			**0**	*80-119*	*%REC*	*1*	*27-Jan-2021 20:34*
Surr: Toluene-d8	*103*			**0**	*89-112*	*%REC*	*1*	*27-Jan-2021 20:34*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	31-Jan-2021 13:28

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 01-Mar-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
Sample ID: 16WW31-210119
Collection Date: 19-Jan-2021 15:10

ANALYTICAL REPORT
WorkOrder:HS21010777
Lab ID:HS21010777-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	27-Jan-2021 20:55
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jan-2021 20:55
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jan-2021 20:55
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jan-2021 20:55
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	27-Jan-2021 20:55
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jan-2021 20:55
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jan-2021 20:55
Surr: 1,2-Dichloroethane-d4	*99.5*			**0**	*81-118*	*%REC*	*1*	*27-Jan-2021 20:55*
Surr: 4-Bromofluorobenzene	*106*			**0**	*85-114*	*%REC*	*1*	*27-Jan-2021 20:55*
Surr: Dibromofluoromethane	*97.1*			**0**	*80-119*	*%REC*	*1*	*27-Jan-2021 20:55*
Surr: Toluene-d8	*105*			**0**	*89-112*	*%REC*	*1*	*27-Jan-2021 20:55*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	31-Jan-2021 13:28

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 01-Mar-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
Sample ID: 16WW32-210119
Collection Date: 19-Jan-2021 16:15

ANALYTICAL REPORT
WorkOrder:HS21010777
Lab ID:HS21010777-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	30-Jan-2021 19:08
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	30-Jan-2021 19:08
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	30-Jan-2021 19:08
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	30-Jan-2021 19:08
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	30-Jan-2021 19:08
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	30-Jan-2021 19:08
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	30-Jan-2021 19:08
Surr: 1,2-Dichloroethane-d4	*93.9*			**0**	*81-118*	*%REC*	*1*	*30-Jan-2021 19:08*
Surr: 4-Bromofluorobenzene	*102*			**0**	*85-114*	*%REC*	*1*	*30-Jan-2021 19:08*
Surr: Dibromofluoromethane	*95.8*			**0**	*80-119*	*%REC*	*1*	*30-Jan-2021 19:08*
Surr: Toluene-d8	*102*			**0**	*89-112*	*%REC*	*1*	*30-Jan-2021 19:08*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	31-Jan-2021 13:28

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 01-Mar-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
Sample ID: 16WW16-210120
Collection Date: 20-Jan-2021 08:40

ANALYTICAL REPORT
WorkOrder:HS21010777
Lab ID:HS21010777-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	5.0	U	1.5	5.0	5.0	ug/L	5	30-Jan-2021 20:11
1,1-Dichloroethene	**12**		**1.0**	**2.5**	**5.0**	**ug/L**	5	30-Jan-2021 20:11
1,2-Dichloroethane	**8.6**		**1.0**	**2.5**	**5.0**	**ug/L**	5	30-Jan-2021 20:11
cis-1,2-Dichloroethene	**2,800**		**10**	**25**	**50**	**ug/L**	50	30-Jan-2021 20:32
Methylene chloride	10	U	2.0	10	10	ug/L	5	30-Jan-2021 20:11
Trichloroethene	**5,700**		**10**	**25**	**50**	**ug/L**	50	30-Jan-2021 20:32
Vinyl chloride	**110**		**1.0**	**2.5**	**5.0**	**ug/L**	5	30-Jan-2021 20:11
Surr: 1,2-Dichloroethane-d4	*96.8*			**0**	*81-118*	*%REC*	*5*	*30-Jan-2021 20:11*
Surr: 1,2-Dichloroethane-d4	*96.7*			**0**	*81-118*	*%REC*	*50*	*30-Jan-2021 20:32*
Surr: 4-Bromofluorobenzene	*103*			**0**	*85-114*	*%REC*	*50*	*30-Jan-2021 20:32*
Surr: 4-Bromofluorobenzene	*105*			**0**	*85-114*	*%REC*	*5*	*30-Jan-2021 20:11*
Surr: Dibromofluoromethane	*95.3*			**0**	*80-119*	*%REC*	*5*	*30-Jan-2021 20:11*
Surr: Dibromofluoromethane	*95.3*			**0**	*80-119*	*%REC*	*50*	*30-Jan-2021 20:32*
Surr: Toluene-d8	*98.7*			**0**	*89-112*	*%REC*	*5*	*30-Jan-2021 20:11*
Surr: Toluene-d8	*100*			**0**	*89-112*	*%REC*	*50*	*30-Jan-2021 20:32*
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: TH
Alkalinity, Total (As CaCO3)	**344**	a	**5.00**	**5.00**	**5.00**	**mg/L**	1	27-Jan-2021 00:16
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**5.92**		**0.0600**	**0.200**	**0.200**	**mg/L**	2	21-Jan-2021 19:58
Nitrogen, Nitrate (As N)	**0.741**		**0.0600**	**0.200**	**0.200**	**mg/L**	2	21-Jan-2021 19:58
Sulfate	**849**		**4.00**	**10.0**	**10.0**	**mg/L**	20	23-Jan-2021 01:23
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	31-Jan-2021 13:28
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	01-Feb-2021 13:41
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	28-Jan-2021 15:45

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 01-Mar-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
Sample ID: 16WW35-210120
Collection Date: 20-Jan-2021 09:50

ANALYTICAL REPORT
WorkOrder:HS21010777
Lab ID:HS21010777-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	**7.2**	J	**3.0**	**10**	**10**	**ug/L**	10	28-Jan-2021 16:05
1,1-Dichloroethene	**120**		**2.0**	**5.0**	**10**	**ug/L**	10	28-Jan-2021 16:05
1,2-Dichloroethane	**8.2**	J	**2.0**	**5.0**	**10**	**ug/L**	10	28-Jan-2021 16:05
cis-1,2-Dichloroethene	**12,000**		**20**	**50**	**100**	**ug/L**	100	28-Jan-2021 17:50
Methylene chloride	20	U	4.0	20	20	ug/L	10	28-Jan-2021 16:05
Trichloroethene	**13,000**		**20**	**50**	**100**	**ug/L**	100	28-Jan-2021 17:50
Vinyl chloride	**60**		**2.0**	**5.0**	**10**	**ug/L**	10	28-Jan-2021 16:05
Surr: 1,2-Dichloroethane-d4	*105*			**0**	*81-118*	*%REC*	*10*	*28-Jan-2021 16:05*
Surr: 1,2-Dichloroethane-d4	*102*			**0**	*81-118*	*%REC*	*100*	*28-Jan-2021 17:50*
Surr: 4-Bromofluorobenzene	*106*			**0**	*85-114*	*%REC*	*10*	*28-Jan-2021 16:05*
Surr: 4-Bromofluorobenzene	*105*			**0**	*85-114*	*%REC*	*100*	*28-Jan-2021 17:50*
Surr: Dibromofluoromethane	*97.3*			**0**	*80-119*	*%REC*	*10*	*28-Jan-2021 16:05*
Surr: Dibromofluoromethane	*98.8*			**0**	*80-119*	*%REC*	*100*	*28-Jan-2021 17:50*
Surr: Toluene-d8	*102*			**0**	*89-112*	*%REC*	*10*	*28-Jan-2021 16:05*
Surr: Toluene-d8	*102*			**0**	*89-112*	*%REC*	*100*	*28-Jan-2021 17:50*
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: TH
Alkalinity, Total (As CaCO3)	**886**	a	**5.00**	**5.00**	**5.00**	**mg/L**	1	27-Jan-2021 00:24
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**3.46**		**0.300**	**1.00**	**1.00**	**mg/L**	10	23-Jan-2021 01:41
Nitrogen, Nitrate (As N)	0.200	U	0.0600	0.200	0.200	mg/L	2	21-Jan-2021 20:16
Sulfate	**7,880**		**40.0**	**100**	**100**	**mg/L**	200	23-Jan-2021 01:59
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	31-Jan-2021 13:28
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	01-Feb-2021 13:41
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	28-Jan-2021 15:45

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 01-Mar-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
Sample ID: 16WW36-210120
Collection Date: 20-Jan-2021 10:33

ANALYTICAL REPORT
WorkOrder:HS21010777
Lab ID:HS21010777-07
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	**0.94**	J	**0.30**	**1.0**	**1.0**	**ug/L**	1	27-Jan-2021 21:16
1,1-Dichloroethene	**15**		**0.20**	**0.50**	**1.0**	**ug/L**	1	27-Jan-2021 21:16
1,2-Dichloroethane	**0.85**	J	**0.20**	**0.50**	**1.0**	**ug/L**	1	27-Jan-2021 21:16
cis-1,2-Dichloroethene	**980**		**5.0**	**12**	**25**	**ug/L**	25	28-Jan-2021 18:11
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	27-Jan-2021 21:16
Trichloroethene	**1,500**		**5.0**	**12**	**25**	**ug/L**	25	28-Jan-2021 18:11
Vinyl chloride	**17**		**0.20**	**0.50**	**1.0**	**ug/L**	1	27-Jan-2021 21:16
Surr: 1,2-Dichloroethane-d4	*105*			**0**	*81-118*	*%REC*	*1*	*27-Jan-2021 21:16*
Surr: 1,2-Dichloroethane-d4	*100*			**0**	*81-118*	*%REC*	*25*	*28-Jan-2021 18:11*
Surr: 4-Bromofluorobenzene	*107*			**0**	*85-114*	*%REC*	*1*	*27-Jan-2021 21:16*
Surr: 4-Bromofluorobenzene	*109*			**0**	*85-114*	*%REC*	*25*	*28-Jan-2021 18:11*
Surr: Dibromofluoromethane	*99.0*			**0**	*80-119*	*%REC*	*1*	*27-Jan-2021 21:16*
Surr: Dibromofluoromethane	*97.0*			**0**	*80-119*	*%REC*	*25*	*28-Jan-2021 18:11*
Surr: Toluene-d8	*101*			**0**	*89-112*	*%REC*	*1*	*27-Jan-2021 21:16*
Surr: Toluene-d8	*103*			**0**	*89-112*	*%REC*	*25*	*28-Jan-2021 18:11*
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: TH
Alkalinity, Total (As CaCO3)	**465**	a	**5.00**	**5.00**	**5.00**	**mg/L**	1	27-Jan-2021 00:31
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**0.503**		**0.0300**	**0.100**	**0.100**	**mg/L**	1	21-Jan-2021 20:34
Nitrogen, Nitrate (As N)	**0.0740**	J	**0.0300**	**0.100**	**0.100**	**mg/L**	1	21-Jan-2021 20:34
Sulfate	**180**		**2.00**	**5.00**	**5.00**	**mg/L**	10	23-Jan-2021 03:30
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	31-Jan-2021 13:28
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	01-Feb-2021 13:41
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	28-Jan-2021 15:45

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 01-Mar-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
Sample ID: 16WW55-210120
Collection Date: 20-Jan-2021 11:24

ANALYTICAL REPORT
WorkOrder:HS21010777
Lab ID:HS21010777-08
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	5.0	U	1.5	5.0	5.0	ug/L	5	30-Jan-2021 19:29
1,1-Dichloroethene	**7.1**		**1.0**	**2.5**	**5.0**	**ug/L**	5	30-Jan-2021 19:29
1,2-Dichloroethane	**4.0**	J	**1.0**	**2.5**	**5.0**	**ug/L**	5	30-Jan-2021 19:29
cis-1,2-Dichloroethene	**340**		**1.0**	**2.5**	**5.0**	**ug/L**	5	30-Jan-2021 19:29
Methylene chloride	10	U	2.0	10	10	ug/L	5	30-Jan-2021 19:29
Trichloroethene	**2,900**		**5.0**	**12**	**25**	**ug/L**	25	30-Jan-2021 19:50
Vinyl chloride	**26**		**1.0**	**2.5**	**5.0**	**ug/L**	5	30-Jan-2021 19:29
Surr: 1,2-Dichloroethane-d4	*96.9*			**0**	*81-118*	*%REC*	*5*	*30-Jan-2021 19:29*
Surr: 1,2-Dichloroethane-d4	*94.8*			**0**	*81-118*	*%REC*	*25*	*30-Jan-2021 19:50*
Surr: 4-Bromofluorobenzene	*106*			**0**	*85-114*	*%REC*	*5*	*30-Jan-2021 19:29*
Surr: 4-Bromofluorobenzene	*104*			**0**	*85-114*	*%REC*	*25*	*30-Jan-2021 19:50*
Surr: Dibromofluoromethane	*95.7*			**0**	*80-119*	*%REC*	*5*	*30-Jan-2021 19:29*
Surr: Dibromofluoromethane	*95.7*			**0**	*80-119*	*%REC*	*25*	*30-Jan-2021 19:50*
Surr: Toluene-d8	*97.3*			**0**	*89-112*	*%REC*	*5*	*30-Jan-2021 19:29*
Surr: Toluene-d8	*99.6*			**0**	*89-112*	*%REC*	*25*	*30-Jan-2021 19:50*
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: TH
Alkalinity, Total (As CaCO3)	**325**	a	**5.00**	**5.00**	**5.00**	**mg/L**	1	27-Jan-2021 00:37
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**6.06**		**0.0600**	**0.200**	**0.200**	**mg/L**	2	21-Jan-2021 20:52
Nitrogen, Nitrate (As N)	**0.861**		**0.0600**	**0.200**	**0.200**	**mg/L**	2	21-Jan-2021 20:52
Sulfate	**1,020**		**4.00**	**10.0**	**10.0**	**mg/L**	20	23-Jan-2021 03:48
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	31-Jan-2021 13:28
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	01-Feb-2021 13:41
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	28-Jan-2021 15:45

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 01-Mar-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
Sample ID: 16WW38-210120
Collection Date: 20-Jan-2021 12:23

ANALYTICAL REPORT
WorkOrder:HS21010777
Lab ID:HS21010777-09
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	28-Jan-2021 15:44
1,1-Dichloroethene	**12**		**0.20**	**0.50**	**1.0**	**ug/L**	1	28-Jan-2021 15:44
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	28-Jan-2021 15:44
cis-1,2-Dichloroethene	**210**		**10**	**25**	**50**	**ug/L**	50	30-Jan-2021 20:53
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	28-Jan-2021 15:44
Trichloroethene	**2,300**		**10**	**25**	**50**	**ug/L**	50	30-Jan-2021 20:53
Vinyl chloride	**94**		**0.20**	**0.50**	**1.0**	**ug/L**	1	28-Jan-2021 15:44
Surr: 1,2-Dichloroethane-d4	*101*			**0**	*81-118*	*%REC*	*1*	*28-Jan-2021 15:44*
Surr: 1,2-Dichloroethane-d4	*96.0*			**0**	*81-118*	*%REC*	*50*	*30-Jan-2021 20:53*
Surr: 4-Bromofluorobenzene	*109*			**0**	*85-114*	*%REC*	*1*	*28-Jan-2021 15:44*
Surr: 4-Bromofluorobenzene	*103*			**0**	*85-114*	*%REC*	*50*	*30-Jan-2021 20:53*
Surr: Dibromofluoromethane	*99.4*			**0**	*80-119*	*%REC*	*1*	*28-Jan-2021 15:44*
Surr: Dibromofluoromethane	*97.1*			**0**	*80-119*	*%REC*	*50*	*30-Jan-2021 20:53*
Surr: Toluene-d8	*97.9*			**0**	*89-112*	*%REC*	*1*	*28-Jan-2021 15:44*
Surr: Toluene-d8	*103*			**0**	*89-112*	*%REC*	*50*	*30-Jan-2021 20:53*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	31-Jan-2021 13:28

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 01-Mar-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
Sample ID: 16WW37-210120
Collection Date: 20-Jan-2021 13:05

ANALYTICAL REPORT
WorkOrder:HS21010777
Lab ID:HS21010777-10
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	28-Jan-2021 15:23
1,1-Dichloroethene	**0.70**	J	**0.20**	**0.50**	**1.0**	**ug/L**	1	28-Jan-2021 15:23
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	28-Jan-2021 15:23
cis-1,2-Dichloroethene	**6.5**		**0.20**	**0.50**	**1.0**	**ug/L**	1	28-Jan-2021 15:23
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	28-Jan-2021 15:23
Trichloroethene	**99**		**0.20**	**0.50**	**1.0**	**ug/L**	1	28-Jan-2021 15:23
Vinyl chloride	**3.1**		**0.20**	**0.50**	**1.0**	**ug/L**	1	28-Jan-2021 15:23
Surr: 1,2-Dichloroethane-d4	*102*			**0**	*81-118*	*%REC*	*1*	*28-Jan-2021 15:23*
Surr: 4-Bromofluorobenzene	*108*			**0**	*85-114*	*%REC*	*1*	*28-Jan-2021 15:23*
Surr: Dibromofluoromethane	*98.3*			**0**	*80-119*	*%REC*	*1*	*28-Jan-2021 15:23*
Surr: Toluene-d8	*101*			**0**	*89-112*	*%REC*	*1*	*28-Jan-2021 15:23*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	31-Jan-2021 13:28

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 01-Mar-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
WorkOrder: HS21010777

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R376750 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Groundwater	
HS21010777-05	16WW16-210120	20 Jan 2021 08:40			21 Jan 2021 19:58	2
HS21010777-06	16WW35-210120	20 Jan 2021 09:50			21 Jan 2021 20:16	2
HS21010777-07	16WW36-210120	20 Jan 2021 10:33			21 Jan 2021 20:34	1
HS21010777-08	16WW55-210120	20 Jan 2021 11:24			21 Jan 2021 20:52	2
Batch ID: R376860 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Groundwater	
HS21010777-05	16WW16-210120	20 Jan 2021 08:40			23 Jan 2021 01:23	20
HS21010777-06	16WW35-210120	20 Jan 2021 09:50			23 Jan 2021 01:59	200
HS21010777-06	16WW35-210120	20 Jan 2021 09:50			23 Jan 2021 01:41	10
HS21010777-07	16WW36-210120	20 Jan 2021 10:33			23 Jan 2021 03:30	10
HS21010777-08	16WW55-210120	20 Jan 2021 11:24			23 Jan 2021 03:48	20
Batch ID: R376964 (0)	**Test Name :** ALKALINITY BY SM2320B				**Matrix:** Groundwater	
HS21010777-05	16WW16-210120	20 Jan 2021 08:40			27 Jan 2021 00:16	1
HS21010777-06	16WW35-210120	20 Jan 2021 09:50			27 Jan 2021 00:24	1
HS21010777-07	16WW36-210120	20 Jan 2021 10:33			27 Jan 2021 00:31	1
HS21010777-08	16WW55-210120	20 Jan 2021 11:24			27 Jan 2021 00:37	1
Batch ID: R377067 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS21010777-02	16WW46-210119	19 Jan 2021 12:40			27 Jan 2021 20:34	1
HS21010777-03	16WW31-210119	19 Jan 2021 15:10			27 Jan 2021 20:55	1
HS21010777-07	16WW36-210120	20 Jan 2021 10:33			27 Jan 2021 21:16	1
Batch ID: R377067 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS21010777-01	16LHAAP-210119-TB1	19 Jan 2021 11:30			27 Jan 2021 20:13	1
Batch ID: R377092 (0)	**Test Name :** SUBCONTRACT ANALYSIS - TOC ANALYSIS				**Matrix:** Groundwater	
HS21010777-05	16WW16-210120	20 Jan 2021 08:40			28 Jan 2021 15:45	1
HS21010777-06	16WW35-210120	20 Jan 2021 09:50			28 Jan 2021 15:45	1
HS21010777-07	16WW36-210120	20 Jan 2021 10:33			28 Jan 2021 15:45	1
HS21010777-08	16WW55-210120	20 Jan 2021 11:24			28 Jan 2021 15:45	1
Batch ID: R377130 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS21010777-06	16WW35-210120	20 Jan 2021 09:50			28 Jan 2021 17:50	100
HS21010777-06	16WW35-210120	20 Jan 2021 09:50			28 Jan 2021 16:05	10
HS21010777-07	16WW36-210120	20 Jan 2021 10:33			28 Jan 2021 18:11	25
HS21010777-09	16WW38-210120	20 Jan 2021 12:23			28 Jan 2021 15:44	1
HS21010777-10	16WW37-210120	20 Jan 2021 13:05			28 Jan 2021 15:23	1

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 01-Mar-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
WorkOrder: HS21010777

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R377206 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS21010777-04	16WW32-210119	19 Jan 2021 16:15			30 Jan 2021 19:08	1
HS21010777-05	16WW16-210120	20 Jan 2021 08:40			30 Jan 2021 20:32	50
HS21010777-05	16WW16-210120	20 Jan 2021 08:40			30 Jan 2021 20:11	5
HS21010777-08	16WW55-210120	20 Jan 2021 11:24			30 Jan 2021 19:50	25
HS21010777-08	16WW55-210120	20 Jan 2021 11:24			30 Jan 2021 19:29	5
HS21010777-09	16WW38-210120	20 Jan 2021 12:23			30 Jan 2021 20:53	50
Batch ID: R377212 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** Groundwater	
HS21010777-02	16WW46-210119	19 Jan 2021 12:40			31 Jan 2021 13:28	1
HS21010777-03	16WW31-210119	19 Jan 2021 15:10			31 Jan 2021 13:28	1
HS21010777-04	16WW32-210119	19 Jan 2021 16:15			31 Jan 2021 13:28	1
HS21010777-05	16WW16-210120	20 Jan 2021 08:40			31 Jan 2021 13:28	1
HS21010777-06	16WW35-210120	20 Jan 2021 09:50			31 Jan 2021 13:28	1
HS21010777-07	16WW36-210120	20 Jan 2021 10:33			31 Jan 2021 13:28	1
HS21010777-08	16WW55-210120	20 Jan 2021 11:24			31 Jan 2021 13:28	1
HS21010777-09	16WW38-210120	20 Jan 2021 12:23			31 Jan 2021 13:28	1
HS21010777-10	16WW37-210120	20 Jan 2021 13:05			31 Jan 2021 13:28	1
Batch ID: R377259 (0)	**Test Name :** SUBCONTRACT ANALYSIS - RSK				**Matrix:** Groundwater	
HS21010777-05	16WW16-210120	20 Jan 2021 08:40			01 Feb 2021 13:41	1
HS21010777-06	16WW35-210120	20 Jan 2021 09:50			01 Feb 2021 13:41	1
HS21010777-07	16WW36-210120	20 Jan 2021 10:33			01 Feb 2021 13:41	1
HS21010777-08	16WW55-210120	20 Jan 2021 11:24			01 Feb 2021 13:41	1

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 01-Mar-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
WorkOrder: HS21010777

QC BATCH REPORT

Batch ID: R377067 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-210127** Units: **ug/L** Analysis Date: **27-Jan-2021 13:12**
Client ID: Run ID: **VOA6_377067** SeqNo: **5934190** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	1.0	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
Methylene chloride	2.0	2.0								U
Trichloroethene	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*46.48*	*1.0*	*50*	*0*	*93.0*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*51.14*	*1.0*	*50*	*0*	*102*	*85 - 114*				
Surr: Dibromofluoromethane	*47.19*	*1.0*	*50*	*0*	*94.4*	*80 - 119*				
Surr: Toluene-d8	*50.85*	*1.0*	*50*	*0*	*102*	*89 - 112*				

LCS Sample ID: **VLCSW-210127** Units: **ug/L** Analysis Date: **27-Jan-2021 12:30**
Client ID: Run ID: **VOA6_377067** SeqNo: **5934189** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	19.72	1.0	20	0	98.6	80 - 119				
1,1-Dichloroethene	17.4	1.0	20	0	87.0	71 - 131				
1,2-Dichloroethane	18.59	1.0	20	0	92.9	73 - 128				
cis-1,2-Dichloroethene	19.42	1.0	20	0	97.1	78 - 123				
Methylene chloride	19.04	2.0	20	0	95.2	74 - 124				
Trichloroethene	20.03	1.0	20	0	100	79 - 123				
Vinyl chloride	17.33	1.0	20	0	86.6	58 - 137				
Surr: 1,2-Dichloroethane-d4	*50.69*	*1.0*	*50*	*0*	*101*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*54.88*	*1.0*	*50*	*0*	*110*	*85 - 114*				
Surr: Dibromofluoromethane	*51.3*	*1.0*	*50*	*0*	*103*	*80 - 119*				
Surr: Toluene-d8	*49.19*	*1.0*	*50*	*0*	*98.4*	*89 - 112*				

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 01-Mar-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
WorkOrder: HS21010777

QC BATCH REPORT

Batch ID: R377067 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS21010868-02MS** Units: **ug/L** Analysis Date: **27-Jan-2021 17:46**
Client ID: Run ID: **VOA6_377067** SeqNo: **5934203** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	19.64	1.0	20	0	98.2	80 - 119				
1,1-Dichloroethene	17.98	1.0	20	0	89.9	71 - 131				
1,2-Dichloroethane	18.73	1.0	20	0	93.6	73 - 128				
cis-1,2-Dichloroethene	21.9	1.0	20	0	109	78 - 123				
Methylene chloride	18.24	2.0	20	0	91.2	74 - 124				
Trichloroethene	23.29	1.0	20	0	116	79 - 123				
Vinyl chloride	14.39	1.0	20	0	72.0	58 - 137				
Surr: 1,2-Dichloroethane-d4	*48.7*	*1.0*	*50*	*0*	*97.4*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*52.75*	*1.0*	*50*	*0*	*105*	*85 - 114*				
Surr: Dibromofluoromethane	*48.63*	*1.0*	*50*	*0*	*97.3*	*80 - 119*				
Surr: Toluene-d8	*50.48*	*1.0*	*50*	*0*	*101*	*89 - 112*				

MSD Sample ID: **HS21010868-02MSD** Units: **ug/L** Analysis Date: **27-Jan-2021 18:07**
Client ID: Run ID: **VOA6_377067** SeqNo: **5934204** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	19.42	1.0	20	0	97.1	80 - 119	19.64	1.14	20	
1,1-Dichloroethene	17.73	1.0	20	0	88.6	71 - 131	17.98	1.44	20	
1,2-Dichloroethane	18.39	1.0	20	0	92.0	73 - 128	18.73	1.81	20	
cis-1,2-Dichloroethene	19.2	1.0	20	0	96.0	78 - 123	21.9	13.2	20	
Methylene chloride	18.04	2.0	20	0	90.2	74 - 124	18.24	1.11	20	
Trichloroethene	20.66	1.0	20	0	103	79 - 123	23.29	12	20	
Vinyl chloride	13.37	1.0	20	0	66.8	58 - 137	14.39	7.4	20	
Surr: 1,2-Dichloroethane-d4	*48.76*	*1.0*	*50*	*0*	*97.5*	*81 - 118*	*48.7*	*0.121*	*20*	
Surr: 4-Bromofluorobenzene	*53.85*	*1.0*	*50*	*0*	*108*	*85 - 114*	*52.75*	*2.07*	*20*	
Surr: Dibromofluoromethane	*49.09*	*1.0*	*50*	*0*	*98.2*	*80 - 119*	*48.63*	*0.934*	*20*	
Surr: Toluene-d8	*50.42*	*1.0*	*50*	*0*	*101*	*89 - 112*	*50.48*	*0.106*	*20*	

The following samples were analyzed in this batch: HS21010777-01 HS21010777-02 HS21010777-03 HS21010777-07

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 01-Mar-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
WorkOrder: HS21010777

QC BATCH REPORT

Batch ID: R377130 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-210128** Units: **ug/L** Analysis Date: **28-Jan-2021 12:13**
Client ID: Run ID: **VOA6_377130** SeqNo: **5935540** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	1.0	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
Methylene chloride	2.0	2.0								U
Trichloroethene	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*48.89*	*1.0*	*50*	*0*	*97.8*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*53.02*	*1.0*	*50*	*0*	*106*	*85 - 114*				
Surr: Dibromofluoromethane	*48.22*	*1.0*	*50*	*0*	*96.4*	*80 - 119*				
Surr: Toluene-d8	*51.26*	*1.0*	*50*	*0*	*103*	*89 - 112*				

LCS Sample ID: **VLCSW-210128** Units: **ug/L** Analysis Date: **28-Jan-2021 11:31**
Client ID: Run ID: **VOA6_377130** SeqNo: **5935539** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	20.01	1.0	20	0	100	80 - 119				
1,1-Dichloroethene	20.05	1.0	20	0	100	71 - 131				
1,2-Dichloroethane	19.44	1.0	20	0	97.2	73 - 128				
cis-1,2-Dichloroethene	19.91	1.0	20	0	99.6	78 - 123				
Methylene chloride	20.65	2.0	20	0	103	74 - 124				
Trichloroethene	20.85	1.0	20	0	104	79 - 123				
Vinyl chloride	19.29	1.0	20	0	96.4	58 - 137				
Surr: 1,2-Dichloroethane-d4	*51.15*	*1.0*	*50*	*0*	*102*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*52.22*	*1.0*	*50*	*0*	*104*	*85 - 114*				
Surr: Dibromofluoromethane	*50.72*	*1.0*	*50*	*0*	*101*	*80 - 119*				
Surr: Toluene-d8	*47.38*	*1.0*	*50*	*0*	*94.8*	*89 - 112*				

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 01-Mar-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
WorkOrder: HS21010777

QC BATCH REPORT

Batch ID: R377130 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS21011031-05MS** Units: **ug/L** Analysis Date: **28-Jan-2021 16:26**
Client ID: Run ID: **VOA6_377130** SeqNo: **5935552** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	19.5	1.0	20	0	97.5	80 - 119				
1,1-Dichloroethene	18.27	1.0	20	0	91.3	71 - 131				
1,2-Dichloroethane	18.58	1.0	20	0	92.9	73 - 128				
cis-1,2-Dichloroethene	21.5	1.0	20	0	107	78 - 123				
Methylene chloride	18.25	2.0	20	0	91.3	74 - 124				
Trichloroethene	23.64	1.0	20	0	118	79 - 123				
Vinyl chloride	14.04	1.0	20	0	70.2	58 - 137				
Surr: 1,2-Dichloroethane-d4	*51.68*	*1.0*	*50*	*0*	*103*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*52.16*	*1.0*	*50*	*0*	*104*	*85 - 114*				
Surr: Dibromofluoromethane	*49.21*	*1.0*	*50*	*0*	*98.4*	*80 - 119*				
Surr: Toluene-d8	*49.93*	*1.0*	*50*	*0*	*99.9*	*89 - 112*				

MS Sample ID: **HS21010777-10MS** Units: **ug/L** Analysis Date: **28-Jan-2021 17:08**
Client ID: **16WW37-210120** Run ID: **VOA6_377130** SeqNo: **5935554** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	18.87	1.0	20	0	94.4	80 - 119				
1,1-Dichloroethene	18.67	1.0	20	0.7048	89.8	71 - 131				
1,2-Dichloroethane	18.64	1.0	20	0	93.2	73 - 128				
cis-1,2-Dichloroethene	25.4	1.0	20	6.548	94.3	78 - 123				
Methylene chloride	18.21	2.0	20	0	91.1	74 - 124				
Trichloroethene	123.5	1.0	20	99.17	122	79 - 123				O
Vinyl chloride	16.93	1.0	20	3.112	69.1	58 - 137				
Surr: 1,2-Dichloroethane-d4	*48.88*	*1.0*	*50*	*0*	*97.8*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*53.12*	*1.0*	*50*	*0*	*106*	*85 - 114*				
Surr: Dibromofluoromethane	*48.17*	*1.0*	*50*	*0*	*96.3*	*80 - 119*				
Surr: Toluene-d8	*49.51*	*1.0*	*50*	*0*	*99.0*	*89 - 112*				

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 01-Mar-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
WorkOrder: HS21010777

QC BATCH REPORT

Batch ID: R377130 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS21011031-05MSD** Units: **ug/L** Analysis Date: **28-Jan-2021 16:47**
Client ID: Run ID: **VOA6_377130** SeqNo: **5935553** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	18.78	1.0	20	0	93.9	80 - 119	19.5	3.77	20	
1,1-Dichloroethene	16.52	1.0	20	0	82.6	71 - 131	18.27	10.1	20	
1,2-Dichloroethane	17.66	1.0	20	0	88.3	73 - 128	18.58	5.07	20	
cis-1,2-Dichloroethene	18.3	1.0	20	0	91.5	78 - 123	21.5	16.1	20	
Methylene chloride	16.87	2.0	20	0	84.3	74 - 124	18.25	7.9	20	
Trichloroethene	20.02	1.0	20	0	100	79 - 123	23.64	16.6	20	
Vinyl chloride	12.76	1.0	20	0	63.8	58 - 137	14.04	9.56	20	
Surr: 1,2-Dichloroethane-d4	*50.61*	*1.0*	*50*	*0*	*101*	*81 - 118*	*51.68*	*2.08*	*20*	
Surr: 4-Bromofluorobenzene	*52.69*	*1.0*	*50*	*0*	*105*	*85 - 114*	*52.16*	*1.01*	*20*	
Surr: Dibromofluoromethane	*48.57*	*1.0*	*50*	*0*	*97.1*	*80 - 119*	*49.21*	*1.31*	*20*	
Surr: Toluene-d8	*50.16*	*1.0*	*50*	*0*	*100*	*89 - 112*	*49.93*	*0.462*	*20*	

MSD Sample ID: **HS21010777-10MSD** Units: **ug/L** Analysis Date: **28-Jan-2021 17:29**
Client ID: **16WW37-210120** Run ID: **VOA6_377130** SeqNo: **5935555** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	19.21	1.0	20	0	96.0	80 - 119	18.87	1.76	20	
1,1-Dichloroethene	17.83	1.0	20	0.7048	85.6	71 - 131	18.67	4.57	20	
1,2-Dichloroethane	18.41	1.0	20	0	92.1	73 - 128	18.64	1.22	20	
cis-1,2-Dichloroethene	25.25	1.0	20	6.548	93.5	78 - 123	25.4	0.595	20	
Methylene chloride	18.16	2.0	20	0	90.8	74 - 124	18.21	0.292	20	
Trichloroethene	120.6	1.0	20	99.17	107	79 - 123	123.5	2.39	20	O
Vinyl chloride	16.36	1.0	20	3.112	66.3	58 - 137	16.93	3.39	20	
Surr: 1,2-Dichloroethane-d4	*49.87*	*1.0*	*50*	*0*	*99.7*	*81 - 118*	*48.88*	*2.01*	*20*	
Surr: 4-Bromofluorobenzene	*52.77*	*1.0*	*50*	*0*	*106*	*85 - 114*	*53.12*	*0.662*	*20*	
Surr: Dibromofluoromethane	*48.39*	*1.0*	*50*	*0*	*96.8*	*80 - 119*	*48.17*	*0.45*	*20*	
Surr: Toluene-d8	*50.2*	*1.0*	*50*	*0*	*100*	*89 - 112*	*49.51*	*1.37*	*20*	

The following samples were analyzed in this batch: HS21010777-06 HS21010777-07 HS21010777-09 HS21010777-10

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 01-Mar-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
WorkOrder: HS21010777

QC BATCH REPORT

Batch ID: R377206 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-210130** Units: **ug/L** Analysis Date: **30-Jan-2021 13:10**
Client ID: Run ID: **VOA6_377206** SeqNo: **5937485** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	1.0	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
Methylene chloride	2.0	2.0								U
Trichloroethene	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*47.62*	*1.0*	*50*	*0*	*95.2*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.82*	*1.0*	*50*	*0*	*102*	*85 - 114*				
Surr: Dibromofluoromethane	*48.35*	*1.0*	*50*	*0*	*96.7*	*80 - 119*				
Surr: Toluene-d8	*50.28*	*1.0*	*50*	*0*	*101*	*89 - 112*				

LCS Sample ID: **VLCSW-210130** Units: **ug/L** Analysis Date: **30-Jan-2021 12:27**
Client ID: Run ID: **VOA6_377206** SeqNo: **5937484** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	20.61	1.0	20	0	103	80 - 119				
1,1-Dichloroethene	19.08	1.0	20	0	95.4	71 - 131				
1,2-Dichloroethane	19.79	1.0	20	0	99.0	73 - 128				
cis-1,2-Dichloroethene	20.45	1.0	20	0	102	78 - 123				
Methylene chloride	20.32	2.0	20	0	102	74 - 124				
Trichloroethene	21.7	1.0	20	0	109	79 - 123				
Vinyl chloride	18.55	1.0	20	0	92.8	58 - 137				
Surr: 1,2-Dichloroethane-d4	*47.14*	*1.0*	*50*	*0*	*94.3*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*51.7*	*1.0*	*50*	*0*	*103*	*85 - 114*				
Surr: Dibromofluoromethane	*48.84*	*1.0*	*50*	*0*	*97.7*	*80 - 119*				
Surr: Toluene-d8	*46.7*	*1.0*	*50*	*0*	*93.4*	*89 - 112*				

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 01-Mar-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
WorkOrder: HS21010777

QC BATCH REPORT

Batch ID: R377206 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS21010912-02MS** Units: **ug/L** Analysis Date: **30-Jan-2021 14:34**
Client ID: Run ID: **VOA6_377206** SeqNo: **5937489** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	18.1	1.0	20	0	90.5	80 - 119				
1,1-Dichloroethene	16.65	1.0	20	0	83.2	71 - 131				
1,2-Dichloroethane	17.78	1.0	20	0	88.9	73 - 128				
cis-1,2-Dichloroethene	17.83	1.0	20	0	89.2	78 - 123				
Methylene chloride	16.86	2.0	20	0	84.3	74 - 124				
Trichloroethene	19.89	1.0	20	0	99.5	79 - 123				
Vinyl chloride	12.75	1.0	20	0	63.8	58 - 137				
Surr: 1,2-Dichloroethane-d4	*45.22*	*1.0*	*50*	*0*	*90.4*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*51.38*	*1.0*	*50*	*0*	*103*	*85 - 114*				
Surr: Dibromofluoromethane	*47.54*	*1.0*	*50*	*0*	*95.1*	*80 - 119*				
Surr: Toluene-d8	*49.49*	*1.0*	*50*	*0*	*99.0*	*89 - 112*				

MSD Sample ID: **HS21010912-02MSD** Units: **ug/L** Analysis Date: **30-Jan-2021 14:55**
Client ID: Run ID: **VOA6_377206** SeqNo: **5937490** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	18.63	1.0	20	0	93.2	80 - 119	18.1	2.87	20	
1,1-Dichloroethene	16.4	1.0	20	0	82.0	71 - 131	16.65	1.54	20	
1,2-Dichloroethane	17.63	1.0	20	0	88.2	73 - 128	17.78	0.857	20	
cis-1,2-Dichloroethene	17.53	1.0	20	0	87.6	78 - 123	17.83	1.72	20	
Methylene chloride	16.81	2.0	20	0	84.1	74 - 124	16.86	0.298	20	
Trichloroethene	19.08	1.0	20	0	95.4	79 - 123	19.89	4.18	20	
Vinyl chloride	12.21	1.0	20	0	61.1	58 - 137	12.75	4.33	20	
Surr: 1,2-Dichloroethane-d4	*45.49*	*1.0*	*50*	*0*	*91.0*	*81 - 118*	*45.22*	*0.594*	*20*	
Surr: 4-Bromofluorobenzene	*51.74*	*1.0*	*50*	*0*	*103*	*85 - 114*	*51.38*	*0.693*	*20*	
Surr: Dibromofluoromethane	*47.21*	*1.0*	*50*	*0*	*94.4*	*80 - 119*	*47.54*	*0.696*	*20*	
Surr: Toluene-d8	*50.29*	*1.0*	*50*	*0*	*101*	*89 - 112*	*49.49*	*1.61*	*20*	

The following samples were analyzed in this batch: HS21010777-04 HS21010777-05 HS21010777-08 HS21010777-09

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 01-Mar-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
WorkOrder: HS21010777

QC BATCH REPORT

Batch ID: R376750 (0) **Instrument:** ICS-Integrion **Method:** ANIONS BY SW9056A

MBLK Sample ID: **MBLK-012121** Units: **mg/L** Analysis Date: **22-Jan-2021 06:14**
Client ID: Run ID: **ICS-Integrion_376750** SeqNo: **5927328** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	0.100	0.100								U
Nitrogen, Nitrate (As N)	0.100	0.100								U

LCS Sample ID: **LCS-012121** Units: **mg/L** Analysis Date: **22-Jan-2021 06:32**
Client ID: Run ID: **ICS-Integrion_376750** SeqNo: **5927329** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.703	0.100	4	0	92.6	80 - 120				
Nitrogen, Nitrate (As N)	4.118	0.100	4	0	103	80 - 120				

MS Sample ID: **HS21010780-03MS** Units: **mg/L** Analysis Date: **22-Jan-2021 00:11**
Client ID: Run ID: **ICS-Integrion_376750** SeqNo: **5927322** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	2.431	0.100	2	0.9615	73.5	80 - 120				S
Nitrogen, Nitrate (As N)	2.134	0.100	2	0.0595	104	80 - 120				

MSD Sample ID: **HS21010780-03MSD** Units: **mg/L** Analysis Date: **22-Jan-2021 00:30**
Client ID: Run ID: **ICS-Integrion_376750** SeqNo: **5927323** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	2.429	0.100	2	0.9615	73.4	80 - 120	2.431	0.107	20	S
Nitrogen, Nitrate (As N)	2.107	0.100	2	0.0595	102	80 - 120	2.134	1.29	20	

The following samples were analyzed in this batch: HS21010777-05 HS21010777-06 HS21010777-07 HS21010777-08

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 01-Mar-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
WorkOrder: HS21010777

QC BATCH REPORT

Batch ID: R376860 (0) **Instrument:** ICS-Integrion **Method:** ANIONS BY SW9056A

MBLK Sample ID: **MBLK-012221** Units: **mg/L** Analysis Date: **23-Jan-2021 05:19**
Client ID: Run ID: **ICS-Integrion_376860** SeqNo: **5929357** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	0.100	0.100								U
Sulfate	0.500	0.500								U

LCS Sample ID: **LCS-012221** Units: **mg/L** Analysis Date: **23-Jan-2021 05:37**
Client ID: Run ID: **ICS-Integrion_376860** SeqNo: **5929358** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.616	0.100	4	0	90.4	80 - 120				
Sulfate	18.69	0.500	20	0	93.4	80 - 120				

MS Sample ID: **HS21010868-04MS** Units: **mg/L** Analysis Date: **23-Jan-2021 00:47**
Client ID: Run ID: **ICS-Integrion_376860** SeqNo: **5929347** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	2.716	0.100	2	1.108	80.4	80 - 120				
Sulfate	386.9	0.500	10	376.7	102	80 - 120				EO

MSD Sample ID: **HS21010868-04MSD** Units: **mg/L** Analysis Date: **23-Jan-2021 01:05**
Client ID: Run ID: **ICS-Integrion_376860** SeqNo: **5929348** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	2.745	0.100	2	1.108	81.9	80 - 120	2.716	1.07	20	
Sulfate	388	0.500	10	376.7	112	80 - 120	386.9	0.28	20	EO

The following samples were analyzed in this batch: HS21010777-05 HS21010777-06 HS21010777-07 HS21010777-08

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 01-Mar-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
WorkOrder: HS21010777

QC BATCH REPORT

Batch ID: R376964 (0) **Instrument: ManTech01** **Method: ALKALINITY BY SM2320B**

MBLK Sample ID: **WBLKW2-210126** Units: **mg/L** Analysis Date: **26-Jan-2021 22:41**
Client ID: Run ID: **ManTech01_376964** SeqNo: **5931726** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	5.00	5.00								U

LCS Sample ID: **LCS2-210126** Units: **mg/L** Analysis Date: **26-Jan-2021 22:20**
Client ID: Run ID: **ManTech01_376964** SeqNo: **5931723** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	1015	5.00	1000	0	101	85 - 115				

LCSD Sample ID: **LCSD2-210126** Units: **mg/L** Analysis Date: **26-Jan-2021 22:51**
Client ID: Run ID: **ManTech01_376964** SeqNo: **5931727** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	1019	5.00	1000	0	102	85 - 115	1015	0.47	20	

DUP Sample ID: **HS21010960-02DUP** Units: **mg/L** Analysis Date: **26-Jan-2021 23:05**
Client ID: Run ID: **ManTech01_376964** SeqNo: **5931729** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	635.3	5.00					634.3	0.164	20	

The following samples were analyzed in this batch: HS21010777-05 HS21010777-06 HS21010777-07 HS21010777-08

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 01-Mar-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
WorkOrder: **HS21010777**

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

RIGHT SOLUTIONS | RIGHT PARTNER

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	20-030-0	26-Mar-2021
California	2919, 2020-2021	30-Apr-2021
Dept of Defense	PJLA L20-507	22-Dec-2021
Florida	E87611-30-07/01/2020	30-Jun-2021
Illinois	2000322020-4	09-May-2021
Kansas	E-10352 2020-2021	31-Jul-2021
Kentucky	123043, 2020-2021	30-Apr-2021
Louisiana	03087, 2020-2021	30-Jun-2021
North Carolina	624-2021	31-Dec-2021
North Dakota	R-193 2020-2021	30-Apr-2021
Oklahoma	2020-165	31-Aug-2021
Texas	T104704231-20-26	30-Apr-2021

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 01-Mar-21

Sample Receipt Checklist

Work Order ID: HS21010777 **Date/Time Received:** **21-Jan-2021 10:35**

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

Completed By: /S/ Pablo Marinez (eSignature) 21-Jan-2021 14:25 (Date/Time) **Reviewed by:** /S/ Corey Grandits (eSignature) 21-Jan-2021 18:38 (Date/Time)

Matrices: **WATER** Carrier name: **FedEx**

	Yes	No	
Shipping container/cooler in good condition?	☑	☐	Not Present ☐
Custody seals intact on shipping container/cooler?	☑	☐	Not Present ☐
Custody seals intact on sample bottles?	☐	☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	☐	☐	Not Present ☑
Chain of custody present?	☑	☐	2 Page(s)
Chain of custody signed when relinquished and received?	☑	☐	COC IDs:CLIENT
Samplers name present on COC?	☑	☐	
Chain of custody agrees with sample labels?	☑	☐	
Samples in proper container/bottle?	☑	☐	
Sample containers intact?	☑	☐	
Sufficient sample volume for indicated test?	☑	☐	
All samples received within holding time?	☑	☐	
Container/Temp Blank temperature in compliance?	☑	☐	

Temperature(s)/Thermometer(s):	0.3C UC/C	IR 31
Cooler(s)/Kit(s):	46657	
Date/Time sample(s) sent to storage:	1/21/21 12:35	

	Yes	No	
Water - VOA vials have zero headspace?	☑	☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	☑	☐	N/A ☐
pH adjusted?	☐	☑	N/A ☐

pH adjusted by:

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

RIGHT SOLUTIONS | RIGHT PARTNER

CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd. Suite 210 Houston, TX. 77099 (281) 530-5656 ATTN: R.J Modashia LHAAP 16-210120-ALS Page 1 of 2

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

Project No. 501032

Job: **LHAAP 16 January 2021**

Prepared By: Mike Martinez

P.O. Number

Field Sample I.D.	Time	Sample Matrix	Date / Time	MS / MSD	No. OF CONTAINERS	VOC by SW 8260B	TOC by SM5310C	MEE by RSK 175	Anions (bromide, sulfate, nitrate) by SW9056 and Alkalinity by SM2320	Bromide by SW9056	Perchlorate by SW6850	Metals (arsenic, chromium, manganese, nickel, thallium) by SW6020				Remarks (Preservatives, etc.)	Lab I.D.#
16LHAAP-210119-TB1		LQ	01-19-21	1130		2	2										
16WW46-210119		GW	01-19-21	1240		4	3					1					
16WW31-210119		GW	01-19-21	1510		4	3					1					
16WW32-210119		GW	01-19-21	1015		4	3					1					
16WW16-210120		GW	01-20-21	0840		10	3	2	3	1	(1)	1					
16WW35-210120		GW	01-20-21	0950		10	3	2	3	1		1					
16WW36-210120		GW	01-20-21	1033		10	3	2	3	1		1					
16WW55-210120		GW	01-20-21	1124		10	3	2	3	1		1					

HS21010777

Aptim Environmental & Infrastucture, Inc.
LHAAP 16 January 2021

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

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
[signature]	01-20-21	1430	[signature]	1/21/2021	10:35						

For Lab Use Only

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

Remarks:
46657. 0.30 VC. 0.31 cl-0.0

(Word) SAI-ces\Forms\Chain of Custody - BiWeekly

RIGHT SOLUTIONS | RIGHT PARTNER

CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd. Suite 210, Houston, TX. 77099 (281) 530-5656 ATTN: R.J Modashia LHAAP16-210120-ALS

Page 12 of 12

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

Project No. 501032

Job: **LHAAP 16 January 2021**

Prepared By: Mike Martinez

P.O. Number

Field Sample I.D. Time	Sample Matrix	Date /	MS / MSD	No. OF CONTAINERS	VOC by SW 8260B	TOC by SM5310C	MEE by RSK 175	Anions (bromide, sulfate, nitrate) by SW9056 and Alkalinity by SM2320	Bromide by SW9056	Perchlorate by SW6850	Metals (arsenic, chromium, manganese, nickel, thallium) by SW6020				Remarks (Preservatives, etc.)	Lab I.D.#
16WW38-210120	GW	01-20-21 / 1223		4	3					1						
16WW37-210120	GW	01-20-21 / 1305	X	12	9					3						

HS21010777

Aptim Environmental & Infrastucture, Inc.
LHAAP 16 January 2021

1480

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

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
[illegible]	01-2021	1480	J.M	1/21/2021	10:35						

For Lab Use Only

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

Remarks:

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887
46657

CUSTODY SEAL
Date: 01-20-21 Time: 1900
Name:
Company:

Seal Broken By: PM
Date: 1-21-21

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887
46657

CUSTODY SEAL
Date: 01-20-21 Time: 1900
Name:
Company:

Seal Broken By: PM
Date: 1-21-21

TRK# 9473 0838 9564
FedEx.
TRK# 0221 9473 0838 9564

RETURNS MON-SAT
PRIORITY OVERNIGHT
THU - 21 JAN AA
PRIORITY OVERNIGHT

AB SGRA 46657

77099
TX-US
IAH

RIGHT SOLUTIONS | RIGHT PARTNER

March 1, 2021

Service Request No:E2100073

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

Laboratory Results for: HS21010777

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory January 21, 2021
For your reference, these analyses have been assigned our service request number **E2100073.**

Revision I - This report was revised to correct the sample IDs and collection date/time to reflex the COC.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current TNI standards, where applicable, and except as noted in the laboratory case narrative provided. All results are intended to be considered in their entirety and ALS Environmental is not responsible for use of less than the complete final report. Results apply only to the items submitted to the laboratory, as received for analysis. In accordance with the current TNI Standard, a statement on the estimated uncertainty of measurement of any quantitative analysis will be supplied upon request.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Corey Grandits
Project Manager

ADDRESS 10450 Stancliff Rd., Suite 210, Houston, TX 77099
PHONE +1 281 530 5656 | FAX +1 281 530 5887
ALS Group USA, Corp.
dba ALS Environmental

Certificate of Analysis

ALS Environmental - Houston HRMS
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Environmental

Client:	ALS Houston	**Service Request No.:**	E2100073
Project:	HS21010777	**Date Received:**	01/21/21
Sample Matrix:	W		

CASE NARRATIVE

All analyses were performed in adherence to the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier II. When appropriate to the method, method blank results have been reported with each analytical test.

Sample Receipt

Nine samples were received for analysis at ALS Environmental in Houston on 01/21/21.

The samples were received in good condition and are consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

Data Validation Notes and Discussion

Precision and Accuracy:

EQ2100033: Laboratory Control Spike/Duplicate Laboratory Control Spike (LCS/DLCS) samples were analyzed and reported in lieu of a MS/MSD for this extraction batch. The LCS/DLCS & MS/MSD recoveries are within QC.

DoD Certification is held for the method/matrix/analytes provided in this report.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.

Use of ALS group USA Corp dba ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.

Client: ALS Environmental - US **Service Request:**E2100073
Project: HS21010777

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
E2100073-001	16WW46-210119	1/19/2021	1240
E2100073-002	16WW31-210119	1/19/2021	1510
E2100073-003	16WW32-210119	1/19/2021	1615
E2100073-004	16WW16-210120	1/20/2021	0840
E2100073-005	16WW35-210120	1/20/2021	0950
E2100073-006	16WW36-210120	1/20/2021	1033
E2100073-007	16WW55-210120	1/20/2021	1124
E2100073-008	16WW38-210120	1/20/2021	1223
E2100073-009	16WW37-210120	1/20/2021	1305

Service Request Summary

Folder #: **E2100073**
Client Name: ALS Environmental - US
Project Name: HS21010777
Project Number:

Report To: RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Houston, TX 77099-4338
USA
Phone Number: 281-530-5656
Cell Number:
Fax Number: 281-530-5887
E-mail: rj.modashia@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 01/21/21
Internal Due Date: 2/4/2021
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS21010777
EDD: No EDD Specified

11 125 mL-Glass Bottle NM AMBER Teflon Liner Unpreserved
Location: EHRMS-WIC 6D
Pressure Gas:

Lab Samp No.	Client Samp No	Matrix	Collected	HOUSTON ClO4 DOD/6850
E2100073-001	16WW46-210119	Ground Water	01/19/21 1240	**IV**
E2100073-002	16WW31-210119	Ground Water	01/19/21 1510	**IV**
E2100073-003	16WW32-210119	Ground Water	01/19/21 1615	**IV**
E2100073-004	16WW16-210120	Ground Water	01/20/21 0840	**IV**
E2100073-005	16WW35-210120	Ground Water	01/20/21 0950	**IV**
E2100073-006	16WW36-210120	Ground Water	01/20/21 1033	**IV**
E2100073-007	16WW55-210120	Ground Water	01/20/21 1124	**IV**
E2100073-008	16WW38-210120	Ground Water	01/20/21 1223	**IV**
E2100073-009	16WW37-210120	Ground Water	01/20/21 1305	**IV**

RIGHT SOLUTIONS | RIGHT PARTNER

Service Request Summary

Folder #: **E2100073**
Client Name: ALS Environmental - US
Project Name: HS21010777
Project Number:

Report To: RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Houston, TX 77099-4338
USA
Phone Number: 281-530-5656
Cell Number:
Fax Number: 281-530-5887
E-mail: rj.modashia@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 01/21/21
Internal Due Date: 2/4/2021
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS21010777
EDD: No EDD Specified

11 125 mL-Glass Bottle NM AMBER Teflon Liner Unpreserved
Location: EHRMS-WIC 6D
Pressure Gas:

Test Comments:

Group	Test/Method	Samples	Comments
Semivoa GCMS	ClO4 DOD/6850	8	II Due 2/4,IV due 2/11
Semivoa GCMS	ClO4 DOD/6850	1	MS/MSD

RIGHT SOLUTIONS | RIGHT PARTNER

Data Qualifiers

Lab Standard

+	Possible Tedlar bag artifact.
A	TIC is a suspected aldol-condensation product
B	Analyte found in the associated method blank as well as in the sample.
BC	Reported results are not blank corrected.
BH	The back section of the tube yielded higher results than the front.
BT	Results indicated possible breakthrough; back section >=10% front section.
C	Result identification confirmed.
D	Compound identified in an analysis at a secondary dilution factor
D	Spike was diluted out
DE	Reported results are corrected for desorption efficiency.
E	Estimated value. Concentration above calibration range
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
H1	Sample analysis performed past holding time. See case narrative.
H2	Initial analysis within holding time. Reanalysis for the required dilution was past holding time.
H3	Sample was received and analyzed past holding time.
H4	Sample was extracted past required extraction holding time, but analyzed within analysis holding time. See case narrative.
I	Internal standard not within the specified limits. See case narrative.
J	Estimated Value. Concentration found below MRL.
K	A deflection in the QC ion may indicate interference with the quantitation of this ion. The concentration of this analyte should be considered as an estimate.
K	Analyte was detected above the method reporting limit prior to normalization.
K	The reference ion ratio was outside acceptance criteria, which may indicate a potential bias to this result.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
L1	Laboratory control sample recovery outside the specified limits; results may be biased high.
L2	Laboratory control sample recovery outside the specified limits; results may be biased low.
L3	Laboratory control sample recovery outside the specified limits.
M	Matrix interference; results may be biased high.
M	The duplicate injection precision not met.
M1	Matrix interference due to coelution with a non-target compound; results may be biased high.
N	Presumptive evidence of a compound for TICs that have been identified based on a mass spectral library search.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.

RIGHT SOLUTIONS | RIGHT PARTNER

Data Qualifiers

Lab Standard

O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
P	Indicates chlorodiphenyl ether interference present at the retention time of the target compound.
P	Pesticide/Aroclor target analyte > 40% difference for detected concentrations between GC columns
Q	Indicates as estimated value because the P and P + 2 theoretical abundance ratio does not meet method criteria.
R	Duplicate Precision not met.
R1	Duplicate precision not within the specified limits; however, the results are below the MRL and considered estimated.
S	Surrogate recovery not within specified limits.
S	The reported value was determined by the Method of Standard Additions (MSA).
T	Analyte is a tentatively identified compound, result is estimated.
U	Compound was analyzed for, but was not detected (ND).
V1	The continuing calibration verification standard was outside (biased high) the specified limits for this compound.
V2	The continuing calibration verification standard was outside (biased low) the specified limits for this compound.
W	Result quantified, but the corresponding peak was detected outside the generated retention time window.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
X	See case narrative.
Y	Recovery outside limits
Y	The chromatogram resembles a petroleum product but does not match the calibration standard.
Z	The chromatogram does not resemble a petroleum product.
i	The MRL/MDL has been elevated due to a matrix interference.

ALS Laboratory Group

Acronyms

Cal	Calibration
Conc	CONCentration
Dioxin(s)	Polychlorinated dibenzo-p-dioxin(s)
EDL	Estimated Detection Limit
EMPC	Estimated Maximum Possible Concentration
Flags	Data qualifiers
Furan(s)	Polychlorinated dibenzofuran(s)
g	Grams
ICAL	Initial CALibration
ID	IDentifier
Ions	Masses monitored for the analyte during data acquisition
L	Liter (s)
LCS	Laboratory Control Sample
DLCS	Duplicate Laboratory Control Sample
MB	Method Blank
MCL	Method Calibration Limit
MDL	Method Detection Limit
mL	Milliliters
MS	Matrix Spiked sample
DMS	Duplicate Matrix Spiked sample
NO	Number of peaks meeting all identification criteria
PCDD(s)	Polychlorinated dibenzo-p-dioxin(s)
PCDF(s)	Polychlorinated dibenzofuran(s)
ppb	Parts per billion
ppm	Parts per million
ppq	Parts per quadrillion
ppt	Parts per trillion
QA	Quality Assurance
QC	Quality Control
Ratio	Ratio of areas from monitored ions for an analyte
% Rec.	Percent recovery
RPD	Relative Percent Difference
RRF	Relative Response Factor
RT	Retention Time
SDG	Sample Delivery Group
S/N	Signal-to-noise ratio
TEF	Toxicity Equivalence Factor
TEQ	Toxicity Equivalence Quotient

10450 Stancliff Rd, Houston, TX 77099 | 281-530-5656 | www.alsglobal.com

ALS Environmental

State Certifications, Accreditations, and Licenses

Agency	Number	Expire Date
American Association for Laboratory Accreditation	2897.01 2020	11/30/2021
Arizona Department of Health Services	AZ0793-2020	5/27/2021
Arkansas Department of Environmental Quality	20-030-0	3/26/2021
California Department of Health Services	2919-2020	4/30/2021
Department of Defense	A2LA 2897.01	11/30/2021
Florida Department of Health	E87611-2020	6/30/2021
Hawaii Department of Health	2020	4/30/2021
Illinois Environmental Protection Agency	2000322020-4	5/9/2021
Kansas Department of Health and Environment	E-10352-2020	7/31/2021
Louisiana Department of Environmental Quality	03087-2020	6/30/2021
Maine Department of Health and Human Services	2020016	6/5/2022
Maryland Department of the Environment	343-2020	6/30/2021
Michigan Depratment of Environmental Quality	9971-2020	4/30/2021
Nebraska Department of Health and Human Services	NE-OS-25-13 (2020)	4/30/2021
Nevada Department of Concervation and Natural Resources	TX026932021-1	7/31/2021
New Hampshire Environmental Laboratory Accreditation Program	209420	4/24/2021
New Jersey Department of Environmental Protection	TX008	6/30/2021
New York Department of Health	11707	3/31/2021
Oklahoma Department of Environmental Quality	2020-123	8/31/2021
Pennsylvania Department of Environmental Protection	014	6/30/2021
Tennessee Department of Environment and Concervation	04016-2020	4/30/2021
Texas Commision on Environmental Quality	T104704231-20-26	4/30/2021
United States Department of Agriculture	P330-19-00299	10/10/2022

Chain of Custody

ALS Environmental - Houston HRMS
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

RIGHT SOLUTIONS | RIGHT PARTNER

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID: 15511**

SUBCONTRACT TO:

ALS Environmental
10450 Stancliff RoadSuite 210
Houston, TX 77084 **Phone:** +1 281 530 5656

CUSTOMER INFORMATION:

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

INVOICE INFORMATION:

Company: ALS Houston
Contact: Accounts Payable
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Reference: HS21010777
TSR: Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS21010777-02**	**16WW46-210119**	**Groundwater**	**19 Jan 2021 12:40**
	Provide Level II and Level IV reports on a seperate pdf.			04 Feb 2021
2.	**HS21010777-03**	**16WW31-210119**	**Groundwater**	**19 Jan 2021 15:10**
	Provide Level II and Level IV reports on a seperate pdf.			04 Feb 2021
3.	**HS21010777-04**	**16WW32-210119**	**Groundwater**	**19 Jan 2021 16:15**
	Provide Level II and Level IV reports on a seperate pdf.			04 Feb 2021
4.	**HS21010777-05**	**16WW16-210120**	**Groundwater**	**20 Jan 2021 08:40**
	Provide Level II and Level IV reports on a seperate pdf.			04 Feb 2021
5.	**HS21010777-06**	**16WW35-210120**	**Groundwater**	**20 Jan 2021 09:50**
	Provide Level II and Level IV reports on a seperate pdf.			04 Feb 2021
6.	**HS21010777-07**	**16WW36-210120**	**Groundwater**	**20 Jan 2021 10:33**
	Provide Level II and Level IV reports on a seperate pdf.			04 Feb 2021
7.	**HS21010777-08**	**16WW55-210120**	**Groundwater**	**20 Jan 2021 11:24**
	Provide Level II and Level IV reports on a seperate pdf.			04 Feb 2021
8.	**HS21010777-09**	**16WW38-210120**	**Groundwater**	**20 Jan 2021 12:23**
	Provide Level II and Level IV reports on a seperate pdf.			04 Feb 2021
9.	**HS21010777-10**	**16WW37-210120**	**Groundwater**	**20 Jan 2021 13:05**

RIGHT SOLUTIONS | RIGHT PARTNER

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID: 15511**

LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
ANALYSIS REQUESTED			DUE DATE
Provide Level II and Level IV reports on a seperate pdf.			04 Feb 2021

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.
HS21010777-10 16WW37-210120 has extra volume for MS/MSD

QC Level: DOD IV (DoD Data Package)

Relinquished By:	J. Mauron	Date/Time:	01/21/21 13:40
Received By:		Date/Time:	1/21/21 13:40
Cooler ID(s):		Temperature(s):	

REV01
RIGHT SOLUTIONS | RIGHT PARTNER

ALS Environmental

Cooler Receipt Form

Project Chemist: CG

Client/Project: ALG-H

Thermometer ID: 1241

Date/Time Received: 11/21/21 Initials: CG

Date/Time Logged in: 11/21/21 Initials: CG

1. Method of delivery: ○ US Mail ○ Fed Ex ○ UPS ○ DHL ✓ ALG Courier ○ Client

2. Samples received in: ✓ Cooler ○ Box ○ Envelope ○ Other

3. Were custody seals on coolers? ○ Yes ✓ No

Were they intact? ○ Yes ○ No ✓ N/A

Were they signed and dated? ○ Yes ○ No ✓ N/A

If yes, how many and where?

4. Packing Material: ○ Inserts ✓ Baggies ○ Bubble Wrap ○ Gel Packs ✓ Wet Ice ○ Sleeves ○ Other

5. Foreign or Regulated Soil? ○ Yes ○ No Location of Sampling:

Cooler Tracking Number	COC ID	Date Opened	Time Opened	Opened By	Temp. °C	Temp Blank?
NA		11/21/21	1340	CG	2.9	☑
						☐
						☐
						☐

6. Were custody papers properly filled out (ink, signed, dated, etc)? ✓ Yes ○ No

7. Did all bottles arrive in good condition (not broken, no signs of leakage)? ✓ Yes ○ No

8. Were all sample labels complete (i.e., sample ID, analysis, preservation, etc)? ✓ Yes ○ No

9. Were appropriate bottles/containers and volumes received for the requested tests? ✓ Yes ○ No

10. Did sample labels and tags agree with custody documents? ✓ Yes ○ No

Notes, Discrepancies, & Resolutions:

Service request Label:

RIGHT SOLUTIONS | RIGHT PARTNER

10450 Stancliff Rd., Suite 210
Houston, TX 77099
T: +1 713 266 1599
F: +1 713 266 1599
www.alsglobal.com

SAMPLE ACCEPTANCE POLICY

This policy outlines the criteria samples must meet to be accepted by ALS Environmental – Houston HRMS.

Cooler Custody Seals (desirable, mandatory if specified in SAP):

- ✓ Intact on outside of cooler, signed and dated

Chain-of-Custody (COC) documentation (mandatory):

The following is required on each COC:

- ✓ Sample ID, the location, date and time of collection, collector's name, preservation type, sample type, and any other special remarks concerning the sampleThe COC must be completed in ink.
- ✓ Signature and date of relinquishing party.

In the absence of a COC at sample receipt, the COC will be requested from the client.

Sample Integrity (mandatory):

Samples are inspected upon arrival to ensure that sample integrity was not compromised during transfer to the laboratory.

- ✓ Sample containers must arrive in good condition (not broken or leaking).
- ✓ Samples must be labeled appropriately, including Sample IDs, and requested test using durable labels and indelible ink.
- ✓ The correct type of sample bottle must be used for the method requested.
- ✓ An appropriate sample volume, or weight, must be received.
- ✓ Sample IDs and number of containers must reconcile with the COC.
- ✓ Samples must be received within the method defined holding time.

Temperature Requirement (varies by sample matrix):

- ✓ Aqueous and Non-aqueous samples must be shipped and stored cold, at 0 to 6ºC.
- ✓ Tissue samples must be shipped and stored frozen, at -20 to -10ºC.
- ✓ Air samples are shipped and stored cold, at 0 to 6ºC
- ✓ The sample temperature must be recorded on the COC

All cooler inspections are documented on the Cooler Receipt Form (CRF). A separate CRF is completed for each service request. Any samples not meeting the above criteria are noted on the CRF and the Project Manager notified. The Project Manager must resolve any sample integrity issues with the client prior to proceeding with the analysis. Such resolutions are documented in writing and filed with the project folder. Data associated with samples received outside of this acceptance policy will be qualified on the case narrative of the final report

Preparation Information Benchsheets

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

RIGHT SOLUTIONS | RIGHT PARTNER

Preparation Information Benchsheet

Prep Run#: 373395 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
Team: Semivoa GCMS/JRODRIGUEZ **Prep Method:** Method **Prep Date/Time:** 1/27/21 10:16

#	Lab Code	Client ID	B#	Method /Test	pH	Cl	Matrix	Amt. Ext.	Sample Description
1	E2100072-001	LH18/24-SP650_012021-BIX	.01	6850/ClO4 DOD			Ground Water	10mL	
2	E2100073-001	16WW46-210119	.01	6850/ClO4 DOD			Ground Water	10mL	
3	E2100073-002	16WW31-210119	.01	6850/ClO4 DOD			Ground Water	10mL	
4	E2100073-003	16WW32-210119	.01	6850/ClO4 DOD			Ground Water	10mL	
5	E2100073-004	16WW16-210120	.01	6850/ClO4 DOD			Ground Water	10mL	
6	E2100073-005	16WW35-210120	.01	6850/ClO4 DOD			Ground Water	10mL	
7	E2100073-006	16WW36-210120	.01	6850/ClO4 DOD			Ground Water	10mL	
8	E2100073-007	16WW55-210120	.01	6850/ClO4 DOD			Ground Water	10mL	
9	E2100073-008	16WW38-210120	.01	6850/ClO4 DOD			Ground Water	10mL	
10	E2100073-009	16WW37-210120	.01	6850/ClO4 DOD			Ground Water	10mL	
11	E2100074-001	16WW25-210121	.01	6850/ClO4 DOD			Ground Water	10mL	
12	E2100074-002	16WW25-210121-FD	.01	6850/ClO4 DOD			Ground Water	10mL	
13	E2100074-003	16WW26-210121	.01	6850/ClO4 DOD			Ground Water	10mL	
14	E2100074-004	16WW29-210121	.01	6850/ClO4 DOD			Ground Water	10mL	
15	E2100074-005	16WW30-210121	.01	6850/ClO4 DOD			Ground Water	10mL	
16	E2100074-006	16WW48-210121	.01	6850/ClO4 DOD			Ground Water	10mL	
17	EQ2100033-01	MB		6850/ClO4 DOD			Liquid	10mL	
18	EQ2100033-02	LCS		6850/ClO4 DOD			Liquid	10mL	
19	EQ2100033-03	DLCS		6850/ClO4 DOD			Liquid	10mL	
20	EQ2100033-04	16WW37-210119 MS	.01	6850/ClO4 DOD			Liquid	10mL	
21	EQ2100033-05	16WW37-210119 DMS	.01	6850/ClO4 DOD			Liquid	10mL	

Spiking Solutions

Name: Perchlorate Intermediate Stock1 Inventory ID 214035 Logbook Ref: Perchlorate Expires On: 05/23/2021

EQ2100033-02	1.00µL	EQ2100033-03	1.00µL	EQ2100033-04	1.00µL	EQ2100033-05	1.00µL

Name: Perchlorate Internal Standard 1ug/mL Inventory ID 214820 Logbook Ref: Perchlorate Internal Standard Expires On: 07/03/2021

E2100072-001	100.00µL	E2100073-001	100.00µL	E2100073-002	100.00µL	E2100073-003	100.00µL	E2100073-004	100.00µL	E2100073-005	100.00µL
E2100073-006	100.00µL	E2100073-007	100.00µL	E2100073-008	100.00µL	E2100073-009	100.00µL	E2100074-001	100.00µL	E2100074-002	100.00µL
E2100074-003	100.00µL	E2100074-004	100.00µL	E2100074-005	100.00µL	E2100074-006	100.00µL	EQ2100033-01	100.00µL	EQ2100033-02	100.00µL
EQ2100033-03	100.00µL	EQ2100033-04	100.00µL	EQ2100033-05	100.00µL						

Preparation Information Benchsheet

Prep Run#: 373395
Team: Semivoa GCMS/JRODRIGUEZ

Prep WorkFlow: GenExt28Day
Prep Method: Method

Status: Prepped
Prep Date/Time: 1/27/21 10:16

Preparation Steps

Step: Preparation
Started: 1/27/21 10:16
Finished: 1/27/21 11:00
By: GRIVERA
Comments

Comments: _____

Reviewed By: GR Date: 1/27/21

Chain of Custody

Relinquished By: _____ Date: _____

Received By: _____ Date: _____

Extracts Examined
Yes No

REV01

RIGHT SOLUTIONS | RIGHT PARTNER

Analytical Results

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100073
Project:	HS21010777	**Date Collected:**	1/19/21 1240
Sample Matrix:	Ground Water	**Date Received:**	1/21/21
Sample Name:	16WW46-210119	**Units:**	µg/L
Lab Code:	E2100073-001	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	1/27/21	1/29/21 12:43	373395	711564	

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100073
Project:	HS21010777	**Date Collected:**	1/19/21 1510
Sample Matrix:	Ground Water	**Date Received:**	1/21/21
Sample Name:	16WW31-210119	**Units:**	µg/L
Lab Code:	E2100073-002	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	1/27/21	1/29/21 12:51	373395	711564	

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100073
Project:	HS21010777	**Date Collected:**	1/19/21 1615
Sample Matrix:	Ground Water	**Date Received:**	1/21/21
Sample Name:	16WW32-210119	**Units:**	µg/L
Lab Code:	E2100073-003	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	1/27/21	1/29/21 12:58	373395	711564	

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100073
Project:	HS21010777	**Date Collected:**	1/20/21 0840
Sample Matrix:	Ground Water	**Date Received:**	1/21/21
Sample Name:	16WW16-210120	**Units:**	µg/L
Lab Code:	E2100073-004	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**309**		1.00	0.500	0.250	10	1/27/21	1/29/21 13:06	373395	711564	

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100073
Project:	HS21010777	**Date Collected:**	1/20/21 0950
Sample Matrix:	Ground Water	**Date Received:**	1/21/21
Sample Name:	16WW35-210120	**Units:**	µg/L
Lab Code:	E2100073-005	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	1.00	0.500	0.250	10	1/27/21	1/29/21 13:22	373395	711564	

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100073
Project:	HS21010777	**Date Collected:**	1/20/21 1033
Sample Matrix:	Ground Water	**Date Received:**	1/21/21
Sample Name:	16WW36-210120	**Units:**	µg/L
Lab Code:	E2100073-006	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	1/27/21	1/29/21 13:30	373395	711564	

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100073
Project:	HS21010777	**Date Collected:**	1/20/21 1124
Sample Matrix:	Ground Water	**Date Received:**	1/21/21
Sample Name:	16WW55-210120	**Units:**	µg/L
Lab Code:	E2100073-007	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**259**		1.00	0.500	0.250	10	1/27/21	1/29/21 13:38	373395	711564	

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100073
Project:	HS21010777	**Date Collected:**	1/20/21 1223
Sample Matrix:	Ground Water	**Date Received:**	1/21/21
Sample Name:	16WW38-210120	**Units:**	µg/L
Lab Code:	E2100073-008	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	1/27/21	1/29/21 13:46	373395	711564	

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100073
Project:	HS21010777	**Date Collected:**	1/20/21 1305
Sample Matrix:	Ground Water	**Date Received:**	1/21/21
Sample Name:	16WW37-210120	**Units:**	µg/L
Lab Code:	E2100073-009	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.786**		0.500	0.250	0.125	5	1/27/21	1/29/21 15:21	373395	711564	

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100073
Project:	HS21010777	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	µg/L
Lab Code:	EQ2100033-01	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	1/27/21	1/29/21 11:55	373395	711564	

RIGHT SOLUTIONS | RIGHT PARTNER

Accuracy & Precision

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2100073
Project:	HS21010777	**Date Analyzed:**	1/29/21
Sample Matrix:	Ground Water		

Lab Control Sample Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method:	6850	**Units:**	µg/L
Prep Method:	Method	**Basis:**	NA
		Extraction Lot:	373395

	Lab Control Sample EQ2100033-02			Duplicate Lab Control Sample EQ2100033-03					
Analyte Name	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Perchlorate	0.106	0.100	106	0.113	0.100	113	84 - 119	6	15

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

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100073
Project:	HS21010777	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2100033-02	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.106**		0.100	0.0500	0.0250	1	1/27/21	1/29/21 12:03	373395	711564	

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100073
Project:	HS21010777	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Duplicate Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2100033-03	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.113**		0.100	0.0500	0.0250	1	1/27/21	1/29/21 12:11	373395	711564	

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2100073
Project:	HS21010777	**Date Collected:**	1/19/21
Sample Matrix:	Ground Water	**Date Received:**	1/21/21
		Date Analyzed:	1/29/21

Matrix Spike Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Sample Name:	16WW37-210120	**Units:**	µg/L
Lab Code:	E2100073-009	**Basis:**	NA

Analytical Method: 6850
Prep Method: Method

		16WW37-210119MS				16WW37-210119DMS					
		Matrix Spike				**Duplicate Matrix Spike**					
		EQ2100033-04				EQ2100033-05					
Analyte Name	**Sample Result**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Perchlorate	0.786	0.897	0.100	110	0.904	0.100	117	84 - 119	<1	15

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

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

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100073
Project:	HS21010777	**Date Collected:**	1/19/21 1305
Sample Matrix:	Ground Water	**Date Received:**	1/21/21
Sample Name:	16WW37-210120	**Units:**	µg/L
Lab Code:	EQ2100033-04	**Basis:**	NA
Run Type:	Matrix Spike		

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.897**		0.500	0.250	0.125	5	1/27/21	1/29/21 15:05	373395	711564	

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100073
Project:	HS21010777	**Date Collected:**	1/19/21 1305
Sample Matrix:	Ground Water	**Date Received:**	1/21/21
Sample Name:	16WW37-210120	**Units:**	µg/L
Lab Code:	EQ2100033-05	**Basis:**	NA
Run Type:	Duplicate Matrix Spike		

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.904**		0.500	0.250	0.125	5	1/27/21	1/29/21 15:13	373395	711564	

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

January 28, 2021

Analytical Report for Service Request No: K2100636

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

RE: ALS Houston DOD TOC

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory January 22, 2021
For your reference, these analyses have been assigned our service request number **K2100636.**

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

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

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

for Kelley Lovejoy
Project Manager

RIGHT SOLUTIONS | RIGHT PARTNER

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
Qualifiers
State Certifications, Accreditations, And Licenses
Case Narrative
Chain of Custody
General Chemistry

RIGHT SOLUTIONS | RIGHT PARTNER

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.

RIGHT SOLUTIONS | RIGHT PARTNER

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.

RIGHT SOLUTIONS | RIGHT PARTNER

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.

RIGHT SOLUTIONS | RIGHT PARTNER

Case Narrative

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

RIGHT SOLUTIONS | RIGHT PARTNER

1317 South 13th Ave, Kelso, WA 98626 | 1-360-577-7222 | www.alsglobal.com

ALS Environmental

Client: ALS Environmental - US
Project: ALS Houston DOD TOC
Sample Matrix: Ground Water

Service Request: K2100636
Date Received: 01/22/2021

CASE NARRATIVE

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

Sample Receipt:

Four ground water samples were received for analysis at ALS Environmental on 01/22/2021. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The samples were stored at minimum in accordance with the analytical method requirements.

General Chemistry:

No significant anomalies were noted with this analysis.

Approved by _____ Date 01/28/2021

RIGHT SOLUTIONS | RIGHT PARTNER

Chain of Custody

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

RIGHT SOLUTIONS | RIGHT PARTNER

K2100636

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID:** **15512**

SUBCONTRACT TO:

ALS Environmental Kelso
1317 S. 13th Avenue
Kelso, WA 98626 **Phone:** +1 360 501 3312

CUSTOMER INFORMATION:

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

INVOICE INFORMATION:

Company: ALS Houston
Contact: Accounts Payable
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Reference: HS21010777
TSR: Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS21010777-05**	**16WW16-210120**	**Groundwater**	**20 Jan 2021 08:40**
	TOC: Provide Level II & DOD Level IV/EQuIS APTIM EDD			04 Feb 2021
2.	**HS21010777-06**	**16WW35-210120**	**Groundwater**	**20 Jan 2021 09:50**
	TOC: Provide Level II & DOD Level IV/EQuIS APTIM EDD			04 Feb 2021
3.	**HS21010777-07**	**16WW36-210120**	**Groundwater**	**20 Jan 2021 10:33**
	TOC: Provide Level II & DOD Level IV/EQuIS APTIM EDD			04 Feb 2021
4.	**HS21010777-08**	**16WW55-210120**	**Groundwater**	**20 Jan 2021 11:24**
	TOC: Provide Level II & DOD Level IV/EQuIS APTIM EDD			04 Feb 2021

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

QC Level: DOD IV (DoD Data Package)

Relinquished By: _____ Date/Time: 1/21/2021 1800

Received By: K Morrow ALS Kelso Date/Time: KMC 1/22/21 1035

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

RIGHT SOLUTIONS | RIGHT PARTNER

RIGHT SOLUTIONS | RIGHT PARTNER

PM KL

Cooler Receipt and Preservation Form

Client ALS-Houston Service Request K21 001436

Received: 1/22/21 Opened: 1/22/21 By: [illegible] Unloaded: 1/22/21 By: [illegible]

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
4. Was a Temperature Blank present in cooler? NA Y N If yes, notate the temperature in the appropriate column below:
   If no, take the temperature of a representative sample bottle contained within the cooler; notate in the column "Sample Temp":
5. Were samples received within the method specified temperature ranges? NA Y N
   If no, were they received on ice and same day as collected? If not, notate the cooler # below and notify the PM. NA Y N

If applicable, tissue samples were received: *Frozen* *Partially Thawed* *Thawed*

Temp Blank	Sample Temp	IR Gun	Cooler #/COC ID / NA	Out of temp indicate with "X"	PM Notified if out of temp	Tracking Number NA	Filed
2.2		IR02	15512			9473 0839 7161	

6. Packing material: *Inserts* *Baggies* *Bubble Wrap* *Gel Packs* *Wet Ice* *Dry Ice* *Sleeves* _____
7. Were custody papers properly filled out (~~ink, signed~~, etc.)? NA Y N
8. Were samples received in good condition (unbroken) NA Y N
9. Were all sample labels complete (ie, analysis, preservation, etc.)? NA Y N
10. Did all sample labels and tags agree with custody papers? NA Y N
11. Were appropriate bottles/containers and volumes received for the tests indicated? NA Y N
12. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* NA Y N
13. Were VOA vials received without headspace? *Indicate in the table below.* NA Y N
14. Was C12/Res negative? NA Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

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

Notes, Discrepancies, Resolutions: _____

RIGHT SOLUTIONS | RIGHT PARTNER

General Chemistry

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	K2100636
Project:	ALS Houston DOD TOC	**Date Collected:**	01/20/21
Sample Matrix:	Ground Water	**Date Received:**	01/22/21
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
16WW16-210120	K2100636-001	**4.07**	0.50	0.20	0.07	1	01/26/21 18:01	
16WW35-210120	K2100636-002	**27.8**	0.50	0.20	0.07	1	01/26/21 18:01	
16WW36-210120	K2100636-003	**10.2**	0.50	0.20	0.07	1	01/26/21 18:01	
16WW55-210120	K2100636-004	**4.25**	0.50	0.20	0.07	1	01/26/21 18:01	
Method Blank	K2100636-MB	ND U	0.50	0.20	0.07	1	01/26/21 18:01	

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K2100636
Project:	ALS Houston DOD TOC	**Date Analyzed:**	01/26/21
Sample Matrix:	Ground Water	**Date Extracted:**	NA

Lab Control Sample Summary
Carbon, Total Organic

Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA
		Analysis Lot:	711233

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K2100636-LCS	23.2	25.0	93	83-117

RIGHT SOLUTIONS | RIGHT PARTNER

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

LABORATORY REPORT

February 1, 2021

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

RE: HS21010777

Dear RJ:

Enclosed are the results of the samples submitted to our laboratory on January 22, 2021. For your reference, these analyses have been assigned our service request number P2100344.

All analyses were performed according to our laboratory's NELAP and DoD-ELAP-approved quality assurance program. The test results meet requirements of the current NELAP and DoD-ELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP and DoD-ELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

ALS | Environmental

By Hayden Akers at 11:25 am, Feb 01, 2021

Hayden Akers
Project Manager

RIGHT SOLUTIONS | RIGHT PARTNER

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

Client: ALS Laboratory Group
Project: HS21010777

Service Request No: P2100344

CASE NARRATIVE

The samples were received intact under chain of custody on January 22, 2021 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

Methane, Ethene and Ethane Analysis

The samples were analyzed for methane, ethene, and ethane using a gas chromatograph equipped with a flame ionization detector (FID). A known amount of liquid was displaced by injecting 8.0 milliliters of helium creating a headspace in the sample vial. Each sample vial was agitated using a sonic disrupter for fifteen minutes and then allowed to equilibrate for at least two hours. A volume of the headspace was withdrawn using a gas-tight syringe and analyzed using a manual injection technique. The amount of dissolved gases (methane, ethene and ethane) in the original sample was calculated using Henry's Law. This method was performed with guidance from RSK 175. This method is included on the laboratory's NELAP and DoD-ELAP scope of accreditation. Any analytes flagged with an X are not included on the laboratory's NELAP or DoD-ELAP accreditation.

Manual integrations were performed on the following samples and analytes. Refer to the raw data for additional information.

Sample Identification(s)	Analyte(s)
P2100334-001	Methane
P2100334-002	Methane, Ethane
P2100334-003	Methane, Ethene
P2100334-004	Ethene, Ethane

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.

Use of ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.

RIGHT SOLUTIONS | RIGHT PARTNER

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

ALS Environmental – Simi Valley

CERTIFICATIONS, ACCREDITATIONS, AND REGISTRATIONS

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

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

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS ENVIRONMENTAL

DETAIL SUMMARY REPORT

Client: ALS Laboratory Group
Project ID: HS21010777

Service Request: P2100344

Date Received: 1/22/2021
Time Received: 09:30

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	RSK 175 - Gases
16WW16-210120	P2100344-001	Water	1/20/2021	08:40	X
16WW35-210120	P2100344-002	Water	1/20/2021	09:50	X
16WW36-210120	P2100344-003	Water	1/20/2021	10:33	X
16WW55-210120	P2100344-004	Water	1/20/2021	11:24	X

RIGHT SOLUTIONS | RIGHT PARTNER

P2100344

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID:** **15517**

SUBCONTRACT TO:

ALS Environmental
2655 Park Center Drive, Suite A
Simi Valley, CA 93065
Phone: +1 805 526 7161

CUSTOMER INFORMATION:

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

INVOICE INFORMATION:

Company: ALS Houston
Contact: Accounts Payable
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Reference: HS21010777
TSR: Sonia West

	LAB SAMPLE ID / ANALYSIS REQUESTED	CLIENT SAMPLE ID	MATRIX	COLLECT DATE / DUE DATE
1.	**HS21010777-05**	**16WW16-210120**	**Groundwater**	**20 Jan 2021 08:40**
	MEE ~~+ CO2~~ CH4 1/21. Provide DOD LV II & IV pdf separate. EDD. EQuIS 5.0 - Longhorn		Equis	04 Feb 2021
2.	**HS21010777-06**	**16WW35-210120**	**Groundwater**	**20 Jan 2021 09:50**
	MEE ~~+ CO2~~ CH4 1/21. Provide DOD LV II & IV pdf separate. EDD. EQuIS 5.0 - Longhorn		Equis	04 Feb 2021
3.	**HS21010777-07**	**16WW36-210120**	**Groundwater**	**20 Jan 2021 10:33**
	MEE ~~+ CO2~~ CH4 1/21. Provide DOD LV II & IV pdf separate. EDD. EQuIS 5.0 - Longhorn		Equis	04 Feb 2021
4.	**HS21010777-08**	**16WW55-210120**	**Groundwater**	**20 Jan 2021 11:24**
	MEE ~~+ CO2~~ CH4 1/21. Provide DOD LV II & IV pdf separate. EDD. EQuIS 5.0 - Longhorn		Equis	04 Feb 2021

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

QC Level: DOD IV (DoD Data Package)

Relinquished By: _____ Date/Time: 1/21/2021 1800

Received By: _____ Date/Time: ~~1-22-21 0930~~

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

2° not

RIGHT SOLUTIONS | RIGHT PARTNER

R2106344

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Purchase Order

PO: HS21010777

VENDOR:

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

Phone: +1 805 526 7161

CUSTOMER INFORMATION:

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

INVOICE INFORMATION:

Company: ALS Houston
Contact: Accounts Payable
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Reference: 15517
TSR: Sonia West

Item	Catalog No	Unit Price	Quantity	Ext Price
1. MEE + CO2. Provide DOD LV II & IV pdf separate. Equis EDD. EQuIS 5.0 - Longhorn	NA	$41.25	4	$165.00
			Order Total:	$165.00

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Environmental
Sample Acceptance Check Form

Client: ALS Laboratory Group Work order: P2100344
Project: HS21010777
Sample(s) received on: 1/22/21 Date opened: 1/22/21 by: ADAVID

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

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

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P2100344-001.04	40ml VOA HCL		1		A	CB 1/26/21
P2100344-001.05	40ml VOA HCL				A	
P2100344-001.06	40ml VOA HCL				A	
P2100344-002.04	40ml VOA HCL		1		A	CB 1/26/21
P2100344-002.05	40ml VOA HCL				A	
P2100344-002.06	40ml VOA HCL				A	
P2100344-003.04	40ml VOA HCL		1		A	CB 1/26/21
P2100344-003.05	40ml VOA HCL				A	
P2100344-003.06	40ml VOA HCL				A	
P2100344-004.04	40ml VOA HCL		1		A	CB 1/26/21
P2100344-004.05	40ml VOA HCL				A	
P2100344-004.06	40ml VOA HCL				A	

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

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **16WW16-210120**
Client Project ID: **HS21010777**

ALS Project ID: P2100344
ALS Sample ID: P2100344-001

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

Date Collected: 1/20/21
Date Received: 1/22/21
Date Analyzed: 1/26/21
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	**380**	1.3	1.0	0.51	
74-85-1	Ethene	**2.8**	1.0	0.55	0.24	
74-84-0	Ethane	**0.75**	0.60	0.47	0.16	

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **16WW35-210120**
Client Project ID: **HS21010777**

ALS Project ID: P2100344
ALS Sample ID: P2100344-002

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

Date Collected: 1/20/21
Date Received: 1/22/21
Date Analyzed: 1/26/21
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	**53**	1.3	1.0	0.51	
74-85-1	Ethene	**2.6**	1.0	0.55	0.24	
74-84-0	Ethane	**0.20**	0.60	0.47	0.16	**J**

U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.
J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

RIGHT SOLUTIONS | RIGHT PARTNER

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **16WW36-210120**
Client Project ID: **HS21010777**

ALS Project ID: P2100344
ALS Sample ID: P2100344-003

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

Date Collected: 1/20/21
Date Received: 1/22/21
Date Analyzed: 1/26/21
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	**240**	1.3	1.0	0.51	
74-85-1	Ethene	**0.81**	1.0	0.55	0.24	**J**
74-84-0	Ethane	0.47	0.60	0.47	0.16	**U**

U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.
J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

RIGHT SOLUTIONS | RIGHT PARTNER

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **16WW55-210120**
Client Project ID: **HS21010777**

ALS Project ID: P2100344
ALS Sample ID: P2100344-004

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

Date Collected: 1/20/21
Date Received: 1/22/21
Date Analyzed: 1/26/21
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	**63**	1.3	1.0	0.51	
74-85-1	Ethene	**0.92**	1.0	0.55	0.24	**J**
74-84-0	Ethane	**0.25**	0.60	0.47	0.16	**J**

U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.
J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

RIGHT SOLUTIONS | RIGHT PARTNER

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **Method Control Sample**
Client Project ID: **HS21010777**

ALS Project ID: P2100344
ALS Sample ID: P210126-MB

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

Date Collected: NA
Date Received: NA
Date Analyzed: 1/26/21
Volume(s) Analyzed: 0.10 ml(s)

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

The Method Control Sample is laboratory water carried through the entire analytical process.
U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

RIGHT SOLUTIONS | RIGHT PARTNER

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE / DUPLICATE LABORATORY CONTROL SAMPLE SUMMARY

Client: **ALS Laboratory Group**
Client Sample ID: **Duplicate Lab Control Sample**
Client Project ID: **HS21010777**

ALS Project ID: P2100344
ALS Sample ID: P210126-LCS
P210126-DLCS

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

Date Collected: NA
Date Received: NA
Date Analyzed: 1/26/21
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Spike Amount LCS / DLCS µg/L	Result[1] LCS µg/L	Result[1] DLCS µg/L	% Recovery LCS	% Recovery DLCS	DOD Acceptance Limits	RPD	RPD Limit	Data Qualifier
74-82-8	Methane	2.52	2.34	2.40	**93**	**95**	73-125	2	26	
74-85-1	Ethene	4.40	4.83	4.88	**110**	**111**	72-133	0.9	11	
74-84-0	Ethane	4.72	4.79	4.87	**101**	**103**	74-131	2	10	

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

RIGHT SOLUTIONS | RIGHT PARTNER

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

February 05, 2021

Susan Huang
Aptim Environmental & Infrastucture, Inc.
2500 City West Blvd., Suite 1700
Houston, TX 77042

Work Order: **HS21010868**

Laboratory Results for: **LHAAP 16 January 2021**

Dear Susan Huang,

ALS Environmental received 7 sample(s) on Jan 22, 2021 for the analysis presented in the following report.

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

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

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

Sincerely,

Generated By: JUMOKE.LAWAL
RJ Modashia
Project Manager

ALS Houston, US Date: 05-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
Work Order: HS21010868

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS21010868-01	16LHAAP-210121-TB2	Water	CG-121520 -107	21-Jan-2021 07:30	22-Jan-2021 09:35	☐
HS21010868-02	16WW25-210121	Groundwater		21-Jan-2021 08:52	22-Jan-2021 09:35	☐
HS21010868-03	16WW25-210121-FD	Groundwater		21-Jan-2021 08:52	22-Jan-2021 09:35	☐
HS21010868-04	16WW26-210121	Groundwater		21-Jan-2021 10:00	22-Jan-2021 09:35	☐
HS21010868-05	16WW29-210121	Groundwater		21-Jan-2021 11:10	22-Jan-2021 09:35	☐
HS21010868-06	16WW30-210121	Groundwater		21-Jan-2021 12:02	22-Jan-2021 09:35	☐
HS21010868-07	16WW48-210121	Groundwater		21-Jan-2021 13:03	22-Jan-2021 09:35	☐

ALS Houston, US Date: 05-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
Work Order: HS21010868

CASE NARRATIVE

Work Order Comments

- The analysis for Methane, Methene, Ethane by RSK175 was subcontracted to ALS Simi Valley, CA. Final report attached.

  The analysis for Perchlorate was subcontracted to ALS Houston High-Res Lab. Final report attached.

  The analysis for TOC was subcontracted to ALS Kelso, WA. Final report attached.

GCMS Volatiles by Method SW8260

Batch ID: R377067

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

WetChemistry by Method SM2320B

Batch ID: R376896

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

WetChemistry by Method SW9056

Batch ID: R376860

Sample ID: 16WW25-210121 (HS21010868-02)

- Sample ran at 5X due to high concentration of sulfate

Sample ID: 16WW25-210121-FD (HS21010868-03)

- Sample ran at 5X due to high concentration of sulfate

Sample ID: 16WW48-210121 (HS21010868-07)

- Sample ran at 2X due to high concentration of sulfate

Batch ID: R377623

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

Batch ID: R377636

Sample ID: HS21011137-01MSD

- MSD is for an unrelated sample (Sulfate)

ALS Houston, US Date: 05-Feb-21

Client:	Aptim Environmental & Infrastucture, Inc.	**ANALYTICAL REPORT**	
Project:	LHAAP 16 January 2021	WorkOrder:HS21010868	
Sample ID:	16LHAAP-210121-TB2	Lab ID:HS21010868-01	
Collection Date:	21-Jan-2021 07:30	Matrix:Water	

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	27-Jan-2021 15:39
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jan-2021 15:39
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jan-2021 15:39
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jan-2021 15:39
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	27-Jan-2021 15:39
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jan-2021 15:39
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jan-2021 15:39
Surr: 1,2-Dichloroethane-d4	*97.3*			**0**	*81-118*	*%REC*	*1*	*27-Jan-2021 15:39*
Surr: 4-Bromofluorobenzene	*104*			**0**	*85-114*	*%REC*	*1*	*27-Jan-2021 15:39*
Surr: Dibromofluoromethane	*96.5*			**0**	*80-119*	*%REC*	*1*	*27-Jan-2021 15:39*
Surr: Toluene-d8	*104*			**0**	*89-112*	*%REC*	*1*	*27-Jan-2021 15:39*

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

ALS Houston, US Date: 05-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
Sample ID: 16WW25-210121
Collection Date: 21-Jan-2021 08:52

ANALYTICAL REPORT
WorkOrder:HS21010868
Lab ID:HS21010868-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	27-Jan-2021 16:22
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jan-2021 16:22
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jan-2021 16:22
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jan-2021 16:22
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	27-Jan-2021 16:22
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jan-2021 16:22
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jan-2021 16:22
Surr: 1,2-Dichloroethane-d4	*97.7*			**0**	*81-118*	*%REC*	*1*	*27-Jan-2021 16:22*
Surr: 4-Bromofluorobenzene	*104*			**0**	*85-114*	*%REC*	*1*	*27-Jan-2021 16:22*
Surr: Dibromofluoromethane	*98.2*			**0**	*80-119*	*%REC*	*1*	*27-Jan-2021 16:22*
Surr: Toluene-d8	*105*			**0**	*89-112*	*%REC*	*1*	*27-Jan-2021 16:22*
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: TH
Alkalinity, Total (As CaCO3)	**28.7**	a	**5.00**	**5.00**	**5.00**	**mg/L**	1	25-Jan-2021 21:41
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**2.67**		**0.150**	**0.500**	**0.500**	**mg/L**	5	22-Jan-2021 22:04
Nitrogen, Nitrate (As N)	0.500	U	0.150	0.500	0.500	mg/L	5	22-Jan-2021 22:04
Sulfate	**2,160**		**20.0**	**50.0**	**50.0**	**mg/L**	100	05-Feb-2021 11:23
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	31-Jan-2021 13:28
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	01-Feb-2021 13:41
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	**0**		**0**	**0**	**0**	**NA**	1	29-Jan-2021 17:31

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

ALS Houston, US Date: 05-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
Sample ID: 16WW25-210121-FD
Collection Date: 21-Jan-2021 08:52

ANALYTICAL REPORT
WorkOrder:HS21010868
Lab ID:HS21010868-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	27-Jan-2021 16:43
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jan-2021 16:43
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jan-2021 16:43
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jan-2021 16:43
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	27-Jan-2021 16:43
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jan-2021 16:43
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jan-2021 16:43
Surr: 1,2-Dichloroethane-d4	*99.9*			**0**	*81-118*	*%REC*	*1*	*27-Jan-2021 16:43*
Surr: 4-Bromofluorobenzene	*110*			**0**	*85-114*	*%REC*	*1*	*27-Jan-2021 16:43*
Surr: Dibromofluoromethane	*98.3*			**0**	*80-119*	*%REC*	*1*	*27-Jan-2021 16:43*
Surr: Toluene-d8	*102*			**0**	*89-112*	*%REC*	*1*	*27-Jan-2021 16:43*
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: TH
Alkalinity, Total (As CaCO3)	**32.3**	a	**5.00**	**5.00**	**5.00**	**mg/L**	1	25-Jan-2021 21:47
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**2.67**		**0.150**	**0.500**	**0.500**	**mg/L**	5	22-Jan-2021 23:16
Nitrogen, Nitrate (As N)	0.500	U	0.150	0.500	0.500	mg/L	5	22-Jan-2021 23:16
Sulfate	**2,050**		**20.0**	**50.0**	**50.0**	**mg/L**	100	05-Feb-2021 11:40
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	31-Jan-2021 13:28
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	01-Feb-2021 13:41
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	**0**		**0**	**0**	**0**	**NA**	1	29-Jan-2021 17:31

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

ALS Houston, US Date: 05-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
Sample ID: 16WW26-210121
Collection Date: 21-Jan-2021 10:00

ANALYTICAL REPORT
WorkOrder:HS21010868
Lab ID:HS21010868-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	27-Jan-2021 17:04
1,1-Dichloroethene	**1.5**		**0.20**	**0.50**	**1.0**	**ug/L**	1	27-Jan-2021 17:04
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jan-2021 17:04
cis-1,2-Dichloroethene	**54**		**0.20**	**0.50**	**1.0**	**ug/L**	1	27-Jan-2021 17:04
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	27-Jan-2021 17:04
Trichloroethene	**1,000**		**5.0**	**12**	**25**	**ug/L**	25	27-Jan-2021 18:49
Vinyl chloride	**1.4**		**0.20**	**0.50**	**1.0**	**ug/L**	1	27-Jan-2021 17:04
Surr: 1,2-Dichloroethane-d4	*98.7*			**0**	*81-118*	*%REC*	*25*	*27-Jan-2021 18:49*
Surr: 1,2-Dichloroethane-d4	*97.9*			**0**	*81-118*	*%REC*	*1*	*27-Jan-2021 17:04*
Surr: 4-Bromofluorobenzene	*105*			**0**	*85-114*	*%REC*	*1*	*27-Jan-2021 17:04*
Surr: 4-Bromofluorobenzene	*104*			**0**	*85-114*	*%REC*	*25*	*27-Jan-2021 18:49*
Surr: Dibromofluoromethane	*97.7*			**0**	*80-119*	*%REC*	*1*	*27-Jan-2021 17:04*
Surr: Dibromofluoromethane	*97.5*			**0**	*80-119*	*%REC*	*25*	*27-Jan-2021 18:49*
Surr: Toluene-d8	*100*			**0**	*89-112*	*%REC*	*1*	*27-Jan-2021 17:04*
Surr: Toluene-d8	*101*			**0**	*89-112*	*%REC*	*25*	*27-Jan-2021 18:49*
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: TH
Alkalinity, Total (As CaCO3)	**15.0**	a	**5.00**	**5.00**	**5.00**	**mg/L**	1	25-Jan-2021 22:09
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**1.11**		**0.0300**	**0.100**	**0.100**	**mg/L**	1	22-Jan-2021 23:35
Nitrogen, Nitrate (As N)	**0.220**		**0.0300**	**0.100**	**0.100**	**mg/L**	1	22-Jan-2021 23:35
Sulfate	**354**		**4.00**	**10.0**	**10.0**	**mg/L**	20	05-Feb-2021 11:57
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	31-Jan-2021 13:28
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	01-Feb-2021 13:41
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	**0**		**0**	**0**	**0**	**NA**	1	29-Jan-2021 17:31

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

ALS Houston, US Date: 05-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
Sample ID: 16WW29-210121
Collection Date: 21-Jan-2021 11:10

ANALYTICAL REPORT
WorkOrder:HS21010868
Lab ID:HS21010868-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	27-Jan-2021 19:31
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jan-2021 19:31
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jan-2021 19:31
cis-1,2-Dichloroethene	**1.8**		**0.20**	**0.50**	**1.0**	**ug/L**	1	27-Jan-2021 19:31
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	27-Jan-2021 19:31
Trichloroethene	**0.99**	J	**0.20**	**0.50**	**1.0**	**ug/L**	1	27-Jan-2021 19:31
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jan-2021 19:31
Surr: 1,2-Dichloroethane-d4	*101*			**0**	*81-118*	*%REC*	*1*	*27-Jan-2021 19:31*
Surr: 4-Bromofluorobenzene	*106*			**0**	*85-114*	*%REC*	*1*	*27-Jan-2021 19:31*
Surr: Dibromofluoromethane	*98.8*			**0**	*80-119*	*%REC*	*1*	*27-Jan-2021 19:31*
Surr: Toluene-d8	*102*			**0**	*89-112*	*%REC*	*1*	*27-Jan-2021 19:31*
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: TH
Alkalinity, Total (As CaCO3)	**26.2**	a	**5.00**	**5.00**	**5.00**	**mg/L**	1	25-Jan-2021 22:22
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**0.886**		**0.0300**	**0.100**	**0.100**	**mg/L**	1	22-Jan-2021 23:53
Nitrogen, Nitrate (As N)	**0.273**		**0.0300**	**0.100**	**0.100**	**mg/L**	1	22-Jan-2021 23:53
Sulfate	**462**		**4.00**	**10.0**	**10.0**	**mg/L**	20	05-Feb-2021 12:49
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	31-Jan-2021 13:28
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	01-Feb-2021 13:41
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	**0**		**0**	**0**	**0**	**NA**	1	29-Jan-2021 17:31

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

ALS Houston, US Date: 05-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
Sample ID: 16WW30-210121
Collection Date: 21-Jan-2021 12:02

ANALYTICAL REPORT
WorkOrder:HS21010868
Lab ID:HS21010868-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	27-Jan-2021 19:52
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jan-2021 19:52
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jan-2021 19:52
cis-1,2-Dichloroethene	**0.77**	J	**0.20**	**0.50**	**1.0**	**ug/L**	1	27-Jan-2021 19:52
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	27-Jan-2021 19:52
Trichloroethene	**2.2**		**0.20**	**0.50**	**1.0**	**ug/L**	1	27-Jan-2021 19:52
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jan-2021 19:52
Surr: 1,2-Dichloroethane-d4	*102*			**0**	*81-118*	*%REC*	*1*	*27-Jan-2021 19:52*
Surr: 4-Bromofluorobenzene	*105*			**0**	*85-114*	*%REC*	*1*	*27-Jan-2021 19:52*
Surr: Dibromofluoromethane	*97.8*			**0**	*80-119*	*%REC*	*1*	*27-Jan-2021 19:52*
Surr: Toluene-d8	*102*			**0**	*89-112*	*%REC*	*1*	*27-Jan-2021 19:52*
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**4.18**		**0.0600**	**0.200**	**0.200**	**mg/L**	2	05-Feb-2021 14:56
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	31-Jan-2021 13:28
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	**0**		**0**	**0**	**0**	**NA**	1	29-Jan-2021 17:31

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

ALS Houston, US Date: 05-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
Sample ID: 16WW48-210121
Collection Date: 21-Jan-2021 13:03

ANALYTICAL REPORT
WorkOrder:HS21010868
Lab ID:HS21010868-07
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	10	U	3.0	10	10	ug/L	10	27-Jan-2021 17:25
1,1-Dichloroethene	**36**		**2.0**	**5.0**	**10**	**ug/L**	10	27-Jan-2021 17:25
1,2-Dichloroethane	**36**		**2.0**	**5.0**	**10**	**ug/L**	10	27-Jan-2021 17:25
cis-1,2-Dichloroethene	**15,000**		**20**	**50**	**100**	**ug/L**	100	27-Jan-2021 18:28
Methylene chloride	20	U	4.0	20	20	ug/L	10	27-Jan-2021 17:25
Trichloroethene	**13,000**		**20**	**50**	**100**	**ug/L**	100	27-Jan-2021 18:28
Vinyl chloride	**20**		**2.0**	**5.0**	**10**	**ug/L**	10	27-Jan-2021 17:25
Surr: 1,2-Dichloroethane-d4	*101*			**0**	*81-118*	*%REC*	*10*	*27-Jan-2021 17:25*
Surr: 1,2-Dichloroethane-d4	*99.4*			**0**	*81-118*	*%REC*	*100*	*27-Jan-2021 18:28*
Surr: 4-Bromofluorobenzene	*108*			**0**	*85-114*	*%REC*	*10*	*27-Jan-2021 17:25*
Surr: 4-Bromofluorobenzene	*105*			**0**	*85-114*	*%REC*	*100*	*27-Jan-2021 18:28*
Surr: Dibromofluoromethane	*98.0*			**0**	*80-119*	*%REC*	*10*	*27-Jan-2021 17:25*
Surr: Dibromofluoromethane	*98.2*			**0**	*80-119*	*%REC*	*100*	*27-Jan-2021 18:28*
Surr: Toluene-d8	*99.8*			**0**	*89-112*	*%REC*	*10*	*27-Jan-2021 17:25*
Surr: Toluene-d8	*101*			**0**	*89-112*	*%REC*	*100*	*27-Jan-2021 18:28*
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: TH
Alkalinity, Total (As CaCO3)	**358**	a	**5.00**	**5.00**	**5.00**	**mg/L**	1	25-Jan-2021 22:16
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**7.43**		**0.300**	**1.00**	**1.00**	**mg/L**	10	05-Feb-2021 12:45
Nitrogen, Nitrate (As N)	**0.408**		**0.0600**	**0.200**	**0.200**	**mg/L**	2	23-Jan-2021 00:11
Sulfate	**2,380**		**20.0**	**50.0**	**50.0**	**mg/L**	100	05-Feb-2021 13:03
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	31-Jan-2021 13:28
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	01-Feb-2021 13:41
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	**0**		**0**	**0**	**0**	**NA**	1	29-Jan-2021 17:31

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

ALS Houston, US Date: 05-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
WorkOrder: HS21010868

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R376860 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Groundwater	
HS21010868-02	16WW25-210121	21 Jan 2021 08:52			22 Jan 2021 22:04	5
HS21010868-03	16WW25-210121-FD	21 Jan 2021 08:52			22 Jan 2021 23:16	5
HS21010868-04	16WW26-210121	21 Jan 2021 10:00			22 Jan 2021 23:35	1
HS21010868-05	16WW29-210121	21 Jan 2021 11:10			22 Jan 2021 23:53	1
HS21010868-07	16WW48-210121	21 Jan 2021 13:03			23 Jan 2021 00:11	2
Batch ID: R376896 (0)	**Test Name :** ALKALINITY BY SM2320B				**Matrix:** Groundwater	
HS21010868-02	16WW25-210121	21 Jan 2021 08:52			25 Jan 2021 21:41	1
HS21010868-03	16WW25-210121-FD	21 Jan 2021 08:52			25 Jan 2021 21:47	1
HS21010868-04	16WW26-210121	21 Jan 2021 10:00			25 Jan 2021 22:09	1
HS21010868-05	16WW29-210121	21 Jan 2021 11:10			25 Jan 2021 22:22	1
HS21010868-07	16WW48-210121	21 Jan 2021 13:03			25 Jan 2021 22:16	1
Batch ID: R377067 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS21010868-02	16WW25-210121	21 Jan 2021 08:52			27 Jan 2021 16:22	1
HS21010868-03	16WW25-210121-FD	21 Jan 2021 08:52			27 Jan 2021 16:43	1
HS21010868-04	16WW26-210121	21 Jan 2021 10:00			27 Jan 2021 18:49	25
HS21010868-04	16WW26-210121	21 Jan 2021 10:00			27 Jan 2021 17:04	1
HS21010868-05	16WW29-210121	21 Jan 2021 11:10			27 Jan 2021 19:31	1
HS21010868-06	16WW30-210121	21 Jan 2021 12:02			27 Jan 2021 19:52	1
HS21010868-07	16WW48-210121	21 Jan 2021 13:03			27 Jan 2021 18:28	100
HS21010868-07	16WW48-210121	21 Jan 2021 13:03			27 Jan 2021 17:25	10
Batch ID: R377067 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS21010868-01	16LHAAP-210121-TB2	21 Jan 2021 07:30			27 Jan 2021 15:39	1
Batch ID: R377188 (0)	**Test Name :** SUBCONTRACT ANALYSIS - TOC ANALYSIS				**Matrix:** Groundwater	
HS21010868-02	16WW25-210121	21 Jan 2021 08:52			29 Jan 2021 17:31	1
HS21010868-03	16WW25-210121-FD	21 Jan 2021 08:52			29 Jan 2021 17:31	1
HS21010868-04	16WW26-210121	21 Jan 2021 10:00			29 Jan 2021 17:31	1
HS21010868-05	16WW29-210121	21 Jan 2021 11:10			29 Jan 2021 17:31	1
HS21010868-06	16WW30-210121	21 Jan 2021 12:02			29 Jan 2021 17:31	1
HS21010868-07	16WW48-210121	21 Jan 2021 13:03			29 Jan 2021 17:31	1
Batch ID: R377212 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** Groundwater	
HS21010868-02	16WW25-210121	21 Jan 2021 08:52			31 Jan 2021 13:28	1
HS21010868-03	16WW25-210121-FD	21 Jan 2021 08:52			31 Jan 2021 13:28	1
HS21010868-04	16WW26-210121	21 Jan 2021 10:00			31 Jan 2021 13:28	1
HS21010868-05	16WW29-210121	21 Jan 2021 11:10			31 Jan 2021 13:28	1
HS21010868-06	16WW30-210121	21 Jan 2021 12:02			31 Jan 2021 13:28	1
HS21010868-07	16WW48-210121	21 Jan 2021 13:03			31 Jan 2021 13:28	1

ALS Houston, US Date: 05-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
WorkOrder: HS21010868

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R377259 (0)	**Test Name :** SUBCONTRACT ANALYSIS - RSK				**Matrix:** Groundwater	
HS21010868-02	16WW25-210121	21 Jan 2021 08:52			01 Feb 2021 13:41	1
HS21010868-03	16WW25-210121-FD	21 Jan 2021 08:52			01 Feb 2021 13:41	1
HS21010868-04	16WW26-210121	21 Jan 2021 10:00			01 Feb 2021 13:41	1
HS21010868-05	16WW29-210121	21 Jan 2021 11:10			01 Feb 2021 13:41	1
HS21010868-07	16WW48-210121	21 Jan 2021 13:03			01 Feb 2021 13:41	1
Batch ID: R377623 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Groundwater	
HS21010868-02	16WW25-210121	21 Jan 2021 08:52			05 Feb 2021 11:23	100
HS21010868-03	16WW25-210121-FD	21 Jan 2021 08:52			05 Feb 2021 11:40	100
HS21010868-04	16WW26-210121	21 Jan 2021 10:00			05 Feb 2021 11:57	20
HS21010868-05	16WW29-210121	21 Jan 2021 11:10			05 Feb 2021 12:49	20
Batch ID: R377636 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Groundwater	
HS21010868-06	16WW30-210121	21 Jan 2021 12:02			05 Feb 2021 14:56	2
HS21010868-07	16WW48-210121	21 Jan 2021 13:03			05 Feb 2021 13:03	100
HS21010868-07	16WW48-210121	21 Jan 2021 13:03			05 Feb 2021 12:45	10

ALS Houston, US Date: 05-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
WorkOrder: HS21010868

QC BATCH REPORT

Batch ID: R377067 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-210127** Units: **ug/L** Analysis Date: **27-Jan-2021 13:12**
Client ID: Run ID: **VOA6_377067** SeqNo: **5934190** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	1.0	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
Methylene chloride	2.0	2.0								U
Trichloroethene	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*46.48*	*1.0*	*50*	*0*	*93.0*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*51.14*	*1.0*	*50*	*0*	*102*	*85 - 114*				
Surr: Dibromofluoromethane	*47.19*	*1.0*	*50*	*0*	*94.4*	*80 - 119*				
Surr: Toluene-d8	*50.85*	*1.0*	*50*	*0*	*102*	*89 - 112*				

LCS Sample ID: **VLCSW-210127** Units: **ug/L** Analysis Date: **27-Jan-2021 12:30**
Client ID: Run ID: **VOA6_377067** SeqNo: **5934189** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	19.72	1.0	20	0	98.6	80 - 119				
1,1-Dichloroethene	17.4	1.0	20	0	87.0	71 - 131				
1,2-Dichloroethane	18.59	1.0	20	0	92.9	73 - 128				
cis-1,2-Dichloroethene	19.42	1.0	20	0	97.1	78 - 123				
Methylene chloride	19.04	2.0	20	0	95.2	74 - 124				
Trichloroethene	20.03	1.0	20	0	100	79 - 123				
Vinyl chloride	17.33	1.0	20	0	86.6	58 - 137				
Surr: 1,2-Dichloroethane-d4	*50.69*	*1.0*	*50*	*0*	*101*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*54.88*	*1.0*	*50*	*0*	*110*	*85 - 114*				
Surr: Dibromofluoromethane	*51.3*	*1.0*	*50*	*0*	*103*	*80 - 119*				
Surr: Toluene-d8	*49.19*	*1.0*	*50*	*0*	*98.4*	*89 - 112*				

ALS Houston, US Date: 05-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
WorkOrder: HS21010868

QC BATCH REPORT

Batch ID: R377067 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS21010868-02MS** Units: **ug/L** Analysis Date: **27-Jan-2021 17:46**
Client ID: **16WW25-210121** Run ID: **VOA6_377067** SeqNo: **5934203** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	19.64	1.0	20	0	98.2	80 - 119				
1,1-Dichloroethene	17.98	1.0	20	0	89.9	71 - 131				
1,2-Dichloroethane	18.73	1.0	20	0	93.6	73 - 128				
cis-1,2-Dichloroethene	21.9	1.0	20	0	109	78 - 123				
Methylene chloride	18.24	2.0	20	0	91.2	74 - 124				
Trichloroethene	23.29	1.0	20	0	116	79 - 123				
Vinyl chloride	14.39	1.0	20	0	72.0	58 - 137				
Surr: 1,2-Dichloroethane-d4	*48.7*	*1.0*	*50*	*0*	*97.4*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*52.75*	*1.0*	*50*	*0*	*105*	*85 - 114*				
Surr: Dibromofluoromethane	*48.63*	*1.0*	*50*	*0*	*97.3*	*80 - 119*				
Surr: Toluene-d8	*50.48*	*1.0*	*50*	*0*	*101*	*89 - 112*				

MSD Sample ID: **HS21010868-02MSD** Units: **ug/L** Analysis Date: **27-Jan-2021 18:07**
Client ID: **16WW25-210121** Run ID: **VOA6_377067** SeqNo: **5934204** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	19.42	1.0	20	0	97.1	80 - 119	19.64	1.14	20	
1,1-Dichloroethene	17.73	1.0	20	0	88.6	71 - 131	17.98	1.44	20	
1,2-Dichloroethane	18.39	1.0	20	0	92.0	73 - 128	18.73	1.81	20	
cis-1,2-Dichloroethene	19.2	1.0	20	0	96.0	78 - 123	21.9	13.2	20	
Methylene chloride	18.04	2.0	20	0	90.2	74 - 124	18.24	1.11	20	
Trichloroethene	20.66	1.0	20	0	103	79 - 123	23.29	12	20	
Vinyl chloride	13.37	1.0	20	0	66.8	58 - 137	14.39	7.4	20	
Surr: 1,2-Dichloroethane-d4	*48.76*	*1.0*	*50*	*0*	*97.5*	*81 - 118*	*48.7*	*0.121*	*20*	
Surr: 4-Bromofluorobenzene	*53.85*	*1.0*	*50*	*0*	*108*	*85 - 114*	*52.75*	*2.07*	*20*	
Surr: Dibromofluoromethane	*49.09*	*1.0*	*50*	*0*	*98.2*	*80 - 119*	*48.63*	*0.934*	*20*	
Surr: Toluene-d8	*50.42*	*1.0*	*50*	*0*	*101*	*89 - 112*	*50.48*	*0.106*	*20*	

The following samples were analyzed in this batch: HS21010868-01 HS21010868-02 HS21010868-03 HS21010868-04 HS21010868-05 HS21010868-06 HS21010868-07

ALS Houston, US Date: 05-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
WorkOrder: HS21010868

QC BATCH REPORT

Batch ID: R376860 (0) **Instrument:** ICS-Integrion **Method:** ANIONS BY SW9056A

MBLK Sample ID: **MBLK-012221** Units: **mg/L** Analysis Date: **23-Jan-2021 05:19**
Client ID: Run ID: **ICS-Integrion_376860** SeqNo: **5929357** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	0.100	0.100								U
Nitrogen, Nitrate (As N)	0.100	0.100								U

LCS Sample ID: **LCS-012221** Units: **mg/L** Analysis Date: **23-Jan-2021 05:37**
Client ID: Run ID: **ICS-Integrion_376860** SeqNo: **5929358** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.616	0.100	4	0	90.4	80 - 120				
Nitrogen, Nitrate (As N)	3.783	0.100	4	0	94.6	80 - 120				

MS Sample ID: **HS21010868-04MS** Units: **mg/L** Analysis Date: **23-Jan-2021 00:47**
Client ID: **16WW26-210121** Run ID: **ICS-Integrion_376860** SeqNo: **5929347** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	2.716	0.100	2	1.108	80.4	80 - 120				
Nitrogen, Nitrate (As N)	2.186	0.100	2	0.2198	98.3	80 - 120				

MSD Sample ID: **HS21010868-04MSD** Units: **mg/L** Analysis Date: **23-Jan-2021 01:05**
Client ID: **16WW26-210121** Run ID: **ICS-Integrion_376860** SeqNo: **5929348** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	2.745	0.100	2	1.108	81.9	80 - 120	2.716	1.07	20	
Nitrogen, Nitrate (As N)	2.21	0.100	2	0.2198	99.5	80 - 120	2.186	1.09	20	

The following samples were analyzed in this batch: HS21010868-02 HS21010868-03 HS21010868-04 HS21010868-05 HS21010868-07

ALS Houston, US Date: 05-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
WorkOrder: HS21010868

QC BATCH REPORT

Batch ID: R376896 (0) **Instrument: ManTech01** **Method: ALKALINITY BY SM2320B**

MBLK Sample ID: **WBLKW2-210125** Units: **mg/L** Analysis Date: **25-Jan-2021 19:27**
Client ID: Run ID: **ManTech01_376896** SeqNo: **5930201** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	5.00	5.00								U

LCS Sample ID: **WLCS2-210125** Units: **mg/L** Analysis Date: **25-Jan-2021 18:56**
Client ID: Run ID: **ManTech01_376896** SeqNo: **5930197** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	1018	5.00	1000	0	102	85 - 115				

LCSD Sample ID: **WLCSD2-210125** Units: **mg/L** Analysis Date: **25-Jan-2021 19:06**
Client ID: Run ID: **ManTech01_376896** SeqNo: **5930198** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	1026	5.00	1000	0	103	85 - 115	1018	0.756	20	

DUP Sample ID: **HS21010742-11DUP** Units: **mg/L** Analysis Date: **25-Jan-2021 19:42**
Client ID: Run ID: **ManTech01_376896** SeqNo: **5930203** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	100.7	5.00					99.04	1.69	20	

The following samples were analyzed in this batch: HS21010868-02 HS21010868-03 HS21010868-04 HS21010868-05 HS21010868-07

ALS Houston, US Date: 05-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
WorkOrder: HS21010868

QC BATCH REPORT

Batch ID: R377623 (0) **Instrument:** ICS2100 **Method:** ANIONS BY SW9056A

MBLK Sample ID: **MBLK-** Units: **mg/L** Analysis Date: **05-Feb-2021 10:32**
Client ID: Run ID: **ICS2100_377623** SeqNo: **5946290** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	0.500	0.500								U

LCS Sample ID: **LCS-** Units: **mg/L** Analysis Date: **05-Feb-2021 10:49**
Client ID: Run ID: **ICS2100_377623** SeqNo: **5946291** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	20.09	0.500	20	0	100	80 - 120				

MS Sample ID: **HS21010868-04MS** Units: **mg/L** Analysis Date: **05-Feb-2021 12:14**
Client ID: **16WW26-210121** Run ID: **ICS2100_377623** SeqNo: **5946295** PrepDate: DF: **20**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	557.7	10.0	200	354	102	80 - 120				

MSD Sample ID: **HS21010868-04MSD** Units: **mg/L** Analysis Date: **05-Feb-2021 13:07**
Client ID: **16WW26-210121** Run ID: **ICS2100_377623** SeqNo: **5946298** PrepDate: DF: **20**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	557.7	10.0	200	354	102	80 - 120	557.7	0.0043	20	

The following samples were analyzed in this batch: HS21010868-02 HS21010868-03 HS21010868-04 HS21010868-05

ALS Houston, US Date: 05-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
WorkOrder: HS21010868

QC BATCH REPORT

Batch ID: R377636 (0) **Instrument:** ICS-Integrion **Method:** ANIONS BY SW9056A

MBLK Sample ID: **MBLK-** Units: **mg/L** Analysis Date: **05-Feb-2021 10:20**
Client ID: Run ID: **ICS-Integrion_377636** SeqNo: **5946543** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	0.100	0.100								U
Sulfate	0.500	0.500								U

LCS Sample ID: **LCS-** Units: **mg/L** Analysis Date: **05-Feb-2021 10:38**
Client ID: Run ID: **ICS-Integrion_377636** SeqNo: **5946544** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.689	0.100	4	0	92.2	80 - 120				
Sulfate	19.09	0.500	20	0	95.5	80 - 120				

MS Sample ID: **HS21011137-01MS** Units: **mg/L** Analysis Date: **05-Feb-2021 11:33**
Client ID: Run ID: **ICS-Integrion_377636** SeqNo: **5946546** PrepDate: DF: **100**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	170.1	10.0	200	6.5	81.8	80 - 120				
Sulfate	8278	50.0	1000	7312	96.6	80 - 120				O

MSD Sample ID: **HS21011137-01MSD** Units: **mg/L** Analysis Date: **05-Feb-2021 11:51**
Client ID: Run ID: **ICS-Integrion_377636** SeqNo: **5946547** PrepDate: DF: **100**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	169.1	10.0	200	6.5	81.3	80 - 120	170.1	0.625	20	
Sulfate	8049	50.0	1000	7312	73.7	80 - 120	8278	2.81	20	SO

The following samples were analyzed in this batch: HS21010868-06 HS21010868-07

ALS Houston, US Date: 05-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
WorkOrder: **HS21010868**

QUALIFIERS, ACRONYMS, UNITS

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

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

ALS Houston, US Date: 05-Feb-21

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	20-030-0	26-Mar-2021
California	2919, 2020-2021	30-Apr-2021
Dept of Defense	PJLA L20-507	22-Dec-2021
Florida	E87611-30-07/01/2020	30-Jun-2021
Illinois	2000322020-4	09-May-2021
Kansas	E-10352 2020-2021	31-Jul-2021
Kentucky	123043, 2020-2021	30-Apr-2021
Louisiana	03087, 2020-2021	30-Jun-2021
North Carolina	624-2021	31-Dec-2021
North Dakota	R-193 2020-2021	30-Apr-2021
Oklahoma	2020-165	31-Aug-2021
Texas	T104704231-20-26	30-Apr-2021

ALS Houston, US Date: 05-Feb-21

Sample Receipt Checklist

Work Order ID: HS21010868 **Date/Time Received:** **22-Jan-2021 09:35**

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

Completed By: /S/ Paresh M. Giga (eSignature) 22-Jan-2021 14:28 (Date/Time) **Reviewed by:** /S/ Corey Grandits (eSignature) 22-Jan-2021 16:12 (Date/Time)

Matrices: **GW/Water** Carrier name: **FedEx**

	Yes	No	Not Present
Shipping container/cooler in good condition?	☑	☐	☐
Custody seals intact on shipping container/cooler?	☑	☐	☐
Custody seals intact on sample bottles?	☐	☐	☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	☐	☐	☑
Chain of custody present?	☑	☐	1 Page(s)
Chain of custody signed when relinquished and received?	☑	☐	COC IDs:None
Samplers name present on COC?	☑	☐	
Chain of custody agrees with sample labels?	☑	☐	
Samples in proper container/bottle?	☑	☐	
Sample containers intact?	☑	☐	
Sufficient sample volume for indicated test?	☑	☐	
All samples received within holding time?	☑	☐	
Container/Temp Blank temperature in compliance?	☑	☐	

Temperature(s)/Thermometer(s):	0.9C U/c	IR31
Cooler(s)/Kit(s):	3863	
Date/Time sample(s) sent to storage:	1/22/2021 14:45	

	Yes	No	
Water - VOA vials have zero headspace?	☑	☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	☑	☐	N/A ☐
pH adjusted?	☐	☑	N/A ☐

pH adjusted by:

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd. Suite 210 Houston, TX. 77099 (281) 530-5656 ATTN: R.J Modashia LHAAP 16-210121-ALS Page 1 of 1

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

Project No. 501032

Job: **LHAAP 16 January 2021**

Prepared By: Mike Martinez

P.O. Number

Field Sample I.D. Time	Sample Matrix	Date /	MS / MSD	No. OF CONTAINERS	VOC by SW 8260B	TOC by SM5310C	MEE by RSK 175	Anions (bromide, sulfate, nitrate) by SW9056 and Alkalinity by SM2320	Bromide by SW9056	Perchlorate by SW6850	Metals (arsenic, chromium, manganese, nickel, thallium) by SW6020				Remarks (Preservatives, etc.)	Lab I.D.#
16 LHAAP-210121-TB2	LG	01-21-21 / 0730		2	2											
16 WW25-210121	GW	01-21-21 / 0852		10	3	2	3	1		1						
16 WW25-210121-FD	GW	01-21-21 / 0852		10	3	2	3	1		1						
16 WW26-210121	GW	01-21-21 / 1000		10	3	2	3	1		1						
16 WW29-210121	GW	01-21-21 / 1110		10	3	2	3	1		1						
16 WW30-210121	GW	01-21-21 / 1202		7	3	2			1	1						
16 WW48-210121	GW	01-21-21 / 1363		10	3	2	3	1		1						

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

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
[signature]	01-21-21	1405									

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition
J. Anderson	1/22/21	09.35							

Remarks: Cooler 3863 1231
Temp 0.9°C CFO

HS21010868

Aptim Environmental & Infrastucture, Inc.
Longhorn Army Ammunition Plant 16

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

01086046

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

CUSTODY SEAL
Date: 01-21-21 Time: 1419
Name: [illegible]
Company: [illegible]
Seal Broken By:
Date:

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

CUSTODY SEAL
Date: 01-21-21 Time: 1419
Name: [illegible]
Company: [illegible]
Seal Broken By:
Date:

FedEx 0221 4380 9534 1014

RETURNS MON - SAT
22 JAN AA
PRIORITY OVERNIGHT

AB SGRA

77099
TX-US
IAH

TRK# 779552 2130/2071 GGGA 560G1/1136/05A2

January 31, 2021

Service Request No:E2100074

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

Laboratory Results for: HS21010868

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory January 22, 2021
For your reference, these analyses have been assigned our service request number **E2100074.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current TNI standards, where applicable, and except as noted in the laboratory case narrative provided. All results are intended to be considered in their entirety and ALS Environmental is not responsible for use of less than the complete final report. Results apply only to the items submitted to the laboratory, as received for analysis. In accordance with the current TNI Standard, a statement on the estimated uncertainty of measurement of any quantitative analysis will be supplied upon request.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Corey Grandits
Project Manager

ADDRESS 10450 Stancliff Rd., Suite 210, Houston, TX 77099
PHONE +1 281 530 5656 | FAX +1 281 530 5887
ALS Group USA, Corp.
dba ALS Environmental

Certificate of Analysis

ALS Environmental - Houston HRMS
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

ALS Environmental

Client:	ALS Houston	**Service Request No.:**	E2100074
Project:	HS21010868	**Date Received:**	01/22/21
Sample Matrix:	W		

CASE NARRATIVE

All analyses were performed in adherence to the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier II. When appropriate to the method, method blank results have been reported with each analytical test.

Sample Receipt

Six samples were received for analysis at ALS Environmental in Houston on 01/22/21.

The samples were received in good condition and are consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

Data Validation Notes and Discussion

Precision and Accuracy:

EQ2100033: Laboratory Control Spike/Duplicate Laboratory Control Spike (LCS/DLCS) samples were analyzed and reported in lieu of a MS/MSD for this extraction batch. The LCS/DLCS & MS/MSD (unrelated sample) recoveries are within QC.

DoD Certification is held for the method/matrix/analytes provided in this report.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.

Use of ALS group USA Corp dba ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.

Client: ALS Environmental - US **Service Request:**E2100074
Project: HS21010868

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
E2100074-001	16WW25-210121	1/21/2021	0852
E2100074-002	16WW25-210121-FD	1/21/2021	0852
E2100074-003	16WW26-210121	1/21/2021	1000
E2100074-004	16WW29-210121	1/21/2021	1110
E2100074-005	16WW30-210121	1/21/2021	1202
E2100074-006	16WW48-210121	1/21/2021	1303

Service Request Summary

Folder #: **E2100074**
Client Name: ALS Environmental - US
Project Name: HS21010868
Project Number:

Report To: RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Houston, TX 77099-4338
USA
Phone Number: 281-530-5656
Cell Number:
Fax Number: 281-530-5887
E-mail: rj.modashia@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 01/22/21
Internal Due Date: 2/5/2021
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS21010868
EDD: No EDD Specified

6 125 mL-Glass Bottle NM AMBER Teflon Liner Unpreserved
Location: EHRMS-WIC 4B
Pressure Gas:

Lab Samp No.	Client Samp No	Matrix	Collected	HOUSTON ClO4 DOD/6850
E2100074-001	16WW25-210121	Ground Water	01/21/21 0852	**IV**
E2100074-002	16WW25-210121-FD	Ground Water	01/21/21 0852	**IV**
E2100074-003	16WW26-210121	Ground Water	01/21/21 1000	**IV**
E2100074-004	16WW29-210121	Ground Water	01/21/21 1110	**IV**
E2100074-005	16WW30-210121	Ground Water	01/21/21 1202	**IV**
E2100074-006	16WW48-210121	Ground Water	01/21/21 1303	**IV**

Service Request Summary

Folder #:	**E2100074**
Client Name:	ALS Environmental - US
Project Name:	HS21010868
Project Number:	
Report To:	RJ Modashia ALS Laboratory Group 10450 Stancliff Road Houston, TX 77099-4338 USA
Phone Number:	281-530-5656
Cell Number:	
Fax Number:	281-530-5887
E-mail:	rj.modashia@alsglobal.com

Project Chemist:	Corey Grandits
Originating Lab:	HOUSTON
Logged By:	CGRANDITS
Date Received:	01/22/21
Internal Due Date:	2/5/2021
QAP:	LAB QAP
Qualifier Set:	Lab Standard
Formset:	Lab Standard
Merged?:	Y
Report to MDL?:	Y
P.O. Number:	HS21010868
EDD:	No EDD Specified

6 125 mL-Glass Bottle NM AMBER Teflon Liner Unpreserved

Location: EHRMS-WIC 4B

Pressure Gas:

Test Comments:

Group	Test/Method	Samples	Comments
Semivoa GCMS	ClO4 DOD/6850	6	II Due 2/5,IV due 2/12

Data Qualifiers

Lab Standard

+	Possible Tedlar bag artifact.
A	TIC is a suspected aldol-condensation product
B	Analyte found in the associated method blank as well as in the sample.
BC	Reported results are not blank corrected.
BH	The back section of the tube yielded higher results than the front.
BT	Results indicated possible breakthrough; back section >=10% front section.
C	Result identification confirmed.
D	Compound identified in an analysis at a secondary dilution factor
D	Spike was diluted out
DE	Reported results are corrected for desorption efficiency.
E	Estimated value. Concentration above calibration range
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
H1	Sample analysis performed past holding time. See case narrative.
H2	Initial analysis within holding time. Reanalysis for the required dilution was past holding time.
H3	Sample was received and analyzed past holding time.
H4	Sample was extracted past required extraction holding time, but analyzed within analysis holding time. See case narrative.
I	Internal standard not within the specified limits. See case narrative.
J	Estimated Value. Concentration found below MRL.
K	A deflection in the QC ion may indicate interference with the quantitation of this ion. The concentration of this analyte should be considered as an estimate.
K	Analyte was detected above the method reporting limit prior to normalization.
K	The reference ion ratio was outside acceptance criteria, which may indicate a potential bias to this result.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
L1	Laboratory control sample recovery outside the specified limits; results may be biased high.
L2	Laboratory control sample recovery outside the specified limits; results may be biased low.
L3	Laboratory control sample recovery outside the specified limits.
M	Matrix interference; results may be biased high.
M	The duplicate injection precision not met.
M1	Matrix interference due to coelution with a non-target compound; results may be biased high.
N	Presumptive evidence of a compound for TICs that have been identified based on a mass spectral library search.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.

Data Qualifiers

Lab Standard

O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
P	Indicates chlorodiphenyl ether interference present at the retention time of the target compound.
P	Pesticide/Aroclor target analyte > 40% difference for detected concentrations between GC columns
Q	Indicates as estimated value because the P and P + 2 theoretical abundance ratio does not meet method criteria.
R	Duplicate Precision not met.
R1	Duplicate precision not within the specified limits; however, the results are below the MRL and considered estimated.
S	Surrogate recovery not within specified limits.
S	The reported value was determined by the Method of Standard Additions (MSA).
T	Analyte is a tentatively identified compound, result is estimated.
U	Compound was analyzed for, but was not detected (ND).
V1	The continuing calibration verification standard was outside (biased high) the specified limits for this compound.
V2	The continuing calibration verification standard was outside (biased low) the specified limits for this compound.
W	Result quantified, but the corresponding peak was detected outside the generated retention time window.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
X	See case narrative.
Y	Recovery outside limits
Y	The chromatogram resembles a petroleum product but does not match the calibration standard.
Z	The chromatogram does not resemble a petroleum product.
i	The MRL/MDL has been elevated due to a matrix interference.

ALS Laboratory Group

Acronyms

Cal	Calibration
Conc	CONCentration
Dioxin(s)	Polychlorinated dibenzo-p-dioxin(s)
EDL	Estimated Detection Limit
EMPC	Estimated Maximum Possible Concentration
Flags	Data qualifiers
Furan(s)	Polychlorinated dibenzofuran(s)
g	Grams
ICAL	Initial CALibration
ID	IDentifier
Ions	Masses monitored for the analyte during data acquisition
L	Liter (s)
LCS	Laboratory Control Sample
DLCS	Duplicate Laboratory Control Sample
MB	Method Blank
MCL	Method Calibration Limit
MDL	Method Detection Limit
mL	Milliliters
MS	Matrix Spiked sample
DMS	Duplicate Matrix Spiked sample
NO	Number of peaks meeting all identification criteria
PCDD(s)	Polychlorinated dibenzo-p-dioxin(s)
PCDF(s)	Polychlorinated dibenzofuran(s)
ppb	Parts per billion
ppm	Parts per million
ppq	Parts per quadrillion
ppt	Parts per trillion
QA	Quality Assurance
QC	Quality Control
Ratio	Ratio of areas from monitored ions for an analyte
% Rec.	Percent recovery
RPD	Relative Percent Difference
RRF	Relative Response Factor
RT	Retention Time
SDG	Sample Delivery Group
S/N	Signal-to-noise ratio
TEF	Toxicity Equivalence Factor
TEQ	Toxicity Equivalence Quotient

10450 Stancliff Rd, Houston, TX 77099 | 281-530-5656 | www.alsglobal.com

ALS Environmental

State Certifications, Accreditations, and Licenses

Agency	Number	Expire Date
American Association for Laboratory Accreditation	2897.01 2020	11/30/2021
Arizona Department of Health Services	AZ0793-2020	5/27/2021
Arkansas Department of Environmental Quality	20-030-0	3/26/2021
California Department of Health Services	2919-2020	4/30/2021
Department of Defense	A2LA 2897.01	11/30/2021
Florida Department of Health	E87611-2020	6/30/2021
Hawaii Department of Health	2020	4/30/2021
Illinois Environmental Protection Agency	2000322020-4	5/9/2021
Kansas Department of Health and Environment	E-10352-2020	7/31/2021
Louisiana Department of Environmental Quality	03087-2020	6/30/2021
Maine Department of Health and Human Services	2020016	6/5/2022
Maryland Department of the Environment	343-2020	6/30/2021
Michigan Depratment of Environmental Quality	9971-2020	4/30/2021
Nebraska Department of Health and Human Services	NE-OS-25-13 (2020)	4/30/2021
Nevada Department of Concervation and Natural Resources	TX026932021-1	7/31/2021
New Hampshire Environmental Laboratory Accreditation Program	209420	4/24/2021
New Jersey Department of Environmental Protection	TX008	6/30/2021
New York Department of Health	11707	3/31/2021
Oklahoma Department of Environmental Quality	2020-123	8/31/2021
Pennsylvania Department of Environmental Protection	014	6/30/2021
Tennessee Department of Environment and Concervation	04016-2020	4/30/2021
Texas Commision on Environmental Quality	T104704231-20-26	4/30/2021
United States Department of Agriculture	P330-19-00299	10/10/2022

Chain of Custody

ALS Environmental - Houston HRMS
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID: 15523**

SUBCONTRACT TO:

ALS Environmental
10450 Stancliff RoadSuite 210
Houston, TX 77084 **Phone:** +1 281 530 5656

CUSTOMER INFORMATION:

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

INVOICE INFORMATION:

Company: ALS Houston
Contact: Accounts Payable
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Reference: HS21010868
TSR: Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS21010868-02**	**16WW25-210121**	**Groundwater**	**21 Jan 2021 08:52**
	Provide Level II and Level IV reports on a seperate pdf.			05 Feb 2021
2.	**HS21010868-03**	**16WW25-210121-FD**	**Groundwater**	**21 Jan 2021 08:52**
	Provide Level II and Level IV reports on a seperate pdf.			05 Feb 2021
3.	**HS21010868-04**	**16WW26-210121**	**Groundwater**	**21 Jan 2021 10:00**
	Provide Level II and Level IV reports on a seperate pdf.			05 Feb 2021
4.	**HS21010868-05**	**16WW29-210121**	**Groundwater**	**21 Jan 2021 11:10**
	Provide Level II and Level IV reports on a seperate pdf.			05 Feb 2021
5.	**HS21010868-06**	**16WW30-210121**	**Groundwater**	**21 Jan 2021 12:02**
	Provide Level II and Level IV reports on a seperate pdf.			05 Feb 2021
6.	**HS21010868-07**	**16WW48-210121**	**Groundwater**	**21 Jan 2021 13:03**
	Provide Level II and Level IV reports on a seperate pdf.			05 Feb 2021

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

QC Level: DOD IV (DoD Data Package)

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense**

COC ID: **15523**

Relinquished By: _____ Date/Time: _____

Received By: _____ Date/Time: 1/22/21 1507

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

ALS Environmental

Cooler Receipt Form

Project Chemist: CG

Client/Project: ALS-H

Thermometer ID: 1231

Date/Time Received: 1/22/21 Initials: CG

Date/Time Logged in: 1/22/21 Initials: CG

1. Method of delivery: ○ US Mail ○ Fed Ex ○ UPS ○ DHL ✓ Courier (ALS) ○ Client
2. Samples received in: ✓ Cooler ○ Box ○ Envelope ○ Other
3. Were custody seals on coolers? ○ Yes ✓ No
   Were they intact? ○ Yes ○ No ✓ N/A
   Were they signed and dated? ○ Yes ○ No ✓ N/A
   If yes, how many and where?
4. Packing Material: ○ Inserts ✓ Baggies ○ Bubble Wrap ○ Gel Packs ✓ Wet Ice ○ Sleeves ○ Other
5. Foreign or Regulated Soil? ○ Yes ○ No Location of Sampling:

Cooler Tracking Number	COC ID	Date Opened	Time Opened	Opened By	Temp. °C	Temp Blank?
NA		1/22/21	1907	CG	4.1	☒
						☐
						☐
						☐

6. Were custody papers properly filled out (ink, signed, dated, etc)? ✓ Yes ○ No
7. Did all bottles arrive in good condition (not broken, no signs of leakage)? ✓ Yes ○ No
8. Were all sample labels complete (i.e., sample ID, analysis, preservation, etc)? ✓ Yes ○ No
9. Were appropriate bottles/containers and volumes received for the requested tests? ✓ Yes ○ No
10. Did sample labels and tags agree with custody documents? ✓ Yes ○ No

Notes, Discrepancies, & Resolutions:

Service request Label:

HS-HRMSCoolerReceipt R1.0

10450 Stancliff Rd., Suite 210
Houston, TX 77099
T: +1 713 266 1599
F: +1 713 266 1599
www.alsglobal.com

SAMPLE ACCEPTANCE POLICY

This policy outlines the criteria samples must meet to be accepted by ALS Environmental – Houston HRMS.

Cooler Custody Seals (desirable, mandatory if specified in SAP):

- ✓ Intact on outside of cooler, signed and dated

Chain-of-Custody (COC) documentation (mandatory):

The following is required on each COC:

- ✓ Sample ID, the location, date and time of collection, collector's name, preservation type, sample type, and any other special remarks concerning the sampleThe COC must be completed in ink.
- ✓ Signature and date of relinquishing party.

In the absence of a COC at sample receipt, the COC will be requested from the client.

Sample Integrity (mandatory):

Samples are inspected upon arrival to ensure that sample integrity was not compromised during transfer to the laboratory.

- ✓ Sample containers must arrive in good condition (not broken or leaking).
- ✓ Samples must be labeled appropriately, including Sample IDs, and requested test using durable labels and indelible ink.
- ✓ The correct type of sample bottle must be used for the method requested.
- ✓ An appropriate sample volume, or weight, must be received.
- ✓ Sample IDs and number of containers must reconcile with the COC.
- ✓ Samples must be received within the method defined holding time.

Temperature Requirement (varies by sample matrix):

- ✓ Aqueous and Non-aqueous samples must be shipped and stored cold, at 0 to 6ºC.
- ✓ Tissue samples must be shipped and stored frozen, at -20 to -10ºC.
- ✓ Air samples are shipped and stored cold, at 0 to 6ºC
- ✓ The sample temperature must be recorded on the COC

All cooler inspections are documented on the Cooler Receipt Form (CRF). A separate CRF is completed for each service request. Any samples not meeting the above criteria are noted on the CRF and the Project Manager notified. The Project Manager must resolve any sample integrity issues with the client prior to proceeding with the analysis. Such resolutions are documented in writing and filed with the project folder. Data associated with samples received outside of this acceptance policy will be qualified on the case narrative of the final report

Preparation Information Benchsheets

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

Preparation Information Benchsheet

Prep Run#: 373395 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
Team: Semivoa GCMS/JRODRIGUEZ **Prep Method:** Method **Prep Date/Time:** 1/27/21 10:16

#	Lab Code	Client ID	B#	Method /Test	pH	Cl	Matrix	Amt. Ext.	Sample Description
1	E2100072-001	LH18/24-SP650_012021-BIX	.01	6850/ClO4 DOD			Ground Water	10mL	
2	E2100073-001	16WW46-210119	.01	6850/ClO4 DOD			Ground Water	10mL	
3	E2100073-002	16WW31-210119	.01	6850/ClO4 DOD			Ground Water	10mL	
4	E2100073-003	16WW32-210119	.01	6850/ClO4 DOD			Ground Water	10mL	
5	E2100073-004	16WW16-210119	.01	6850/ClO4 DOD			Ground Water	10mL	
6	E2100073-005	16WW35-210119	.01	6850/ClO4 DOD			Ground Water	10mL	
7	E2100073-006	16WW36-210119	.01	6850/ClO4 DOD			Ground Water	10mL	
8	E2100073-007	16WW55-210119	.01	6850/ClO4 DOD			Ground Water	10mL	
9	E2100073-008	16WW38-210119	.01	6850/ClO4 DOD			Ground Water	10mL	
10	E2100073-009	16WW37-210119	.01	6850/ClO4 DOD			Ground Water	10mL	
11	E2100074-001	16WW25-210121	.01	6850/ClO4 DOD			Ground Water	10mL	
12	E2100074-002	16WW25-210121-FD	.01	6850/ClO4 DOD			Ground Water	10mL	
13	E2100074-003	16WW26-210121	.01	6850/ClO4 DOD			Ground Water	10mL	
14	E2100074-004	16WW29-210121	.01	6850/ClO4 DOD			Ground Water	10mL	
15	E2100074-005	16WW30-210121	.01	6850/ClO4 DOD			Ground Water	10mL	
16	E2100074-006	16WW48-210121	.01	6850/ClO4 DOD			Ground Water	10mL	
17	EQ2100033-01	MB		6850/ClO4 DOD			Liquid	10mL	
18	EQ2100033-02	LCS		6850/ClO4 DOD			Liquid	10mL	
19	EQ2100033-03	DLCS		6850/ClO4 DOD			Liquid	10mL	
20	EQ2100033-04	16WW37-210119 MS	.01	6850/ClO4 DOD			Liquid	10mL	
21	EQ2100033-05	16WW37-210119 DMS	.01	6850/ClO4 DOD			Liquid	10mL	

Spiking Solutions

Name: Perchlorate Intermediate Stock1 Inventory ID 214035 Logbook Ref: Perchlorate Expires On: 05/23/2021

EQ2100033-02	1.00µL	EQ2100033-03	1.00µL	EQ2100033-04	1.00µL	EQ2100033-05	1.00µL

Name: Perchlorate Internal Standard 1ug/mL Inventory ID 214820 Logbook Ref: Perchlorate Internal Standard Expires On: 07/03/2021

E2100072-001	100.00µL	E2100073-001	100.00µL	E2100073-002	100.00µL	E2100073-003	100.00µL	E2100073-004	100.00µL	E2100073-005	100.00µL
E2100073-006	100.00µL	E2100073-007	100.00µL	E2100073-008	100.00µL	E2100073-009	100.00µL	E2100074-001	100.00µL	E2100074-002	100.00µL
E2100074-003	100.00µL	E2100074-004	100.00µL	E2100074-005	100.00µL	E2100074-006	100.00µL	EQ2100033-01	100.00µL	EQ2100033-02	100.00µL
EQ2100033-03	100.00µL	EQ2100033-04	100.00µL	EQ2100033-05	100.00µL						

Preparation Information Benchsheet

Prep Run#: 373395 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
Team: Semivoa GCMS/JRODRIGUEZ **Prep Method:** Method **Prep Date/Time:** 1/27/21 10:16

Preparation Steps

Step: Preparation
Started: 1/27/21 10:16
Finished: 1/27/21 11:00
By: GRIVERA
Comments

Comments: _____

Reviewed By: GR Date: 1/27/21

Chain of Custody

Relinquished By: _____ Date: _____ Extracts Examined
Received By: _____ Date: _____ Yes No

Analytical Results

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100074
Project:	HS21010868	**Date Collected:**	1/21/21 0852
Sample Matrix:	Ground Water	**Date Received:**	1/22/21
Sample Name:	16WW25-210121	**Units:**	µg/L
Lab Code:	E2100074-001	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	1.00	0.500	0.250	10	1/27/21	1/29/21 14:01	373395	711564	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100074
Project:	HS21010868	**Date Collected:**	1/21/21 0852
Sample Matrix:	Ground Water	**Date Received:**	1/22/21
Sample Name:	16WW25-210121-FD	**Units:**	µg/L
Lab Code:	E2100074-002	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	1.00	0.500	0.250	10	1/27/21	1/29/21 14:09	373395	711564	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100074
Project:	HS21010868	**Date Collected:**	1/21/21 1000
Sample Matrix:	Ground Water	**Date Received:**	1/22/21
Sample Name:	16WW26-210121	**Units:**	µg/L
Lab Code:	E2100074-003	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	1/27/21	1/29/21 14:17	373395	711564	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100074
Project:	HS21010868	**Date Collected:**	1/21/21 1110
Sample Matrix:	Ground Water	**Date Received:**	1/22/21
Sample Name:	16WW29-210121	**Units:**	µg/L
Lab Code:	E2100074-004	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	1/27/21	1/29/21 14:25	373395	711564	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100074
Project:	HS21010868	**Date Collected:**	1/21/21 1202
Sample Matrix:	Ground Water	**Date Received:**	1/22/21
Sample Name:	16WW30-210121	**Units:**	µg/L
Lab Code:	E2100074-005	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	1/27/21	1/29/21 14:33	373395	711564	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100074
Project:	HS21010868	**Date Collected:**	1/21/21 1303
Sample Matrix:	Ground Water	**Date Received:**	1/22/21
Sample Name:	16WW48-210121	**Units:**	µg/L
Lab Code:	E2100074-006	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**122**		1.00	0.500	0.250	10	1/27/21	1/29/21 14:49	373395	711564	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100074
Project:	HS21010868	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	µg/L
Lab Code:	EQ2100033-01	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	1/27/21	1/29/21 11:55	373395	711564	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100074
Project:	HS21010868	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2100033-02	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.106**		0.100	0.0500	0.0250	1	1/27/21	1/29/21 12:03	373395	711564	

Accuracy & Precision

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2100074
Project:	HS21010868	**Date Analyzed:**	1/29/21
Sample Matrix:	Ground Water		

Lab Control Sample Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method:	6850	**Units:**	µg/L
Prep Method:	Method	**Basis:**	NA
		Extraction Lot:	373395

	Lab Control Sample EQ2100033-02			Duplicate Lab Control Sample EQ2100033-03					
Analyte Name	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Perchlorate	0.106	0.100	106	0.113	0.100	113	84 - 119	6	15

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

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

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100074
Project:	HS21010868	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Duplicate Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2100033-03	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.113**		0.100	0.0500	0.0250	1	1/27/21	1/29/21 12:11	373395	711564	

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2100074
Project:	HS21010868	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
		Date Analyzed:	1/29/21

Matrix Spike Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Sample Name:	Batch QC	**Units:**	µg/L
Lab Code:	E2100073-009	**Basis:**	NA

Analytical Method: 6850
Prep Method: Method

		Batch QCMS **Matrix Spike** EQ2100033-04				Batch QCDMS **Duplicate Matrix Spike** EQ2100033-05					
Analyte Name	**Sample Result**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Perchlorate	0.786	0.897	0.100	110	0.904	0.100	117	84 - 119	<1	15

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

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

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

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100074
Project:	HS21010868	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Batch QC	**Units:**	µg/L
Lab Code:	EQ2100033-04	**Basis:**	NA
Run Type:	Matrix Spike		

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.897**		0.500	0.250	0.125	5	1/27/21	1/29/21 15:05	373395	711564	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100074
Project:	HS21010868	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Batch QC	**Units:**	µg/L
Lab Code:	EQ2100033-05	**Basis:**	NA
Run Type:	Duplicate Matrix Spike		

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.904**		0.500	0.250	0.125	5	1/27/21	1/29/21 15:13	373395	711564	

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

LABORATORY REPORT

February 1, 2021

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

RE: HS21010868

Dear RJ:

Enclosed are the results of the samples submitted to our laboratory on January 26, 2021. For your reference, these analyses have been assigned our service request number P2100404.

All analyses were performed according to our laboratory's NELAP and DoD-ELAP-approved quality assurance program. The test results meet requirements of the current NELAP and DoD-ELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP and DoD-ELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

ALS | Environmental

By Hayden Akers at 11:27 am, Feb 01, 2021

Hayden Akers
Project Manager

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

Client: ALS Laboratory Group
Project: HS21010868

Service Request No: P2100404

CASE NARRATIVE

The samples were received intact under chain of custody on January 26, 2021 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

Methane, Ethene and Ethane Analysis

The samples were analyzed for methane, ethene, and ethane using a gas chromatograph equipped with a flame ionization detector (FID). A known amount of liquid was displaced by injecting 8.0 milliliters of helium creating a headspace in the sample vial. Each sample vial was agitated using a sonic disrupter for fifteen minutes and then allowed to equilibrate for at least two hours. A volume of the headspace was withdrawn using a gas-tight syringe and analyzed using a manual injection technique. The amount of dissolved gases (methane, ethene and ethane) in the original sample was calculated using Henry's Law. This method was performed with guidance from RSK 175. This method is included on the laboratory's NELAP and DoD-ELAP scope of accreditation. Any analytes flagged with an X are not included on the laboratory's NELAP or DoD-ELAP accreditation.

Manual integrations were performed on the following sample(s) and analyte(s). Refer to the raw data for additional information.

Sample Identification(s)	Analyte(s)
P2100404-002	Methane
P2100404-003	Methane

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.

Use of ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.

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

ALS Environmental – Simi Valley

CERTIFICATIONS, ACCREDITATIONS, AND REGISTRATIONS

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

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

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

ALS ENVIRONMENTAL

DETAIL SUMMARY REPORT

Client: ALS Laboratory Group
Service Request: P2100404
Project ID: HS21010868

Date Received: 1/26/2021
Time Received: 10:00

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	RSK 175 - Gases
16WW25-210121	P2100404-001	Water	1/21/2021	08:52	X
16WW25-210121-FD	P2100404-002	Water	1/21/2021	08:52	X
16WW26-210121	P2100404-003	Water	1/21/2021	10:00	X
16WW29-210121	P2100404-004	Water	1/21/2021	11:10	X
16WW48-210121	P2100404-005	Water	1/21/2021	13:03	X

R2100404

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 **Dept of Defense**
STATE:

COC ID: 15522

SUBCONTRACT TO:

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

Phone: +1 805 526 7161

CUSTOMER INFORMATION:

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

INVOICE INFORMATION:

Company: ALS Houston
Contact: Accounts Payable
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Reference: HS21010868
TSR: Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS21010868-02**	**16WW25-210121**	**Groundwater**	**21 Jan 2021 08:52**
	MEE Only. Provide DOD LV II & IV pdf separate. EQuIS 5.0 - Longhorn		Equis EDD.	05 Feb 2021
2.	**HS21010868-03**	**16WW25-210121-FD**	**Groundwater**	**21 Jan 2021 08:52**
	MEE Only. Provide DOD LV II & IV pdf separate. EQuIS 5.0 - Longhorn		Equis EDD.	05 Feb 2021
3.	**HS21010868-04**	**16WW26-210121**	**Groundwater**	**21 Jan 2021 10:00**
	MEE Only. Provide DOD LV II & IV pdf separate. EQuIS 5.0 - Longhorn		Equis EDD.	05 Feb 2021
4.	**HS21010868-05**	**16WW29-210121**	**Groundwater**	**21 Jan 2021 11:10**
	MEE Only. Provide DOD LV II & IV pdf separate. EQuIS 5.0 - Longhorn		Equis EDD.	05 Feb 2021
5.	**HS21010868-07**	**16WW48-210121**	**Groundwater**	**21 Jan 2021 13:03**
	MEE Only. Provide DOD LV II & IV pdf separate. EQuIS 5.0 - Longhorn		Equis EDD.	05 Feb 2021

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

QC Level: DOD IV (DoD Data Package)

R100404

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense**

COC ID: **15522**

Relinquished By: _____ Date/Time: 1/25/2021 1800.

Received By: _____ Date/Time: 1-26-21 1000

Cooler ID(s): _____ Temperature(s): _____ 2° wr

ALS Environmental
Sample Acceptance Check Form

Client: ALS Laboratory Group Work order: P2100404
Project: HS21010868
Sample(s) received on: 1/26/21 Date opened: 1/26/21 by: ADAVID

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

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

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P2100404-001.01	40ml VOA HCL		1		A	CB 01/28/21
P2100404-001.02	40ml VOA HCL				A	
P2100404-001.03	40ml VOA HCL				A	
P2100404-002.01	40ml VOA HCL		1		A	CB 01/28/21
P2100404-002.02	40ml VOA HCL				A	
P2100404-002.03	40ml VOA HCL				A	
P2100404-003.01	40ml VOA HCL		1		A	CB 01/28/21
P2100404-003.02	40ml VOA HCL				A	
P2100404-003.03	40ml VOA HCL				A	
P2100404-004.01	40ml VOA HCL		1		A	CB 01/28/21
P2100404-004.02	40ml VOA HCL				A	
P2100404-004.03	40ml VOA HCL				A	
P2100404-005.01	40ml VOA HCL		1		A	CB 01/28/21
P2100404-005.02	40ml VOA HCL				A	
P2100404-005.03	40ml VOA HCL				A	

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

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

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **16WW25-210121**
Client Project ID: **HS21010868**

ALS Project ID: P2100404
ALS Sample ID: P2100404-001

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

Date Collected: 1/21/21
Date Received: 1/26/21
Date Analyzed: 1/28/21
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	**9.9**	1.3	1.0	0.51	
74-85-1	Ethene	0.55	1.0	0.55	0.24	**U**
74-84-0	Ethane	0.47	0.60	0.47	0.16	**U**

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

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **16WW25-210121-FD**
Client Project ID: **HS21010868**

ALS Project ID: P2100404
ALS Sample ID: P2100404-002

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

Date Collected: 1/21/21
Date Received: 1/26/21
Date Analyzed: 1/28/21
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	**9.6**	1.3	1.0	0.51	
74-85-1	Ethene	0.55	1.0	0.55	0.24	**U**
74-84-0	Ethane	0.47	0.60	0.47	0.16	**U**

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

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **16WW26-210121**
Client Project ID: **HS21010868**

ALS Project ID: P2100404
ALS Sample ID: P2100404-003

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

Date Collected: 1/21/21
Date Received: 1/26/21
Date Analyzed: 1/28/21
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	**2.5**	1.3	1.0	0.51	
74-85-1	Ethene	0.55	1.0	0.55	0.24	**U**
74-84-0	Ethane	0.47	0.60	0.47	0.16	**U**

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

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **16WW29-210121**
Client Project ID: **HS21010868**

ALS Project ID: P2100404
ALS Sample ID: P2100404-004

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

Date Collected: 1/21/21
Date Received: 1/26/21
Date Analyzed: 1/28/21
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	**8.0**	1.3	1.0	0.51	
74-85-1	Ethene	0.55	1.0	0.55	0.24	**U**
74-84-0	Ethane	0.47	0.60	0.47	0.16	**U**

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

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **16WW48-210121**
Client Project ID: **HS21010868**

ALS Project ID: P2100404
ALS Sample ID: P2100404-005

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

Date Collected: 1/21/21
Date Received: 1/26/21
Date Analyzed: 1/28/21
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	**1.2**	1.3	1.0	0.51	**J**
74-85-1	Ethene	0.55	1.0	0.55	0.24	**U**
74-84-0	Ethane	0.47	0.60	0.47	0.16	**U**

U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.
J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **Method Control Sample**
Client Project ID: **HS21010868**

ALS Project ID: P2100404
ALS Sample ID: P210128-MB

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

Date Collected: NA
Date Received: NA
Date Analyzed: 1/28/21
Volume(s) Analyzed: 0.10 ml(s)

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

The Method Control Sample is laboratory water carried through the entire analytical process.
U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE / DUPLICATE LABORATORY CONTROL SAMPLE SUMMARY

Client: **ALS Laboratory Group**
Client Sample ID: **Duplicate Lab Control Sample**
Client Project ID: **HS21010868**

ALS Project ID: P2100404
ALS Sample ID: P210128-LCS
P210128-DLCS

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

Date Collected: NA
Date Received: NA
Date Analyzed: 1/28/21
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Spike Amount LCS / DLCS µg/L	Result[1] LCS µg/L	Result[1] DLCS µg/L	% Recovery LCS	% Recovery DLCS	DOD Acceptance Limits	RPD	RPD Limit	Data Qualifier
74-82-8	Methane	2.52	2.51	2.43	**100**	**96**	73-125	4	26	
74-85-1	Ethene	4.40	4.85	4.97	**110**	**113**	72-133	3	11	
74-84-0	Ethane	4.72	4.67	4.81	**99**	**102**	74-131	3	10	

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

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

January 29, 2021

Analytical Report for Service Request No: K2100682

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

RE: ALS Houston DOD TOC

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory January 26, 2021
For your reference, these analyses have been assigned our service request number **K2100682.**

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

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

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

for Kelley Lovejoy
Project Manager

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

Table of Contents

Acronyms
Qualifiers
State Certifications, Accreditations, And Licenses
Case Narrative
Chain of Custody
General Chemistry

Acronyms

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

Inorganic Data Qualifiers

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

Metals Data Qualifiers

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

Organic Data Qualifiers

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

Additional Petroleum Hydrocarbon Specific Qualifiers

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

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

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

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

Case Narrative

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

1317 South 13th Ave, Kelso, WA 98626 | 1-360-577-7222 | www.alsglobal.com

ALS Environmental

Client: ALS Environmental - US
Project: ALS Houston DOD TOC
Sample Matrix: Ground Water

Service Request: K2100682
Date Received: 01/26/2021

CASE NARRATIVE

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

Sample Receipt:

Six ground water samples were received for analysis at ALS Environmental on 01/26/2021. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The samples were stored at minimum in accordance with the analytical method requirements.

General Chemistry:

Method SM 5310 C, 01/26/2021: The matrix spike recovery of Total Organic Carbon for sample 16WW25-210121 was outside control criteria. Recovery in the Laboratory Control Sample (LCS) was acceptable, which indicated the analytical batch was in control. The matrix spike outlier suggested a potential low bias in this matrix. No further corrective action was appropriate.

Approved by Noe D. Dan Date 01/29/2021

Chain of Custody

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

KZ100682

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID: 15521**

SUBCONTRACT TO:

ALS Environmental Kelso
1317 S. 13th Avenue
Kelso, WA 98626 **Phone:** +1 360 501 3312

CUSTOMER INFORMATION:

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

INVOICE INFORMATION:

Company: ALS Houston
Contact: Accounts Payable
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Reference: HS21010868
TSR: Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS21010868-02**	**16WW25-210121**	**Groundwater**	**21 Jan 2021 08:52**
	TOC: Provide Level II & DOD Level IV/EQuIS APTIM EDD			05 Feb 2021
2.	**HS21010868-03**	**16WW25-210121-FD**	**Groundwater**	**21 Jan 2021 08:52**
	TOC: Provide Level II & DOD Level IV/EQuIS APTIM EDD			05 Feb 2021
3.	**HS21010868-04**	**16WW26-210121**	**Groundwater**	**21 Jan 2021 10:00**
	TOC: Provide Level II & DOD Level IV/EQuIS APTIM EDD			05 Feb 2021
4.	**HS21010868-05**	**16WW29-210121**	**Groundwater**	**21 Jan 2021 11:10**
	TOC: Provide Level II & DOD Level IV/EQuIS APTIM EDD			05 Feb 2021
5.	**HS21010868-06**	**16WW30-210121**	**Groundwater**	**21 Jan 2021 12:02**
	TOC: Provide Level II & DOD Level IV/EQuIS APTIM EDD			05 Feb 2021
6.	**HS21010868-07**	**16WW48-210121**	**Groundwater**	**21 Jan 2021 13:03**
	TOC: Provide Level II & DOD Level IV/EQuIS APTIM EDD			05 Feb 2021

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

QC Level: DOD IV (DoD Data Package)

K2100682

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID: 15521**

Relinquished By: Date/Time: 1/25/2021 1800

Received By: Date/Time: 1/26/21 0950

Cooler ID(s): Temperature(s):

PM KL

Cooler Receipt and Preservation Form

Client AR-Houston Service Request K21 004583

Received: 11/24/21 Opened: 11/24/21 By: BR Unloaded: 11/24/21 By: BR

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
4. Was a Temperature Blank present in cooler? NA Y N If yes, notate the temperature in the appropriate column below:
   If no, take the temperature of a representative sample bottle contained within the cooler; notate in the column "Sample Temp":
5. Were samples received within the method specified temperature ranges? NA Y N
   If no, were they received on ice and same day as collected? If not, notate the cooler # below and notify the PM. NA Y N

If applicable, tissue samples were received: *Frozen* *Partially Thawed* *Thawed*

Temp Blank	Sample Temp	IR Gun	Cooler #/COC ID / NA	Out of temp indicate with "X"	PM Notified If out of temp	Tracking Number NA	Filed
0.8	—	1201		—	—	9473083971001	

6. Packing material: *Inserts* *Baggies* *Bubble Wrap* *Gel Packs* *Wet Ice* *Dry Ice* *Sleeves* _____
7. Were custody papers properly filled out (ink, signed, etc.)? NA Y N
8. Were samples received in good condition (unbroken) NA Y N
9. Were all sample labels complete (ie, analysis, preservation, etc.)? NA Y N
10. Did all sample labels and tags agree with custody papers? NA Y N
11. Were appropriate bottles/containers and volumes received for the tests indicated? NA Y N
12. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* NA Y N
13. Were VOA vials received without headspace? *Indicate in the table below.* NA Y N
14. Was C12/Res negative? NA Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count Bottle Type	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:**	K2100682
Project:	ALS Houston DOD TOC	**Date Collected:**	01/21/21
Sample Matrix:	Ground Water	**Date Received:**	01/26/21
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
16WW25-210121	K2100682-001	**13.1**	0.50	0.20	0.07	1	01/26/21 18:01	
16WW25-210121-FD	K2100682-002	**12.5**	0.50	0.20	0.07	1	01/26/21 18:01	
16WW26-210121	K2100682-003	**1.65**	0.50	0.20	0.07	1	01/26/21 18:01	
16WW29-210121	K2100682-004	**4.47**	0.50	0.20	0.07	1	01/26/21 18:01	
16WW30-210121	K2100682-005	**1.01**	0.50	0.20	0.07	1	01/26/21 18:01	
16WW48-210121	K2100682-006	**7.81**	0.50	0.20	0.07	1	01/26/21 18:01	
Method Blank	K2100682-MB	ND	0.50	0.20	0.07	1	01/26/21 18:01	U

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K2100682
Project	ALS Houston DOD TOC	**Date Collected:**	01/21/21
Sample Matrix:	Ground Water	**Date Received:**	01/26/21
		Date Analyzed:	01/26/21

Replicate Sample Summary
General Chemistry Parameters

Sample Name:	16WW25-210121	**Units:**	mg/L
Lab Code:	K2100682-001	**Basis:**	NA

Analyte Name	Analysis Method	LOQ	LOD	MDL	Sample Result	Duplicate Sample K2100682-001DUP Result	Average	RPD	RPD Limit
Carbon, Total Organic	SM 5310 C	0.50	0.20	0.07	13.1	12.8	13.0	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:**	K2100682
Project:	ALS Houston DOD TOC	**Date Collected:**	01/21/21
Sample Matrix:	Ground Water	**Date Received:**	01/26/21
		Date Analyzed:	01/26/21
		Date Extracted:	NA

Matrix Spike Summary
Carbon, Total Organic

Sample Name:	16WW25-210121	**Units:**	mg/L
Lab Code:	K2100682-001	**Basis:**	NA
Analysis Method:	SM 5310 C		
Prep Method:	None		

Matrix Spike
K2100682-001MS

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Carbon, Total Organic	13.1	30.6	25.0	70 *	83-117

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

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

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

Matrix Spike and Matrix Spike Duplicate Data is presented for information purposes only. The matrix may or may not be relevant to samples reported in this report. The laboratory evaluates system performance based on the LCS and LCSD control limits.

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K2100682
Project:	ALS Houston DOD TOC	**Date Analyzed:**	01/26/21
Sample Matrix:	Ground Water	**Date Extracted:**	NA

Lab Control Sample Summary
Carbon, Total Organic

Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA
		Analysis Lot:	711233

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K2100682-LCS	23.2	25.0	93	83-117

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

February 03, 2021

Susan Huang
Aptim Environmental & Infrastucture, Inc.
2500 City West Blvd., Suite 1700
Houston, TX 77042

Work Order: **HS21010919**

Laboratory Results for: **Longhorn Army Ammunition Plant- 16**

Dear Susan Huang,

ALS Environmental received 11 sample(s) on Jan 23, 2021 for the analysis presented in the following report.

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

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

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

Sincerely,

Generated By: JUMOKE.LAWAL

RJ Modashia
Project Manager

ALS Houston, US Date: 03-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant- 16
Work Order: HS21010919

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS21010919-01	16LHAAP-210122-TB3	Water	CG-121520 -123	23-Jan-2021 07:45	23-Jan-2021 10:55	☐
HS21010919-02	16WW13-210122	Groundwater		22-Jan-2021 09:30	23-Jan-2021 10:55	☐
HS21010919-03	16RW02-210122	Groundwater		22-Jan-2021 10:20	23-Jan-2021 10:55	☐
HS21010919-04	16RW01-210122	Groundwater		22-Jan-2021 11:32	23-Jan-2021 10:55	☐
HS21010919-05	16PM09-210122	Groundwater		22-Jan-2021 12:40	23-Jan-2021 10:55	☐
HS21010919-06	16PM02-210122	Groundwater		22-Jan-2021 13:26	23-Jan-2021 10:55	☐
HS21010919-07	16PM03-210122	Groundwater		22-Jan-2021 14:15	23-Jan-2021 10:55	☐
HS21010919-08	16RW07-210122	Groundwater		22-Jan-2021 14:52	23-Jan-2021 10:55	☐
HS21010919-09	16RW06-210122	Groundwater		22-Jan-2021 15:37	23-Jan-2021 10:55	☐
HS21010919-10	16WW14-210122	Groundwater		22-Jan-2021 16:16	23-Jan-2021 10:55	☐
HS21010919-11	16WW44-210122	Groundwater		22-Jan-2021 17:05	23-Jan-2021 10:55	☐

ALS Houston, US Date: 03-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant- 16
Work Order: HS21010919

CASE NARRATIVE

Work Order Comments

- The analysis for Perchlorate was subcontracted to ALS High Res Lab Houston, TX. Final report attached.

GCMS Volatiles by Method SW8260

Batch ID: R377239

Sample ID: HS21011019-02MSD

- MSD is performed on unrelated sample

Batch ID: R377206

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

ALS Houston, US Date: 03-Feb-21

Client:	Aptim Environmental & Infrastucture, Inc.	**ANALYTICAL REPORT**
Project:	Longhorn Army Ammunition Plant- 16	WorkOrder:HS21010919
Sample ID:	16LHAAP-210122-TB3	Lab ID:HS21010919-01
Collection Date:	23-Jan-2021 07:45	Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	01-Feb-2021 03:46
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	01-Feb-2021 03:46
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	01-Feb-2021 03:46
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	01-Feb-2021 03:46
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	01-Feb-2021 03:46
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	01-Feb-2021 03:46
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	01-Feb-2021 03:46
Surr: 1,2-Dichloroethane-d4	*97.4*			**0**	*81-118*	*%REC*	*1*	*01-Feb-2021 03:46*
Surr: 4-Bromofluorobenzene	*104*			**0**	*85-114*	*%REC*	*1*	*01-Feb-2021 03:46*
Surr: Dibromofluoromethane	*97.8*			**0**	*80-119*	*%REC*	*1*	*01-Feb-2021 03:46*
Surr: Toluene-d8	*102*			**0**	*89-112*	*%REC*	*1*	*01-Feb-2021 03:46*

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

ALS Houston, US Date: 03-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant- 16
Sample ID: 16WW13-210122
Collection Date: 22-Jan-2021 09:30

ANALYTICAL REPORT
WorkOrder:HS21010919
Lab ID:HS21010919-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	30-Jan-2021 14:13
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	30-Jan-2021 14:13
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	30-Jan-2021 14:13
cis-1,2-Dichloroethene	**190**		**1.0**	**2.5**	**5.0**	**ug/L**	5	01-Feb-2021 03:25
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	30-Jan-2021 14:13
Trichloroethene	**97**		**0.20**	**0.50**	**1.0**	**ug/L**	1	30-Jan-2021 14:13
Vinyl chloride	**1.1**		**0.20**	**0.50**	**1.0**	**ug/L**	1	30-Jan-2021 14:13
Surr: 1,2-Dichloroethane-d4	*93.7*			**0**	*81-118*	*%REC*	*1*	*30-Jan-2021 14:13*
Surr: 1,2-Dichloroethane-d4	*95.8*			**0**	*81-118*	*%REC*	*5*	*01-Feb-2021 03:25*
Surr: 4-Bromofluorobenzene	*101*			**0**	*85-114*	*%REC*	*1*	*30-Jan-2021 14:13*
Surr: 4-Bromofluorobenzene	*105*			**0**	*85-114*	*%REC*	*5*	*01-Feb-2021 03:25*
Surr: Dibromofluoromethane	*96.5*			**0**	*80-119*	*%REC*	*1*	*30-Jan-2021 14:13*
Surr: Dibromofluoromethane	*97.1*			**0**	*80-119*	*%REC*	*5*	*01-Feb-2021 03:25*
Surr: Toluene-d8	*100*			**0**	*89-112*	*%REC*	*1*	*30-Jan-2021 14:13*
Surr: Toluene-d8	*100*			**0**	*89-112*	*%REC*	*5*	*01-Feb-2021 03:25*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	31-Jan-2021 13:28

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

ALS Houston, US Date: 03-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant- 16
Sample ID: 16RW02-210122
Collection Date: 22-Jan-2021 10:20

ANALYTICAL REPORT
WorkOrder:HS21010919
Lab ID:HS21010919-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	01-Feb-2021 04:07
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	01-Feb-2021 04:07
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	01-Feb-2021 04:07
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	01-Feb-2021 04:07
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	01-Feb-2021 04:07
Trichloroethene	**1.9**		**0.20**	**0.50**	**1.0**	**ug/L**	1	01-Feb-2021 04:07
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	01-Feb-2021 04:07
Surr: 1,2-Dichloroethane-d4	*95.7*			**0**	*81-118*	*%REC*	*1*	*01-Feb-2021 04:07*
Surr: 4-Bromofluorobenzene	*104*			**0**	*85-114*	*%REC*	*1*	*01-Feb-2021 04:07*
Surr: Dibromofluoromethane	*96.8*			**0**	*80-119*	*%REC*	*1*	*01-Feb-2021 04:07*
Surr: Toluene-d8	*101*			**0**	*89-112*	*%REC*	*1*	*01-Feb-2021 04:07*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	31-Jan-2021 13:28

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

ALS Houston, US Date: 03-Feb-21

Client:	Aptim Environmental & Infrastucture, Inc.	**ANALYTICAL REPORT**
Project:	Longhorn Army Ammunition Plant- 16	WorkOrder:HS21010919
Sample ID:	16RW01-210122	Lab ID:HS21010919-04
Collection Date:	22-Jan-2021 11:32	Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	10	U	3.0	10	10	ug/L	10	01-Feb-2021 06:14
1,1-Dichloroethene	5.0	U	2.0	5.0	10	ug/L	10	01-Feb-2021 06:14
1,2-Dichloroethane	5.0	U	2.0	5.0	10	ug/L	10	01-Feb-2021 06:14
cis-1,2-Dichloroethene	**120**		**2.0**	**5.0**	**10**	**ug/L**	10	01-Feb-2021 06:14
Methylene chloride	20	U	4.0	20	20	ug/L	10	01-Feb-2021 06:14
Trichloroethene	**2,900**		**20**	**50**	**100**	**ug/L**	100	01-Feb-2021 06:35
Vinyl chloride	5.0	U	2.0	5.0	10	ug/L	10	01-Feb-2021 06:14
Surr: 1,2-Dichloroethane-d4	*95.1*			**0**	*81-118*	*%REC*	*10*	*01-Feb-2021 06:14*
Surr: 1,2-Dichloroethane-d4	*97.7*			**0**	*81-118*	*%REC*	*100*	*01-Feb-2021 06:35*
Surr: 4-Bromofluorobenzene	*104*			**0**	*85-114*	*%REC*	*100*	*01-Feb-2021 06:35*
Surr: 4-Bromofluorobenzene	*101*			**0**	*85-114*	*%REC*	*10*	*01-Feb-2021 06:14*
Surr: Dibromofluoromethane	*97.3*			**0**	*80-119*	*%REC*	*10*	*01-Feb-2021 06:14*
Surr: Dibromofluoromethane	*97.0*			**0**	*80-119*	*%REC*	*100*	*01-Feb-2021 06:35*
Surr: Toluene-d8	*102*			**0**	*89-112*	*%REC*	*100*	*01-Feb-2021 06:35*
Surr: Toluene-d8	*101*			**0**	*89-112*	*%REC*	*10*	*01-Feb-2021 06:14*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	31-Jan-2021 13:28

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

ALS Houston, US Date: 03-Feb-21

Client:	Aptim Environmental & Infrastucture, Inc.	**ANALYTICAL REPORT**
Project:	Longhorn Army Ammunition Plant- 16	WorkOrder:HS21010919
Sample ID:	16PM09-210122	Lab ID:HS21010919-05
Collection Date:	22-Jan-2021 12:40	Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	**1.8**		**0.30**	**1.0**	**1.0**	**ug/L**	1	01-Feb-2021 02:01
1,1-Dichloroethene	**33**		**0.20**	**0.50**	**1.0**	**ug/L**	1	01-Feb-2021 02:01
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	01-Feb-2021 02:01
cis-1,2-Dichloroethene	**560**		**2.0**	**5.0**	**10**	**ug/L**	10	01-Feb-2021 03:04
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	01-Feb-2021 02:01
Trichloroethene	**1,300**		**2.0**	**5.0**	**10**	**ug/L**	10	01-Feb-2021 03:04
Vinyl chloride	**32**		**0.20**	**0.50**	**1.0**	**ug/L**	1	01-Feb-2021 02:01
Surr: 1,2-Dichloroethane-d4	*95.1*			**0**	*81-118*	*%REC*	*1*	*01-Feb-2021 02:01*
Surr: 1,2-Dichloroethane-d4	*94.0*			**0**	*81-118*	*%REC*	*10*	*01-Feb-2021 03:04*
Surr: 4-Bromofluorobenzene	*106*			**0**	*85-114*	*%REC*	*1*	*01-Feb-2021 02:01*
Surr: 4-Bromofluorobenzene	*102*			**0**	*85-114*	*%REC*	*10*	*01-Feb-2021 03:04*
Surr: Dibromofluoromethane	*97.2*			**0**	*80-119*	*%REC*	*1*	*01-Feb-2021 02:01*
Surr: Dibromofluoromethane	*96.0*			**0**	*80-119*	*%REC*	*10*	*01-Feb-2021 03:04*
Surr: Toluene-d8	*97.9*			**0**	*89-112*	*%REC*	*1*	*01-Feb-2021 02:01*
Surr: Toluene-d8	*98.6*			**0**	*89-112*	*%REC*	*10*	*01-Feb-2021 03:04*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	31-Jan-2021 13:28

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

ALS Houston, US Date: 03-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant- 16
Sample ID: 16PM02-210122
Collection Date: 22-Jan-2021 13:26

ANALYTICAL REPORT
WorkOrder:HS21010919
Lab ID:HS21010919-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	25	U	7.5	25	25	ug/L	25	01-Feb-2021 07:38
1,1-Dichloroethene	**34**		**5.0**	**12**	**25**	**ug/L**	25	01-Feb-2021 07:38
1,2-Dichloroethane	**13**	J	**5.0**	**12**	**25**	**ug/L**	25	01-Feb-2021 07:38
cis-1,2-Dichloroethene	**2,700**		**5.0**	**12**	**25**	**ug/L**	25	01-Feb-2021 07:38
Methylene chloride	50	U	10	50	50	ug/L	25	01-Feb-2021 07:38
Trichloroethene	**23,000**		**50**	**120**	**250**	**ug/L**	250	01-Feb-2021 07:59
Vinyl chloride	**50**		**5.0**	**12**	**25**	**ug/L**	25	01-Feb-2021 07:38
Surr: 1,2-Dichloroethane-d4	*98.9*			**0**	*81-118*	*%REC*	*25*	*01-Feb-2021 07:38*
Surr: 1,2-Dichloroethane-d4	*97.0*			**0**	*81-118*	*%REC*	*250*	*01-Feb-2021 07:59*
Surr: 4-Bromofluorobenzene	*101*			**0**	*85-114*	*%REC*	*25*	*01-Feb-2021 07:38*
Surr: 4-Bromofluorobenzene	*105*			**0**	*85-114*	*%REC*	*250*	*01-Feb-2021 07:59*
Surr: Dibromofluoromethane	*96.3*			**0**	*80-119*	*%REC*	*25*	*01-Feb-2021 07:38*
Surr: Dibromofluoromethane	*98.2*			**0**	*80-119*	*%REC*	*250*	*01-Feb-2021 07:59*
Surr: Toluene-d8	*97.6*			**0**	*89-112*	*%REC*	*25*	*01-Feb-2021 07:38*
Surr: Toluene-d8	*101*			**0**	*89-112*	*%REC*	*250*	*01-Feb-2021 07:59*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	31-Jan-2021 13:28

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

ALS Houston, US Date: 03-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant- 16
Sample ID: 16PM03-210122
Collection Date: 22-Jan-2021 14:15

ANALYTICAL REPORT
WorkOrder:HS21010919
Lab ID:HS21010919-07
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	10	U	3.0	10	10	ug/L	10	01-Feb-2021 06:56
1,1-Dichloroethene	**31**		**2.0**	**5.0**	**10**	**ug/L**	10	01-Feb-2021 06:56
1,2-Dichloroethane	**18**		**2.0**	**5.0**	**10**	**ug/L**	10	01-Feb-2021 06:56
cis-1,2-Dichloroethene	**5,300**		**20**	**50**	**100**	**ug/L**	100	01-Feb-2021 07:17
Methylene chloride	20	U	4.0	20	20	ug/L	10	01-Feb-2021 06:56
Trichloroethene	**9,800**		**20**	**50**	**100**	**ug/L**	100	01-Feb-2021 07:17
Vinyl chloride	**310**		**2.0**	**5.0**	**10**	**ug/L**	10	01-Feb-2021 06:56
Surr: 1,2-Dichloroethane-d4	*98.6*			**0**	*81-118*	*%REC*	*10*	*01-Feb-2021 06:56*
Surr: 1,2-Dichloroethane-d4	*95.8*			**0**	*81-118*	*%REC*	*100*	*01-Feb-2021 07:17*
Surr: 4-Bromofluorobenzene	*106*			**0**	*85-114*	*%REC*	*10*	*01-Feb-2021 06:56*
Surr: 4-Bromofluorobenzene	*103*			**0**	*85-114*	*%REC*	*100*	*01-Feb-2021 07:17*
Surr: Dibromofluoromethane	*96.8*			**0**	*80-119*	*%REC*	*10*	*01-Feb-2021 06:56*
Surr: Dibromofluoromethane	*95.7*			**0**	*80-119*	*%REC*	*100*	*01-Feb-2021 07:17*
Surr: Toluene-d8	*99.0*			**0**	*89-112*	*%REC*	*10*	*01-Feb-2021 06:56*
Surr: Toluene-d8	*102*			**0**	*89-112*	*%REC*	*100*	*01-Feb-2021 07:17*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	31-Jan-2021 13:28

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

ALS Houston, US Date: 03-Feb-21

Client:	Aptim Environmental & Infrastucture, Inc.	**ANALYTICAL REPORT**
Project:	Longhorn Army Ammunition Plant- 16	WorkOrder:HS21010919
Sample ID:	16RW07-210122	Lab ID:HS21010919-08
Collection Date:	22-Jan-2021 14:52	Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	5.0	U	1.5	5.0	5.0	ug/L	5	01-Feb-2021 05:32
1,1-Dichloroethene	**13**		**1.0**	**2.5**	**5.0**	**ug/L**	5	01-Feb-2021 05:32
1,2-Dichloroethane	2.5	U	1.0	2.5	5.0	ug/L	5	01-Feb-2021 05:32
cis-1,2-Dichloroethene	**120**		**1.0**	**2.5**	**5.0**	**ug/L**	5	01-Feb-2021 05:32
Methylene chloride	10	U	2.0	10	10	ug/L	5	01-Feb-2021 05:32
Trichloroethene	**2,000**		**5.0**	**12**	**25**	**ug/L**	25	01-Feb-2021 05:53
Vinyl chloride	**90**		**1.0**	**2.5**	**5.0**	**ug/L**	5	01-Feb-2021 05:32
Surr: 1,2-Dichloroethane-d4	*96.6*			**0**	*81-118*	*%REC*	*5*	*01-Feb-2021 05:32*
Surr: 1,2-Dichloroethane-d4	*95.9*			**0**	*81-118*	*%REC*	*25*	*01-Feb-2021 05:53*
Surr: 4-Bromofluorobenzene	*106*			**0**	*85-114*	*%REC*	*5*	*01-Feb-2021 05:32*
Surr: 4-Bromofluorobenzene	*107*			**0**	*85-114*	*%REC*	*25*	*01-Feb-2021 05:53*
Surr: Dibromofluoromethane	*96.4*			**0**	*80-119*	*%REC*	*5*	*01-Feb-2021 05:32*
Surr: Dibromofluoromethane	*95.2*			**0**	*80-119*	*%REC*	*25*	*01-Feb-2021 05:53*
Surr: Toluene-d8	*100*			**0**	*89-112*	*%REC*	*5*	*01-Feb-2021 05:32*
Surr: Toluene-d8	*103*			**0**	*89-112*	*%REC*	*25*	*01-Feb-2021 05:53*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	31-Jan-2021 13:28

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

ALS Houston, US Date: 03-Feb-21

Client:	Aptim Environmental & Infrastucture, Inc.	**ANALYTICAL REPORT**
Project:	Longhorn Army Ammunition Plant- 16	WorkOrder:HS21010919
Sample ID:	16RW06-210122	Lab ID:HS21010919-09
Collection Date:	22-Jan-2021 15:37	Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	01-Feb-2021 04:29
1,1-Dichloroethene	**1.3**		**0.20**	**0.50**	**1.0**	**ug/L**	1	01-Feb-2021 04:29
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	01-Feb-2021 04:29
cis-1,2-Dichloroethene	**3.3**		**0.20**	**0.50**	**1.0**	**ug/L**	1	01-Feb-2021 04:29
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	01-Feb-2021 04:29
Trichloroethene	**95**		**0.20**	**0.50**	**1.0**	**ug/L**	1	01-Feb-2021 04:29
Vinyl chloride	**2.2**		**0.20**	**0.50**	**1.0**	**ug/L**	1	01-Feb-2021 04:29
Surr: 1,2-Dichloroethane-d4	*96.2*			**0**	*81-118*	*%REC*	*1*	*01-Feb-2021 04:29*
Surr: 4-Bromofluorobenzene	*101*			**0**	*85-114*	*%REC*	*1*	*01-Feb-2021 04:29*
Surr: Dibromofluoromethane	*96.2*			**0**	*80-119*	*%REC*	*1*	*01-Feb-2021 04:29*
Surr: Toluene-d8	*103*			**0**	*89-112*	*%REC*	*1*	*01-Feb-2021 04:29*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	31-Jan-2021 13:28

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

ALS Houston, US Date: 03-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant- 16
Sample ID: 16WW14-210122
Collection Date: 22-Jan-2021 16:16

ANALYTICAL REPORT
WorkOrder:HS21010919
Lab ID:HS21010919-10
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	01-Feb-2021 04:50
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	01-Feb-2021 04:50
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	01-Feb-2021 04:50
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	01-Feb-2021 04:50
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	01-Feb-2021 04:50
Trichloroethene	**18**		**0.20**	**0.50**	**1.0**	**ug/L**	1	01-Feb-2021 04:50
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	01-Feb-2021 04:50
Surr: 1,2-Dichloroethane-d4	*95.7*			**0**	*81-118*	*%REC*	*1*	*01-Feb-2021 04:50*
Surr: 4-Bromofluorobenzene	*104*			**0**	*85-114*	*%REC*	*1*	*01-Feb-2021 04:50*
Surr: Dibromofluoromethane	*96.8*			**0**	*80-119*	*%REC*	*1*	*01-Feb-2021 04:50*
Surr: Toluene-d8	*104*			**0**	*89-112*	*%REC*	*1*	*01-Feb-2021 04:50*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	31-Jan-2021 13:28

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

ALS Houston, US Date: 03-Feb-21

Client:	Aptim Environmental & Infrastucture, Inc.	**ANALYTICAL REPORT**
Project:	Longhorn Army Ammunition Plant- 16	WorkOrder:HS21010919
Sample ID:	16WW44-210122	Lab ID:HS21010919-11
Collection Date:	22-Jan-2021 17:05	Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	01-Feb-2021 05:11
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	01-Feb-2021 05:11
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	01-Feb-2021 05:11
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	01-Feb-2021 05:11
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	01-Feb-2021 05:11
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	01-Feb-2021 05:11
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	01-Feb-2021 05:11
Surr: 1,2-Dichloroethane-d4	*96.2*			**0**	*81-118*	*%REC*	*1*	*01-Feb-2021 05:11*
Surr: 4-Bromofluorobenzene	*103*			**0**	*85-114*	*%REC*	*1*	*01-Feb-2021 05:11*
Surr: Dibromofluoromethane	*96.2*			**0**	*80-119*	*%REC*	*1*	*01-Feb-2021 05:11*
Surr: Toluene-d8	*102*			**0**	*89-112*	*%REC*	*1*	*01-Feb-2021 05:11*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	31-Jan-2021 13:28

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

ALS Houston, US Date: 03-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant- 16
WorkOrder: HS21010919

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R377206 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS21010919-02	16WW13-210122	22 Jan 2021 09:30			30 Jan 2021 14:13	1
Batch ID: R377212 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** Groundwater	
HS21010919-02	16WW13-210122	22 Jan 2021 09:30			31 Jan 2021 13:28	1
HS21010919-03	16RW02-210122	22 Jan 2021 10:20			31 Jan 2021 13:28	1
HS21010919-04	16RW01-210122	22 Jan 2021 11:32			31 Jan 2021 13:28	1
HS21010919-05	16PM09-210122	22 Jan 2021 12:40			31 Jan 2021 13:28	1
HS21010919-06	16PM02-210122	22 Jan 2021 13:26			31 Jan 2021 13:28	1
HS21010919-07	16PM03-210122	22 Jan 2021 14:15			31 Jan 2021 13:28	1
HS21010919-08	16RW07-210122	22 Jan 2021 14:52			31 Jan 2021 13:28	1
HS21010919-09	16RW06-210122	22 Jan 2021 15:37			31 Jan 2021 13:28	1
HS21010919-10	16WW14-210122	22 Jan 2021 16:16			31 Jan 2021 13:28	1
HS21010919-11	16WW44-210122	22 Jan 2021 17:05			31 Jan 2021 13:28	1
Batch ID: R377239 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS21010919-02	16WW13-210122	22 Jan 2021 09:30			01 Feb 2021 03:25	5
HS21010919-03	16RW02-210122	22 Jan 2021 10:20			01 Feb 2021 04:07	1
HS21010919-04	16RW01-210122	22 Jan 2021 11:32			01 Feb 2021 06:35	100
HS21010919-04	16RW01-210122	22 Jan 2021 11:32			01 Feb 2021 06:14	10
HS21010919-05	16PM09-210122	22 Jan 2021 12:40			01 Feb 2021 03:04	10
HS21010919-05	16PM09-210122	22 Jan 2021 12:40			01 Feb 2021 02:01	1
HS21010919-06	16PM02-210122	22 Jan 2021 13:26			01 Feb 2021 07:59	250
HS21010919-06	16PM02-210122	22 Jan 2021 13:26			01 Feb 2021 07:38	25
HS21010919-07	16PM03-210122	22 Jan 2021 14:15			01 Feb 2021 07:17	100
HS21010919-07	16PM03-210122	22 Jan 2021 14:15			01 Feb 2021 06:56	10
HS21010919-08	16RW07-210122	22 Jan 2021 14:52			01 Feb 2021 05:53	25
HS21010919-08	16RW07-210122	22 Jan 2021 14:52			01 Feb 2021 05:32	5
HS21010919-09	16RW06-210122	22 Jan 2021 15:37			01 Feb 2021 04:29	1
HS21010919-10	16WW14-210122	22 Jan 2021 16:16			01 Feb 2021 04:50	1
HS21010919-11	16WW44-210122	22 Jan 2021 17:05			01 Feb 2021 05:11	1
Batch ID: R377239 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS21010919-01	16LHAAP-210122-TB3	23 Jan 2021 07:45			01 Feb 2021 03:46	1

ALS Houston, US Date: 03-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant- 16
WorkOrder: HS21010919

QC BATCH REPORT

Batch ID: R377206 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-210130** Units: **ug/L** Analysis Date: **30-Jan-2021 13:10**
Client ID: Run ID: **VOA6_377206** SeqNo: **5937485** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	1.0	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
Methylene chloride	2.0	2.0								U
Trichloroethene	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*47.62*	*1.0*	*50*	*0*	*95.2*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.82*	*1.0*	*50*	*0*	*102*	*85 - 114*				
Surr: Dibromofluoromethane	*48.35*	*1.0*	*50*	*0*	*96.7*	*80 - 119*				
Surr: Toluene-d8	*50.28*	*1.0*	*50*	*0*	*101*	*89 - 112*				

LCS Sample ID: **VLCSW-210130** Units: **ug/L** Analysis Date: **30-Jan-2021 12:27**
Client ID: Run ID: **VOA6_377206** SeqNo: **5937484** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	20.61	1.0	20	0	103	80 - 119				
1,1-Dichloroethene	19.08	1.0	20	0	95.4	71 - 131				
1,2-Dichloroethane	19.79	1.0	20	0	99.0	73 - 128				
Methylene chloride	20.32	2.0	20	0	102	74 - 124				
Trichloroethene	21.7	1.0	20	0	109	79 - 123				
Vinyl chloride	18.55	1.0	20	0	92.8	58 - 137				
Surr: 1,2-Dichloroethane-d4	*47.14*	*1.0*	*50*	*0*	*94.3*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*51.7*	*1.0*	*50*	*0*	*103*	*85 - 114*				
Surr: Dibromofluoromethane	*48.84*	*1.0*	*50*	*0*	*97.7*	*80 - 119*				
Surr: Toluene-d8	*46.7*	*1.0*	*50*	*0*	*93.4*	*89 - 112*				

ALS Houston, US Date: 03-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant- 16
WorkOrder: HS21010919

QC BATCH REPORT

Batch ID: R377206 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS21010912-02MS** Units: **ug/L** Analysis Date: **30-Jan-2021 14:34**
Client ID: Run ID: **VOA6_377206** SeqNo: **5937489** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	18.1	1.0	20	0	90.5	80 - 119				
1,1-Dichloroethene	16.65	1.0	20	0	83.2	71 - 131				
1,2-Dichloroethane	17.78	1.0	20	0	88.9	73 - 128				
Methylene chloride	16.86	2.0	20	0	84.3	74 - 124				
Trichloroethene	19.89	1.0	20	0	99.5	79 - 123				
Vinyl chloride	12.75	1.0	20	0	63.8	58 - 137				
Surr: 1,2-Dichloroethane-d4	*45.22*	*1.0*	*50*	*0*	*90.4*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*51.38*	*1.0*	*50*	*0*	*103*	*85 - 114*				
Surr: Dibromofluoromethane	*47.54*	*1.0*	*50*	*0*	*95.1*	*80 - 119*				
Surr: Toluene-d8	*49.49*	*1.0*	*50*	*0*	*99.0*	*89 - 112*				

MSD Sample ID: **HS21010912-02MSD** Units: **ug/L** Analysis Date: **30-Jan-2021 14:55**
Client ID: Run ID: **VOA6_377206** SeqNo: **5937490** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	18.63	1.0	20	0	93.2	80 - 119	18.1	2.87	20	
1,1-Dichloroethene	16.4	1.0	20	0	82.0	71 - 131	16.65	1.54	20	
1,2-Dichloroethane	17.63	1.0	20	0	88.2	73 - 128	17.78	0.857	20	
Methylene chloride	16.81	2.0	20	0	84.1	74 - 124	16.86	0.298	20	
Trichloroethene	19.08	1.0	20	0	95.4	79 - 123	19.89	4.18	20	
Vinyl chloride	12.21	1.0	20	0	61.1	58 - 137	12.75	4.33	20	
Surr: 1,2-Dichloroethane-d4	*45.49*	*1.0*	*50*	*0*	*91.0*	*81 - 118*	*45.22*	*0.594*	*20*	
Surr: 4-Bromofluorobenzene	*51.74*	*1.0*	*50*	*0*	*103*	*85 - 114*	*51.38*	*0.693*	*20*	
Surr: Dibromofluoromethane	*47.21*	*1.0*	*50*	*0*	*94.4*	*80 - 119*	*47.54*	*0.696*	*20*	
Surr: Toluene-d8	*50.29*	*1.0*	*50*	*0*	*101*	*89 - 112*	*49.49*	*1.61*	*20*	

The following samples were analyzed in this batch: HS21010919-02

ALS Houston, US Date: 03-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant- 16
WorkOrder: HS21010919

QC BATCH REPORT

Batch ID: R377239 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-210131** Units: **ug/L** Analysis Date: **01-Feb-2021 00:16**
Client ID: Run ID: **VOA6_377239** SeqNo: **5938087** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	1.0	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
Methylene chloride	2.0	2.0								U
Trichloroethene	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*46.99*	*1.0*	*50*	*0*	*94.0*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*51.25*	*1.0*	*50*	*0*	*103*	*85 - 114*				
Surr: Dibromofluoromethane	*47.72*	*1.0*	*50*	*0*	*95.4*	*80 - 119*				
Surr: Toluene-d8	*50.91*	*1.0*	*50*	*0*	*102*	*89 - 112*				

LCS Sample ID: **VLCSW-210131** Units: **ug/L** Analysis Date: **31-Jan-2021 23:12**
Client ID: Run ID: **VOA6_377239** SeqNo: **5938114** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	20.62	1.0	20	0	103	80 - 119				
1,1-Dichloroethene	19.99	1.0	20	0	100.0	71 - 131				
1,2-Dichloroethane	20.53	1.0	20	0	103	73 - 128				
cis-1,2-Dichloroethene	21.45	1.0	20	0	107	78 - 123				
Methylene chloride	21.41	2.0	20	0	107	74 - 124				
Trichloroethene	22.09	1.0	20	0	110	79 - 123				
Vinyl chloride	19.91	1.0	20	0	99.6	58 - 137				
Surr: 1,2-Dichloroethane-d4	*54.81*	*1.0*	*50*	*0*	*110*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*52.28*	*1.0*	*50*	*0*	*105*	*85 - 114*				
Surr: Dibromofluoromethane	*54.15*	*1.0*	*50*	*0*	*108*	*80 - 119*				
Surr: Toluene-d8	*48.45*	*1.0*	*50*	*0*	*96.9*	*89 - 112*				

ALS Houston, US Date: 03-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant- 16
WorkOrder: HS21010919

QC BATCH REPORT

Batch ID: R377239 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS21011019-02MS** Units: **ug/L** Analysis Date: **01-Feb-2021 02:22**
Client ID: Run ID: **VOA6_377239** SeqNo: **5938093** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	18.1	1.0	20	0	90.5	80 - 119				
1,1-Dichloroethene	15.34	1.0	20	0	76.7	71 - 131				
1,2-Dichloroethane	17.42	1.0	20	0	87.1	73 - 128				
cis-1,2-Dichloroethene	19.05	1.0	20	0	95.3	78 - 123				
Methylene chloride	17.38	2.0	20	0	86.9	74 - 124				
Trichloroethene	21.91	1.0	20	0	110	79 - 123				
Vinyl chloride	12.37	1.0	20	0	61.8	58 - 137				
Surr: 1,2-Dichloroethane-d4	*45.92*	*1.0*	*50*	*0*	*91.8*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*52.92*	*1.0*	*50*	*0*	*106*	*85 - 114*				
Surr: Dibromofluoromethane	*47.52*	*1.0*	*50*	*0*	*95.0*	*80 - 119*				
Surr: Toluene-d8	*48.61*	*1.0*	*50*	*0*	*97.2*	*89 - 112*				

MSD Sample ID: **HS21011019-02MSD** Units: **ug/L** Analysis Date: **01-Feb-2021 02:43**
Client ID: Run ID: **VOA6_377239** SeqNo: **5938094** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	18.16	1.0	20	0	90.8	80 - 119	18.1	0.33	20	
1,1-Dichloroethene	14.8	1.0	20	0	74.0	71 - 131	15.34	3.6	20	
1,2-Dichloroethane	16.57	1.0	20	0	82.8	73 - 128	17.42	5	20	
cis-1,2-Dichloroethene	17.35	1.0	20	0	86.8	78 - 123	19.05	9.34	20	
Methylene chloride	16.76	2.0	20	0	83.8	74 - 124	17.38	3.65	20	
Trichloroethene	18.85	1.0	20	0	94.3	79 - 123	21.91	15	20	
Vinyl chloride	11.58	1.0	20	0	57.9	58 - 137	12.37	6.53	20	S
Surr: 1,2-Dichloroethane-d4	*46.24*	*1.0*	*50*	*0*	*92.5*	*81 - 118*	*45.92*	*0.679*	*20*	
Surr: 4-Bromofluorobenzene	*52.93*	*1.0*	*50*	*0*	*106*	*85 - 114*	*52.92*	*0.0276*	*20*	
Surr: Dibromofluoromethane	*47.68*	*1.0*	*50*	*0*	*95.4*	*80 - 119*	*47.52*	*0.328*	*20*	
Surr: Toluene-d8	*49.33*	*1.0*	*50*	*0*	*98.7*	*89 - 112*	*48.61*	*1.47*	*20*	

The following samples were analyzed in this batch:

HS21010919-01	HS21010919-02	HS21010919-03	HS21010919-04
HS21010919-05	HS21010919-06	HS21010919-07	HS21010919-08
HS21010919-09	HS21010919-10	HS21010919-11	

ALS Houston, US Date: 03-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant- 16
WorkOrder: **HS21010919**

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	20-030-0	26-Mar-2021
California	2919, 2020-2021	30-Apr-2021
Dept of Defense	PJLA L20-507	22-Dec-2021
Florida	E87611-30-07/01/2020	30-Jun-2021
Illinois	2000322020-4	09-May-2021
Kansas	E-10352 2020-2021	31-Jul-2021
Kentucky	123043, 2020-2021	30-Apr-2021
Louisiana	03087, 2020-2021	30-Jun-2021
North Carolina	624-2021	31-Dec-2021
North Dakota	R-193 2020-2021	30-Apr-2021
Oklahoma	2020-165	31-Aug-2021
Texas	T104704231-20-26	30-Apr-2021

ALS Houston, US Date: 03-Feb-21

Sample Receipt Checklist

Work Order ID: HS21010919 **Date/Time Received:** **23-Jan-2021 10:55**

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

Completed By: /S/ Paresh M. Giga (eSignature) 25-Jan-2021 10:07 (Date/Time) **Reviewed by:** /S/ RJ Modashia (eSignature) 25-Jan-2021 21:07 (Date/Time)

Matrices: **GW/Water** Carrier name: **FedEx**

	Yes	No	Not Present
Shipping container/cooler in good condition?	☑	☐	☐
Custody seals intact on shipping container/cooler?	☑	☐	☐
Custody seals intact on sample bottles?	☐	☐	☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	☐	☐	☑
Chain of custody present?	☑	☐	2 Page(s)
Chain of custody signed when relinquished and received?	☑	☐	COC IDs:None
Samplers name present on COC?	☑	☐	
Chain of custody agrees with sample labels?	☑	☐	
Samples in proper container/bottle?	☑	☐	
Sample containers intact?	☑	☐	
Sufficient sample volume for indicated test?	☑	☐	
All samples received within holding time?	☑	☐	
Container/Temp Blank temperature in compliance?	☑	☐	

Temperature(s)/Thermometer(s):	0.8C U/c	IR31
Cooler(s)/Kit(s):	3718	
Date/Time sample(s) sent to storage:	1/23/2021 16:00	

	Yes	No	
Water - VOA vials have zero headspace?	☑	☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	☐	☐	N/A ☑
pH adjusted?	☐	☐	N/A ☑

pH adjusted by:

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd. Suite 210 Houston, TX. 77099 (281) 530-5656 ATTN: R.J Modashia LHAAPIG-210122-ALS

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

Project No. 501032

Job: **LHAAP 16 January 2021**

Prepared By: Mike Martinez

P.O. Number

Analyses

Field Sample I.D. Time	Sample Matrix	Date /	MS / MSD	No. OF CONTAINERS	VOC by SW 8260B	TOC by SM5310C	MEE by RSK 175	Anions (bromide, sulfate, nitrate) by SW9056 and Alkalinity by SM2320	Bromide by SW9056	Perchlorate by SW6850	Metals (arsenic, chromium, manganese, nickel, thallium) by SW6020				Remarks (Preservati etc.)
16LHAAP-210122-TB3	UG	01-22-21 / 0945		2	2										
16GW13-210122	GW	01-22-21 / 0930		4	3					1					
16RW02-210122	GW	01-22-21 / 1020		4	3					1					
16RW01-210122	GW	01-22-21 / 1132		4	3					1					
16PM09-210122	GW	01-22-21 / 1240		4	3					1					
16PM02-210122	GW	01-22-21 / 1326		4	3					1					
16PM05-210122	GW	01-22-21 / 1415		4	3					1					
16RW07-210122	GW	01-22-21 / 1452		4	3					1					

Aptim Environmental & Infrastucture, Inc.
Longhorn Army Ammunition Plant
HS21010919

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

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
[signature]	01-22-21	1755									

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition
J. [illegible]	1/23/21	10:55							

Remarks: Color 3718 11231
Temp 0.8°C C80

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

CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd. Suite 210 Houston, TX. 77099 (281) 530-5656 ATTN: R.J Modashia LHAAP16-210122-ALS Page 2 of 2

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

Project No. 501032

Job: **LHAAP 16 January 2021**

Prepared By: Mike Martinez

P.O. Number

Field Sample I.D. Time	Sample Matrix	Date /	MS / MSD	No. OF CONTAINERS	VOC by SW 8260B	TOC by SM5310C	MEE by RSK 175	Anions (bromide, sulfate, nitrate) by SW9056 and Alkalinity by SM2320	Bromide by SW9056	Perchlorate by SW6850	Metals (arsenic, chromium, manganese, nickel, thallium) by SW6020				Remarks (Preservatives, etc.)
16RW06-210122	GW	01-22-21/1537		4	3					1					
16WW14-210122	GW	01-22-21/1616		4	3					1					
16WW44-210122	GW	01-22-21/1705		4	3					1					

Analyses

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

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
[signature]	01-22-21	1735									

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition
J. [illegible]	1/23/21	10:55							

Remarks:

Aptim Environmental & Infrastucture, Inc.
Longhorn Army Ammunition Plant

HS21010919

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5687
3718

CUSTODY SEAL

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5687

CUSTODY SEAL

FedEx
TRK# 0221 9473 0838 9575

SATURDAY 12:00P
PRIORITY OVERNIGHT

XO SGRA 3718.

77099
TX-US IAH

February 03, 2021

Service Request No:E2100082

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

Laboratory Results for: HS21010919

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory January 25, 2021
For your reference, these analyses have been assigned our service request number **E2100082.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current TNI standards, where applicable, and except as noted in the laboratory case narrative provided. All results are intended to be considered in their entirety and ALS Environmental is not responsible for use of less than the complete final report. Results apply only to the items submitted to the laboratory, as received for analysis. In accordance with the current TNI Standard, a statement on the estimated uncertainty of measurement of any quantitative analysis will be supplied upon request.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Corey Grandits
Project Manager

ADDRESS 10450 Stancliff Rd., Suite 210, Houston, TX 77099
PHONE +1 281 530 5656 | FAX +1 281 530 5887
ALS Group USA, Corp.
dba ALS Environmental

Certificate of Analysis

ALS Environmental - Houston HRMS
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

ALS Environmental

Client:	ALS Houston	**Service Request No.:**	E2100082
Project:	HS21010919	**Date Received:**	01/25/21
Sample Matrix:	W		

CASE NARRATIVE

All analyses were performed in adherence to the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier II. When appropriate to the method, method blank results have been reported with each analytical test.

Sample Receipt

Ten samples were received for analysis at ALS Environmental in Houston on 01/25/21.

The samples were received in good condition and are consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

Data Validation Notes and Discussion

Precision and Accuracy:

EQ2100045: Laboratory Control Spike/Duplicate Laboratory Control Spike (LCS/DLCS) samples were analyzed and reported in lieu of a MS/MSD for this extraction batch. The LCS and DLCS RPD was marginally above QC limits; the individual recoveries met acceptance criteria.

Sample E2100082-008 was reported from a dilution due to internal standard failure at the 1x.

DoD Certification is held for the method/matrix/analytes provided in this report.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.

Use of ALS group USA Corp dba ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.

Client: ALS Environmental - US **Service Request:**E2100082
Project: HS21010919

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
E2100082-001	16WW13-210122	1/22/2021	0930
E2100082-002	16RW02-210122	1/22/2021	1020
E2100082-003	16RW01-210122	1/22/2021	1132
E2100082-004	16PM09-210122	1/22/2021	1240
E2100082-005	16PM02-210122	1/22/2021	1326
E2100082-006	16PM03-210122	1/22/2021	1415
E2100082-007	16RW07-210122	1/22/2021	1452
E2100082-008	16RW06-210122	1/22/2021	1537
E2100082-009	16WW14-210122	1/22/2021	1616
E2100082-010	16WW44-210122	1/22/2021	1705

Service Request Summary

Folder #: **E2100082**
Client Name: ALS Environmental - US
Project Name: HS21010919
Project Number:

Report To: RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Houston, TX 77099-4338
USA
Phone Number: 281-530-5656
Cell Number:
Fax Number: 281-530-5887
E-mail: rj.modashia@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 01/25/21
Internal Due Date: 2/8/2021
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS21010919
EDD: No EDD Specified

10 125 mL-Glass Bottle NM AMBER Teflon Liner Unpreserved
Location: EHRMS-WIC 6C
Pressure Gas:

Lab Samp No.	Client Samp No	Matrix	Collected	HOUSTON ClO4 DOD/6850
E2100082-001	16WW13-210122	Ground Water	01/22/21 0930	**IV**
E2100082-002	16RW02-210122	Ground Water	01/22/21 1020	**IV**
E2100082-003	16RW01-210122	Ground Water	01/22/21 1132	**IV**
E2100082-004	16PM09-210122	Ground Water	01/22/21 1240	**IV**
E2100082-005	16PM02-210122	Ground Water	01/22/21 1326	**IV**
E2100082-006	16PM03-210122	Ground Water	01/22/21 1415	**IV**
E2100082-007	16RW07-210122	Ground Water	01/22/21 1452	**IV**
E2100082-008	16RW06-210122	Ground Water	01/22/21 1537	**IV**
E2100082-009	16WW14-210122	Ground Water	01/22/21 1616	**IV**
E2100082-010	16WW44-210122	Ground Water	01/22/21 1705	**IV**

Service Request Summary

Folder #:	**E2100082**
Client Name:	ALS Environmental - US
Project Name:	HS21010919
Project Number:	
Report To:	RJ Modashia ALS Laboratory Group 10450 Stancliff Road Houston, TX 77099-4338 USA
Phone Number:	281-530-5656
Cell Number:	
Fax Number:	281-530-5887
E-mail:	rj.modashia@alsglobal.com

Project Chemist:	Corey Grandits
Originating Lab:	HOUSTON
Logged By:	CGRANDITS
Date Received:	01/25/21
Internal Due Date:	2/8/2021
QAP:	LAB QAP
Qualifier Set:	Lab Standard
Formset:	Lab Standard
Merged?:	Y
Report to MDL?:	Y
P.O. Number:	HS21010919
EDD:	No EDD Specified

10 125 mL-Glass Bottle NM AMBER Teflon Liner Unpreserved

Location: EHRMS-WIC 6C

Pressure Gas:

Test Comments:

Group	Test/Method	Samples	Comments
Semivoa GCMS	ClO4 DOD/6850	10	II Due 2/8,IV due 2/15

Data Qualifiers

Lab Standard

+	Possible Tedlar bag artifact.
A	TIC is a suspected aldol-condensation product
B	Analyte found in the associated method blank as well as in the sample.
BC	Reported results are not blank corrected.
BH	The back section of the tube yielded higher results than the front.
BT	Results indicated possible breakthrough; back section >=10% front section.
C	Result identification confirmed.
D	Compound identified in an analysis at a secondary dilution factor
D	Spike was diluted out
DE	Reported results are corrected for desorption efficiency.
E	Estimated value. Concentration above calibration range
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
H1	Sample analysis performed past holding time. See case narrative.
H2	Initial analysis within holding time. Reanalysis for the required dilution was past holding time.
H3	Sample was received and analyzed past holding time.
H4	Sample was extracted past required extraction holding time, but analyzed within analysis holding time. See case narrative.
I	Internal standard not within the specified limits. See case narrative.
J	Estimated Value. Concentration found below MRL.
K	A deflection in the QC ion may indicate interference with the quantitation of this ion. The concentration of this analyte should be considered as an estimate.
K	Analyte was detected above the method reporting limit prior to normalization.
K	The reference ion ratio was outside acceptance criteria, which may indicate a potential bias to this result.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
L1	Laboratory control sample recovery outside the specified limits; results may be biased high.
L2	Laboratory control sample recovery outside the specified limits; results may be biased low.
L3	Laboratory control sample recovery outside the specified limits.
M	Matrix interference; results may be biased high.
M	The duplicate injection precision not met.
M1	Matrix interference due to coelution with a non-target compound; results may be biased high.
N	Presumptive evidence of a compound for TICs that have been identified based on a mass spectral library search.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.

Data Qualifiers

Lab Standard

O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
P	Indicates chlorodiphenyl ether interference present at the retention time of the target compound.
P	Pesticide/Aroclor target analyte > 40% difference for detected concentrations between GC columns
Q	Indicates as estimated value because the P and P + 2 theoretical abundance ratio does not meet method criteria.
R	Duplicate Precision not met.
R1	Duplicate precision not within the specified limits; however, the results are below the MRL and considered estimated.
S	Surrogate recovery not within specified limits.
S	The reported value was determined by the Method of Standard Additions (MSA).
T	Analyte is a tentatively identified compound, result is estimated.
U	Compound was analyzed for, but was not detected (ND).
V1	The continuing calibration verification standard was outside (biased high) the specified limits for this compound.
V2	The continuing calibration verification standard was outside (biased low) the specified limits for this compound.
W	Result quantified, but the corresponding peak was detected outside the generated retention time window.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
X	See case narrative.
Y	Recovery outside limits
Y	The chromatogram resembles a petroleum product but does not match the calibration standard.
Z	The chromatogram does not resemble a petroleum product.
i	The MRL/MDL has been elevated due to a matrix interference.

ALS Laboratory Group

Acronyms

Cal	Calibration
Conc	CONCentration
Dioxin(s)	Polychlorinated dibenzo-p-dioxin(s)
EDL	Estimated Detection Limit
EMPC	Estimated Maximum Possible Concentration
Flags	Data qualifiers
Furan(s)	Polychlorinated dibenzofuran(s)
g	Grams
ICAL	Initial CALibration
ID	IDentifier
Ions	Masses monitored for the analyte during data acquisition
L	Liter (s)
LCS	Laboratory Control Sample
DLCS	Duplicate Laboratory Control Sample
MB	Method Blank
MCL	Method Calibration Limit
MDL	Method Detection Limit
mL	Milliliters
MS	Matrix Spiked sample
DMS	Duplicate Matrix Spiked sample
NO	Number of peaks meeting all identification criteria
PCDD(s)	Polychlorinated dibenzo-p-dioxin(s)
PCDF(s)	Polychlorinated dibenzofuran(s)
ppb	Parts per billion
ppm	Parts per million
ppq	Parts per quadrillion
ppt	Parts per trillion
QA	Quality Assurance
QC	Quality Control
Ratio	Ratio of areas from monitored ions for an analyte
% Rec.	Percent recovery
RPD	Relative Percent Difference
RRF	Relative Response Factor
RT	Retention Time
SDG	Sample Delivery Group
S/N	Signal-to-noise ratio
TEF	Toxicity Equivalence Factor
TEQ	Toxicity Equivalence Quotient

10450 Stancliff Rd, Houston, TX 77099 | 281-530-5656 | www.alsglobal.com

ALS Environmental

State Certifications, Accreditations, and Licenses

Agency	Number	Expire Date
American Association for Laboratory Accreditation	2897.01 2020	11/30/2021
Arizona Department of Health Services	AZ0793-2020	5/27/2021
Arkansas Department of Environmental Quality	20-030-0	3/26/2021
California Department of Health Services	2919-2020	4/30/2021
Department of Defense	A2LA 2897.01	11/30/2021
Florida Department of Health	E87611-2020	6/30/2021
Hawaii Department of Health	2020	4/30/2021
Illinois Environmental Protection Agency	2000322020-4	5/9/2021
Kansas Department of Health and Environment	E-10352-2020	7/31/2021
Louisiana Department of Environmental Quality	03087-2020	6/30/2021
Maine Department of Health and Human Services	2020016	6/5/2022
Maryland Department of the Environment	343-2020	6/30/2021
Michigan Depratment of Environmental Quality	9971-2020	4/30/2021
Nebraska Department of Health and Human Services	NE-OS-25-13 (2020)	4/30/2021
Nevada Department of Concervation and Natural Resources	TX026932021-1	7/31/2021
New Hampshire Environmental Laboratory Accreditation Program	209420	4/24/2021
New Jersey Department of Environmental Protection	TX008	6/30/2021
New York Department of Health	11707	3/31/2021
Oklahoma Department of Environmental Quality	2020-123	8/31/2021
Pennsylvania Department of Environmental Protection	014	6/30/2021
Tennessee Department of Environment and Concervation	04016-2020	4/30/2021
Texas Commision on Environmental Quality	T104704231-20-26	4/30/2021
United States Department of Agriculture	P330-19-00299	10/10/2022

Chain of Custody

ALS Environmental - Houston HRMS
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID: 15525**

SUBCONTRACT TO:

ALS Environmental
10450 Stancliff RoadSuite 210
Houston, TX 77084 **Phone:** +1 281 530 5656

CUSTOMER INFORMATION:

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

INVOICE INFORMATION:

Company: ALS Houston
Contact: Accounts Payable
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Reference: HS21010919
TSR: Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS21010919-02**	**16WW13-210122**	**Groundwater**	**22 Jan 2021 09:30**
	Provide Level II and Level IV reports on a seperate pdf.			08 Feb 2021
2.	**HS21010919-03**	**16RW02-210122**	**Groundwater**	**22 Jan 2021 10:20**
	Provide Level II and Level IV reports on a seperate pdf.			08 Feb 2021
3.	**HS21010919-04**	**16RW01-210122**	**Groundwater**	**22 Jan 2021 11:32**
	Provide Level II and Level IV reports on a seperate pdf.			08 Feb 2021
4.	**HS21010919-05**	**16PM09-210122**	**Groundwater**	**22 Jan 2021 12:40**
	Provide Level II and Level IV reports on a seperate pdf.			08 Feb 2021
5.	**HS21010919-06**	**16PM02-210122**	**Groundwater**	**22 Jan 2021 13:26**
	Provide Level II and Level IV reports on a seperate pdf.			08 Feb 2021
6.	**HS21010919-07**	**16PM03-210122**	**Groundwater**	**22 Jan 2021 14:15**
	Provide Level II and Level IV reports on a seperate pdf.			08 Feb 2021
7.	**HS21010919-08**	**16RW07-210122**	**Groundwater**	**22 Jan 2021 14:52**
	Provide Level II and Level IV reports on a seperate pdf.			08 Feb 2021
8.	**HS21010919-09**	**16RW06-210122**	**Groundwater**	**22 Jan 2021 15:37**
	Provide Level II and Level IV reports on a seperate pdf.			08 Feb 2021
9.	**HS21010919-10**	**16WW14-210122**	**Groundwater**	**22 Jan 2021 16:16**

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID: 15525**

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
	Provide Level II and Level IV reports on a seperate pdf.			08 Feb 2021
10.	**HS21010919-11**	**16WW44-210122**	**Groundwater**	**22 Jan 2021 17:05**
	Provide Level II and Level IV reports on a seperate pdf.			08 Feb 2021

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

QC Level: DOD IV (DoD Data Package)

Relinquished By:		Date/Time:	1/25/2021 12:10.
Received By:	COREY G	Date/Time:	1/25/21 1216
Cooler ID(s):		Temperature(s):	

ALS Environmental

Cooler Receipt Form

Project Chemist: CG

Client/Project: ALG-41

Thermometer ID: 1R31

Date/Time Received: 11/29/21 Initials: CG

Date/Time Logged in: 11/29/21 Initials: CG

1. Method of delivery: ○ US Mail ○ Fed Ex ○ UPS ○ DHL ✓ ALS Courier ○ Client
2. Samples received in: ✓ Cooler ○ Box ○ Envelope ○ Other
3. Were custody seals on coolers? ○ Yes ✓ No
   Were they intact? ○ Yes ○ No ✓ N/A
   Were they signed and dated? ○ Yes ○ No ✓ N/A
   If yes, how many and where?
4. Packing Material: ○ Inserts ✓ Baggies ○ Bubble Wrap ○ Gel Packs ✓ Wet Ice ○ Sleeves ○ Other
5. Foreign or Regulated Soil? ○ Yes ○ No Location of Sampling:

Cooler Tracking Number	COC ID	Date Opened	Time Opened	Opened By	Temp. °C	Temp Blank?
NA		11/29/21	1210	CG	2.7	☒
						☐
						☐
						☐

6. Were custody papers properly filled out (ink, signed, dated, etc)? ✓ Yes ○ No
7. Did all bottles arrive in good condition (not broken, no signs of leakage)? ✓ Yes ○ No
8. Were all sample labels complete (i.e., sample ID, analysis, preservation, etc)? ✓ Yes ○ No
9. Were appropriate bottles/containers and volumes received for the requested tests? ✓ Yes ○ No
10. Did sample labels and tags agree with custody documents? ✓ Yes ○ No

Notes, Discrepancies, & Resolutions:

Service request Label:

10450 Stancliff Rd., Suite 210
Houston, TX 77099
T: +1 713 266 1599
F: +1 713 266 1599
www.alsglobal.com

SAMPLE ACCEPTANCE POLICY

This policy outlines the criteria samples must meet to be accepted by ALS Environmental – Houston HRMS.

Cooler Custody Seals (desirable, mandatory if specified in SAP):

- ✓ Intact on outside of cooler, signed and dated

Chain-of-Custody (COC) documentation (mandatory):

The following is required on each COC:

- ✓ Sample ID, the location, date and time of collection, collector's name, preservation type, sample type, and any other special remarks concerning the sampleThe COC must be completed in ink.
- ✓ Signature and date of relinquishing party.

In the absence of a COC at sample receipt, the COC will be requested from the client.

Sample Integrity (mandatory):

Samples are inspected upon arrival to ensure that sample integrity was not compromised during transfer to the laboratory.

- ✓ Sample containers must arrive in good condition (not broken or leaking).
- ✓ Samples must be labeled appropriately, including Sample IDs, and requested test using durable labels and indelible ink.
- ✓ The correct type of sample bottle must be used for the method requested.
- ✓ An appropriate sample volume, or weight, must be received.
- ✓ Sample IDs and number of containers must reconcile with the COC.
- ✓ Samples must be received within the method defined holding time.

Temperature Requirement (varies by sample matrix):

- ✓ Aqueous and Non-aqueous samples must be shipped and stored cold, at 0 to 6ºC.
- ✓ Tissue samples must be shipped and stored frozen, at -20 to -10ºC.
- ✓ Air samples are shipped and stored cold, at 0 to 6ºC
- ✓ The sample temperature must be recorded on the COC

All cooler inspections are documented on the Cooler Receipt Form (CRF). A separate CRF is completed for each service request. Any samples not meeting the above criteria are noted on the CRF and the Project Manager notified. The Project Manager must resolve any sample integrity issues with the client prior to proceeding with the analysis. Such resolutions are documented in writing and filed with the project folder. Data associated with samples received outside of this acceptance policy will be qualified on the case narrative of the final report

Preparation Information Benchsheets

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

Preparation Information Benchsheet

Prep Run#: 373396 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
Team: Semivoa GCMS/JRODRIGUEZ **Prep Method:** Method **Prep Date/Time:** 1/27/21 10:26

#	Lab Code	Client ID	B#	Method /Test	pH	Cl	Matrix	Amt. Ext.	Sample Description
1	E2100082-001	16WW13-210122	.01	6850/ClO4 DOD			Ground Water	10mL	
2	E2100082-002	16RW02-210122	.01	6850/ClO4 DOD			Ground Water	10mL	
3	E2100082-003	16RW01-210122	.01	6850/ClO4 DOD			Ground Water	10mL	
4	E2100082-004	16PM09-210122	.01	6850/ClO4 DOD			Ground Water	10mL	
5	E2100082-005	16PM02-210122	.01	6850/ClO4 DOD			Ground Water	10mL	
6	E2100082-006	16PM03-210122	.01	6850/ClO4 DOD			Ground Water	10mL	
7	E2100082-007	16RW07-210122	.01	6850/ClO4 DOD			Ground Water	10mL	
8	E2100082-008	16RW06-210122	.01	6850/ClO4 DOD			Ground Water	10mL	
9	E2100082-009	16WW14-210122	.01	6850/ClO4 DOD			Ground Water	10mL	
10	E2100082-010	16WW44-210122	.01	6850/ClO4 DOD			Ground Water	10mL	
11	E2100084-001	16WW56-210125	.01	6850/ClO4 DOD			Ground Water	10mL	
12	E2100084-002	16WW22-210125	.01	6850/ClO4 DOD			Ground Water	10mL	
13	E2100084-003	16WW41-210125	.01	6850/ClO4 DOD			Ground Water	10mL	
14	E2100084-004	16EW01-210125	.01	6850/ClO4 DOD			Ground Water	10mL	
15	EQ2100035-01	MB		6850/ClO4 DOD			Liquid	10mL	
16	EQ2100035-02	LCS		6850/ClO4 DOD			Liquid	10mL	
17	EQ2100035-03	DLCS		6850/ClO4 DOD			Liquid	10mL	

Spiking Solutions

Name: Perchlorate Intermediate Stock1 Inventory ID 214035 Logbook Ref: Perchlorate Expires On: 05/23/2021

EQ2100035-02 1.00µL EQ2100035-03 1.00µL

Name: Perchlorate Internal Standard 1ug/mL Inventory ID 214820 Logbook Ref: Perchlorate Internal Standard Expires On: 07/03/2021

E2100084-001 100.00µL E2100084-002 100.00µL E2100084-003 100.00µL E2100084-004 100.00µL EQ2100035-01 100.00µL EQ2100035-02 100.00µL
EQ2100035-03 100.00µL

Preparation Steps

Step: Preparation
Started: 1/27/21 10:26
Finished: 1/27/21 11:00
By: GRIVERA
Comments

Preparation Information Benchsheet

Prep Run#: 373396
Team: Semivoa GCMS/JRODRIGUEZ

Prep WorkFlow: GenExt28Day
Prep Method: Method

Status: Prepped
Prep Date/Time: 1/27/21 10:26

Comments:

Reviewed By: GR Date: 1/27/21

Chain of Custody

Relinquished By: Date:

Received By: Date:

Extracts Examined
Yes No

Analytical Results

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100082
Project:	HS21010919	**Date Collected:**	1/22/21 0930
Sample Matrix:	Ground Water	**Date Received:**	1/25/21
Sample Name:	16WW13-210122	**Units:**	µg/L
Lab Code:	E2100082-001	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	1/27/21	1/29/21 16:56	373396	711656	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100082
Project:	HS21010919	**Date Collected:**	1/22/21 1020
Sample Matrix:	Ground Water	**Date Received:**	1/25/21
Sample Name:	16RW02-210122	**Units:**	µg/L
Lab Code:	E2100082-002	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	1/27/21	1/29/21 17:04	373396	711656	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100082
Project:	HS21010919	**Date Collected:**	1/22/21 1132
Sample Matrix:	Ground Water	**Date Received:**	1/25/21
Sample Name:	16RW01-210122	**Units:**	µg/L
Lab Code:	E2100082-003	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	1/27/21	1/29/21 17:12	373396	711656	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100082
Project:	HS21010919	**Date Collected:**	1/22/21 1240
Sample Matrix:	Ground Water	**Date Received:**	1/25/21
Sample Name:	16PM09-210122	**Units:**	µg/L
Lab Code:	E2100082-004	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	1/27/21	1/29/21 17:20	373396	711656	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100082
Project:	HS21010919	**Date Collected:**	1/22/21 1326
Sample Matrix:	Ground Water	**Date Received:**	1/25/21
Sample Name:	16PM02-210122	**Units:**	µg/L
Lab Code:	E2100082-005	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	1/27/21	1/29/21 17:28	373396	711656	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100082
Project:	HS21010919	**Date Collected:**	1/22/21 1415
Sample Matrix:	Ground Water	**Date Received:**	1/25/21
Sample Name:	16PM03-210122	**Units:**	µg/L
Lab Code:	E2100082-006	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**330**		1.00	0.500	0.250	10	1/27/21	1/29/21 17:36	373396	711656	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100082
Project:	HS21010919	**Date Collected:**	1/22/21 1452
Sample Matrix:	Ground Water	**Date Received:**	1/25/21
Sample Name:	16RW07-210122	**Units:**	µg/L
Lab Code:	E2100082-007	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.638**		0.500	0.250	0.125	5	1/27/21	1/29/21 17:44	373396	711656	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100082
Project:	HS21010919	**Date Collected:**	1/22/21 1537
Sample Matrix:	Ground Water	**Date Received:**	1/25/21
Sample Name:	16RW06-210122	**Units:**	µg/L
Lab Code:	E2100082-008	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.500	0.250	0.125	5	1/27/21	1/29/21 17:52	373396	711656	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100082
Project:	HS21010919	**Date Collected:**	1/22/21 1616
Sample Matrix:	Ground Water	**Date Received:**	1/25/21
Sample Name:	16WW14-210122	**Units:**	µg/L
Lab Code:	E2100082-009	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	1/27/21	1/29/21 17:59	373396	711656	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100082
Project:	HS21010919	**Date Collected:**	1/22/21 1705
Sample Matrix:	Ground Water	**Date Received:**	1/25/21
Sample Name:	16WW44-210122	**Units:**	µg/L
Lab Code:	E2100082-010	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	1/27/21	1/29/21 18:07	373396	711656	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100082
Project:	HS21010919	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	µg/L
Lab Code:	EQ2100035-01	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	1/27/21	1/29/21 15:36	373396	711564	

Accuracy & Precision

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2100082
Project:	HS21010919	**Date Analyzed:**	1/29/21
Sample Matrix:	Ground Water		

Lab Control Sample Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method:	6850	**Units:**	µg/L
Prep Method:	Method	**Basis:**	NA
		Extraction Lot:	373396

	Lab Control Sample EQ2100035-02			Duplicate Lab Control Sample EQ2100035-03					
Analyte Name	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Perchlorate	0.0842	0.100	84	0.0987	0.100	99	84 - 119	16 *	15

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

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

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100082
Project:	HS21010919	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2100035-02	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.0842**	J	0.100	0.0500	0.0250	1	1/27/21	1/29/21 15:44	373396	711564	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100082
Project:	HS21010919	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Duplicate Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2100035-03	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.0987**	J	0.100	0.0500	0.0250	1	1/27/21	1/29/21 15:52	373396	711564	

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

February 11, 2021

Susan Huang
Aptim Environmental & Infrastucture, Inc.
2500 City West Blvd., Suite 1700
Houston, TX 77042

Work Order: **HS21010984**

Laboratory Results for: **LHAAP 16 January 2021**

Dear Susan Huang,

ALS Environmental received 5 sample(s) on Jan 26, 2021 for the analysis presented in the following report.

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

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

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

Sincerely,

Generated By: JUMOKE.LAWAL

RJ Modashia
Project Manager

ALS Houston, US Date: 11-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
Work Order: HS21010984

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS21010984-01	16LHAAP-210125-TB4	Water	CG-121520 -121	25-Jan-2021 07:30	26-Jan-2021 11:20	☐
HS21010984-02	16WW56-210125	Groundwater		25-Jan-2021 08:53	26-Jan-2021 11:20	☐
HS21010984-03	16WW22-210125	Groundwater		25-Jan-2021 11:40	26-Jan-2021 11:20	☐
HS21010984-04	16WW41-210125	Groundwater		25-Jan-2021 12:47	26-Jan-2021 11:20	☐
HS21010984-05	16EW01-210125	Groundwater		25-Jan-2021 14:02	26-Jan-2021 11:20	☐

ALS Houston, US Date: 11-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
Work Order: HS21010984

CASE NARRATIVE

Work Order Comments

- The analysis for Methane, Methene, Ethane and CO2 by RSK175 was subcontracted to ALS Simi Valley, CA. Final report attached.

Work Order Comments

- The analysis for Perchlorate was subcontracted to ALS Houston High-Res Lab. Final report attached.

  The analysis for TOC was subcontracted to ALS Kelso, WA. Final report attached.

GCMS Volatiles by Method SW8260

Batch ID: R377314

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

WetChemistry by Method SW9056

Batch ID: R376993

Sample ID: 16EW01-210125 (HS21010984-05)

- Sample ran at 5X due to high concentration of sulfate

Sample ID: 16WW22-210125 (HS21010984-03)

- Sample ran at 2X due to high concentration of Chloride

Sample ID: 16WW41-210125 (HS21010984-04)

- Sample ran at 5X due to high concentration of sulfate

Sample ID: 16WW56-210125 (HS21010984-02)

- Sample ran at 2X due to high concentration of Chloride

Batch ID: R377777

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

WetChemistry by Method SM2320B

Batch ID: R376964

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

ALS Houston, US Date: 11-Feb-21

Client:	Aptim Environmental & Infrastucture, Inc.	**ANALYTICAL REPORT**
Project:	LHAAP 16 January 2021	WorkOrder:HS21010984
Sample ID:	16LHAAP-210125-TB4	Lab ID:HS21010984-01
Collection Date:	25-Jan-2021 07:30	Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	02-Feb-2021 06:23
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	02-Feb-2021 06:23
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	02-Feb-2021 06:23
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	02-Feb-2021 06:23
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	02-Feb-2021 06:23
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	02-Feb-2021 06:23
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	02-Feb-2021 06:23
Surr: 1,2-Dichloroethane-d4	*95.9*			**0**	*81-118*	*%REC*	*1*	*02-Feb-2021 06:23*
Surr: 4-Bromofluorobenzene	*103*			**0**	*85-114*	*%REC*	*1*	*02-Feb-2021 06:23*
Surr: Dibromofluoromethane	*96.9*			**0**	*80-119*	*%REC*	*1*	*02-Feb-2021 06:23*
Surr: Toluene-d8	*99.7*			**0**	*89-112*	*%REC*	*1*	*02-Feb-2021 06:23*

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

ALS Houston, US Date: 11-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
Sample ID: 16WW56-210125
Collection Date: 25-Jan-2021 08:53

ANALYTICAL REPORT
WorkOrder:HS21010984
Lab ID:HS21010984-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	02-Feb-2021 06:44
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	02-Feb-2021 06:44
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	02-Feb-2021 06:44
cis-1,2-Dichloroethene	**3.7**		**0.20**	**0.50**	**1.0**	**ug/L**	1	02-Feb-2021 06:44
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	02-Feb-2021 06:44
Trichloroethene	**29**		**0.20**	**0.50**	**1.0**	**ug/L**	1	02-Feb-2021 06:44
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	02-Feb-2021 06:44
Surr: 1,2-Dichloroethane-d4	*96.5*			**0**	*81-118*	*%REC*	*1*	*02-Feb-2021 06:44*
Surr: 4-Bromofluorobenzene	*102*			**0**	*85-114*	*%REC*	*1*	*02-Feb-2021 06:44*
Surr: Dibromofluoromethane	*98.2*			**0**	*80-119*	*%REC*	*1*	*02-Feb-2021 06:44*
Surr: Toluene-d8	*102*			**0**	*89-112*	*%REC*	*1*	*02-Feb-2021 06:44*
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: TH
Alkalinity, Total (As CaCO3)	**188**	a	**5.00**	**5.00**	**5.00**	**mg/L**	1	27-Jan-2021 00:44
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**5.10**		**0.0600**	**0.200**	**0.200**	**mg/L**	2	26-Jan-2021 19:43
Nitrogen, Nitrate (As N)	**0.213**		**0.0600**	**0.200**	**0.200**	**mg/L**	2	26-Jan-2021 19:43
Sulfate	**252**		**4.00**	**10.0**	**10.0**	**mg/L**	20	08-Feb-2021 19:05
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	31-Jan-2021 13:28
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	05-Feb-2021 16:56
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	11-Feb-2021 12:44

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

ALS Houston, US Date: 11-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
Sample ID: 16WW22-210125
Collection Date: 25-Jan-2021 11:40

ANALYTICAL REPORT
WorkOrder:HS21010984
Lab ID:HS21010984-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	02-Feb-2021 07:05
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	02-Feb-2021 07:05
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	02-Feb-2021 07:05
cis-1,2-Dichloroethene	**3.2**		**0.20**	**0.50**	**1.0**	**ug/L**	1	02-Feb-2021 07:05
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	02-Feb-2021 07:05
Trichloroethene	**30**		**0.20**	**0.50**	**1.0**	**ug/L**	1	02-Feb-2021 07:05
Vinyl chloride	**0.49**	J	**0.20**	**0.50**	**1.0**	**ug/L**	1	02-Feb-2021 07:05
Surr: 1,2-Dichloroethane-d4	*94.8*			**0**	*81-118*	*%REC*	*1*	*02-Feb-2021 07:05*
Surr: 4-Bromofluorobenzene	*103*			**0**	*85-114*	*%REC*	*1*	*02-Feb-2021 07:05*
Surr: Dibromofluoromethane	*95.6*			**0**	*80-119*	*%REC*	*1*	*02-Feb-2021 07:05*
Surr: Toluene-d8	*102*			**0**	*89-112*	*%REC*	*1*	*02-Feb-2021 07:05*
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: TH
Alkalinity, Total (As CaCO3)	**200**	a	**5.00**	**5.00**	**5.00**	**mg/L**	1	27-Jan-2021 00:50
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**5.54**		**0.0600**	**0.200**	**0.200**	**mg/L**	2	26-Jan-2021 20:01
Nitrogen, Nitrate (As N)	**0.186**	J	**0.0600**	**0.200**	**0.200**	**mg/L**	2	26-Jan-2021 20:01
Sulfate	**307**		**4.00**	**10.0**	**10.0**	**mg/L**	20	08-Feb-2021 19:23
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	31-Jan-2021 13:28
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	05-Feb-2021 16:56
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	11-Feb-2021 12:44

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

ALS Houston, US Date: 11-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
Sample ID: 16WW41-210125
Collection Date: 25-Jan-2021 12:47

ANALYTICAL REPORT
WorkOrder:HS21010984
Lab ID:HS21010984-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	10	U	3.0	10	10	ug/L	10	02-Feb-2021 07:26
1,1-Dichloroethene	**20**		**2.0**	**5.0**	**10**	**ug/L**	10	02-Feb-2021 07:26
1,2-Dichloroethane	5.0	U	2.0	5.0	10	ug/L	10	02-Feb-2021 07:26
cis-1,2-Dichloroethene	**2,400**		**20**	**50**	**100**	**ug/L**	100	02-Feb-2021 07:47
Methylene chloride	20	U	4.0	20	20	ug/L	10	02-Feb-2021 07:26
Trichloroethene	**5,400**		**20**	**50**	**100**	**ug/L**	100	02-Feb-2021 07:47
Vinyl chloride	**340**		**2.0**	**5.0**	**10**	**ug/L**	10	02-Feb-2021 07:26
Surr: 1,2-Dichloroethane-d4	*96.9*			**0**	*81-118*	*%REC*	*100*	*02-Feb-2021 07:47*
Surr: 1,2-Dichloroethane-d4	*98.7*			**0**	*81-118*	*%REC*	*10*	*02-Feb-2021 07:26*
Surr: 4-Bromofluorobenzene	*102*			**0**	*85-114*	*%REC*	*10*	*02-Feb-2021 07:26*
Surr: 4-Bromofluorobenzene	*102*			**0**	*85-114*	*%REC*	*100*	*02-Feb-2021 07:47*
Surr: Dibromofluoromethane	*98.1*			**0**	*80-119*	*%REC*	*10*	*02-Feb-2021 07:26*
Surr: Dibromofluoromethane	*97.5*			**0**	*80-119*	*%REC*	*100*	*02-Feb-2021 07:47*
Surr: Toluene-d8	*101*			**0**	*89-112*	*%REC*	*10*	*02-Feb-2021 07:26*
Surr: Toluene-d8	*102*			**0**	*89-112*	*%REC*	*100*	*02-Feb-2021 07:47*
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: TH
Alkalinity, Total (As CaCO3)	**1,010**	a	**5.00**	**5.00**	**5.00**	**mg/L**	1	27-Jan-2021 01:16
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	1.00	U	0.300	1.00	1.00	mg/L	10	08-Feb-2021 19:41
Nitrogen, Nitrate (As N)	0.500	U	0.150	0.500	0.500	mg/L	5	26-Jan-2021 20:19
Sulfate	**9,300**		**100**	**250**	**250**	**mg/L**	500	08-Feb-2021 20:00
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	31-Jan-2021 13:28
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	05-Feb-2021 16:56
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	11-Feb-2021 12:44

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

ALS Houston, US Date: 11-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
Sample ID: 16EW01-210125
Collection Date: 25-Jan-2021 14:02

ANALYTICAL REPORT
WorkOrder:HS21010984
Lab ID:HS21010984-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	10	U	3.0	10	10	ug/L	10	02-Feb-2021 08:08
1,1-Dichloroethene	**24**		**2.0**	**5.0**	**10**	**ug/L**	10	02-Feb-2021 08:08
1,2-Dichloroethane	**16**		**2.0**	**5.0**	**10**	**ug/L**	10	02-Feb-2021 08:08
cis-1,2-Dichloroethene	**7,200**		**20**	**50**	**100**	**ug/L**	100	02-Feb-2021 08:29
Methylene chloride	20	U	4.0	20	20	ug/L	10	02-Feb-2021 08:08
Trichloroethene	**4,100**		**20**	**50**	**100**	**ug/L**	100	02-Feb-2021 08:29
Vinyl chloride	**820**		**2.0**	**5.0**	**10**	**ug/L**	10	02-Feb-2021 08:08
Surr: 1,2-Dichloroethane-d4	*97.8*			**0**	*81-118*	*%REC*	*10*	*02-Feb-2021 08:08*
Surr: 1,2-Dichloroethane-d4	*95.8*			**0**	*81-118*	*%REC*	*100*	*02-Feb-2021 08:29*
Surr: 4-Bromofluorobenzene	*104*			**0**	*85-114*	*%REC*	*10*	*02-Feb-2021 08:08*
Surr: 4-Bromofluorobenzene	*102*			**0**	*85-114*	*%REC*	*100*	*02-Feb-2021 08:29*
Surr: Dibromofluoromethane	*95.7*			**0**	*80-119*	*%REC*	*10*	*02-Feb-2021 08:08*
Surr: Dibromofluoromethane	*96.5*			**0**	*80-119*	*%REC*	*100*	*02-Feb-2021 08:29*
Surr: Toluene-d8	*98.5*			**0**	*89-112*	*%REC*	*10*	*02-Feb-2021 08:08*
Surr: Toluene-d8	*101*			**0**	*89-112*	*%REC*	*100*	*02-Feb-2021 08:29*
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: TH
Alkalinity, Total (As CaCO3)	**891**	a	**5.00**	**5.00**	**5.00**	**mg/L**	1	27-Jan-2021 01:25
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**13.5**		**0.300**	**1.00**	**1.00**	**mg/L**	10	08-Feb-2021 20:18
Nitrogen, Nitrate (As N)	**1.46**		**0.150**	**0.500**	**0.500**	**mg/L**	5	26-Jan-2021 20:37
Sulfate	**4,270**		**100**	**250**	**250**	**mg/L**	500	08-Feb-2021 21:48
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	31-Jan-2021 13:28
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	05-Feb-2021 16:56
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	11-Feb-2021 12:44

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

ALS Houston, US Date: 11-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
WorkOrder: HS21010984

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R376964 (0)	**Test Name :** ALKALINITY BY SM2320B				**Matrix:** Groundwater	
HS21010984-02	16WW56-210125	25 Jan 2021 08:53			27 Jan 2021 00:44	1
HS21010984-03	16WW22-210125	25 Jan 2021 11:40			27 Jan 2021 00:50	1
HS21010984-04	16WW41-210125	25 Jan 2021 12:47			27 Jan 2021 01:16	1
HS21010984-05	16EW01-210125	25 Jan 2021 14:02			27 Jan 2021 01:25	1
Batch ID: R376993 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Groundwater	
HS21010984-02	16WW56-210125	25 Jan 2021 08:53			26 Jan 2021 19:43	2
HS21010984-03	16WW22-210125	25 Jan 2021 11:40			26 Jan 2021 20:01	2
HS21010984-04	16WW41-210125	25 Jan 2021 12:47			26 Jan 2021 20:19	5
HS21010984-05	16EW01-210125	25 Jan 2021 14:02			26 Jan 2021 20:37	5
Batch ID: R377212 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** Groundwater	
HS21010984-02	16WW56-210125	25 Jan 2021 08:53			31 Jan 2021 13:28	1
HS21010984-03	16WW22-210125	25 Jan 2021 11:40			31 Jan 2021 13:28	1
HS21010984-04	16WW41-210125	25 Jan 2021 12:47			31 Jan 2021 13:28	1
HS21010984-05	16EW01-210125	25 Jan 2021 14:02			31 Jan 2021 13:28	1
Batch ID: R377314 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS21010984-02	16WW56-210125	25 Jan 2021 08:53			02 Feb 2021 06:44	1
HS21010984-03	16WW22-210125	25 Jan 2021 11:40			02 Feb 2021 07:05	1
HS21010984-04	16WW41-210125	25 Jan 2021 12:47			02 Feb 2021 07:47	100
HS21010984-04	16WW41-210125	25 Jan 2021 12:47			02 Feb 2021 07:26	10
HS21010984-05	16EW01-210125	25 Jan 2021 14:02			02 Feb 2021 08:29	100
HS21010984-05	16EW01-210125	25 Jan 2021 14:02			02 Feb 2021 08:08	10
Batch ID: R377314 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS21010984-01	16LHAAP-210125-TB4	25 Jan 2021 07:30			02 Feb 2021 06:23	1
Batch ID: R377635 (0)	**Test Name :** SUBCONTRACT ANALYSIS - RSK				**Matrix:** Groundwater	
HS21010984-02	16WW56-210125	25 Jan 2021 08:53			05 Feb 2021 16:56	1
HS21010984-03	16WW22-210125	25 Jan 2021 11:40			05 Feb 2021 16:56	1
HS21010984-04	16WW41-210125	25 Jan 2021 12:47			05 Feb 2021 16:56	1
HS21010984-05	16EW01-210125	25 Jan 2021 14:02			05 Feb 2021 16:56	1
Batch ID: R377777 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Groundwater	
HS21010984-02	16WW56-210125	25 Jan 2021 08:53			08 Feb 2021 19:05	20
HS21010984-03	16WW22-210125	25 Jan 2021 11:40			08 Feb 2021 19:23	20
HS21010984-04	16WW41-210125	25 Jan 2021 12:47			08 Feb 2021 20:00	500
HS21010984-04	16WW41-210125	25 Jan 2021 12:47			08 Feb 2021 19:41	10
HS21010984-05	16EW01-210125	25 Jan 2021 14:02			08 Feb 2021 21:48	500
HS21010984-05	16EW01-210125	25 Jan 2021 14:02			08 Feb 2021 20:18	10

ALS Houston, US Date: 11-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
WorkOrder: HS21010984

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R377953 (0)	**Test Name :** SUBCONTRACT ANALYSIS - TOC ANALYSIS				**Matrix:** Groundwater	
HS21010984-02	16WW56-210125	25 Jan 2021 08:53			11 Feb 2021 12:44	1
HS21010984-03	16WW22-210125	25 Jan 2021 11:40			11 Feb 2021 12:44	1
HS21010984-04	16WW41-210125	25 Jan 2021 12:47			11 Feb 2021 12:44	1
HS21010984-05	16EW01-210125	25 Jan 2021 14:02			11 Feb 2021 12:44	1

ALS Houston, US Date: 11-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
WorkOrder: HS21010984

QC BATCH REPORT

Batch ID: R377314 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-210201** Units: **ug/L** Analysis Date: **02-Feb-2021 00:25**
Client ID: Run ID: **VOA6_377314** SeqNo: **5939732** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	1.0	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
Methylene chloride	2.0	2.0								U
Trichloroethene	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*47.51*	*1.0*	*50*	*0*	*95.0*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*51.41*	*1.0*	*50*	*0*	*103*	*85 - 114*				
Surr: Dibromofluoromethane	*48.22*	*1.0*	*50*	*0*	*96.4*	*80 - 119*				
Surr: Toluene-d8	*51.06*	*1.0*	*50*	*0*	*102*	*89 - 112*				

LCS Sample ID: **VLCSW-210201** Units: **ug/L** Analysis Date: **01-Feb-2021 23:21**
Client ID: Run ID: **VOA6_377314** SeqNo: **5939731** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	19.78	1.0	20	0	98.9	80 - 119				
1,1-Dichloroethene	17.55	1.0	20	0	87.8	71 - 131				
1,2-Dichloroethane	18.63	1.0	20	0	93.2	73 - 128				
cis-1,2-Dichloroethene	20.07	1.0	20	0	100	78 - 123				
Methylene chloride	20.31	2.0	20	0	102	74 - 124				
Trichloroethene	19.79	1.0	20	0	98.9	79 - 123				
Vinyl chloride	18.11	1.0	20	0	90.5	58 - 137				
Surr: 1,2-Dichloroethane-d4	*51.38*	*1.0*	*50*	*0*	*103*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.79*	*1.0*	*50*	*0*	*102*	*85 - 114*				
Surr: Dibromofluoromethane	*52.17*	*1.0*	*50*	*0*	*104*	*80 - 119*				
Surr: Toluene-d8	*47.69*	*1.0*	*50*	*0*	*95.4*	*89 - 112*				

ALS Houston, US Date: 11-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
WorkOrder: HS21010984

QC BATCH REPORT

Batch ID: R377314 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS21011006-06MS** Units: **ug/L** Analysis Date: **02-Feb-2021 04:16**
Client ID: Run ID: **VOA6_377314** SeqNo: **5939743** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	17.96	1.0	20	0	89.8	80 - 119				
1,1-Dichloroethene	16.52	1.0	20	0	82.6	71 - 131				
1,2-Dichloroethane	17.09	1.0	20	0	85.5	73 - 128				
cis-1,2-Dichloroethene	17.79	1.0	20	0	89.0	78 - 123				
Methylene chloride	17.03	2.0	20	0	85.1	74 - 124				
Trichloroethene	23.89	1.0	20	4.848	95.2	79 - 123				
Vinyl chloride	12.65	1.0	20	0	63.2	58 - 137				
Surr: 1,2-Dichloroethane-d4	*47.9*	*1.0*	*50*	*0*	*95.8*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.6*	*1.0*	*50*	*0*	*101*	*85 - 114*				
Surr: Dibromofluoromethane	*48.05*	*1.0*	*50*	*0*	*96.1*	*80 - 119*				
Surr: Toluene-d8	*49.41*	*1.0*	*50*	*0*	*98.8*	*89 - 112*				

MSD Sample ID: **HS21011006-06MSD** Units: **ug/L** Analysis Date: **02-Feb-2021 04:37**
Client ID: Run ID: **VOA6_377314** SeqNo: **5939744** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	18.08	1.0	20	0	90.4	80 - 119	17.96	0.698	20	
1,1-Dichloroethene	15.25	1.0	20	0	76.3	71 - 131	16.52	7.99	20	
1,2-Dichloroethane	17.08	1.0	20	0	85.4	73 - 128	17.09	0.0928	20	
cis-1,2-Dichloroethene	17.2	1.0	20	0	86.0	78 - 123	17.79	3.38	20	
Methylene chloride	16.77	2.0	20	0	83.8	74 - 124	17.03	1.54	20	
Trichloroethene	23.18	1.0	20	4.848	91.7	79 - 123	23.89	3.02	20	
Vinyl chloride	11.73	1.0	20	0	58.7	58 - 137	12.65	7.5	20	
Surr: 1,2-Dichloroethane-d4	*47.17*	*1.0*	*50*	*0*	*94.3*	*81 - 118*	*47.9*	*1.55*	*20*	
Surr: 4-Bromofluorobenzene	*51.02*	*1.0*	*50*	*0*	*102*	*85 - 114*	*50.6*	*0.814*	*20*	
Surr: Dibromofluoromethane	*48.22*	*1.0*	*50*	*0*	*96.4*	*80 - 119*	*48.05*	*0.34*	*20*	
Surr: Toluene-d8	*49.78*	*1.0*	*50*	*0*	*99.6*	*89 - 112*	*49.41*	*0.756*	*20*	

The following samples were analyzed in this batch: HS21010984-01 HS21010984-02 HS21010984-03 HS21010984-04 HS21010984-05

ALS Houston, US Date: 11-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
WorkOrder: HS21010984

QC BATCH REPORT

Batch ID: R376964 (0) **Instrument: ManTech01** **Method: ALKALINITY BY SM2320B**

MBLK Sample ID: **WBLKW2-210126** Units: **mg/L** Analysis Date: **26-Jan-2021 22:41**
Client ID: Run ID: **ManTech01_376964** SeqNo: **5931726** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	5.00	5.00								U

LCS Sample ID: **LCS2-210126** Units: **mg/L** Analysis Date: **26-Jan-2021 22:20**
Client ID: Run ID: **ManTech01_376964** SeqNo: **5931723** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	1015	5.00	1000	0	101	85 - 115				

LCSD Sample ID: **LCSD2-210126** Units: **mg/L** Analysis Date: **26-Jan-2021 22:51**
Client ID: Run ID: **ManTech01_376964** SeqNo: **5931727** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	1019	5.00	1000	0	102	85 - 115	1015	0.47	20	

DUP Sample ID: **HS21010960-02DUP** Units: **mg/L** Analysis Date: **26-Jan-2021 23:05**
Client ID: Run ID: **ManTech01_376964** SeqNo: **5931729** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	635.3	5.00					634.3	0.164	20	

The following samples were analyzed in this batch: HS21010984-02 HS21010984-03 HS21010984-04 HS21010984-05

ALS Houston, US Date: 11-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
WorkOrder: HS21010984

QC BATCH REPORT

Batch ID: R376993 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY SW9056A**

MBLK Sample ID: **MBLK-012621** Units: **mg/L** Analysis Date: **26-Jan-2021 15:48**
Client ID: Run ID: **ICS-Integrion_376993** SeqNo: **5932699** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	0.100	0.100								U
Nitrogen, Nitrate (As N)	0.100	0.100								U

LCS Sample ID: **LCS-012621** Units: **mg/L** Analysis Date: **26-Jan-2021 16:06**
Client ID: Run ID: **ICS-Integrion_376993** SeqNo: **5932700** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.657	0.100	4	0	91.4	80 - 120				
Nitrogen, Nitrate (As N)	3.827	0.100	4	0	95.7	80 - 120				

MS Sample ID: **HS21010960-02MS** Units: **mg/L** Analysis Date: **26-Jan-2021 18:31**
Client ID: Run ID: **ICS-Integrion_376993** SeqNo: **5932735** PrepDate: DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	15.64	0.500	10	6.885	87.5	80 - 120				
Nitrogen, Nitrate (As N)	10.2	0.500	10	0.375	98.2	80 - 120				

MSD Sample ID: **HS21010960-02MSD** Units: **mg/L** Analysis Date: **26-Jan-2021 18:49**
Client ID: Run ID: **ICS-Integrion_376993** SeqNo: **5932706** PrepDate: DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	15.29	0.500	10	6.885	84.0	80 - 120	15.64	2.26	20	
Nitrogen, Nitrate (As N)	10.26	0.500	10	0.375	98.8	80 - 120	10.2	0.548	20	

The following samples were analyzed in this batch: HS21010984-02 HS21010984-03 HS21010984-04 HS21010984-05

ALS Houston, US Date: 11-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
WorkOrder: HS21010984

QC BATCH REPORT

Batch ID: R377777 (0) **Instrument:** ICS-Integrion **Method:** ANIONS BY SW9056A

MBLK Sample ID: **MBLK-** Units: **mg/L** Analysis Date: **08-Feb-2021 10:22**
Client ID: Run ID: **ICS-Integrion_377777** SeqNo: **5950074** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	0.100	0.100								U
Sulfate	0.500	0.500								U

LCS Sample ID: **LCS-** Units: **mg/L** Analysis Date: **08-Feb-2021 10:58**
Client ID: Run ID: **ICS-Integrion_377777** SeqNo: **5950075** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.615	0.100	4	0	90.4	80 - 120				
Sulfate	19.26	0.500	20	0	96.3	80 - 120				

MS Sample ID: **HS21010984-05MS** Units: **mg/L** Analysis Date: **08-Feb-2021 22:06**
Client ID: **16EW01-210125** Run ID: **ICS-Integrion_377777** SeqNo: **5950088** PrepDate: DF: **500**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	909.9	50.0	1000	77.6	83.2	80 - 120				
Sulfate	9436	250	5000	4268	103	80 - 120				

MSD Sample ID: **HS21010984-05MSD** Units: **mg/L** Analysis Date: **08-Feb-2021 22:24**
Client ID: **16EW01-210125** Run ID: **ICS-Integrion_377777** SeqNo: **5950089** PrepDate: DF: **500**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	911.3	50.0	1000	77.6	83.4	80 - 120	909.9	0.154	20	
Sulfate	8972	250	5000	4268	94.1	80 - 120	9436	5.04	20	

The following samples were analyzed in this batch: HS21010984-02 HS21010984-03 HS21010984-04 HS21010984-05

ALS Houston, US Date: 11-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
WorkOrder: **HS21010984**

QUALIFIERS, ACRONYMS, UNITS

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

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

ALS Houston, US Date: 11-Feb-21

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	20-030-0	26-Mar-2021
California	2919, 2020-2021	30-Apr-2021
Dept of Defense	PJLA L20-507	22-Dec-2021
Florida	E87611-30-07/01/2020	30-Jun-2021
Illinois	2000322020-4	09-May-2021
Kansas	E-10352 2020-2021	31-Jul-2021
Kentucky	123043, 2020-2021	30-Apr-2021
Louisiana	03087, 2020-2021	30-Jun-2021
North Carolina	624-2021	31-Dec-2021
North Dakota	R-193 2020-2021	30-Apr-2021
Oklahoma	2020-165	31-Aug-2021
Texas	T104704231-20-26	30-Apr-2021

ALS Houston, US Date: 11-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
Work Order: HS21010984

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS21010984-01	16LHAAP-210125-TB4	Login	1/26/2021 4:51:52 PM	PMG	VOA212
HS21010984-02	16WW56-210125	Login	1/26/2021 4:51:52 PM	PMG	WET134
HS21010984-02	16WW56-210125	Login	1/26/2021 4:51:52 PM	PMG	Sub
HS21010984-02	16WW56-210125	Login	1/26/2021 4:51:52 PM	PMG	VOA212
HS21010984-02	16WW56-210125	Login	1/26/2021 4:51:52 PM	PMG	Sub
HS21010984-02	16WW56-210125	Login	1/26/2021 4:51:52 PM	PMG	Sub
HS21010984-03	16WW22-210125	Login	1/26/2021 4:51:52 PM	PMG	WET134
HS21010984-03	16WW22-210125	Login	1/26/2021 4:51:52 PM	PMG	Sub
HS21010984-03	16WW22-210125	Login	1/26/2021 4:51:52 PM	PMG	VOA212
HS21010984-03	16WW22-210125	Login	1/26/2021 4:51:52 PM	PMG	Sub
HS21010984-03	16WW22-210125	Login	1/26/2021 4:51:52 PM	PMG	Sub
HS21010984-04	16WW41-210125	Login	1/26/2021 4:51:52 PM	PMG	WET134
HS21010984-04	16WW41-210125	Login	1/26/2021 4:51:52 PM	PMG	Sub
HS21010984-04	16WW41-210125	Login	1/26/2021 4:51:52 PM	PMG	VOA212
HS21010984-04	16WW41-210125	Login	1/26/2021 4:51:52 PM	PMG	Sub
HS21010984-04	16WW41-210125	Login	1/26/2021 4:51:52 PM	PMG	Sub
HS21010984-05	16EW01-210125	Login	1/26/2021 4:51:52 PM	PMG	WET134
HS21010984-05	16EW01-210125	Login	1/26/2021 4:51:52 PM	PMG	Sub
HS21010984-05	16EW01-210125	Login	1/26/2021 4:51:52 PM	PMG	VOA212
HS21010984-05	16EW01-210125	Login	1/26/2021 4:51:52 PM	PMG	Sub
HS21010984-05	16EW01-210125	Login	1/26/2021 4:51:52 PM	PMG	Sub

ALS Houston, US Date: 11-Feb-21

Sample Receipt Checklist

Work Order ID: HS21010984 **Date/Time Received:** **26-Jan-2021 11:20**

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

Completed By: /S/ Paresh M. Giga (eSignature) 26-Jan-2021 16:57 (Date/Time) **Reviewed by:** /S/ RJ Modashia (eSignature) 26-Jan-2021 19:25 (Date/Time)

Matrices: **GW/Water** Carrier name: **FedEx**

	Yes	No	Not Present
Shipping container/cooler in good condition?	☑	☐	☐
Custody seals intact on shipping container/cooler?	☑	☐	☐
Custody seals intact on sample bottles?	☐	☐	☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	☐	☐	☑
Chain of custody present?	☑	☐	1 Page(s)
Chain of custody signed when relinquished and received?	☑	☐	COC IDs:None
Samplers name present on COC?	☑	☐	
Chain of custody agrees with sample labels?	☑	☐	
Samples in proper container/bottle?	☑	☐	
Sample containers intact?	☑	☐	
Sufficient sample volume for indicated test?	☑	☐	
All samples received within holding time?	☑	☐	
Container/Temp Blank temperature in compliance?	☑	☐	

Temperature(s)/Thermometer(s):	0.8C U/c	IR31
Cooler(s)/Kit(s):	46045	
Date/Time sample(s) sent to storage:	1/26/2021 15:15	

	Yes	No	
Water - VOA vials have zero headspace?	☑	☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	☐	☐	N/A ☑
pH adjusted?	☐	☐	N/A ☑

pH adjusted by:

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd. Suite 210 Houston, TX 77099 (281) 530-5656 ATTN: R.J Modashia LHAAP 16 210125-ALS Page 1 of 1

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

Project No. 501032

Job: **LHAAP 16 January 2021**

Prepared By: Mike Martinez

P.O. Number

Analyses

Field Sample I.D. Time	Sample Matrix	Date /	MS / MSD	No. OF CONTAINERS	VOC by SW 8260B	TOC by SM5310C	MEE by RSK 175	Anions (bromide, sulfate, nitrate) by SW9056 and Alkalinity by SM2320	Bromide by SW9056	Perchlorate by SW6850	Metals (arsenic, chromium, manganese, nickel, thallium) by SW6020				Remarks (Preservatives, etc.)
16LHAAP-210125-TB4	LQ	01-25-21/ 0730		2	2										
16GW56-210125	GW	01-25-21/ 0853		10	3	2	3	1		1					
16GW22-210125	GW	01-25-21/ 1140		10	3	2	3	1		1					
16GW41-210125	GW	01-25-21/ 1247		10	3	2	3	1		1					
16EW01-210125	GW	01-25-21/ 1402		10	3	2	3	1		1					

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

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
[signature]	01-25-21	1458	J. Musumm	1/26/21	11:20						

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition
J. Musumm	1/26/21	11:20							

Remarks:
Cooler 46045 12231
Temp 0.8°C CFO

Aptim Environmental & Infrastructure, Inc.
LHAAP 16 January 2021
HS21010984

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

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5687

44650

CUSTODY SEAL
Date:
Time: 1520
Name:
Company:
Seal Broken By:
Date:

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5687

CUSTODY SEAL
Date: 1520
Name:
Company:
Seal Broken By:
Date:

FedEx
TRK# 9473 0838 9553
0221

TUE - 26 JAN AA
PRIORITY OVERNIGHT

AB SGRA

44650 77099
TX-US
IAH

January 31, 2021

Service Request No:E2100084

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

Laboratory Results for: HS21010984

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory January 26, 2021
For your reference, these analyses have been assigned our service request number **E2100084.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current TNI standards, where applicable, and except as noted in the laboratory case narrative provided. All results are intended to be considered in their entirety and ALS Environmental is not responsible for use of less than the complete final report. Results apply only to the items submitted to the laboratory, as received for analysis. In accordance with the current TNI Standard, a statement on the estimated uncertainty of measurement of any quantitative analysis will be supplied upon request.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Corey Grandits
Project Manager

ADDRESS 10450 Stancliff Rd., Suite 210, Houston, TX 77099
PHONE +1 281 530 5656 | FAX +1 281 530 5887
ALS Group USA, Corp.
dba ALS Environmental

Certificate of Analysis

ALS Environmental - Houston HRMS
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

ALS Environmental

Client:	ALS Houston	**Service Request No.:**	E2100084
Project:	HS21010984	**Date Received:**	01/26/21
Sample Matrix:	W		

CASE NARRATIVE

All analyses were performed in adherence to the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier II. When appropriate to the method, method blank results have been reported with each analytical test.

Sample Receipt

Four samples were received for analysis at ALS Environmental in Houston on 01/26/21.

The samples were received in good condition and are consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

Data Validation Notes and Discussion

Precision and Accuracy:

EQ2100035: Laboratory Control Spike/Duplicate Laboratory Control Spike (LCS/DLCS) samples were analyzed and reported in lieu of a MS/MSD for this extraction batch. The LCS/DLCS RPD was marginally above QC limit; the individual recoveries met acceptance criteria.

DoD Certification is held for the method/matrix/analytes provided in this report.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.

Use of ALS group USA Corp dba ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.

Client: ALS Environmental - US **Service Request:**E2100084
Project: HS21010984

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
E2100084-001	16WW56-210125	1/25/2021	0853
E2100084-002	16WW22-210125	1/25/2021	1140
E2100084-003	16WW41-210125	1/25/2021	1247
E2100084-004	16EW01-210125	1/25/2021	1402

Service Request Summary

Folder #: **E2100084**
Client Name: ALS Environmental - US
Project Name: HS21010984
Project Number:

Report To: RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Houston, TX 77099-4338
USA
Phone Number: 281-530-5656
Cell Number:
Fax Number: 281-530-5887
E-mail: rj.modashia@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 01/26/21
Internal Due Date: 2/9/2021
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS21010984
EDD: No EDD Specified

4 125 mL-Glass Bottle NM AMBER Teflon Liner Unpreserved
Location: EHRMS-WIC 4B
Pressure Gas:

Lab Samp No.	Client Samp No	Matrix	Collected	HOUSTON ClO4 DOD/6850
E2100084-001	16WW56-210125	Ground Water	01/25/21 0853	**IV**
E2100084-002	16WW22-210125	Ground Water	01/25/21 1140	**IV**
E2100084-003	16WW41-210125	Ground Water	01/25/21 1247	**IV**
E2100084-004	16EW01-210125	Ground Water	01/25/21 1402	**IV**

Service Request Summary

Folder #:	**E2100084**	Project Chemist:	Corey Grandits
Client Name:	ALS Environmental - US	Originating Lab:	HOUSTON
Project Name:	HS21010984	Logged By:	CGRANDITS
Project Number:		Date Received:	01/26/21
		Internal Due Date:	2/9/2021
Report To:	RJ Modashia	QAP:	LAB QAP
	ALS Laboratory Group	Qualifier Set:	Lab Standard
	10450 Stancliff Road	Formset:	Lab Standard
	Houston, TX 77099-4338 USA	Merged?:	Y
Phone Number:	281-530-5656	Report to MDL?:	Y
Cell Number:		P.O. Number:	HS21010984
Fax Number:	281-530-5887	EDD:	No EDD Specified
E-mail:	rj.modashia@alsglobal.com		

4 125 mL-Glass Bottle NM AMBER Teflon Liner Unpreserved

Location: EHRMS-WIC 4B

Pressure Gas:

Test Comments:

Group	Test/Method	Samples	Comments
Semivoa GCMS	ClO4 DOD/6850	4	II Due 2/9,IV due 2/16

Data Qualifiers

Lab Standard

+	Possible Tedlar bag artifact.
A	TIC is a suspected aldol-condensation product
B	Analyte found in the associated method blank as well as in the sample.
BC	Reported results are not blank corrected.
BH	The back section of the tube yielded higher results than the front.
BT	Results indicated possible breakthrough; back section >=10% front section.
C	Result identification confirmed.
D	Compound identified in an analysis at a secondary dilution factor
D	Spike was diluted out
DE	Reported results are corrected for desorption efficiency.
E	Estimated value. Concentration above calibration range
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
H1	Sample analysis performed past holding time. See case narrative.
H2	Initial analysis within holding time. Reanalysis for the required dilution was past holding time.
H3	Sample was received and analyzed past holding time.
H4	Sample was extracted past required extraction holding time, but analyzed within analysis holding time. See case narrative.
I	Internal standard not within the specified limits. See case narrative.
J	Estimated Value. Concentration found below MRL.
K	A deflection in the QC ion may indicate interference with the quantitation of this ion. The concentration of this analyte should be considered as an estimate.
K	Analyte was detected above the method reporting limit prior to normalization.
K	The reference ion ratio was outside acceptance criteria, which may indicate a potential bias to this result.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
L1	Laboratory control sample recovery outside the specified limits; results may be biased high.
L2	Laboratory control sample recovery outside the specified limits; results may be biased low.
L3	Laboratory control sample recovery outside the specified limits.
M	Matrix interference; results may be biased high.
M	The duplicate injection precision not met.
M1	Matrix interference due to coelution with a non-target compound; results may be biased high.
N	Presumptive evidence of a compound for TICs that have been identified based on a mass spectral library search.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.

Data Qualifiers

Lab Standard

O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
P	Indicates chlorodiphenyl ether interference present at the retention time of the target compound.
P	Pesticide/Aroclor target analyte > 40% difference for detected concentrations between GC columns
Q	Indicates as estimated value because the P and P + 2 theoretical abundance ratio does not meet method criteria.
R	Duplicate Precision not met.
R1	Duplicate precision not within the specified limits; however, the results are below the MRL and considered estimated.
S	Surrogate recovery not within specified limits.
S	The reported value was determined by the Method of Standard Additions (MSA).
T	Analyte is a tentatively identified compound, result is estimated.
U	Compound was analyzed for, but was not detected (ND).
V1	The continuing calibration verification standard was outside (biased high) the specified limits for this compound.
V2	The continuing calibration verification standard was outside (biased low) the specified limits for this compound.
W	Result quantified, but the corresponding peak was detected outside the generated retention time window.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
X	See case narrative.
Y	Recovery outside limits
Y	The chromatogram resembles a petroleum product but does not match the calibration standard.
Z	The chromatogram does not resemble a petroleum product.
i	The MRL/MDL has been elevated due to a matrix interference.

ALS Laboratory Group

Acronyms

Cal	Calibration
Conc	CONCentration
Dioxin(s)	Polychlorinated dibenzo-p-dioxin(s)
EDL	Estimated Detection Limit
EMPC	Estimated Maximum Possible Concentration
Flags	Data qualifiers
Furan(s)	Polychlorinated dibenzofuran(s)
g	Grams
ICAL	Initial CALibration
ID	IDentifier
Ions	Masses monitored for the analyte during data acquisition
L	Liter (s)
LCS	Laboratory Control Sample
DLCS	Duplicate Laboratory Control Sample
MB	Method Blank
MCL	Method Calibration Limit
MDL	Method Detection Limit
mL	Milliliters
MS	Matrix Spiked sample
DMS	Duplicate Matrix Spiked sample
NO	Number of peaks meeting all identification criteria
PCDD(s)	Polychlorinated dibenzo-p-dioxin(s)
PCDF(s)	Polychlorinated dibenzofuran(s)
ppb	Parts per billion
ppm	Parts per million
ppq	Parts per quadrillion
ppt	Parts per trillion
QA	Quality Assurance
QC	Quality Control
Ratio	Ratio of areas from monitored ions for an analyte
% Rec.	Percent recovery
RPD	Relative Percent Difference
RRF	Relative Response Factor
RT	Retention Time
SDG	Sample Delivery Group
S/N	Signal-to-noise ratio
TEF	Toxicity Equivalence Factor
TEQ	Toxicity Equivalence Quotient

10450 Stancliff Rd, Houston, TX 77099 | 281-530-5656 | www.alsglobal.com

ALS Environmental

State Certifications, Accreditations, and Licenses

Agency	Number	Expire Date
American Association for Laboratory Accreditation	2897.01 2020	11/30/2021
Arizona Department of Health Services	AZ0793-2020	5/27/2021
Arkansas Department of Environmental Quality	20-030-0	3/26/2021
California Department of Health Services	2919-2020	4/30/2021
Department of Defense	A2LA 2897.01	11/30/2021
Florida Department of Health	E87611-2020	6/30/2021
Hawaii Department of Health	2020	4/30/2021
Illinois Environmental Protection Agency	2000322020-4	5/9/2021
Kansas Department of Health and Environment	E-10352-2020	7/31/2021
Louisiana Department of Environmental Quality	03087-2020	6/30/2021
Maine Department of Health and Human Services	2020016	6/5/2022
Maryland Department of the Environment	343-2020	6/30/2021
Michigan Depratment of Environmental Quality	9971-2020	4/30/2021
Nebraska Department of Health and Human Services	NE-OS-25-13 (2020)	4/30/2021
Nevada Department of Concervation and Natural Resources	TX026932021-1	7/31/2021
New Hampshire Environmental Laboratory Accreditation Program	209420	4/24/2021
New Jersey Department of Environmental Protection	TX008	6/30/2021
New York Department of Health	11707	3/31/2021
Oklahoma Department of Environmental Quality	2020-123	8/31/2021
Pennsylvania Department of Environmental Protection	014	6/30/2021
Tennessee Department of Environment and Concervation	04016-2020	4/30/2021
Texas Commision on Environmental Quality	T104704231-20-26	4/30/2021
United States Department of Agriculture	P330-19-00299	10/10/2022

Chain of Custody

ALS Environmental - Houston HRMS
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID: 15536**

SUBCONTRACT TO:

ALS Environmental
10450 Stancliff RoadSuite 210
Houston, TX 77084 **Phone:** +1 281 530 5656

CUSTOMER INFORMATION:

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

INVOICE INFORMATION:

Company: ALS Houston
Contact: Accounts Payable
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Reference: HS21010984
TSR: Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS21010984-02**	**16WW56-210125**	**Groundwater**	**25 Jan 2021 08:53**
	Provide Level II and Level IV reports on a seperate pdf.			09 Feb 2021
2.	**HS21010984-03**	**16WW22-210125**	**Groundwater**	**25 Jan 2021 11:40**
	Provide Level II and Level IV reports on a seperate pdf.			09 Feb 2021
3.	**HS21010984-04**	**16WW41-210125**	**Groundwater**	**25 Jan 2021 12:47**
	Provide Level II and Level IV reports on a seperate pdf.			09 Feb 2021
4.	**HS21010984-05**	**16EW01-210125**	**Groundwater**	**25 Jan 2021 14:02**
	Provide Level II and Level IV reports on a seperate pdf.			09 Feb 2021

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. Mackey Date/Time: 01/26/21 1540
Received By: [illegible] Date/Time: 1/26/21 1540
Cooler ID(s): Temperature(s):

ALS Environmental

Cooler Receipt Form

Project Chemist: CH

Client/Project: ALS-H

Thermometer ID: IR31

Date/Time Received: 1/26/21 Initials: CH Date/Time Logged in: 1/26/21 Initials: CH

1. Method of delivery: ○ US Mail ○ Fed Ex ○ UPS ○ DHL ✓ ALS Courier ○ Client
2. Samples received in: ✓ Cooler ○ Box ○ Envelope ○ Other
3. Were custody seals on coolers? ○ Yes ✓ No
   Were they intact? ○ Yes ○ No ✓ N/A
   Were they signed and dated? ○ Yes ○ No ✓ N/A
   If yes, how many and where?
4. Packing Material: ○ Inserts ✓ Baggies ○ Bubble Wrap ○ Gel Packs ✓ Wet Ice ○ Sleeves ○ Other
5. Foreign or Regulated Soil? ○ Yes ○ No Location of Sampling:

Cooler Tracking Number	COC ID	Date Opened	Time Opened	Opened By	Temp. °C	Temp Blank?
NA		1/26/21	1540	CH	1.0	☒
						☐
						☐
						☐

6. Were custody papers properly filled out (ink, signed, dated, etc)? ✓ Yes ○ No
7. Did all bottles arrive in good condition (not broken, no signs of leakage)? ✓ Yes ○ No
8. Were all sample labels complete (i.e., sample ID, analysis, preservation, etc)? ✓ Yes ○ No
9. Were appropriate bottles/containers and volumes received for the requested tests? ✓ Yes ○ No
10. Did sample labels and tags agree with custody documents? ✓ Yes ○ No

Notes, Discrepancies, & Resolutions:

Service request Label:

10450 Stancliff Rd., Suite 210
Houston, TX 77099
T: +1 713 266 1599
F: +1 713 266 1599
www.alsglobal.com

SAMPLE ACCEPTANCE POLICY

This policy outlines the criteria samples must meet to be accepted by ALS Environmental – Houston HRMS.

Cooler Custody Seals (desirable, mandatory if specified in SAP):

- ✓ Intact on outside of cooler, signed and dated

Chain-of-Custody (COC) documentation (mandatory):

The following is required on each COC:

- ✓ Sample ID, the location, date and time of collection, collector's name, preservation type, sample type, and any other special remarks concerning the sampleThe COC must be completed in ink.
- ✓ Signature and date of relinquishing party.

In the absence of a COC at sample receipt, the COC will be requested from the client.

Sample Integrity (mandatory):

Samples are inspected upon arrival to ensure that sample integrity was not compromised during transfer to the laboratory.

- ✓ Sample containers must arrive in good condition (not broken or leaking).
- ✓ Samples must be labeled appropriately, including Sample IDs, and requested test using durable labels and indelible ink.
- ✓ The correct type of sample bottle must be used for the method requested.
- ✓ An appropriate sample volume, or weight, must be received.
- ✓ Sample IDs and number of containers must reconcile with the COC.
- ✓ Samples must be received within the method defined holding time.

Temperature Requirement (varies by sample matrix):

- ✓ Aqueous and Non-aqueous samples must be shipped and stored cold, at 0 to 6ºC.
- ✓ Tissue samples must be shipped and stored frozen, at -20 to -10ºC.
- ✓ Air samples are shipped and stored cold, at 0 to 6ºC
- ✓ The sample temperature must be recorded on the COC

All cooler inspections are documented on the Cooler Receipt Form (CRF). A separate CRF is completed for each service request. Any samples not meeting the above criteria are noted on the CRF and the Project Manager notified. The Project Manager must resolve any sample integrity issues with the client prior to proceeding with the analysis. Such resolutions are documented in writing and filed with the project folder. Data associated with samples received outside of this acceptance policy will be qualified on the case narrative of the final report

Preparation Information Benchsheets

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

Preparation Information Benchsheet

Prep Run#: 373396 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
Team: Semivoa GCMS/JRODRIGUEZ **Prep Method:** Method **Prep Date/Time:** 1/27/21 10:26

#	Lab Code	Client ID	B#	Method /Test	pH	Cl	Matrix	Amt. Ext.	Sample Description
1	E2100082-001	16WW13-210122	.01	6850/ClO4 DOD			Ground Water	10mL	
2	E2100082-002	16RW02-210122	.01	6850/ClO4 DOD			Ground Water	10mL	
3	E2100082-003	16RW01-210122	.01	6850/ClO4 DOD			Ground Water	10mL	
4	E2100082-004	16PM09-210122	.01	6850/ClO4 DOD			Ground Water	10mL	
5	E2100082-005	16PM02-210122	.01	6850/ClO4 DOD			Ground Water	10mL	
6	E2100082-006	16PM03-210122	.01	6850/ClO4 DOD			Ground Water	10mL	
7	E2100082-007	16RW07-210122	.01	6850/ClO4 DOD			Ground Water	10mL	
8	E2100082-008	16RW06-210122	.01	6850/ClO4 DOD			Ground Water	10mL	
9	E2100082-009	16WW14-210122	.01	6850/ClO4 DOD			Ground Water	10mL	
10	E2100082-010	16WW44-210122	.01	6850/ClO4 DOD			Ground Water	10mL	
11	E2100084-001	16WW56-210125	.01	6850/ClO4 DOD			Ground Water	10mL	
12	E2100084-002	16WW22-210125	.01	6850/ClO4 DOD			Ground Water	10mL	
13	E2100084-003	16WW41-210125	.01	6850/ClO4 DOD			Ground Water	10mL	
14	E2100084-004	16EW01-210125	.01	6850/ClO4 DOD			Ground Water	10mL	
15	EQ2100035-01	MB		6850/ClO4 DOD			Liquid	10mL	
16	EQ2100035-02	LCS		6850/ClO4 DOD			Liquid	10mL	
17	EQ2100035-03	DLCS		6850/ClO4 DOD			Liquid	10mL	

Spiking Solutions

Name: Perchlorate Intermediate Stock1 Inventory ID 214035 Logbook Ref: Perchlorate Expires On: 05/23/2021

EQ2100035-02 1.00µL EQ2100035-03 1.00µL

Name: Perchlorate Internal Standard 1ug/mL Inventory ID 214820 Logbook Ref: Perchlorate Internal Standard Expires On: 07/03/2021

E2100084-001 100.00µL E2100084-002 100.00µL E2100084-003 100.00µL E2100084-004 100.00µL EQ2100035-01 100.00µL EQ2100035-02 100.00µL
EQ2100035-03 100.00µL

Preparation Steps

Step: Preparation
Started: 1/27/21 10:26
Finished: 1/27/21 11:00
By: GRIVERA
Comments

Preparation Information Benchsheet

Prep Run#: 373396
Team: Semivoa GCMS/JRODRIGUEZ

Prep WorkFlow: GenExt28Day
Prep Method: Method

Status: Prepped
Prep Date/Time: 1/27/21 10:26

Comments:

Reviewed By: GR Date: 1/27/21

Chain of Custody

Relinquished By: Date:

Received By: Date:

Extracts Examined
Yes No

Analytical Results

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100084
Project:	HS21010984	**Date Collected:**	1/25/21 0853
Sample Matrix:	Ground Water	**Date Received:**	1/26/21
Sample Name:	16WW56-210125	**Units:**	µg/L
Lab Code:	E2100084-001	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.200	0.100	0.0500	2	1/27/21	1/29/21 16:33	373396	711564	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100084
Project:	HS21010984	**Date Collected:**	1/25/21 1140
Sample Matrix:	Ground Water	**Date Received:**	1/26/21
Sample Name:	16WW22-210125	**Units:**	µg/L
Lab Code:	E2100084-002	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.246**	J	0.500	0.250	0.125	5	1/27/21	1/29/21 16:08	373396	711564	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100084
Project:	HS21010984	**Date Collected:**	1/25/21 1247
Sample Matrix:	Ground Water	**Date Received:**	1/26/21
Sample Name:	16WW41-210125	**Units:**	µg/L
Lab Code:	E2100084-003	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**3.71**		1.00	0.500	0.250	10	1/27/21	1/29/21 16:40	373396	711564	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100084
Project:	HS21010984	**Date Collected:**	1/25/21 1402
Sample Matrix:	Ground Water	**Date Received:**	1/26/21
Sample Name:	16EW01-210125	**Units:**	µg/L
Lab Code:	E2100084-004	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**180**		1.00	0.500	0.250	10	1/27/21	1/29/21 16:25	373396	711564	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100084
Project:	HS21010984	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	µg/L
Lab Code:	EQ2100035-01	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	1/27/21	1/29/21 15:36	373396	711564	

Accuracy & Precision

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2100084
Project:	HS21010984	**Date Analyzed:**	1/29/21
Sample Matrix:	Ground Water		

Lab Control Sample Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method:	6850	**Units:**	µg/L
Prep Method:	Method	**Basis:**	NA
		Extraction Lot:	373396

	Lab Control Sample EQ2100035-02			Duplicate Lab Control Sample EQ2100035-03					
Analyte Name	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Perchlorate	0.0842	0.100	84	0.0987	0.100	99	84 - 119	16 *	15

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

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

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100084
Project:	HS21010984	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2100035-02	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.0842**	J	0.100	0.0500	0.0250	1	1/27/21	1/29/21 15:44	373396	711564	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100084
Project:	HS21010984	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Duplicate Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2100035-03	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.0987**	J	0.100	0.0500	0.0250	1	1/27/21	1/29/21 15:52	373396	711564	

LABORATORY REPORT

February 5, 2021

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

RE: HS21010984

Dear RJ:

Enclosed are the results of the samples submitted to our laboratory on January 28, 2021. For your reference, these analyses have been assigned our service request number P2100450.

All analyses were performed according to our laboratory's NELAP and DoD-ELAP-approved quality assurance program. The test results meet requirements of the current NELAP and DoD-ELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP and DoD-ELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

ALS | Environmental

By Hayden Akers at 2:46 pm, Feb 05, 2021

Hayden Akers
Project Manager

Client: ALS Laboratory Group
Project: HS21010984

Service Request No: P2100450

CASE NARRATIVE

The samples were received intact under chain of custody on January 28, 2021 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

Methane, Ethene and Ethane Analysis

The samples were analyzed for methane, ethene, and ethane using a gas chromatograph equipped with a flame ionization detector (FID). A known amount of liquid was displaced by injecting 8.0 milliliters of helium creating a headspace in the sample vial. Each sample vial was agitated using a sonic disrupter for fifteen minutes and then allowed to equilibrate for at least two hours. A volume of the headspace was withdrawn using a gas-tight syringe and analyzed using a manual injection technique. The amount of dissolved gases (methane, ethene and ethane) in the original sample was calculated using Henry's Law. This method was performed with guidance from RSK 175. This method is included on the laboratory's NELAP and DoD-ELAP scope of accreditation. Any analytes flagged with an X are not included on the laboratory's NELAP or DoD-ELAP accreditation.

Manual integrations were performed on the following sample(s) and analyte(s). Refer to the raw data for additional information.

Sample Identification(s)	Analyte(s)
P2100450-001-003	Methane

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.

Use of ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.

ALS Environmental – Simi Valley

CERTIFICATIONS, ACCREDITATIONS, AND REGISTRATIONS

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

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

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

ALS ENVIRONMENTAL

DETAIL SUMMARY REPORT

Client: ALS Laboratory Group
Project ID: HS21010984

Service Request: P2100450

Date Received: 1/28/2021
Time Received: 10:15

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	RSK 175 - Gases
16WW56-210125	P2100450-001	Water	1/25/2021	08:53	X
16WW22-210125	P2100450-002	Water	1/25/2021	11:40	X
16WW41-210125	P2100450-003	Water	1/25/2021	12:47	X
16EW01-210125	P2100450-004	Water	1/25/2021	14:02	X

R100450

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID:** **15537**

SUBCONTRACT TO:

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

Phone: +1 805 526 7161

CUSTOMER INFORMATION:

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

INVOICE INFORMATION:

Company: ALS Houston
Contact: Accounts Payable
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Reference: HS21010984
TSR: Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS21010984-02**	**16WW56-210125**	**Groundwater**	**25 Jan 2021 08:53**
	MEE Only. Provide DOD LV II & IV pdf separate. EQuIS 5.0 - Longhorn		Equis EDD.	09 Feb 2021
2.	**HS21010984-03**	**16WW22-210125**	**Groundwater**	**25 Jan 2021 11:40**
	MEE Only. Provide DOD LV II & IV pdf separate. EQuIS 5.0 - Longhorn		Equis EDD.	09 Feb 2021
3.	**HS21010984-04**	**16WW41-210125**	**Groundwater**	**25 Jan 2021 12:47**
	MEE Only. Provide DOD LV II & IV pdf separate. EQuIS 5.0 - Longhorn		Equis EDD.	09 Feb 2021
4.	**HS21010984-05**	**16EW01-210125**	**Groundwater**	**25 Jan 2021 14:02**
	MEE Only. Provide DOD LV II & IV pdf separate. EQuIS 5.0 - Longhorn		Equis EDD.	09 Feb 2021

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

QC Level: DOD IV (DoD Data Package)

Relinquished By: _____ Date/Time: 1/27/2021 1800.

Received By: _____ Date/Time: 1-28-21 1015

Cooler ID(s): _____ Temperature(s): 2°C wet

ALS Environmental
Sample Acceptance Check Form

Client: ALS Laboratory Group Work order: P2100450
Project: HS21010984
Sample(s) received on: 1/28/2021 Date opened: 1/28/2021 by: ADAVID

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

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

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P2100450-001.01	40ml VOA HCL		1		A	CB 02/01/21
P2100450-001.02	40ml VOA HCL				A	
P2100450-001.03	40ml VOA HCL				A	
P2100450-002.01	40ml VOA HCL		1		A	CB 02/01/21
P2100450-002.02	40ml VOA HCL				A	
P2100450-002.03	40ml VOA HCL				A	
P2100450-003.01	40ml VOA HCL		1		A	CB 02/01/21
P2100450-003.02	40ml VOA HCL				A	
P2100450-003.03	40ml VOA HCL				A	
P2100450-004.01	40ml VOA HCL		1		A	CB 02/01/21
P2100450-004.02	40ml VOA HCL				A	
P2100450-004.03	40ml VOA HCL				A	

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

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

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **16WW56-210125**
Client Project ID: **HS21010984**

ALS Project ID: P2100450
ALS Sample ID: P2100450-001

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

Date Collected: 01/25/21
Date Received: 01/28/21
Date Analyzed: 02/01/21
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	**0.57**	1.3	1.0	0.51	**J**
74-85-1	Ethene	**0.36**	1.0	0.55	0.24	**J**
74-84-0	Ethane	0.47	0.60	0.47	0.16	**U**

U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.
J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **16WW22-210125**
Client Project ID: **HS21010984**

ALS Project ID: P2100450
ALS Sample ID: P2100450-002

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

Date Collected: 01/25/21
Date Received: 01/28/21
Date Analyzed: 02/01/21
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	**0.91**	1.3	1.0	0.51	**J**
74-85-1	Ethene	0.55	1.0	0.55	0.24	**U**
74-84-0	Ethane	0.47	0.60	0.47	0.16	**U**

U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.
J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **16WW41-210125**
Client Project ID: **HS21010984**

ALS Project ID: P2100450
ALS Sample ID: P2100450-003

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

Date Collected: 01/25/21
Date Received: 01/28/21
Date Analyzed: 02/01/21
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	**180**	1.3	1.0	0.51	
74-85-1	Ethene	**110**	1.0	0.55	0.24	
74-84-0	Ethane	**0.54**	0.60	0.47	0.16	**J**

U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.
J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **16EW01-210125**
Client Project ID: **HS21010984**

ALS Project ID: P2100450
ALS Sample ID: P2100450-004

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

Date Collected: 01/25/21
Date Received: 01/28/21
Date Analyzed: 02/01/21
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	**11**	1.3	1.0	0.51	
74-85-1	Ethene	**9.1**	1.0	0.55	0.24	
74-84-0	Ethane	0.47	0.60	0.47	0.16	**U**

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

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **Method Control Sample**
Client Project ID: **HS21010984**

ALS Project ID: P2100450
ALS Sample ID: P210201-MB

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

Date Collected: NA
Date Received: NA
Date Analyzed: 2/01/21
Volume(s) Analyzed: 0.10 ml(s)

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

The Method Control Sample is laboratory water carried through the entire analytical process.
U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE / DUPLICATE LABORATORY CONTROL SAMPLE SUMMARY

Client: **ALS Laboratory Group**
Client Sample ID: **Duplicate Lab Control Sample**
Client Project ID: **HS21010984**

ALS Project ID: P2100450
ALS Sample ID: P210201-LCS
P210201-DLCS

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

Date Collected: NA
Date Received: NA
Date Analyzed: 2/01/21
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Spike Amount LCS / DLCS µg/L	Result[1] LCS µg/L	Result[1] DLCS µg/L	% Recovery LCS	% Recovery DLCS	DOD Acceptance Limits	RPD	RPD Limit	Data Qualifier
74-82-8	Methane	2.52	2.64	2.66	**105**	**106**	73-125	0.9	26	
74-85-1	Ethene	4.40	4.41	4.45	**100**	**101**	72-133	1	11	
74-84-0	Ethane	4.72	4.47	4.48	**95**	**95**	74-131	0	10	

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

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

February 05, 2021

Analytical Report for Service Request No: K2100770

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

RE: ALS Houston DOD TOC

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory January 28, 2021
For your reference, these analyses have been assigned our service request number **K2100770.**

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
Qualifiers
State Certifications, Accreditations, And Licenses
Case Narrative
Chain of Custody
General Chemistry

Acronyms

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

Inorganic Data Qualifiers

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

Metals Data Qualifiers

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

Organic Data Qualifiers

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

Additional Petroleum Hydrocarbon Specific Qualifiers

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

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

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

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

Case Narrative

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

1317 South 13th Ave, Kelso, WA 98626 | 1-360-577-7222 | www.alsglobal.com

ALS Environmental

Client: ALS Environmental - US
Project: ALS Houston DOD TOC
Sample Matrix: Ground Water

Service Request: K2100770
Date Received: 01/28/2021

CASE NARRATIVE

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

Sample Receipt:

Four ground water samples were received for analysis at ALS Environmental on 01/28/2021. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The samples were stored at minimum in accordance with the analytical method requirements.

General Chemistry:

No significant anomalies were noted with this analysis.

Approved by _____ Date 02/05/2021

Chain of Custody

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

1/2100770

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID: 15535**

SUBCONTRACT TO:

ALS Environmental Kelso
1317 S. 13th Avenue
Kelso, WA 98626 **Phone:** +1 360 501 3312

CUSTOMER INFORMATION:

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

INVOICE INFORMATION:

Company: ALS Houston
Contact: Accounts Payable
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Reference: HS21010984
TSR: Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS21010984-02**	**16WW56-210125**	**Groundwater**	**25 Jan 2021 08:53**
	TOC: Provide Level II & DOD Level IV/EQuIS APTIM EDD			09 Feb 2021
2.	**HS21010984-03**	**16WW22-210125**	**Groundwater**	**25 Jan 2021 11:40**
	TOC: Provide Level II & DOD Level IV/EQuIS APTIM EDD			09 Feb 2021
3.	**HS21010984-04**	**16WW41-210125**	**Groundwater**	**25 Jan 2021 12:47**
	TOC: Provide Level II & DOD Level IV/EQuIS APTIM EDD			09 Feb 2021
4.	**HS21010984-05**	**16EW01-210125**	**Groundwater**	**25 Jan 2021 14:02**
	TOC: Provide Level II & DOD Level IV/EQuIS APTIM EDD			09 Feb 2021

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

QC Level: DOD IV (DoD Data Package)

Relinquished By: Date/Time: 1/27/2021 1800

Received By: Date/Time: 1/28/21 1030

Cooler ID(s): Temperature(s):

PM VL

Cooler Receipt and Preservation Form

Client AIS - Houston Service Request K21 00770

Received: 11/28/21 Opened: 11/28/21 By: BR Unloaded: 11/28/21 By: BR

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
4. Was a Temperature Blank present in cooler? NA Y N If yes, notate the temperature in the appropriate column below:
   If no, take the temperature of a representative sample bottle contained within the cooler; notate in the column "Sample Temp":
5. Were samples received within the method specified temperature ranges? NA Y N
   If no, were they received on ice and same day as collected? If not, notate the cooler # below and notify the PM. NA Y N

If applicable, tissue samples were received: *Frozen* *Partially Thawed* *Thawed*

Temp Blank	Sample Temp	IR Gun	Cooler #/COC ID / NA	Out of temp indicate with "X"	PM Notified If out of temp	Tracking Number NA	Filed
1.7	—	1R01		—	—	9473083988 45	

6. Packing material: *Inserts* *Baggies* *Bubble Wrap* *Gel Packs* *Wet Ice* *Dry Ice* *Sleeves* _____
7. Were custody papers properly filled out (ink, signed, etc.)? NA Y N
8. Were samples received in good condition (unbroken) NA Y N
9. Were all sample labels complete (ie, analysis, preservation, etc.)? NA Y N
10. Did all sample labels and tags agree with custody papers? NA Y N
11. Were appropriate bottles/containers and volumes received for the tests indicated? NA Y N
12. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* NA Y N
13. Were VOA vials received without headspace? *Indicate in the table below.* NA Y N
14. Was C12/Res negative? NA Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count Bottle Type	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:**	K2100770
Project:	ALS Houston DOD TOC	**Date Collected:**	01/25/21
Sample Matrix:	Ground Water	**Date Received:**	01/28/21
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
16WW56-210125	K2100770-001	**1.17**	0.50	0.20	0.07	1	02/03/21 11:05	
16WW22-210125	K2100770-002	**1.13**	0.50	0.20	0.07	1	02/03/21 11:05	
16WW41-210125	K2100770-003	**49.6**	1.0	0.4	0.2	2	02/03/21 11:05	
16EW01-210125	K2100770-004	**19.4**	0.50	0.20	0.07	1	02/03/21 11:05	
Method Blank	K2100770-MB	ND U	0.50	0.20	0.07	1	02/03/21 11:05	

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K2100770
Project:	ALS Houston DOD TOC	**Date Analyzed:**	02/03/21
Sample Matrix:	Ground Water	**Date Extracted:**	NA

Lab Control Sample Summary
Carbon, Total Organic

Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA
		Analysis Lot:	711915

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K2100770-LCS	25.9	25.0	104	83-117

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

March 08, 2021

Susan Huang
Aptim Environmental & Infrastucture, Inc.
2500 City West Blvd., Suite 1700
Houston, TX 77042

Work Order: **HS21011042**

Laboratory Results for: **LHAAP 16 January 2021**

Dear Susan Huang,

ALS Environmental received 7 sample(s) on Jan 27, 2021 for the analysis presented in the following report.

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

Regards,

Generated By: RJ.MODASHIA

RJ Modashia
Project Manager

ALS Houston, US Date: 08-Mar-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
Work Order: HS21011042

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS21011042-01	16LHAAP-210126-TB5	Water	CG-121520-126	26-Jan-2021 07:00	27-Jan-2021 10:05	☐
HS21011042-02	16EW02-210126	Groundwater		26-Jan-2021 08:25	27-Jan-2021 10:05	☐
HS21011042-03	16IW03-210126	Groundwater		26-Jan-2021 12:30	27-Jan-2021 10:05	☐
HS21011042-04	16IW03-210126-FD	Groundwater		26-Jan-2021 12:30	27-Jan-2021 10:05	☐
HS21011042-05	16IW10-210126	Groundwater		26-Jan-2021 13:07	27-Jan-2021 10:05	☐
HS21011042-06	16IW10-210126-FD	Groundwater		26-Jan-2021 13:07	27-Jan-2021 10:05	☐
HS21011042-07	16IW09-210126	Groundwater		26-Jan-2021 13:41	27-Jan-2021 10:05	☐

Revision:1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 08-Mar-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
Work Order: HS21011042

CASE NARRATIVE

Work Order Comments

- REV01: Revised to add RSK-175 report.
- The analysis for Methane, Methene, Ethane and CO2 by RSK175 was subcontracted to ALS Simi Valley, CA. Final report attached.
- The analysis for Perchlorate was subcontracted to ALS Salt Lake City, UT. Final report attached.

Work Order Comments

- The analysis for Perchlorate was subcontracted to ALS Houston High-Res Lab. Final report attached

The analysis for TOC was subcontracted to ALS Environmental in Kelso WA. Final report attached.

The analyses for RSK-175 Dissolved Gases and CO2 were subcontracted to ALS Environmental in Simi Valley, CA. Final Report attached.

GCMS Volatiles by Method SW8260

Batch ID: R377396

Sample ID: HS21011103-06MSD

- MSD is for an unrelated sample

WetChemistry by Method SM2320B

Batch ID: R377113

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

WetChemistry by Method SW9056

Batch ID: R377090

Sample ID: 16EW02-210126 (HS21011042-02)

- Sample ran at 2X due to high concentration of Sulfate

Sample ID: 16IW10-210126 (HS21011042-05)

- Sample ran at 2X due to high concentration of chloride

Sample ID: 16IW10-210126-FD (HS21011042-06)

- Sample ran at 2X due to high concentration of chloride

Batch ID: R377954

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 08-Mar-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
Sample ID: 16LHAAP-210126-TB5
Collection Date: 26-Jan-2021 07:00

ANALYTICAL REPORT
WorkOrder:HS21011042
Lab ID:HS21011042-01
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	03-Feb-2021 03:36
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	03-Feb-2021 03:36
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	03-Feb-2021 03:36
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	03-Feb-2021 03:36
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	03-Feb-2021 03:36
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	03-Feb-2021 03:36
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	03-Feb-2021 03:36
Surr: 1,2-Dichloroethane-d4	*95.5*			**0**	*81-118*	*%REC*	*1*	*03-Feb-2021 03:36*
Surr: 4-Bromofluorobenzene	*101*			**0**	*85-114*	*%REC*	*1*	*03-Feb-2021 03:36*
Surr: Dibromofluoromethane	*96.3*			**0**	*80-119*	*%REC*	*1*	*03-Feb-2021 03:36*
Surr: Toluene-d8	*103*			**0**	*89-112*	*%REC*	*1*	*03-Feb-2021 03:36*

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 08-Mar-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
Sample ID: 16EW02-210126
Collection Date: 26-Jan-2021 08:25

ANALYTICAL REPORT
WorkOrder:HS21011042
Lab ID:HS21011042-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	25	U	7.5	25	25	ug/L	25	03-Feb-2021 06:24
1,1-Dichloroethene	**140**		**5.0**	**12**	**25**	**ug/L**	25	03-Feb-2021 06:24
1,2-Dichloroethane	**55**		**5.0**	**12**	**25**	**ug/L**	25	03-Feb-2021 06:24
cis-1,2-Dichloroethene	**35,000**		**50**	**120**	**250**	**ug/L**	250	03-Feb-2021 06:45
Methylene chloride	50	U	10	50	50	ug/L	25	03-Feb-2021 06:24
Trichloroethene	**38,000**		**50**	**120**	**250**	**ug/L**	250	03-Feb-2021 06:45
Vinyl chloride	**930**		**5.0**	**12**	**25**	**ug/L**	25	03-Feb-2021 06:24
Surr: 1,2-Dichloroethane-d4	*99.3*			**0**	*81-118*	*%REC*	*25*	*03-Feb-2021 06:24*
Surr: 1,2-Dichloroethane-d4	*96.0*			**0**	*81-118*	*%REC*	*250*	*03-Feb-2021 06:45*
Surr: 4-Bromofluorobenzene	*105*			**0**	*85-114*	*%REC*	*25*	*03-Feb-2021 06:24*
Surr: 4-Bromofluorobenzene	*103*			**0**	*85-114*	*%REC*	*250*	*03-Feb-2021 06:45*
Surr: Dibromofluoromethane	*97.1*			**0**	*80-119*	*%REC*	*25*	*03-Feb-2021 06:24*
Surr: Dibromofluoromethane	*94.6*			**0**	*80-119*	*%REC*	*250*	*03-Feb-2021 06:45*
Surr: Toluene-d8	*97.1*			**0**	*89-112*	*%REC*	*25*	*03-Feb-2021 06:24*
Surr: Toluene-d8	*98.8*			**0**	*89-112*	*%REC*	*250*	*03-Feb-2021 06:45*
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: TH
Alkalinity, Total (As CaCO3)	**473**	a	**5.00**	**5.00**	**5.00**	**mg/L**	1	28-Jan-2021 19:51
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**7.05**		**0.300**	**1.00**	**1.00**	**mg/L**	10	10-Feb-2021 15:35
Nitrogen, Nitrate (As N)	0.200	U	0.0600	0.200	0.200	mg/L	2	27-Jan-2021 19:17
Sulfate	**2,950**		**20.0**	**50.0**	**50.0**	**mg/L**	100	10-Feb-2021 15:53
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	02-Feb-2021 19:02
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	05-Feb-2021 16:56
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	11-Feb-2021 12:44

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 08-Mar-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
Sample ID: 16IW03-210126
Collection Date: 26-Jan-2021 12:30

ANALYTICAL REPORT
WorkOrder:HS21011042
Lab ID:HS21011042-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	10	U	3.0	10	10	ug/L	10	03-Feb-2021 05:00
1,1-Dichloroethene	**49**		**2.0**	**5.0**	**10**	**ug/L**	10	03-Feb-2021 05:00
1,2-Dichloroethane	**5.9**	J	**2.0**	**5.0**	**10**	**ug/L**	10	03-Feb-2021 05:00
cis-1,2-Dichloroethene	**12,000**		**20**	**50**	**100**	**ug/L**	100	03-Feb-2021 05:21
Methylene chloride	20	U	4.0	20	20	ug/L	10	03-Feb-2021 05:00
Trichloroethene	**8,800**		**20**	**50**	**100**	**ug/L**	100	03-Feb-2021 05:21
Vinyl chloride	**3,700**		**20**	**50**	**100**	**ug/L**	100	03-Feb-2021 05:21
Surr: 1,2-Dichloroethane-d4	*94.0*			**0**	*81-118*	*%REC*	*10*	*03-Feb-2021 05:00*
Surr: 1,2-Dichloroethane-d4	*96.8*			**0**	*81-118*	*%REC*	*100*	*03-Feb-2021 05:21*
Surr: 4-Bromofluorobenzene	*102*			**0**	*85-114*	*%REC*	*10*	*03-Feb-2021 05:00*
Surr: 4-Bromofluorobenzene	*102*			**0**	*85-114*	*%REC*	*100*	*03-Feb-2021 05:21*
Surr: Dibromofluoromethane	*93.4*			**0**	*80-119*	*%REC*	*10*	*03-Feb-2021 05:00*
Surr: Dibromofluoromethane	*98.1*			**0**	*80-119*	*%REC*	*100*	*03-Feb-2021 05:21*
Surr: Toluene-d8	*97.2*			**0**	*89-112*	*%REC*	*10*	*03-Feb-2021 05:00*
Surr: Toluene-d8	*102*			**0**	*89-112*	*%REC*	*100*	*03-Feb-2021 05:21*
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: TH
Alkalinity, Total (As CaCO3)	**1,390**	a	**5.00**	**5.00**	**5.00**	**mg/L**	1	28-Jan-2021 20:02
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**5.17**		**0.0300**	**0.100**	**0.100**	**mg/L**	1	10-Feb-2021 12:52
Nitrogen, Nitrate (As N)	0.100	U	0.0300	0.100	0.100	mg/L	1	27-Jan-2021 19:35
Sulfate	**11.6**		**0.200**	**0.500**	**0.500**	**mg/L**	1	10-Feb-2021 12:52
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	02-Feb-2021 19:02
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	05-Feb-2021 16:56
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	11-Feb-2021 12:44

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 08-Mar-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
Sample ID: 16IW03-210126-FD
Collection Date: 26-Jan-2021 12:30

ANALYTICAL REPORT
WorkOrder:HS21011042
Lab ID:HS21011042-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	10	U	3.0	10	10	ug/L	10	03-Feb-2021 05:42
1,1-Dichloroethene	**48**		**2.0**	**5.0**	**10**	**ug/L**	10	03-Feb-2021 05:42
1,2-Dichloroethane	**5.7**	J	**2.0**	**5.0**	**10**	**ug/L**	10	03-Feb-2021 05:42
cis-1,2-Dichloroethene	**12,000**		**20**	**50**	**100**	**ug/L**	100	03-Feb-2021 06:03
Methylene chloride	20	U	4.0	20	20	ug/L	10	03-Feb-2021 05:42
Trichloroethene	**8,700**		**20**	**50**	**100**	**ug/L**	100	03-Feb-2021 06:03
Vinyl chloride	**3,600**		**20**	**50**	**100**	**ug/L**	100	03-Feb-2021 06:03
Surr: 1,2-Dichloroethane-d4	*94.9*			**0**	*81-118*	*%REC*	*10*	*03-Feb-2021 05:42*
Surr: 1,2-Dichloroethane-d4	*96.2*			**0**	*81-118*	*%REC*	*100*	*03-Feb-2021 06:03*
Surr: 4-Bromofluorobenzene	*106*			**0**	*85-114*	*%REC*	*10*	*03-Feb-2021 05:42*
Surr: 4-Bromofluorobenzene	*102*			**0**	*85-114*	*%REC*	*100*	*03-Feb-2021 06:03*
Surr: Dibromofluoromethane	*95.7*			**0**	*80-119*	*%REC*	*100*	*03-Feb-2021 06:03*
Surr: Dibromofluoromethane	*93.8*			**0**	*80-119*	*%REC*	*10*	*03-Feb-2021 05:42*
Surr: Toluene-d8	*97.9*			**0**	*89-112*	*%REC*	*10*	*03-Feb-2021 05:42*
Surr: Toluene-d8	*100*			**0**	*89-112*	*%REC*	*100*	*03-Feb-2021 06:03*
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: TH
Alkalinity, Total (As CaCO3)	**1,240**	a	**5.00**	**5.00**	**5.00**	**mg/L**	1	28-Jan-2021 20:13
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**4.20**		**0.0300**	**0.100**	**0.100**	**mg/L**	1	10-Feb-2021 13:10
Nitrogen, Nitrate (As N)	**0.152**		**0.0300**	**0.100**	**0.100**	**mg/L**	1	27-Jan-2021 19:53
Sulfate	**18.1**		**0.200**	**0.500**	**0.500**	**mg/L**	1	10-Feb-2021 13:10
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	02-Feb-2021 19:02
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	05-Feb-2021 16:56
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	11-Feb-2021 12:44

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 08-Mar-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
Sample ID: 16IW10-210126
Collection Date: 26-Jan-2021 13:07

ANALYTICAL REPORT
WorkOrder:HS21011042
Lab ID:HS21011042-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	03-Feb-2021 03:57
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	03-Feb-2021 03:57
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	03-Feb-2021 03:57
cis-1,2-Dichloroethene	**23**		**0.20**	**0.50**	**1.0**	**ug/L**	1	03-Feb-2021 03:57
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	03-Feb-2021 03:57
Trichloroethene	**31**		**0.20**	**0.50**	**1.0**	**ug/L**	1	03-Feb-2021 03:57
Vinyl chloride	**8.3**		**0.20**	**0.50**	**1.0**	**ug/L**	1	03-Feb-2021 03:57
Surr: 1,2-Dichloroethane-d4	*92.4*			**0**	*81-118*	*%REC*	*1*	*03-Feb-2021 03:57*
Surr: 4-Bromofluorobenzene	*105*			**0**	*85-114*	*%REC*	*1*	*03-Feb-2021 03:57*
Surr: Dibromofluoromethane	*94.0*			**0**	*80-119*	*%REC*	*1*	*03-Feb-2021 03:57*
Surr: Toluene-d8	*99.0*			**0**	*89-112*	*%REC*	*1*	*03-Feb-2021 03:57*
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: TH
Alkalinity, Total (As CaCO3)	**1,320**	a	**5.00**	**5.00**	**5.00**	**mg/L**	1	28-Jan-2021 20:24
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**83.6**		**0.300**	**1.00**	**1.00**	**mg/L**	10	11-Feb-2021 12:25
Nitrogen, Nitrate (As N)	0.200	U	0.0600	0.200	0.200	mg/L	2	27-Jan-2021 20:12
Sulfate	**6.59**		**0.400**	**1.00**	**1.00**	**mg/L**	2	10-Feb-2021 13:28
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	02-Feb-2021 19:02
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	05-Feb-2021 16:56
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	11-Feb-2021 12:44

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 08-Mar-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
Sample ID: 16IW10-210126-FD
Collection Date: 26-Jan-2021 13:07

ANALYTICAL REPORT
WorkOrder:HS21011042
Lab ID:HS21011042-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	03-Feb-2021 04:18
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	03-Feb-2021 04:18
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	03-Feb-2021 04:18
cis-1,2-Dichloroethene	**22**		**0.20**	**0.50**	**1.0**	**ug/L**	1	03-Feb-2021 04:18
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	03-Feb-2021 04:18
Trichloroethene	**29**		**0.20**	**0.50**	**1.0**	**ug/L**	1	03-Feb-2021 04:18
Vinyl chloride	**8.3**		**0.20**	**0.50**	**1.0**	**ug/L**	1	03-Feb-2021 04:18
Surr: 1,2-Dichloroethane-d4	*95.4*			**0**	*81-118*	*%REC*	*1*	*03-Feb-2021 04:18*
Surr: 4-Bromofluorobenzene	*105*			**0**	*85-114*	*%REC*	*1*	*03-Feb-2021 04:18*
Surr: Dibromofluoromethane	*95.5*			**0**	*80-119*	*%REC*	*1*	*03-Feb-2021 04:18*
Surr: Toluene-d8	*98.9*			**0**	*89-112*	*%REC*	*1*	*03-Feb-2021 04:18*
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: TH
Alkalinity, Total (As CaCO3)	**1,320**	a	**5.00**	**5.00**	**5.00**	**mg/L**	1	28-Jan-2021 20:34
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**84.5**		**0.300**	**1.00**	**1.00**	**mg/L**	10	11-Feb-2021 12:43
Nitrogen, Nitrate (As N)	0.200	U	0.0600	0.200	0.200	mg/L	2	27-Jan-2021 20:30
Sulfate	**6.79**		**0.400**	**1.00**	**1.00**	**mg/L**	2	10-Feb-2021 13:46
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	02-Feb-2021 19:02
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	05-Feb-2021 16:56
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	11-Feb-2021 12:44

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 08-Mar-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
Sample ID: 16IW09-210126
Collection Date: 26-Jan-2021 13:41

ANALYTICAL REPORT
WorkOrder:HS21011042
Lab ID:HS21011042-07
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	03-Feb-2021 04:39
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	03-Feb-2021 04:39
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	03-Feb-2021 04:39
cis-1,2-Dichloroethene	**2.8**		**0.20**	**0.50**	**1.0**	**ug/L**	1	03-Feb-2021 04:39
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	03-Feb-2021 04:39
Trichloroethene	**1.0**		**0.20**	**0.50**	**1.0**	**ug/L**	1	03-Feb-2021 04:39
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	03-Feb-2021 04:39
Surr: 1,2-Dichloroethane-d4	*98.2*			**0**	*81-118*	*%REC*	*1*	*03-Feb-2021 04:39*
Surr: 4-Bromofluorobenzene	*104*			**0**	*85-114*	*%REC*	*1*	*03-Feb-2021 04:39*
Surr: Dibromofluoromethane	*97.0*			**0**	*80-119*	*%REC*	*1*	*03-Feb-2021 04:39*
Surr: Toluene-d8	*97.8*			**0**	*89-112*	*%REC*	*1*	*03-Feb-2021 04:39*
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: TH
Alkalinity, Total (As CaCO3)	**610**	a	**5.00**	**5.00**	**5.00**	**mg/L**	1	28-Jan-2021 20:42
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**4.65**		**0.0300**	**0.100**	**0.100**	**mg/L**	1	10-Feb-2021 15:17
Nitrogen, Nitrate (As N)	**0.615**		**0.0300**	**0.100**	**0.100**	**mg/L**	1	27-Jan-2021 21:42
Sulfate	**7.11**		**0.200**	**0.500**	**0.500**	**mg/L**	1	10-Feb-2021 15:17
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	02-Feb-2021 19:02
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	05-Feb-2021 16:56
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	11-Feb-2021 12:44

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 08-Mar-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
WorkOrder: HS21011042

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R377090 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Groundwater	
HS21011042-02	16EW02-210126	26 Jan 2021 08:25			27 Jan 2021 19:17	2
HS21011042-03	16IW03-210126	26 Jan 2021 12:30			27 Jan 2021 19:35	1
HS21011042-04	16IW03-210126-FD	26 Jan 2021 12:30			27 Jan 2021 19:53	1
HS21011042-05	16IW10-210126	26 Jan 2021 13:07			27 Jan 2021 20:12	2
HS21011042-06	16IW10-210126-FD	26 Jan 2021 13:07			27 Jan 2021 20:30	2
HS21011042-07	16IW09-210126	26 Jan 2021 13:41			27 Jan 2021 21:42	1
Batch ID: R377113 (0)	**Test Name :** ALKALINITY BY SM2320B				**Matrix:** Groundwater	
HS21011042-02	16EW02-210126	26 Jan 2021 08:25			28 Jan 2021 19:51	1
HS21011042-03	16IW03-210126	26 Jan 2021 12:30			28 Jan 2021 20:02	1
HS21011042-04	16IW03-210126-FD	26 Jan 2021 12:30			28 Jan 2021 20:13	1
HS21011042-05	16IW10-210126	26 Jan 2021 13:07			28 Jan 2021 20:24	1
HS21011042-06	16IW10-210126-FD	26 Jan 2021 13:07			28 Jan 2021 20:34	1
HS21011042-07	16IW09-210126	26 Jan 2021 13:41			28 Jan 2021 20:42	1
Batch ID: R377381 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** Groundwater	
HS21011042-02	16EW02-210126	26 Jan 2021 08:25			02 Feb 2021 19:02	1
HS21011042-03	16IW03-210126	26 Jan 2021 12:30			02 Feb 2021 19:02	1
HS21011042-04	16IW03-210126-FD	26 Jan 2021 12:30			02 Feb 2021 19:02	1
HS21011042-05	16IW10-210126	26 Jan 2021 13:07			02 Feb 2021 19:02	1
HS21011042-06	16IW10-210126-FD	26 Jan 2021 13:07			02 Feb 2021 19:02	1
HS21011042-07	16IW09-210126	26 Jan 2021 13:41			02 Feb 2021 19:02	1
Batch ID: R377396 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS21011042-02	16EW02-210126	26 Jan 2021 08:25			03 Feb 2021 06:45	250
HS21011042-02	16EW02-210126	26 Jan 2021 08:25			03 Feb 2021 06:24	25
HS21011042-03	16IW03-210126	26 Jan 2021 12:30			03 Feb 2021 05:21	100
HS21011042-03	16IW03-210126	26 Jan 2021 12:30			03 Feb 2021 05:00	10
HS21011042-04	16IW03-210126-FD	26 Jan 2021 12:30			03 Feb 2021 06:03	100
HS21011042-04	16IW03-210126-FD	26 Jan 2021 12:30			03 Feb 2021 05:42	10
HS21011042-05	16IW10-210126	26 Jan 2021 13:07			03 Feb 2021 03:57	1
HS21011042-06	16IW10-210126-FD	26 Jan 2021 13:07			03 Feb 2021 04:18	1
HS21011042-07	16IW09-210126	26 Jan 2021 13:41			03 Feb 2021 04:39	1
Batch ID: R377396 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS21011042-01	16LHAAP-210126-TB5	26 Jan 2021 07:00			03 Feb 2021 03:36	1

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 08-Mar-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
WorkOrder: HS21011042

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R377635 (0)	**Test Name :** SUBCONTRACT ANALYSIS - RSK				**Matrix:** Groundwater	
HS21011042-02	16EW02-210126	26 Jan 2021 08:25			05 Feb 2021 16:56	1
HS21011042-03	16IW03-210126	26 Jan 2021 12:30			05 Feb 2021 16:56	1
HS21011042-04	16IW03-210126-FD	26 Jan 2021 12:30			05 Feb 2021 16:56	1
HS21011042-05	16IW10-210126	26 Jan 2021 13:07			05 Feb 2021 16:56	1
HS21011042-06	16IW10-210126-FD	26 Jan 2021 13:07			05 Feb 2021 16:56	1
HS21011042-07	16IW09-210126	26 Jan 2021 13:41			05 Feb 2021 16:56	1
Batch ID: R377953 (0)	**Test Name :** SUBCONTRACT ANALYSIS - TOC ANALYSIS				**Matrix:** Groundwater	
HS21011042-02	16EW02-210126	26 Jan 2021 08:25			11 Feb 2021 12:44	1
HS21011042-03	16IW03-210126	26 Jan 2021 12:30			11 Feb 2021 12:44	1
HS21011042-04	16IW03-210126-FD	26 Jan 2021 12:30			11 Feb 2021 12:44	1
HS21011042-05	16IW10-210126	26 Jan 2021 13:07			11 Feb 2021 12:44	1
HS21011042-06	16IW10-210126-FD	26 Jan 2021 13:07			11 Feb 2021 12:44	1
HS21011042-07	16IW09-210126	26 Jan 2021 13:41			11 Feb 2021 12:44	1
Batch ID: R377954 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Groundwater	
HS21011042-02	16EW02-210126	26 Jan 2021 08:25			10 Feb 2021 15:53	100
HS21011042-02	16EW02-210126	26 Jan 2021 08:25			10 Feb 2021 15:35	10
HS21011042-03	16IW03-210126	26 Jan 2021 12:30			10 Feb 2021 12:52	1
HS21011042-04	16IW03-210126-FD	26 Jan 2021 12:30			10 Feb 2021 13:10	1
HS21011042-05	16IW10-210126	26 Jan 2021 13:07			11 Feb 2021 12:25	10
HS21011042-05	16IW10-210126	26 Jan 2021 13:07			10 Feb 2021 13:28	2
HS21011042-06	16IW10-210126-FD	26 Jan 2021 13:07			11 Feb 2021 12:43	10
HS21011042-06	16IW10-210126-FD	26 Jan 2021 13:07			10 Feb 2021 13:46	2
HS21011042-07	16IW09-210126	26 Jan 2021 13:41			10 Feb 2021 15:17	1

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 08-Mar-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
WorkOrder: HS21011042

QC BATCH REPORT

Batch ID: R377396 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-210202** Units: **ug/L** Analysis Date: **02-Feb-2021 23:02**
Client ID: Run ID: **VOA6_377396** SeqNo: **5941674** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	1.0	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
Methylene chloride	2.0	2.0								U
Trichloroethene	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*46.35*	*1.0*	*50*	*0*	*92.7*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.5*	*1.0*	*50*	*0*	*101*	*85 - 114*				
Surr: Dibromofluoromethane	*47.71*	*1.0*	*50*	*0*	*95.4*	*80 - 119*				
Surr: Toluene-d8	*49.97*	*1.0*	*50*	*0*	*99.9*	*89 - 112*				

LCS Sample ID: **VLCSW-210202** Units: **ug/L** Analysis Date: **02-Feb-2021 22:20**
Client ID: Run ID: **VOA6_377396** SeqNo: **5941673** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	20.57	1.0	20	0	103	80 - 119				
1,1-Dichloroethene	19.58	1.0	20	0	97.9	71 - 131				
1,2-Dichloroethane	19.57	1.0	20	0	97.8	73 - 128				
cis-1,2-Dichloroethene	21.25	1.0	20	0	106	78 - 123				
Methylene chloride	21.53	2.0	20	0	108	74 - 124				
Trichloroethene	21.72	1.0	20	0	109	79 - 123				
Vinyl chloride	19.77	1.0	20	0	98.9	58 - 137				
Surr: 1,2-Dichloroethane-d4	*50.38*	*1.0*	*50*	*0*	*101*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*53.08*	*1.0*	*50*	*0*	*106*	*85 - 114*				
Surr: Dibromofluoromethane	*51.31*	*1.0*	*50*	*0*	*103*	*80 - 119*				
Surr: Toluene-d8	*48.93*	*1.0*	*50*	*0*	*97.9*	*89 - 112*				

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 08-Mar-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
WorkOrder: HS21011042

QC BATCH REPORT

Batch ID: R377396 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS21011103-06MS** Units: **ug/L** Analysis Date: **03-Feb-2021 02:33**
Client ID: Run ID: **VOA6_377396** SeqNo: **5941684** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	18.94	1.0	20	0	94.7	80 - 119				
1,1-Dichloroethene	17.17	1.0	20	0	85.8	71 - 131				
1,2-Dichloroethane	18.2	1.0	20	0	91.0	73 - 128				
cis-1,2-Dichloroethene	18.16	1.0	20	0	90.8	78 - 123				
Methylene chloride	17.26	2.0	20	0	86.3	74 - 124				
Trichloroethene	20.8	1.0	20	0	104	79 - 123				
Vinyl chloride	12.73	1.0	20	0	63.7	58 - 137				
Surr: 1,2-Dichloroethane-d4	*45.41*	*1.0*	*50*	*0*	*90.8*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*52.6*	*1.0*	*50*	*0*	*105*	*85 - 114*				
Surr: Dibromofluoromethane	*47.33*	*1.0*	*50*	*0*	*94.7*	*80 - 119*				
Surr: Toluene-d8	*49.06*	*1.0*	*50*	*0*	*98.1*	*89 - 112*				

MSD Sample ID: **HS21011103-06MSD** Units: **ug/L** Analysis Date: **03-Feb-2021 02:54**
Client ID: Run ID: **VOA6_377396** SeqNo: **5941685** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	17.43	1.0	20	0	87.2	80 - 119	18.94	8.27	20	
1,1-Dichloroethene	15.57	1.0	20	0	77.8	71 - 131	17.17	9.77	20	
1,2-Dichloroethane	16.82	1.0	20	0	84.1	73 - 128	18.2	7.9	20	
cis-1,2-Dichloroethene	16.87	1.0	20	0	84.3	78 - 123	18.16	7.36	20	
Methylene chloride	16.45	2.0	20	0	82.2	74 - 124	17.26	4.83	20	
Trichloroethene	18.68	1.0	20	0	93.4	79 - 123	20.8	10.8	20	
Vinyl chloride	11.37	1.0	20	0	56.9	58 - 137	12.73	11.3	20	S
Surr: 1,2-Dichloroethane-d4	*45.5*	*1.0*	*50*	*0*	*91.0*	*81 - 118*	*45.41*	*0.197*	*20*	
Surr: 4-Bromofluorobenzene	*51.2*	*1.0*	*50*	*0*	*102*	*85 - 114*	*52.6*	*2.69*	*20*	
Surr: Dibromofluoromethane	*47.25*	*1.0*	*50*	*0*	*94.5*	*80 - 119*	*47.33*	*0.159*	*20*	
Surr: Toluene-d8	*49.04*	*1.0*	*50*	*0*	*98.1*	*89 - 112*	*49.06*	*0.0295*	*20*	

The following samples were analyzed in this batch: HS21011042-01 HS21011042-02 HS21011042-03 HS21011042-04 HS21011042-05 HS21011042-06 HS21011042-07

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 08-Mar-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
WorkOrder: HS21011042

QC BATCH REPORT

Batch ID: R377090 (0) **Instrument:** ICS2100 **Method:** ANIONS BY SW9056A

MBLK Sample ID: **MBLK-012721** Units: **mg/L** Analysis Date: **28-Jan-2021 09:29**
Client ID: Run ID: **ICS2100_377090** SeqNo: **5934742** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate (As N)	0.100	0.100								U

LCS Sample ID: **LCS-012721** Units: **mg/L** Analysis Date: **28-Jan-2021 09:47**
Client ID: Run ID: **ICS2100_377090** SeqNo: **5934743** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate (As N)	3.791	0.100	4	0	94.8	80 - 120				

MS Sample ID: **HS21011012-16MS** Units: **mg/L** Analysis Date: **28-Jan-2021 01:38**
Client ID: Run ID: **ICS2100_377090** SeqNo: **5934736** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate (As N)	2.213	0.100	2	0.3083	95.2	80 - 120				

MSD Sample ID: **HS21011012-16MSD** Units: **mg/L** Analysis Date: **28-Jan-2021 01:56**
Client ID: Run ID: **ICS2100_377090** SeqNo: **5934737** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate (As N)	2.221	0.100	2	0.3083	95.6	80 - 120	2.213	0.365	20	

The following samples were analyzed in this batch: HS21011042-02 HS21011042-03 HS21011042-04 HS21011042-05 HS21011042-06 HS21011042-07

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 08-Mar-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
WorkOrder: HS21011042

QC BATCH REPORT

Batch ID: R377113 (0) **Instrument:** ManTech01 **Method:** ALKALINITY BY SM2320B

MBLK Sample ID: **WBLKW1-210128** Units: **mg/L** Analysis Date: **28-Jan-2021 18:15**
Client ID: Run ID: **ManTech01_377113** SeqNo: **5935132** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	5.00	5.00								U

LCS Sample ID: **LCS1-210128** Units: **mg/L** Analysis Date: **28-Jan-2021 18:24**
Client ID: Run ID: **ManTech01_377113** SeqNo: **5935133** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	1015	5.00	1000	0	102	85 - 115				

LCSD Sample ID: **LCSD1-210128** Units: **mg/L** Analysis Date: **28-Jan-2021 18:32**
Client ID: Run ID: **ManTech01_377113** SeqNo: **5935134** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	1014	5.00	1000	0	101	85 - 115	1015	0.125	20	

DUP Sample ID: **HS21011092-02DUP** Units: **mg/L** Analysis Date: **28-Jan-2021 18:46**
Client ID: Run ID: **ManTech01_377113** SeqNo: **5935136** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	130.5	5.00					128.2	1.74	20	

The following samples were analyzed in this batch: HS21011042-02 HS21011042-03 HS21011042-04 HS21011042-05 HS21011042-06 HS21011042-07

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 08-Mar-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
WorkOrder: HS21011042

QC BATCH REPORT

Batch ID: R377954 (0) **Instrument:** ICS-Integrion **Method:** ANIONS BY SW9056A

MBLK Sample ID: **MBLK-** Units: **mg/L** Analysis Date: **11-Feb-2021 08:29**
Client ID: Run ID: **ICS-Integrion_377954** SeqNo: **5954072** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	0.100	0.100								U
Sulfate	0.500	0.500								U

LCS Sample ID: **LCS-** Units: **mg/L** Analysis Date: **11-Feb-2021 08:48**
Client ID: Run ID: **ICS-Integrion_377954** SeqNo: **5954073** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.656	0.100	4	0	91.4	80 - 120				
Sulfate	19.81	0.500	20	0	99.0	80 - 120				

MS Sample ID: **HS21020114-04MS** Units: **mg/L** Analysis Date: **11-Feb-2021 05:28**
Client ID: Run ID: **ICS-Integrion_377954** SeqNo: **5954064** PrepDate: DF: **1000**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	1729	100	2000	117.2	80.6	80 - 120				
Sulfate	12760	500	10000	2930	98.3	80 - 120				

MSD Sample ID: **HS21020114-04MSD** Units: **mg/L** Analysis Date: **11-Feb-2021 05:47**
Client ID: Run ID: **ICS-Integrion_377954** SeqNo: **5954065** PrepDate: DF: **1000**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	1738	100	2000	117.2	81.0	80 - 120	1729	0.508	20	
Sulfate	12720	500	10000	2930	97.9	80 - 120	12760	0.275	20	

The following samples were analyzed in this batch: HS21011042-02 HS21011042-03 HS21011042-04 HS21011042-05 HS21011042-06 HS21011042-07

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 08-Mar-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
WorkOrder: **HS21011042**

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

RIGHT SOLUTIONS | RIGHT PARTNER

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	20-030-0	26-Mar-2021
California	2919, 2020-2021	30-Apr-2021
Dept of Defense	PJLA L20-507	22-Dec-2021
Florida	E87611-30-07/01/2020	30-Jun-2021
Illinois	2000322020-4	09-May-2021
Kansas	E-10352 2020-2021	31-Jul-2021
Kentucky	123043, 2020-2021	30-Apr-2021
Louisiana	03087, 2020-2021	30-Jun-2021
North Carolina	624-2021	31-Dec-2021
North Dakota	R-193 2020-2021	30-Apr-2021
Oklahoma	2020-165	31-Aug-2021
Texas	T104704231-20-26	30-Apr-2021

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 08-Mar-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
Work Order: HS21011042

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS21011042-01	16LHAAP-210126-TB5	Login	1/27/2021 4:02:49 PM	PMG	VOA222
HS21011042-02	16EW02-210126	Login	1/27/2021 4:02:49 PM	PMG	WET121
HS21011042-02	16EW02-210126	Login	1/27/2021 4:02:49 PM	PMG	Sub
HS21011042-02	16EW02-210126	Login	1/27/2021 4:02:49 PM	PMG	VOA222
HS21011042-02	16EW02-210126	Login	1/27/2021 4:02:49 PM	PMG	Sub
HS21011042-02	16EW02-210126	Login	1/27/2021 4:02:49 PM	PMG	Sub
HS21011042-03	16IW03-210126	Login	1/27/2021 4:02:49 PM	PMG	WET121
HS21011042-03	16IW03-210126	Login	1/27/2021 4:02:49 PM	PMG	Sub
HS21011042-03	16IW03-210126	Login	1/27/2021 4:02:49 PM	PMG	VOA222
HS21011042-03	16IW03-210126	Login	1/27/2021 4:02:49 PM	PMG	Sub
HS21011042-03	16IW03-210126	Login	1/27/2021 4:02:49 PM	PMG	Sub
HS21011042-04	16IW03-210126-FD	Login	1/27/2021 4:02:49 PM	PMG	WET121
HS21011042-04	16IW03-210126-FD	Login	1/27/2021 4:02:49 PM	PMG	Sub
HS21011042-04	16IW03-210126-FD	Login	1/27/2021 4:02:49 PM	PMG	VOA222
HS21011042-04	16IW03-210126-FD	Login	1/27/2021 4:02:49 PM	PMG	Sub
HS21011042-04	16IW03-210126-FD	Login	1/27/2021 4:02:49 PM	PMG	Sub
HS21011042-05	16IW10-210126	Login	1/27/2021 4:02:49 PM	PMG	WET121
HS21011042-05	16IW10-210126	Login	1/27/2021 4:02:49 PM	PMG	Sub
HS21011042-05	16IW10-210126	Login	1/27/2021 4:02:49 PM	PMG	VOA222
HS21011042-05	16IW10-210126	Login	1/27/2021 4:02:49 PM	PMG	Sub
HS21011042-05	16IW10-210126	Login	1/27/2021 4:02:49 PM	PMG	Sub

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 08-Mar-21

Sample Receipt Checklist

Work Order ID: HS21011042 **Date/Time Received:** **27-Jan-2021 10:05**

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

Completed By: /S/ Paresh M. Giga (eSignature) 27-Jan-2021 16:07 (Date/Time) **Reviewed by:** /S/ RJ Modashia (eSignature) 27-Jan-2021 20:10 (Date/Time)

Matrices: **GW/Water** Carrier name: **FedEx**

	Yes	No	Not Present
Shipping container/cooler in good condition?	☑	☐	☐
Custody seals intact on shipping container/cooler?	☑	☐	☐
Custody seals intact on sample bottles?	☐	☐	☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	☐	☐	☑
Chain of custody present?	☑	☐	1 Page(s)
Chain of custody signed when relinquished and received?	☑	☐	COC IDs:None
Samplers name present on COC?	☑	☐	
Chain of custody agrees with sample labels?	☑	☐	
Samples in proper container/bottle?	☑	☐	
Sample containers intact?	☑	☐	
Sufficient sample volume for indicated test?	☑	☐	
All samples received within holding time?	☑	☐	
Container/Temp Blank temperature in compliance?	☑	☐	

Temperature(s)/Thermometer(s): 1.4C U/c IR31

Cooler(s)/Kit(s): 23944

Date/Time sample(s) sent to storage: 1/27/2021 16:20

	Yes	No	
Water - VOA vials have zero headspace?	☑	☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	☐	☐	N/A ☑
pH adjusted?	☐	☐	N/A ☑

pH adjusted by:

Login Notes: Times Differ : 16IW09-210126
COC - 13:41 Labels - 13:47

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

RIGHT SOLUTIONS | RIGHT PARTNER

CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd. Suite 210 Houston, TX. 77099 (281) 530-5656 ATTN: R.J Modashia LHAAP16-210126-ALS Page 1 of 1

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

Project No. 501032

Job: **LHAAP 16 January 2021**

Prepared By: Mike Martinez

P.O. Number

Field Sample I.D. Time	Sample Matrix	Date /	MS / MSD	No. OF CONTAINERS	VOC by SW 8260B	TOC by SM5310C	MEE by RSK 175	Anions (bromide, sulfate, nitrate) by SW9056 and Alkalinity by SM2320	Bromide by SW9056	Perchlorate by SW6850	Metals (arsenic, chromium, manganese, nickel, thallium) by SW6020				Remarks (Preservatives, etc.)
16LHAAP-210126-TBS	LIQ	01-26-21/0700		2	2										
16EW02-210126	GW	01-26-21/0825		10	3	2	3	1		1					
16IW03-210126	GW	01-26-21/1230		10	3	2	3	1		1					
16IW03-210126-FD	GW	01-26-21/1230		10	3	2	3	1		1					
16IW10-210126	GW	01-26-21/1307		10	3	2	3	1		1					
16IW10-210126-FD	GW	01-26-21/1307		10	3	2	3	1		1					
16IW09-210126	GW	01-26-21/1341		10	3	2	3	1		1					

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

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
	01-26-21	1450									

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition
J. [illegible]	1/27/21	10:05							

Remarks: Cooler 23944 1R31
Temp 1.4°C CFO

Aptim Environmental & Infrastructure, Inc.
LHAAP 16 January 2021
HS21011042

(Word) S:\3-ces\Forms\Chain of Custody - BiWeekly

RIGHT SOLUTIONS | RIGHT PARTNER

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

23944

CUSTODY SEAL
Date: 01-26-21 Time: 15:00
Name: MS
Company: ALS

Seal Broken By: SM
Date: 01/27/21

23944 JAN 27 2021

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

23944

CUSTODY SEAL
Date: 01-26-21 Time: 1500
Name:
Company: ALS

Seal Broken By: SM
Date: 01/27/21

Must Deliver Next Business Day
Time and Tempature Sensitive!

23944

ORIGIN ID:SGRA (903) 930-6193
SCOTT BEESINGER
APTIM ENVIROMENTAL & INFRASTRUCTURE
203-B EAST GRAND AVE
STE 202
MARSHALL, TX 75670
UNITED STATES US

SHIP DATE: 04JAN21
ACTWGT: 1.00 LB MAN
CAD: 6221247/CAFE3408
DIMS: 26x14x14 IN

TO CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099
(281) 530-5656
REF: LHAPP 16-B075777-RJ

RMA:

FedEx Express

FedEx
TRK# 0221 9473 0838 9601

WED - 27 JAN AA
PRIORITY OVERNIGHT

AB SGRA

77099
TX-US
IAH

FID: 162785 26Jan2021 SGGA 560G1/1136/B5A2

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

February 05, 2021

Analytical Report for Service Request No: K2100774

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

RE: ALS Houston DOD TOC

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory January 28, 2021
For your reference, these analyses have been assigned our service request number **K2100774.**

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
Qualifiers
State Certifications, Accreditations, And Licenses
Case Narrative
Chain of Custody
General Chemistry

RIGHT SOLUTIONS | RIGHT PARTNER

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.

RIGHT SOLUTIONS | RIGHT PARTNER

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.

RIGHT SOLUTIONS | RIGHT PARTNER

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.

RIGHT SOLUTIONS | RIGHT PARTNER

Case Narrative

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

RIGHT SOLUTIONS | RIGHT PARTNER

1317 South 13th Ave, Kelso, WA 98626 | 1-360-577-7222 | www.alsglobal.com

ALS Environmental

Client: ALS Environmental - US
Project: ALS Houston DOD TOC
Sample Matrix: Ground Water

Service Request: K2100774
Date Received: 01/28/2021

CASE NARRATIVE

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

Sample Receipt:

Six ground water samples were received for analysis at ALS Environmental on 01/28/2021. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The samples were stored at minimum in accordance with the analytical method requirements.

General Chemistry:

Method SM 5310 C, 02/03/2021: The detection limit was elevated for Total Organic Carbon in samples 16IW03-210126 and 16IW03-210126-FD. An unidentified matrix interference prevented the samples from being run without dilution. No further corrective action was appropriate.

Approved by Kelley Lovejoy Date 02/05/2021

RIGHT SOLUTIONS | RIGHT PARTNER

Chain of Custody

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

RIGHT SOLUTIONS | RIGHT PARTNER

K2100774

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID:** **15544**

SUBCONTRACT TO:

ALS Environmental Kelso
1317 S. 13th Avenue
Kelso, WA 98626
Phone: +1 360 501 3312

CUSTOMER INFORMATION:

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

INVOICE INFORMATION:

Company: ALS Houston
Contact: Accounts Payable
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Reference: HS21011042
TSR: Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS21011042-02**	**16EW02-210126**	**Groundwater**	**26 Jan 2021 08:25**
	TOC: Provide Level II & DOD Level IV/EQuIS APTIM EDD			10 Feb 2021
2.	**HS21011042-03**	**16IW03-210126**	**Groundwater**	**26 Jan 2021 12:30**
	TOC: Provide Level II & DOD Level IV/EQuIS APTIM EDD			10 Feb 2021
3.	**HS21011042-04**	**16IW03-210126-FD**	**Groundwater**	**26 Jan 2021 12:30**
	TOC: Provide Level II & DOD Level IV/EQuIS APTIM EDD			10 Feb 2021
4.	**HS21011042-05**	**16IW10-210126**	**Groundwater**	**26 Jan 2021 13:07**
	TOC: Provide Level II & DOD Level IV/EQuIS APTIM EDD			10 Feb 2021
5.	**HS21011042-06**	**16IW10-210126-FD**	**Groundwater**	**26 Jan 2021 13:07**
	TOC: Provide Level II & DOD Level IV/EQuIS APTIM EDD			10 Feb 2021
6.	**HS21011042-07**	**16IW09-210126**	**Groundwater**	**26 Jan 2021 13:41**
	TOC: Provide Level II & DOD Level IV/EQuIS APTIM EDD			10 Feb 2021

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

QC Level: DOD IV (DoD Data Package)

K2100774

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID: 15544**

Relinquished By: Date/Time: 1/27/2021 1800

Received By: Date/Time: 1/28/21 1030

Cooler ID(s): Temperature(s):

RIGHT SOLUTIONS | RIGHT PARTNER

PM RL

Cooler Receipt and Preservation Form

Client A18 - Houston Service Request K21 00774

Received: 112821 Opened: 112821 By: RK Unloaded: 112821 By: TBR

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
4. Was a Temperature Blank present in cooler? NA Y N If yes, notate the temperature in the appropriate column below:
   If no, take the temperature of a representative sample bottle contained within the cooler; notate in the column "Sample Temp":
5. Were samples received within the method specified temperature ranges? NA Y N
   If no, were they received on ice and same day as collected? If not, notate the cooler # below and notify the PM. NA Y N

If applicable, tissue samples were received: *Frozen* *Partially Thawed* *Thawed*

Temp Blank	Sample Temp	IR Gun	Cooler #/COC ID / NA	Out of temp indicate with "X"	PM Notified If out of temp	Tracking Number NA	Filed
1.7	—	1261		—		9473083988 45	

6. Packing material: *Inserts* *Baggies* *Bubble Wrap* *Gel Packs* *Wet Ice* *Dry Ice* *Sleeves* _____
7. Were custody papers properly filled out (ink, signed, etc.)? NA Y N
8. Were samples received in good condition (unbroken) NA Y N
9. Were all sample labels complete (ie, analysis, preservation, etc.)? NA Y N
10. Did all sample labels and tags agree with custody papers? NA Y N
11. Were appropriate bottles/containers and volumes received for the tests indicated? NA Y N
12. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* NA Y N
13. Were VOA vials received without headspace? *Indicate in the table below.* NA Y N
14. Was C12/Res negative? NA Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

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

Notes, Discrepancies, Resolutions: _____

RIGHT SOLUTIONS | RIGHT PARTNER

General Chemistry

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	K2100774
Project:	ALS Houston DOD TOC	**Date Collected:**	01/26/21
Sample Matrix:	Ground Water	**Date Received:**	01/28/21
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
16EW02-210126	K2100774-001	**12.0**	0.50	0.20	0.07	1	02/03/21 11:05	
16IW03-210126	K2100774-002	ND U	2.5	1.0	0.4	5	02/03/21 11:05	
16IW03-210126-FD	K2100774-003	ND U	2.5	1.0	0.4	5	02/03/21 11:05	
16IW10-210126	K2100774-004	**836**	20	8	3	40	02/03/21 11:05	
16IW10-210126-FD	K2100774-005	**857**	20	8	3	40	02/03/21 11:05	
16IW09-210126	K2100774-006	**787**	20	8	3	40	02/03/21 11:05	
Method Blank	K2100774-MB	ND U	0.50	0.20	0.07	1	02/03/21 11:05	

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K2100774
Project:	ALS Houston DOD TOC	**Date Analyzed:**	02/03/21
Sample Matrix:	Ground Water	**Date Extracted:**	NA

Lab Control Sample Summary
Carbon, Total Organic

Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA
		Analysis Lot:	711915

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K2100774-LCS	25.9	25.0	104	83-117

RIGHT SOLUTIONS | RIGHT PARTNER

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

LABORATORY REPORT

February 5, 2021

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

RE: HS21011042

Dear RJ:

Enclosed are the results of the samples submitted to our laboratory on January 28, 2021. For your reference, these analyses have been assigned our service request number P2100451.

All analyses were performed according to our laboratory's NELAP and DoD-ELAP-approved quality assurance program. The test results meet requirements of the current NELAP and DoD-ELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP and DoD-ELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

ALS | Environmental

By Hayden Akers at 2:43 pm, Feb 05, 2021

Hayden Akers
Project Manager

RIGHT SOLUTIONS | RIGHT PARTNER

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

Client: ALS Laboratory Group
Project: HS21011042

Service Request No: P2100451

CASE NARRATIVE

The samples were received intact under chain of custody on January 28, 2021 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

Methane, Ethene and Ethane Analysis

The samples were analyzed for methane, ethene, and ethane using a gas chromatograph equipped with a flame ionization detector (FID). A known amount of liquid was displaced by injecting 8.0 milliliters of helium creating a headspace in the sample vial. Each sample vial was agitated using a sonic disrupter for fifteen minutes and then allowed to equilibrate for at least two hours. A volume of the headspace was withdrawn using a gas-tight syringe and analyzed using a manual injection technique. The amount of dissolved gases (methane, ethene and ethane) in the original sample was calculated using Henry's Law. This method was performed with guidance from RSK 175. This method is included on the laboratory's NELAP and DoD-ELAP scope of accreditation. Any analytes flagged with an X are not included on the laboratory's NELAP or DoD-ELAP accreditation.

Manual integrations were performed on the following sample(s) and analyte(s). Refer to the raw data for additional information.

Sample Identification(s)	Analyte(s)
P2100451-004	Methane

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.

Use of ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.

RIGHT SOLUTIONS | RIGHT PARTNER

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

ALS Environmental – Simi Valley

CERTIFICATIONS, ACCREDITATIONS, AND REGISTRATIONS

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

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

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS ENVIRONMENTAL

DETAIL SUMMARY REPORT

Client: ALS Laboratory Group
Service Request: P2100451
Project ID: HS21011042

Date Received: 1/28/2021
Time Received: 14:36

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	RSK 175 - Gases
16EW02-210126	P2100451-001	Water	1/26/2021	08:25	X
16IW03-210126	P2100451-002	Water	1/26/2021	12:30	X
16IW03-210126-FD	P2100451-003	Water	1/26/2021	12:30	X
16IW10-210126	P2100451-004	Water	1/26/2021	13:07	X
16IW10-210126-FD	P2100451-005	Water	1/26/2021	13:07	X
16IW09-210126	P2100451-006	Water	1/26/2021	13:41	X

RIGHT SOLUTIONS | RIGHT PARTNER

P210451

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID:** **15546**

SUBCONTRACT TO:

ALS Environmental
2655 Park Center Drive, Suite A
Simi Valley, CA 93065
Phone: +1 805 526 7161

CUSTOMER INFORMATION:

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

INVOICE INFORMATION:

Company: ALS Houston
Contact: Accounts Payable
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Reference: HS21011042
TSR: Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS21011042-02**	**16EW02-210126**	**Groundwater**	**26 Jan 2021 08:25**
	MEE Only. Provide DOD LV II & IV pdf separate. EQuIS 5.0 - Longhorn		Equis EDD.	10 Feb 2021
2.	**HS21011042-03**	**16IW03-210126**	**Groundwater**	**26 Jan 2021 12:30**
	MEE Only. Provide DOD LV II & IV pdf separate. EQuIS 5.0 - Longhorn		Equis EDD.	10 Feb 2021
3.	**HS21011042-04**	**16IW03-210126-FD**	**Groundwater**	**26 Jan 2021 12:30**
	MEE Only. Provide DOD LV II & IV pdf separate. EQuIS 5.0 - Longhorn		Equis EDD.	10 Feb 2021
4.	**HS21011042-05**	**16IW10-210126**	**Groundwater**	**26 Jan 2021 13:07**
	MEE Only. Provide DOD LV II & IV pdf separate. EQuIS 5.0 - Longhorn		Equis EDD.	10 Feb 2021
5.	**HS21011042-06**	**16IW10-210126-FD**	**Groundwater**	**26 Jan 2021 13:07**
	MEE Only. Provide DOD LV II & IV pdf separate. EQuIS 5.0 - Longhorn		Equis EDD.	10 Feb 2021
6.	**HS21011042-07**	**16IW09-210126**	**Groundwater**	**26 Jan 2021 13:41**
	MEE Only. Provide DOD LV II & IV pdf separate. EQuIS 5.0 - Longhorn		Equis EDD.	10 Feb 2021

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

QC Level: DOD IV (DoD Data Package)

R2100451

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense**

COC ID: **15546**

Relinquished By: _____ Date/Time: 1/27/2021 1800

Received By: _____ Date/Time: 1-28-21 1015

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

ALS Environmental
Sample Acceptance Check Form

Client: ALS Laboratory Group Work order: P2100451
Project: HS21011042
Sample(s) received on: 1/28/2021 Date opened: 1/28/2021 by: ADAVID

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

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

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P2100451-001.01	40ml VOA HCL		1			CB 02/01/21
P2100451-001.02	40ml VOA HCL					
P2100451-001.03	40ml VOA HCL					
P2100451-002.01	40ml VOA HCL					
P2100451-002.02	40ml VOA HCL					
P2100451-002.03	40ml VOA HCL		3			CB 02/01/21
P2100451-003.01	40ml VOA HCL		1			CB 02/01/21
P2100451-003.02	40ml VOA HCL					
P2100451-003.03	40ml VOA HCL					
P2100451-004.01	40ml VOA HCL		1			CB 02/01/21
P2100451-004.02	40ml VOA HCL					
P2100451-004.03	40ml VOA HCL					
P2100451-005.01	40ml VOA HCL		1			CB 02/01/21
P2100451-005.02	40ml VOA HCL					
P2100451-005.03	40ml VOA HCL					

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

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Environmental
Sample Acceptance Check Form

Client: ALS Laboratory Group Work order: P2100451
Project: HS21011042
Sample(s) received on: 1/28/2021 Date opened: 1/28/2021 by: ADAVID

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P2100451-006.01	40ml VOA HCL					
P2100451-006.02	40ml VOA HCL		1			CB 02/01/21
P2100451-006.03	40ml VOA HCL					

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

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **16EW02-210126**
Client Project ID: **HS21011042**

ALS Project ID: P2100451
ALS Sample ID: P2100451-001

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

Date Collected: 01/26/21
Date Received: 01/28/21
Date Analyzed: 01/29/21
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	**130**	1.3	1.0	0.51	
74-85-1	Ethene	**26**	1.0	0.55	0.24	
74-84-0	Ethane	**0.71**	0.60	0.47	0.16	

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **16IW03-210126**
Client Project ID: **HS21011042**

ALS Project ID: P2100451
ALS Sample ID: P2100451-002

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

Date Collected: 01/26/21
Date Received: 01/28/21
Date Analyzed: 01/29/21
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	**610**	1.3	1.0	0.51	
74-85-1	Ethene	**500**	1.0	0.55	0.24	
74-84-0	Ethane	**2.7**	0.60	0.47	0.16	

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **16IW03-210126-FD**
Client Project ID: **HS21011042**

ALS Project ID: P2100451
ALS Sample ID: P2100451-003

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

Date Collected: 01/26/21
Date Received: 01/28/21
Date Analyzed: 01/29/21
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	**630**	1.3	1.0	0.51	
74-85-1	Ethene	**530**	1.0	0.55	0.24	
74-84-0	Ethane	**2.8**	0.60	0.47	0.16	

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **16IW10-210126**
Client Project ID: **HS21011042**

ALS Project ID: P2100451
ALS Sample ID: P2100451-004

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

Date Collected: 01/26/21
Date Received: 01/28/21
Date Analyzed: 01/29/21
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	**1,200**	1.3	1.0	0.51	
74-85-1	Ethene	**9.9**	1.0	0.55	0.24	
74-84-0	Ethane	0.47	0.60	0.47	0.16	**U**

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **16IW10-210126-FD**
Client Project ID: **HS21011042**

ALS Project ID: P2100451
ALS Sample ID: P2100451-005

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

Date Collected: 01/26/21
Date Received: 01/28/21
Date Analyzed: 01/29/21
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	**780**	1.3	1.0	0.51	
74-85-1	Ethene	**7.6**	1.0	0.55	0.24	
74-84-0	Ethane	0.47	0.60	0.47	0.16	**U**

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **16IW09-210126**
Client Project ID: **HS21011042**

ALS Project ID: P2100451
ALS Sample ID: P2100451-006

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

Date Collected: 01/26/21
Date Received: 01/28/21
Date Analyzed: 01/29/21
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	**5,200**	1.3	1.0	0.51	
74-85-1	Ethene	0.55	1.0	0.55	0.24	**U**
74-84-0	Ethane	0.47	0.60	0.47	0.16	**U**

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **Method Control Sample**
Client Project ID: **HS21011042**

ALS Project ID: P2100451
ALS Sample ID: P210129-MB

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

Date Collected: NA
Date Received: NA
Date Analyzed: 1/29/21
Volume(s) Analyzed: 0.10 ml(s)

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

The Method Control Sample is laboratory water carried through the entire analytical process.
U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

RIGHT SOLUTIONS | RIGHT PARTNER

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE / DUPLICATE LABORATORY CONTROL SAMPLE SUMMARY

Client: **ALS Laboratory Group**
Client Sample ID: **Duplicate Lab Control Sample**
Client Project ID: **HS21011042**

ALS Project ID: P2100451
ALS Sample ID: P210129-LCS
P210129-DLCS

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

Date Collected: NA
Date Received: NA
Date Analyzed: 1/29/21
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Spike Amount LCS / DLCS µg/L	Result[1] LCS µg/L	Result[1] DLCS µg/L	% Recovery LCS	% Recovery DLCS	DOD Acceptance Limits	RPD	RPD Limit	Data Qualifier
74-82-8	Methane	2.52	2.43	2.32	**96**	**92**	73-125	4	26	
74-85-1	Ethene	4.40	5.10	4.94	**116**	**112**	72-133	4	11	
74-84-0	Ethane	4.72	4.93	4.76	**104**	**101**	74-131	3	10	

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

RIGHT SOLUTIONS | RIGHT PARTNER

February 02, 2021

Service Request No:E2100103

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

Laboratory Results for: HS21011042

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory January 27, 2021
For your reference, these analyses have been assigned our service request number **E2100103.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current TNI standards, where applicable, and except as noted in the laboratory case narrative provided. All results are intended to be considered in their entirety and ALS Environmental is not responsible for use of less than the complete final report. Results apply only to the items submitted to the laboratory, as received for analysis. In accordance with the current TNI Standard, a statement on the estimated uncertainty of measurement of any quantitative analysis will be supplied upon request.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Corey Grandits
Project Manager

ADDRESS 10450 Stancliff Rd., Suite 210, Houston, TX 77099
PHONE +1 281 530 5656 | FAX +1 281 530 5887
ALS Group USA, Corp.
dba ALS Environmental

RIGHT SOLUTIONS | RIGHT PARTNER

Certificate of Analysis

ALS Environmental - Houston HRMS
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Environmental

Client:	ALS Houston	**Service Request No.:**	E2100103
Project:	HS21011042	**Date Received:**	01/27/21
Sample Matrix:	W		

CASE NARRATIVE

All analyses were performed in adherence to the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier II. When appropriate to the method, method blank results have been reported with each analytical test.

Sample Receipt

Six samples were received for analysis at ALS Environmental in Houston on 01/27/21.

The samples were received in good condition and are consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

Data Validation Notes and Discussion

Precision and Accuracy:

EQ2100045: Laboratory Control Spike/Duplicate Laboratory Control Spike (LCS/DLCS) samples were analyzed and reported in addition to a MS/MSD for this extraction batch. The LCS and DLCS recoveries are within QC limits. MS/MSD were performed on an unrelated sample.

All samples in SR E2100103 - lowest practical dilution (5x/10x) performed due to matrix interference.

DoD Certification is held for the method/matrix/analytes provided in this report.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.

Use of ALS group USA Corp dba ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.

RIGHT SOLUTIONS | RIGHT PARTNER

Client: ALS Environmental - US **Service Request:**E2100103
Project: HS21011042

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
E2100103-001	16EW02-210126	1/26/2021	0825
E2100103-002	16IW03-210126	1/26/2021	1230
E2100103-003	16IW03-210126-FD	1/26/2021	1230
E2100103-004	16IW10-210126	1/26/2021	1307
E2100103-005	16IW10-210126-FD	1/26/2021	1307
E2100103-006	16IW09-210126	1/26/2021	1341

RIGHT SOLUTIONS | RIGHT PARTNER

Service Request Summary

Folder #: **E2100103**
Client Name: ALS Environmental - US
Project Name: HS21011042
Project Number:

Report To: RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Houston, TX 77099-4338
USA
Phone Number: 281-530-5656
Cell Number:
Fax Number: 281-530-5887
E-mail: rj.modashia@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 01/27/21
Internal Due Date: 2/10/2021
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS21011042
EDD: No EDD Specified

6 125 mL-Glass Bottle NM AMBER Teflon Liner Unpreserved
Location: EHRMS-WIC 6D
Pressure Gas:

Lab Samp No.	Client Samp No	Matrix	Collected	HOUSTON ClO4 DOD/6850
E2100103-001	16EW02-210126	Ground Water	01/26/21 0825	**IV**
E2100103-002	16IW03-210126	Ground Water	01/26/21 1230	**IV**
E2100103-003	16IW03-210126-FD	Ground Water	01/26/21 1230	**IV**
E2100103-004	16IW10-210126	Ground Water	01/26/21 1307	**IV**
E2100103-005	16IW10-210126-FD	Ground Water	01/26/21 1307	**IV**
E2100103-006	16IW09-210126	Ground Water	01/26/21 1341	**IV**

RIGHT SOLUTIONS | RIGHT PARTNER

Service Request Summary

Folder #: **E2100103**
Client Name: ALS Environmental - US
Project Name: HS21011042
Project Number:

Report To: RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Houston, TX 77099-4338
USA
Phone Number: 281-530-5656
Cell Number:
Fax Number: 281-530-5887
E-mail: rj.modashia@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 01/27/21
Internal Due Date: 2/10/2021
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS21011042
EDD: No EDD Specified

6 125 mL-Glass Bottle NM AMBER Teflon Liner Unpreserved
Location: EHRMS-WIC 6D
Pressure Gas:

Test Comments:

Group	Test/Method	Samples	Comments
Semivoa GCMS	ClO4 DOD/6850	6	II Due 2/10, IV due 2/17

Print

RIGHT SOLUTIONS | RIGHT PARTNER

Data Qualifiers

Lab Standard

+	Possible Tedlar bag artifact.
A	TIC is a suspected aldol-condensation product
B	Analyte found in the associated method blank as well as in the sample.
BC	Reported results are not blank corrected.
BH	The back section of the tube yielded higher results than the front.
BT	Results indicated possible breakthrough; back section >=10% front section.
C	Result identification confirmed.
D	Compound identified in an analysis at a secondary dilution factor
D	Spike was diluted out
DE	Reported results are corrected for desorption efficiency.
E	Estimated value. Concentration above calibration range
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
H1	Sample analysis performed past holding time. See case narrative.
H2	Initial analysis within holding time. Reanalysis for the required dilution was past holding time.
H3	Sample was received and analyzed past holding time.
H4	Sample was extracted past required extraction holding time, but analyzed within analysis holding time. See case narrative.
I	Internal standard not within the specified limits. See case narrative.
J	Estimated Value. Concentration found below MRL.
K	A deflection in the QC ion may indicate interference with the quantitation of this ion. The concentration of this analyte should be considered as an estimate.
K	Analyte was detected above the method reporting limit prior to normalization.
K	The reference ion ratio was outside acceptance criteria, which may indicate a potential bias to this result.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
L1	Laboratory control sample recovery outside the specified limits; results may be biased high.
L2	Laboratory control sample recovery outside the specified limits; results may be biased low.
L3	Laboratory control sample recovery outside the specified limits.
M	Matrix interference; results may be biased high.
M	The duplicate injection precision not met.
M1	Matrix interference due to coelution with a non-target compound; results may be biased high.
N	Presumptive evidence of a compound for TICs that have been identified based on a mass spectral library search.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.

RIGHT SOLUTIONS | RIGHT PARTNER

Data Qualifiers

Lab Standard

O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
P	Indicates chlorodiphenyl ether interference present at the retention time of the target compound.
P	Pesticide/Aroclor target analyte > 40% difference for detected concentrations between GC columns
Q	Indicates as estimated value because the P and P + 2 theoretical abundance ratio does not meet method criteria.
R	Duplicate Precision not met.
R1	Duplicate precision not within the specified limits; however, the results are below the MRL and considered estimated.
S	Surrogate recovery not within specified limits.
S	The reported value was determined by the Method of Standard Additions (MSA).
T	Analyte is a tentatively identified compound, result is estimated.
U	Compound was analyzed for, but was not detected (ND).
V1	The continuing calibration verification standard was outside (biased high) the specified limits for this compound.
V2	The continuing calibration verification standard was outside (biased low) the specified limits for this compound.
W	Result quantified, but the corresponding peak was detected outside the generated retention time window.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
X	See case narrative.
Y	Recovery outside limits
Y	The chromatogram resembles a petroleum product but does not match the calibration standard.
Z	The chromatogram does not resemble a petroleum product.
i	The MRL/MDL has been elevated due to a matrix interference.

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Laboratory Group

Acronyms

Cal	Calibration
Conc	CONCentration
Dioxin(s)	Polychlorinated dibenzo-p-dioxin(s)
EDL	Estimated Detection Limit
EMPC	Estimated Maximum Possible Concentration
Flags	Data qualifiers
Furan(s)	Polychlorinated dibenzofuran(s)
g	Grams
ICAL	Initial CALibration
ID	IDentifier
Ions	Masses monitored for the analyte during data acquisition
L	Liter (s)
LCS	Laboratory Control Sample
DLCS	Duplicate Laboratory Control Sample
MB	Method Blank
MCL	Method Calibration Limit
MDL	Method Detection Limit
mL	Milliliters
MS	Matrix Spiked sample
DMS	Duplicate Matrix Spiked sample
NO	Number of peaks meeting all identification criteria
PCDD(s)	Polychlorinated dibenzo-p-dioxin(s)
PCDF(s)	Polychlorinated dibenzofuran(s)
ppb	Parts per billion
ppm	Parts per million
ppq	Parts per quadrillion
ppt	Parts per trillion
QA	Quality Assurance
QC	Quality Control
Ratio	Ratio of areas from monitored ions for an analyte
% Rec.	Percent recovery
RPD	Relative Percent Difference
RRF	Relative Response Factor
RT	Retention Time
SDG	Sample Delivery Group
S/N	Signal-to-noise ratio
TEF	Toxicity Equivalence Factor
TEQ	Toxicity Equivalence Quotient

RIGHT SOLUTIONS | RIGHT PARTNER

10450 Stancliff Rd, Houston, TX 77099 | 281-530-5656 | www.alsglobal.com

ALS Environmental

State Certifications, Accreditations, and Licenses

Agency	Number	Expire Date
American Association for Laboratory Accreditation	2897.01 2020	11/30/2021
Arizona Department of Health Services	AZ0793-2020	5/27/2021
Arkansas Department of Environmental Quality	20-030-0	3/26/2021
California Department of Health Services	2919-2020	4/30/2021
Department of Defense	A2LA 2897.01	11/30/2021
Florida Department of Health	E87611-2020	6/30/2021
Hawaii Department of Health	2020	4/30/2021
Illinois Environmental Protection Agency	2000322020-4	5/9/2021
Kansas Department of Health and Environment	E-10352-2020	7/31/2021
Louisiana Department of Environmental Quality	03087-2020	6/30/2021
Maine Department of Health and Human Services	2020016	6/5/2022
Maryland Department of the Environment	343-2020	6/30/2021
Michigan Depratment of Environmental Quality	9971-2020	4/30/2021
Nebraska Department of Health and Human Services	NE-OS-25-13 (2020)	4/30/2021
Nevada Department of Concervation and Natural Resources	TX026932021-1	7/31/2021
New Hampshire Environmental Laboratory Accreditation Program	209420	4/24/2021
New Jersey Department of Environmental Protection	TX008	6/30/2021
New York Department of Health	11707	3/31/2021
Oklahoma Department of Environmental Quality	2020-123	8/31/2021
Pennsylvania Department of Environmental Protection	014	6/30/2021
Tennessee Department of Environment and Concervation	04016-2020	4/30/2021
Texas Commision on Environmental Quality	T104704231-20-26	4/30/2021
United States Department of Agriculture	P330-19-00299	10/10/2022

RIGHT SOLUTIONS | RIGHT PARTNER

Chain of Custody

ALS Environmental - Houston HRMS
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

RIGHT SOLUTIONS | RIGHT PARTNER

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID:** **15545**

SUBCONTRACT TO:

ALS Environmental
10450 Stancliff RoadSuite 210
Houston, TX 77084 **Phone:** +1 281 530 5656

CUSTOMER INFORMATION:

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

INVOICE INFORMATION:

Company: ALS Houston
Contact: Accounts Payable
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Reference: HS21011042
TSR: Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS21011042-02**	**16EW02-210126**	**Groundwater**	**26 Jan 2021 08:25**
	Provide Level II and Level IV reports on a seperate pdf.			10 Feb 2021
2.	**HS21011042-03**	**16IW03-210126**	**Groundwater**	**26 Jan 2021 12:30**
	Provide Level II and Level IV reports on a seperate pdf.			10 Feb 2021
3.	**HS21011042-04**	**16IW03-210126-FD**	**Groundwater**	**26 Jan 2021 12:30**
	Provide Level II and Level IV reports on a seperate pdf.			10 Feb 2021
4.	**HS21011042-05**	**16IW10-210126**	**Groundwater**	**26 Jan 2021 13:07**
	Provide Level II and Level IV reports on a seperate pdf.			10 Feb 2021
5.	**HS21011042-06**	**16IW10-210126-FD**	**Groundwater**	**26 Jan 2021 13:07**
	Provide Level II and Level IV reports on a seperate pdf.			10 Feb 2021
6.	**HS21011042-07**	**16IW09-210126**	**Groundwater**	**26 Jan 2021 13:41**
	Provide Level II and Level IV reports on a seperate pdf.			10 Feb 2021

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

QC Level: DOD IV (DoD Data Package)

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID: 15545**

Relinquished By:		Date/Time:	1/27/2021.
Received By:	CA	Date/Time:	1/27/21 1725
Cooler ID(s):		Temperature(s):	

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Environmental

Cooler Receipt Form

Project Chemist: CG

Client/Project: ALS-H

Thermometer ID: IR41

Date/Time Received: 11/27/21 Initials: CG

Date/Time Logged in: 11/27/21 Initials: CG

1. Method of delivery: ○ US Mail ○ Fed Ex ○ UPS ○ DHL ✓ ALS Courier ○ Client
2. Samples received in: ✓ Cooler ○ Box ○ Envelope ○ Other
3. Were custody seals on coolers? ○ Yes ✓ No
   Were they intact? ○ Yes ○ No ✓ N/A
   Were they signed and dated? ○ Yes ○ No ✓ N/A
   If yes, how many and where?
4. Packing Material: ○ Inserts ✓ Baggies ○ Bubble Wrap ○ Gel Packs ✓ Wet Ice ○ Sleeves ○ Other
5. Foreign or Regulated Soil? ○ Yes ✓ No Location of Sampling:

Cooler Tracking Number	COC ID	Date Opened	Time Opened	Opened By	Temp. °C	Temp Blank?
NA		11/27/21	1725	CG	0.6	☑
						☐
						☐
						☐

6. Were custody papers properly filled out (ink, signed, dated, etc)? ✓ Yes ○ No
7. Did all bottles arrive in good condition (not broken, no signs of leakage)? ✓ Yes ○ No
8. Were all sample labels complete (i.e., sample ID, analysis, preservation, etc)? ✓ Yes ○ No
9. Were appropriate bottles/containers and volumes received for the requested tests? ✓ Yes ○ No
10. Did sample labels and tags agree with custody documents? ✓ Yes ○ No

Notes, Discrepancies, & Resolutions:

Service request Label:

RIGHT SOLUTIONS | RIGHT PARTNER

10450 Stancliff Rd., Suite 210
Houston, TX 77099
T: +1 713 266 1599
F: +1 713 266 1599
www.alsglobal.com

SAMPLE ACCEPTANCE POLICY

This policy outlines the criteria samples must meet to be accepted by ALS Environmental – Houston HRMS.

Cooler Custody Seals (desirable, mandatory if specified in SAP):

- ✓ Intact on outside of cooler, signed and dated

Chain-of-Custody (COC) documentation (mandatory):

The following is required on each COC:

- ✓ Sample ID, the location, date and time of collection, collector's name, preservation type, sample type, and any other special remarks concerning the sampleThe COC must be completed in ink.
- ✓ Signature and date of relinquishing party.

In the absence of a COC at sample receipt, the COC will be requested from the client.

Sample Integrity (mandatory):

Samples are inspected upon arrival to ensure that sample integrity was not compromised during transfer to the laboratory.

- ✓ Sample containers must arrive in good condition (not broken or leaking).
- ✓ Samples must be labeled appropriately, including Sample IDs, and requested test using durable labels and indelible ink.
- ✓ The correct type of sample bottle must be used for the method requested.
- ✓ An appropriate sample volume, or weight, must be received.
- ✓ Sample IDs and number of containers must reconcile with the COC.
- ✓ Samples must be received within the method defined holding time.

Temperature Requirement (varies by sample matrix):

- ✓ Aqueous and Non-aqueous samples must be shipped and stored cold, at 0 to 6ºC.
- ✓ Tissue samples must be shipped and stored frozen, at -20 to -10ºC.
- ✓ Air samples are shipped and stored cold, at 0 to 6ºC
- ✓ The sample temperature must be recorded on the COC

All cooler inspections are documented on the Cooler Receipt Form (CRF). A separate CRF is completed for each service request. Any samples not meeting the above criteria are noted on the CRF and the Project Manager notified. The Project Manager must resolve any sample integrity issues with the client prior to proceeding with the analysis. Such resolutions are documented in writing and filed with the project folder. Data associated with samples received outside of this acceptance policy will be qualified on the case narrative of the final report

RIGHT SOLUTIONS | RIGHT PARTNER

Preparation Information Benchsheets

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

RIGHT SOLUTIONS | RIGHT PARTNER

Preparation Information Benchsheet

Prep Run#: 373566 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
Team: Semivoa GCMS/JRODRIGUEZ **Prep Method:** Method **Prep Date/Time:** 2/1/21 08:52

#	Lab Code	Client ID	B#	Method /Test	pH	Cl	Matrix	Amt. Ext.	Sample Description
1	E2100103-001	16EW02-210126	.01	6850/ClO4 DOD			Ground Water	10mL	
2	E2100103-002	16IW03-210126	.01	6850/ClO4 DOD			Ground Water	10mL	
3	E2100103-003	16IW03-210126-FD	.01	6850/ClO4 DOD			Ground Water	10mL	
4	E2100103-004	16IW10-210126	.01	6850/ClO4 DOD			Ground Water	10mL	
5	E2100103-005	16IW10-210126-FD	.01	6850/ClO4 DOD			Ground Water	10mL	
6	E2100103-006	16IW09-210126	.01	6850/ClO4 DOD			Ground Water	10mL	
7	E2100104-001	PT Lot 8218-53	.03	6850/ClO4 DOD			Water	10mL	
8	E2100105-001	LH18/24-SP650_012621_BIX	.01	6850/ClO4 DOD			Water	10mL	
9	E2100106-001	16WW57-21027	.01	6850/ClO4 DOD			Ground Water	10mL	
10	E2100106-002	16SW01-21027	.01	6850/ClO4 DOD			Surface Water	10mL	
11	E2100106-003	16SW02-21027	.01	6850/ClO4 DOD			Surface Water	10mL	
12	E2100106-004	16WW58-210127	.01	6850/ClO4 DOD			Ground Water	10mL	
13	E2100106-005	16IW20-21027	.01	6850/ClO4 DOD			Ground Water	10mL	
14	E2100106-006	16SW03-21027	.01	6850/ClO4 DOD			Surface Water	10mL	
15	E2100107-001	LHAAP17_012521_H1	.01	6850/ClO4 DOD			Ground Water	10mL	
16	E2100107-002	LHAAP17_012521_H2	.01	6850/ClO4 DOD			Ground Water	10mL	
17	EQ2100045-01	MB		6850/ClO4 DOD			Liquid	10mL	
18	EQ2100045-02	LCS		6850/ClO4 DOD			Liquid	10mL	
19	EQ2100045-03	DLCS		6850/ClO4 DOD			Liquid	10mL	
20	EQ2100045-04	16WW57-21027 MS	.02	6850/ClO4 DOD			Liquid	10mL	
21	EQ2100045-05	16WW57-21027 DMS	.03	6850/ClO4 DOD			Liquid	10mL	
22	EQ2100045-06	16IW20-21027 MS	.02	6850/ClO4 DOD			Liquid	10mL	
23	EQ2100045-07	16IW20-21027 DMS	.03	6850/ClO4 DOD			Liquid	10mL	

Spiking Solutions

Name: Perchlorate Intermediate Stock1 Inventory ID 214035 Logbook Ref: Perchlorate Expires On: 05/23/2021

EQ2100045-02	1.00µL	EQ2100045-03	1.00µL	EQ2100045-04	1.00µL	EQ2100045-05	1.00µL	EQ2100045-06	1.00µL	EQ2100045-07	1.00µL

Name: Perchlorate Internal Standard 1ug/mL Inventory ID 214820 Logbook Ref: Perchlorate Internal Standard Expires On: 07/03/2021

E2100103-001	100.00µL	E2100103-002	100.00µL	E2100103-003	100.00µL	E2100103-004	100.00µL	E2100103-005	100.00µL	E2100103-006	100.00µL
E2100105-001	100.00µL	E2100106-001	100.00µL	E2100106-001.R	100.00µL	E2100106-002	100.00µL	E2100106-003	100.00µL	E2100106-004	100.00µL
E2100106-005	100.00µL	E2100106-005.R	100.00µL	E2100106-006	100.00µL	E2100107-001	100.00µL	E2100107-002	100.00µL	EQ2100045-01	100.00µL
EQ2100045-02	100.00µL	EQ2100045-03	100.00µL	EQ2100045-04	100.00µL	EQ2100045-05	100.00µL	EQ2100045-06	100.00µL	EQ2100045-07	100.00µL

Preparation Information Benchsheet

Prep Run#: 373566
Team: Semivoa GCMS/JRODRIGUEZ

Prep WorkFlow: GenExt28Day
Prep Method: Method

Status: Prepped
Prep Date/Time: 2/1/21 08:52

Preparation Steps

Step: Preparation
Started: 2/1/21 08:52
Finished: 2/1/21 09:28
By: GRIVERA
Comments

Comments: _____

Reviewed By: GR Date: 2/1/21

Chain of Custody

Relinquished By: _____ Date: _____

Received By: _____ Date: _____

Extracts Examined
Yes No

RIGHT SOLUTIONS | RIGHT PARTNER

Analytical Results

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100103
Project:	HS21011042	**Date Collected:**	1/26/21 0825
Sample Matrix:	Ground Water	**Date Received:**	1/27/21
Sample Name:	16EW02-210126	**Units:**	µg/L
Lab Code:	E2100103-001	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	1.00	0.500	0.250	10	2/ 1/21	2/2/21 10:53	373566	711866	

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100103
Project:	HS21011042	**Date Collected:**	1/26/21 1230
Sample Matrix:	Ground Water	**Date Received:**	1/27/21
Sample Name:	16IW03-210126	**Units:**	µg/L
Lab Code:	E2100103-002	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	1.00	0.500	0.250	10	2/ 1/21	2/2/21 11:01	373566	711866	

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100103
Project:	HS21011042	**Date Collected:**	1/26/21 1230
Sample Matrix:	Ground Water	**Date Received:**	1/27/21
Sample Name:	16IW03-210126-FD	**Units:**	µg/L
Lab Code:	E2100103-003	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	1.00	0.500	0.250	10	2/ 1/21	2/2/21 11:08	373566	711866	

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100103
Project:	HS21011042	**Date Collected:**	1/26/21 1307
Sample Matrix:	Ground Water	**Date Received:**	1/27/21
Sample Name:	16IW10-210126	**Units:**	µg/L
Lab Code:	E2100103-004	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	1.00	0.500	0.250	10	2/ 1/21	2/2/21 11:16	373566	711866	

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100103
Project:	HS21011042	**Date Collected:**	1/26/21 1307
Sample Matrix:	Ground Water	**Date Received:**	1/27/21
Sample Name:	16IW10-210126-FD	**Units:**	µg/L
Lab Code:	E2100103-005	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	1.00	0.500	0.250	10	2/ 1/21	2/2/21 11:24	373566	711866	

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100103
Project:	HS21011042	**Date Collected:**	1/26/21 1341
Sample Matrix:	Ground Water	**Date Received:**	1/27/21
Sample Name:	16IW09-210126	**Units:**	µg/L
Lab Code:	E2100103-006	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.500	0.250	0.125	5	2/ 1/21	2/2/21 11:32	373566	711866	

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100103
Project:	HS21011042	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	µg/L
Lab Code:	EQ2100045-01	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	2/ 1/21	2/1/21 14:14	373566	711817	

RIGHT SOLUTIONS | RIGHT PARTNER

Accuracy & Precision

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2100103
Project:	HS21011042	**Date Analyzed:**	2/ 1/21
Sample Matrix:	Ground Water		

Lab Control Sample Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method:	6850	**Units:**	µg/L
Prep Method:	Method	**Basis:**	NA
		Extraction Lot:	373566

	Lab Control Sample EQ2100045-02			Duplicate Lab Control Sample EQ2100045-03					
Analyte Name	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Perchlorate	0.0900	0.100	90	0.0846	0.100	85	84 - 119	6	15

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

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100103
Project:	HS21011042	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2100045-02	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.0900**	J	0.100	0.0500	0.0250	1	2/ 1/21	2/1/21 14:21	373566	711817	

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100103
Project:	HS21011042	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Duplicate Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2100045-03	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.0846**	J	0.100	0.0500	0.0250	1	2/ 1/21	2/1/21 14:29	373566	711817	

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2100103
Project:	HS21011042	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
		Date Analyzed:	2/ 1/21

Matrix Spike Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Sample Name:	Batch QC	**Units:**	µg/L
Lab Code:	E2100106-001	**Basis:**	NA

Analytical Method: 6850
Prep Method: Method

		Batch QCMS **Matrix Spike** EQ2100045-04					Batch QCDMS **Duplicate Matrix Spike** EQ2100045-05						
Analyte Name	**Sample Result**	**Result**	**Spike Amount**	**% Rec**			**Result**	**Spike Amount**	**% Rec**		**% Rec Limits**	**RPD**	**RPD Limit**
Perchlorate	ND	0.0527	0.100	53	*		0.0615	0.100	61	*	84 - 119	15	15

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

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

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100103
Project:	HS21011042	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Batch QC	**Units:**	µg/L
Lab Code:	EQ2100045-04	**Basis:**	NA
Run Type:	Matrix Spike		

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.0527**	J	0.100	0.0500	0.0250	1	2/ 1/21	2/1/21 14:37	373566	711817	*

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100103
Project:	HS21011042	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Batch QC	**Units:**	µg/L
Lab Code:	EQ2100045-05	**Basis:**	NA
Run Type:	Duplicate Matrix Spike		

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.0615**	J	0.100	0.0500	0.0250	1	2/ 1/21	2/1/21 14:45	373566	711817	*

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2100103
Project:	HS21011042	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
		Date Analyzed:	2/ 1/21

Matrix Spike Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Sample Name:	Batch QC	**Units:**	µg/L
Lab Code:	E2100106-005	**Basis:**	NA

Analytical Method: 6850
Prep Method: Method

		Batch QCMS **Matrix Spike** EQ2100045-06					Batch QCDMS **Duplicate Matrix Spike** EQ2100045-07						
Analyte Name	**Sample Result**	**Result**	**Spike Amount**	**% Rec**			**Result**	**Spike Amount**	**% Rec**		**% Rec Limits**	**RPD**	**RPD Limit**
Perchlorate	ND	0.0650	0.100	65	*		0.0731	0.100	73	*	84 - 119	12	15

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

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

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100103
Project:	HS21011042	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Batch QC	**Units:**	µg/L
Lab Code:	EQ2100045-06	**Basis:**	NA
Run Type:	Matrix Spike		

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.0650**	J	0.100	0.0500	0.0250	1	2/ 1/21	2/1/21 14:53	373566	711817	*

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100103
Project:	HS21011042	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Batch QC	**Units:**	µg/L
Lab Code:	EQ2100045-07	**Basis:**	NA
Run Type:	Duplicate Matrix Spike		

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.0731**	J	0.100	0.0500	0.0250	1	2/ 1/21	2/1/21 15:01	373566	711817	*

RIGHT SOLUTIONS | RIGHT PARTNER

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

March 16, 2021

Susan Huang
Aptim Environmental & Infrastucture, Inc.
2500 City West Blvd., Suite 1700
Houston, TX 77042

Work Order: **HS21011077**

Laboratory Results for: **LHAAP 16 January 2021**

Dear Susan Huang,

ALS Environmental received 7 sample(s) on Jan 28, 2021 for the analysis presented in the following report.

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

Regards,

Generated By: RJ.MODASHIA

RJ Modashia
Project Manager

ALS Houston, US Date: 16-Mar-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
Work Order: HS21011077

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS21011077-01	16LHAAP-210127-TB6	Water	CG-121520 -104	27-Jan-2021 07:15	28-Jan-2021 09:45	☐
HS21011077-02	16WW57-210127	Groundwater		27-Jan-2021 09:25	28-Jan-2021 09:45	☐
HS21011077-03	16SW01-210127	Surface Water		27-Jan-2021 10:30	28-Jan-2021 09:45	☐
HS21011077-04	16SW02-210127	Surface Water		27-Jan-2021 11:20	28-Jan-2021 09:45	☐
HS21011077-05	16WW58-210127	Groundwater		27-Jan-2021 11:57	28-Jan-2021 09:45	☐
HS21011077-06	16IW20-210127	Groundwater		27-Jan-2021 13:40	28-Jan-2021 09:45	☐
HS21011077-07	16SW03-210127	Surface Water		27-Jan-2021 14:40	28-Jan-2021 09:45	☐

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Mar-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
Work Order: HS21011077

CASE NARRATIVE

Work Order Comments

- REV01: Revised to update the sample IDs to -210127.
- The analysis for Perchlorate was subcontracted to ALS Houston Specialty Lab. Final report attached.

  The analysis for Methane, Methene and Ethane by RSK175 was subcontracted to ALS Simi Valley, CA. Final report attached.

  The analysis for TOC was subcontracted to ALS Kelso, WA. Final report attached.

Work Order Comments

- The analysis for Perchlorate was subcontracted to ALS Houston Specialty Lab. Final report attached.

  The analysis for Methane, Methene and Ethane by RSK175 was subcontracted to ALS Simi Valley, CA. Final report attached.

  The analysis for TOC was subcontracted to ALS Kelso, WA. Final report attached.

GCMS Volatiles by Method SW8260

Batch ID: R377477

Sample ID: 16WW57-21027 (HS21011077-02MS), 16IW20-21027 (HS21011077-06MS)

- MS and/or MSD recovered outside control limits

Metals by Method SW6020

Batch ID: 162477

Sample ID: 16SW01-21027 (HS21011077-03MSD)

- Manganese failed for MSD but passed for MS and PDS.

WetChemistry by Method SW9056

Batch ID: R378021

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

Batch ID: R377315

Sample ID: 16IW20-21027 (HS21011077-06)

- Sample ran at 2X due to high concentration of Chloride

Sample ID: 16IW20-21027 (HS21011077-06MS)

- The MS and/or MSD recovery was outside of the control limits; however, the result in the parent sample is greater than 4x the spike amount. (Bromide, Sulfate)

Sample ID: 16WW57-21027 (HS21011077-02)

- Sample ran at 5X due to high concentration of Sulfate

Sample ID: 16WW57-21027 (HS21011077-02MS)

- The MS and/or MSD recovery was outside of the control limits; however, the result in the parent sample is greater than 4x the spike amount. (Sulfate)

Sample ID: 16WW58-210127 (HS21011077-05)

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Mar-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
Work Order: HS21011077

CASE NARRATIVE

WetChemistry by Method SW9056

Batch ID: R377315

- Sample ran at 2X due to high concentration of Chloride

WetChemistry by Method SM2320B

Batch ID: R377228,R377229

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Mar-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
Sample ID: 16LHAAP-210127-TB6
Collection Date: 27-Jan-2021 07:15

ANALYTICAL REPORT
WorkOrder:HS21011077
Lab ID:HS21011077-01
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	03-Feb-2021 23:21
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	03-Feb-2021 23:21
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	03-Feb-2021 23:21
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	03-Feb-2021 23:21
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	03-Feb-2021 23:21
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	03-Feb-2021 23:21
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	03-Feb-2021 23:21
Surr: 1,2-Dichloroethane-d4	*94.3*			**0**	*81-118*	*%REC*	*1*	*03-Feb-2021 23:21*
Surr: 4-Bromofluorobenzene	*100*			**0**	*85-114*	*%REC*	*1*	*03-Feb-2021 23:21*
Surr: Dibromofluoromethane	*96.7*			**0**	*80-119*	*%REC*	*1*	*03-Feb-2021 23:21*
Surr: Toluene-d8	*100*			**0**	*89-112*	*%REC*	*1*	*03-Feb-2021 23:21*

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Mar-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
Sample ID: 16WW57-210127
Collection Date: 27-Jan-2021 09:25

ANALYTICAL REPORT
WorkOrder:HS21011077
Lab ID:HS21011077-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	04-Feb-2021 01:28
1,1-Dichloroethene	**0.94**	J	**0.20**	**0.50**	**1.0**	**ug/L**	1	04-Feb-2021 01:28
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	04-Feb-2021 01:28
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	04-Feb-2021 01:28
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	04-Feb-2021 01:28
Trichloroethene	**65**		**0.20**	**0.50**	**1.0**	**ug/L**	1	04-Feb-2021 01:28
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	04-Feb-2021 01:28
Surr: 1,2-Dichloroethane-d4	*95.0*			**0**	*81-118*	*%REC*	*1*	*04-Feb-2021 01:28*
Surr: 4-Bromofluorobenzene	*101*			**0**	*85-114*	*%REC*	*1*	*04-Feb-2021 01:28*
Surr: Dibromofluoromethane	*95.6*			**0**	*80-119*	*%REC*	*1*	*04-Feb-2021 01:28*
Surr: Toluene-d8	*102*			**0**	*89-112*	*%REC*	*1*	*04-Feb-2021 01:28*
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: TH
Alkalinity, Total (As CaCO3)	**131**		**5.00**	**5.00**	**5.00**	**mg/L**	1	31-Jan-2021 18:45
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**4.96**		**0.150**	**0.500**	**0.500**	**mg/L**	5	28-Jan-2021 17:38
Nitrogen, Nitrate (As N)	0.500	U	0.150	0.500	0.500	mg/L	5	28-Jan-2021 17:38
Sulfate	**2,520**		**10.0**	**25.0**	**25.0**	**mg/L**	50	11-Feb-2021 21:53
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	02-Feb-2021 19:02
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUBCA
Subcontract Analysis	See Attached		0	0		NA	1	08-Feb-2021 16:56
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	08-Feb-2021 17:00

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Mar-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
Sample ID: 16SW01-210127
Collection Date: 27-Jan-2021 10:30

ANALYTICAL REPORT
WorkOrder:HS21011077
Lab ID:HS21011077-03
Matrix:Surface Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	04-Feb-2021 00:03
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	04-Feb-2021 00:03
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	04-Feb-2021 00:03
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	04-Feb-2021 00:03
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	04-Feb-2021 00:03
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	04-Feb-2021 00:03
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	04-Feb-2021 00:03
Surr: 1,2-Dichloroethane-d4	*93.8*			**0**	*81-118*	*%REC*	*1*	*04-Feb-2021 00:03*
Surr: 4-Bromofluorobenzene	*99.8*			**0**	*85-114*	*%REC*	*1*	*04-Feb-2021 00:03*
Surr: Dibromofluoromethane	*96.3*			**0**	*80-119*	*%REC*	*1*	*04-Feb-2021 00:03*
Surr: Toluene-d8	*102*			**0**	*89-112*	*%REC*	*1*	*04-Feb-2021 00:03*
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 10-Feb-2021		Analyst: JHD
Arsenic	**0.00101**	J	**0.000400**	**0.00100**	**0.00500**	**mg/L**	1	11-Feb-2021 13:38
Chromium	**0.00196**	J	**0.000400**	**0.00100**	**0.00500**	**mg/L**	1	11-Feb-2021 13:38
Manganese	**0.0488**		**0.000700**	**0.00250**	**0.00500**	**mg/L**	1	11-Feb-2021 13:38
Nickel	**0.00384**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	11-Feb-2021 13:38
Thallium	**0.000668**	J	**0.000200**	**0.000500**	**0.00200**	**mg/L**	1	11-Feb-2021 13:38
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	02-Feb-2021 19:02

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Mar-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
Sample ID: 16SW02-210127
Collection Date: 27-Jan-2021 11:20

ANALYTICAL REPORT
WorkOrder:HS21011077
Lab ID:HS21011077-04
Matrix:Surface Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	04-Feb-2021 00:24
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	04-Feb-2021 00:24
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	04-Feb-2021 00:24
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	04-Feb-2021 00:24
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	04-Feb-2021 00:24
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	04-Feb-2021 00:24
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	04-Feb-2021 00:24
Surr: 1,2-Dichloroethane-d4	*95.1*			**0**	*81-118*	*%REC*	*1*	*04-Feb-2021 00:24*
Surr: 4-Bromofluorobenzene	*104*			**0**	*85-114*	*%REC*	*1*	*04-Feb-2021 00:24*
Surr: Dibromofluoromethane	*96.9*			**0**	*80-119*	*%REC*	*1*	*04-Feb-2021 00:24*
Surr: Toluene-d8	*101*			**0**	*89-112*	*%REC*	*1*	*04-Feb-2021 00:24*
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 10-Feb-2021		Analyst: JHD
Arsenic	**0.000934**	J	**0.000400**	**0.00100**	**0.00500**	**mg/L**	1	11-Feb-2021 13:48
Chromium	**0.00175**	J	**0.000400**	**0.00100**	**0.00500**	**mg/L**	1	11-Feb-2021 13:48
Manganese	**0.0450**		**0.000700**	**0.00250**	**0.00500**	**mg/L**	1	11-Feb-2021 13:48
Nickel	**0.00338**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	11-Feb-2021 13:48
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	11-Feb-2021 13:48
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	02-Feb-2021 19:02

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Mar-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
Sample ID: 16WW58-210127
Collection Date: 27-Jan-2021 11:57

ANALYTICAL REPORT
WorkOrder:HS21011077
Lab ID:HS21011077-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	5.0	U	1.5	5.0	5.0	ug/L	5	04-Feb-2021 01:49
1,1-Dichloroethene	2.5	U	1.0	2.5	5.0	ug/L	5	04-Feb-2021 01:49
1,2-Dichloroethane	2.5	U	1.0	2.5	5.0	ug/L	5	04-Feb-2021 01:49
cis-1,2-Dichloroethene	**94**		**1.0**	**2.5**	**5.0**	**ug/L**	5	04-Feb-2021 01:49
Methylene chloride	10	U	2.0	10	10	ug/L	5	04-Feb-2021 01:49
Trichloroethene	**2,700**		**5.0**	**12**	**25**	**ug/L**	25	04-Feb-2021 03:34
Vinyl chloride	2.5	U	1.0	2.5	5.0	ug/L	5	04-Feb-2021 01:49
Surr: 1,2-Dichloroethane-d4	*97.6*			**0**	*81-118*	*%REC*	*5*	*04-Feb-2021 01:49*
Surr: 1,2-Dichloroethane-d4	*93.4*			**0**	*81-118*	*%REC*	*25*	*04-Feb-2021 03:34*
Surr: 4-Bromofluorobenzene	*100*			**0**	*85-114*	*%REC*	*5*	*04-Feb-2021 01:49*
Surr: 4-Bromofluorobenzene	*102*			**0**	*85-114*	*%REC*	*25*	*04-Feb-2021 03:34*
Surr: Dibromofluoromethane	*98.3*			**0**	*80-119*	*%REC*	*5*	*04-Feb-2021 01:49*
Surr: Dibromofluoromethane	*96.5*			**0**	*80-119*	*%REC*	*25*	*04-Feb-2021 03:34*
Surr: Toluene-d8	*100.0*			**0**	*89-112*	*%REC*	*5*	*04-Feb-2021 01:49*
Surr: Toluene-d8	*99.5*			**0**	*89-112*	*%REC*	*25*	*04-Feb-2021 03:34*
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: TH
Alkalinity, Total (As CaCO3)	**85.6**		**5.00**	**5.00**	**5.00**	**mg/L**	1	31-Jan-2021 18:56
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**3.70**		**0.0600**	**0.200**	**0.200**	**mg/L**	2	28-Jan-2021 17:56
Nitrogen, Nitrate (As N)	**0.234**		**0.0600**	**0.200**	**0.200**	**mg/L**	2	28-Jan-2021 17:56
Sulfate	**367**		**4.00**	**10.0**	**10.0**	**mg/L**	20	11-Feb-2021 22:11
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	02-Feb-2021 19:02
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUBCA
Subcontract Analysis	See Attached		0	0		NA	1	08-Feb-2021 16:56
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	08-Feb-2021 17:00

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Mar-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
Sample ID: 16IW20-210127
Collection Date: 27-Jan-2021 13:40

ANALYTICAL REPORT
WorkOrder:HS21011077
Lab ID:HS21011077-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	04-Feb-2021 01:06
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	04-Feb-2021 01:06
1,2-Dichloroethane	**0.92**	J	**0.20**	**0.50**	**1.0**	**ug/L**	1	04-Feb-2021 01:06
cis-1,2-Dichloroethene	**47**		**0.20**	**0.50**	**1.0**	**ug/L**	1	04-Feb-2021 01:06
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	04-Feb-2021 01:06
Trichloroethene	**13**		**0.20**	**0.50**	**1.0**	**ug/L**	1	04-Feb-2021 01:06
Vinyl chloride	**7.2**		**0.20**	**0.50**	**1.0**	**ug/L**	1	04-Feb-2021 01:06
Surr: 1,2-Dichloroethane-d4	*96.2*			**0**	*81-118*	*%REC*	*1*	*04-Feb-2021 01:06*
Surr: 4-Bromofluorobenzene	*101*			**0**	*85-114*	*%REC*	*1*	*04-Feb-2021 01:06*
Surr: Dibromofluoromethane	*96.9*			**0**	*80-119*	*%REC*	*1*	*04-Feb-2021 01:06*
Surr: Toluene-d8	*100*			**0**	*89-112*	*%REC*	*1*	*04-Feb-2021 01:06*
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: TH
Alkalinity, Total (As CaCO3)	**1,110**		**5.00**	**5.00**	**5.00**	**mg/L**	1	31-Jan-2021 22:09
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**46.7**		**0.600**	**2.00**	**2.00**	**mg/L**	20	11-Feb-2021 22:29
Nitrogen, Nitrate (As N)	**0.0802**	J	**0.0600**	**0.200**	**0.200**	**mg/L**	2	28-Jan-2021 18:14
Sulfate	**105**		**0.400**	**1.00**	**1.00**	**mg/L**	2	28-Jan-2021 18:14
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	02-Feb-2021 19:02
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUBCA
Subcontract Analysis	See Attached		0	0		NA	1	08-Feb-2021 16:56
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	08-Feb-2021 17:00

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Mar-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
Sample ID: 16SW03-210127
Collection Date: 27-Jan-2021 14:40

ANALYTICAL REPORT
WorkOrder:HS21011077
Lab ID:HS21011077-07
Matrix:Surface Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	04-Feb-2021 00:45
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	04-Feb-2021 00:45
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	04-Feb-2021 00:45
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	04-Feb-2021 00:45
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	04-Feb-2021 00:45
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	04-Feb-2021 00:45
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	04-Feb-2021 00:45
Surr: 1,2-Dichloroethane-d4	*97.8*			**0**	*81-118*	*%REC*	*1*	*04-Feb-2021 00:45*
Surr: 4-Bromofluorobenzene	*102*			**0**	*85-114*	*%REC*	*1*	*04-Feb-2021 00:45*
Surr: Dibromofluoromethane	*98.4*			**0**	*80-119*	*%REC*	*1*	*04-Feb-2021 00:45*
Surr: Toluene-d8	*102*			**0**	*89-112*	*%REC*	*1*	*04-Feb-2021 00:45*
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 10-Feb-2021		Analyst: JHD
Arsenic	**0.000854**	J	**0.000400**	**0.00100**	**0.00500**	**mg/L**	1	11-Feb-2021 13:50
Chromium	**0.00203**	J	**0.000400**	**0.00100**	**0.00500**	**mg/L**	1	11-Feb-2021 13:50
Manganese	**0.122**		**0.000700**	**0.00250**	**0.00500**	**mg/L**	1	11-Feb-2021 13:50
Nickel	**0.00361**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	11-Feb-2021 13:50
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	11-Feb-2021 13:50
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	02-Feb-2021 19:02

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

RIGHT SOLUTIONS | RIGHT PARTNER

Weight / Prep Log

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
WorkOrder: HS21011077

Batch ID: 162477 **Start Date:** 10 Feb 2021 13:00 **End Date:** 10 Feb 2021 17:00
Method: WATER - SW3010A **Prep Code:** 3010A

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor	
HS21011077-03		10 (mL)	10 (mL)	1	120 plastic HNO3
HS21011077-04		10 (mL)	10 (mL)	1	120 plastic HNO3
HS21011077-07		10 (mL)	10 (mL)	1	120 plastic HNO3

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Mar-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
WorkOrder: HS21011077

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: 162477 (0)	**Test Name :** METALS BY ICPMS BY SW6020A				**Matrix:** Surface Water	
HS21011077-03	16SW01-210127	27 Jan 2021 10:30		10 Feb 2021 17:00	11 Feb 2021 13:38	1
HS21011077-04	16SW02-210127	27 Jan 2021 11:20		10 Feb 2021 17:00	11 Feb 2021 13:48	1
HS21011077-07	16SW03-210127	27 Jan 2021 14:40		10 Feb 2021 17:00	11 Feb 2021 13:50	1
Batch ID: R377228 (0)	**Test Name :** ALKALINITY BY SM2320B				**Matrix:** Groundwater	
HS21011077-02	16WW57-210127	27 Jan 2021 09:25			31 Jan 2021 18:45	1
HS21011077-05	16WW58-210127	27 Jan 2021 11:57			31 Jan 2021 18:56	1
Batch ID: R377229 (0)	**Test Name :** ALKALINITY BY SM2320B				**Matrix:** Groundwater	
HS21011077-06	16IW20-210127	27 Jan 2021 13:40			31 Jan 2021 22:09	1
Batch ID: R377315 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Groundwater	
HS21011077-02	16WW57-210127	27 Jan 2021 09:25			28 Jan 2021 17:38	5
HS21011077-05	16WW58-210127	27 Jan 2021 11:57			28 Jan 2021 17:56	2
HS21011077-06	16IW20-210127	27 Jan 2021 13:40			28 Jan 2021 18:14	2
Batch ID: R377381 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** Surface Water	
HS21011077-03	16SW01-210127	27 Jan 2021 10:30			02 Feb 2021 19:02	1
HS21011077-04	16SW02-210127	27 Jan 2021 11:20			02 Feb 2021 19:02	1
HS21011077-07	16SW03-210127	27 Jan 2021 14:40			02 Feb 2021 19:02	1
Batch ID: R377381 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** Groundwater	
HS21011077-02	16WW57-210127	27 Jan 2021 09:25			02 Feb 2021 19:02	1
HS21011077-05	16WW58-210127	27 Jan 2021 11:57			02 Feb 2021 19:02	1
HS21011077-06	16IW20-210127	27 Jan 2021 13:40			02 Feb 2021 19:02	1
Batch ID: R377477 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Surface Water	
HS21011077-03	16SW01-210127	27 Jan 2021 10:30			04 Feb 2021 00:03	1
HS21011077-04	16SW02-210127	27 Jan 2021 11:20			04 Feb 2021 00:24	1
HS21011077-07	16SW03-210127	27 Jan 2021 14:40			04 Feb 2021 00:45	1
Batch ID: R377477 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS21011077-02	16WW57-210127	27 Jan 2021 09:25			04 Feb 2021 01:28	1
HS21011077-05	16WW58-210127	27 Jan 2021 11:57			04 Feb 2021 03:34	25
HS21011077-05	16WW58-210127	27 Jan 2021 11:57			04 Feb 2021 01:49	5
HS21011077-06	16IW20-210127	27 Jan 2021 13:40			04 Feb 2021 01:06	1
Batch ID: R377477 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS21011077-01	16LHAAP-210127-TB6	27 Jan 2021 07:15			03 Feb 2021 23:21	1
Batch ID: R377730 (0)	**Test Name :** SUBCONTRACT ANALYSIS - RSK				**Matrix:** Groundwater	
HS21011077-02	16WW57-210127	27 Jan 2021 09:25			08 Feb 2021 16:56	1
HS21011077-05	16WW58-210127	27 Jan 2021 11:57			08 Feb 2021 16:56	1
HS21011077-06	16IW20-210127	27 Jan 2021 13:40			08 Feb 2021 16:56	1

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Mar-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
WorkOrder: HS21011077

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R377731 (0)	**Test Name :** SUBCONTRACT ANALYSIS - TOC ANALYSIS				**Matrix:** Groundwater	
HS21011077-02	16WW57-210127	27 Jan 2021 09:25			08 Feb 2021 17:00	1
HS21011077-05	16WW58-210127	27 Jan 2021 11:57			08 Feb 2021 17:00	1
HS21011077-06	16IW20-210127	27 Jan 2021 13:40			08 Feb 2021 17:00	1
Batch ID: R378021 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Groundwater	
HS21011077-02	16WW57-210127	27 Jan 2021 09:25			11 Feb 2021 21:53	50
HS21011077-05	16WW58-210127	27 Jan 2021 11:57			11 Feb 2021 22:11	20
HS21011077-06	16IW20-210127	27 Jan 2021 13:40			11 Feb 2021 22:29	20

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Mar-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
WorkOrder: HS21011077

QC BATCH REPORT

Batch ID: 162477 (0) **Instrument: ICPMS05** **Method: METALS BY ICPMS BY SW6020A**

MBLK Sample ID: **MBLK-162477** Units: **mg/L** Analysis Date: **11-Feb-2021 13:34**
Client ID: Run ID: **ICPMS05_377965** SeqNo: **5954355** PrepDate: **10-Feb-2021** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.00100	0.00500								U
Chromium	0.00100	0.00500								U
Manganese	0.001155	0.00500								J
Nickel	0.00100	0.00500								U
Thallium	0.000500	0.00200								U

LCS Sample ID: **LCS-162477** Units: **mg/L** Analysis Date: **11-Feb-2021 13:36**
Client ID: Run ID: **ICPMS05_377965** SeqNo: **5954356** PrepDate: **10-Feb-2021** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.04865	0.00500	0.05	0	97.3	84 - 116				
Chromium	0.0461	0.00500	0.05	0	92.2	85 - 116				
Manganese	0.04668	0.00500	0.05	0	93.4	87 - 115				
Nickel	0.04942	0.00500	0.05	0	98.8	85 - 117				
Thallium	0.04573	0.00200	0.05	0	91.5	82 - 116				

MS Sample ID: **HS21011077-03MS** Units: **mg/L** Analysis Date: **11-Feb-2021 13:42**
Client ID: **16SW01-210127** Run ID: **ICPMS05_377965** SeqNo: **5954359** PrepDate: **10-Feb-2021** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.04913	0.00500	0.05	0.001008	96.2	84 - 116				
Chromium	0.04684	0.00500	0.05	0.001958	89.8	85 - 116				
Manganese	0.09255	0.00500	0.05	0.04885	87.4	87 - 115				
Nickel	0.05193	0.00500	0.05	0.00384	96.2	85 - 117				
Thallium	0.04778	0.00200	0.05	0.000668	94.2	82 - 116				

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Mar-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
WorkOrder: HS21011077

QC BATCH REPORT

Batch ID: 162477 (0) **Instrument:** ICPMS05 **Method:** METALS BY ICPMS BY SW6020A

MSD Sample ID: **HS21011077-03MSD** Units: **mg/L** Analysis Date: **11-Feb-2021 13:44**
Client ID: **16SW01-210127** Run ID: **ICPMS05_377965** SeqNo: **5954360** PrepDate: **10-Feb-2021** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.04858	0.00500	0.05	0.001008	95.1	84 - 116	0.04913	1.14	20	
Chromium	0.0466	0.00500	0.05	0.001958	89.3	85 - 116	0.04684	0.524	20	
Manganese	0.09129	0.00500	0.05	0.04885	84.9	87 - 115	0.09255	1.37	20	S
Nickel	0.05127	0.00500	0.05	0.00384	94.9	85 - 117	0.05193	1.28	20	
Thallium	0.04781	0.00200	0.05	0.000668	94.3	82 - 116	0.04778	0.0481	20	

PDS Sample ID: **HS21011077-03PDS** Units: **mg/L** Analysis Date: **11-Feb-2021 13:46**
Client ID: **16SW01-210127** Run ID: **ICPMS05_377965** SeqNo: **5954361** PrepDate: **10-Feb-2021** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.09685	0.00500	0.1	0.001008	95.8	80 - 120				
Chromium	0.09078	0.00500	0.1	0.001958	88.8	80 - 120				
Manganese	0.1394	0.00500	0.1	0.04885	90.5	80 - 120				
Nickel	0.09765	0.00500	0.1	0.00384	93.8	80 - 120				
Thallium	0.09798	0.00200	0.1	0.000668	97.3	80 - 120				

SD Sample ID: **HS21011077-03SD** Units: **mg/L** Analysis Date: **11-Feb-2021 13:40**
Client ID: **16SW01-210127** Run ID: **ICPMS05_377965** SeqNo: **5954358** PrepDate: **10-Feb-2021** DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Arsenic	0.00500	0.0250					0.001008	0	10	U
Chromium	0.002155	0.0250					0.001958	0	10	J
Manganese	0.04972	0.0250					0.04885	1.79	10	
Nickel	0.003734	0.0250					0.00384	0	10	J
Thallium	0.00250	0.0100					0.000668	0	10	U

The following samples were analyzed in this batch: HS21011077-03 HS21011077-04 HS21011077-07

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Mar-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
WorkOrder: HS21011077

QC BATCH REPORT

Batch ID: R377477 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-210203** Units: **ug/L** Analysis Date: **03-Feb-2021 23:00**
Client ID: Run ID: **VOA6_377477** SeqNo: **5943426** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	1.0	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
Methylene chloride	2.0	2.0								U
Trichloroethene	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*47.08*	*1.0*	*50*	*0*	*94.2*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.89*	*1.0*	*50*	*0*	*102*	*85 - 114*				
Surr: Dibromofluoromethane	*48.52*	*1.0*	*50*	*0*	*97.0*	*80 - 119*				
Surr: Toluene-d8	*49.43*	*1.0*	*50*	*0*	*98.9*	*89 - 112*				

LCS Sample ID: **VLCSW-210203** Units: **ug/L** Analysis Date: **03-Feb-2021 22:18**
Client ID: Run ID: **VOA6_377477** SeqNo: **5943425** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	19.05	1.0	20	0	95.2	80 - 119				
1,1-Dichloroethene	16.48	1.0	20	0	82.4	71 - 131				
1,2-Dichloroethane	19.29	1.0	20	0	96.5	73 - 128				
cis-1,2-Dichloroethene	20.76	1.0	20	0	104	78 - 123				
Methylene chloride	20.8	2.0	20	0	104	74 - 124				
Trichloroethene	20.55	1.0	20	0	103	79 - 123				
Vinyl chloride	16.56	1.0	20	0	82.8	58 - 137				
Surr: 1,2-Dichloroethane-d4	*50.2*	*1.0*	*50*	*0*	*100*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*51.13*	*1.0*	*50*	*0*	*102*	*85 - 114*				
Surr: Dibromofluoromethane	*51.7*	*1.0*	*50*	*0*	*103*	*80 - 119*				
Surr: Toluene-d8	*47.46*	*1.0*	*50*	*0*	*94.9*	*89 - 112*				

ALS Houston, US Date: 16-Mar-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
WorkOrder: HS21011077

QC BATCH REPORT

Batch ID: R377477 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS21011077-06MS** Units: **ug/L** Analysis Date: **04-Feb-2021 02:10**
Client ID: **16IW20-210127** Run ID: **VOA6_377477** SeqNo: **5943435** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	17.02	1.0	20	0	85.1	80 - 119				
1,1-Dichloroethene	13.99	1.0	20	0	69.9	71 - 131				S
1,2-Dichloroethane	17.23	1.0	20	0.9245	81.5	73 - 128				
cis-1,2-Dichloroethene	60.23	1.0	20	46.83	67.0	78 - 123				S
Methylene chloride	16.34	2.0	20	0	81.7	74 - 124				
Trichloroethene	32.33	1.0	20	13.06	96.4	79 - 123				
Vinyl chloride	16.54	1.0	20	7.169	46.8	58 - 137				S
Surr: 1,2-Dichloroethane-d4	*44.65*	*1.0*	*50*	*0*	*89.3*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*52.85*	*1.0*	*50*	*0*	*106*	*85 - 114*				
Surr: Dibromofluoromethane	*46.61*	*1.0*	*50*	*0*	*93.2*	*80 - 119*				
Surr: Toluene-d8	*48.45*	*1.0*	*50*	*0*	*96.9*	*89 - 112*				

MS Sample ID: **HS21011077-02MS** Units: **ug/L** Analysis Date: **04-Feb-2021 02:52**
Client ID: **16WW57-210127** Run ID: **VOA6_377477** SeqNo: **5943437** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	19.34	1.0	20	0	96.7	80 - 119				
1,1-Dichloroethene	15.44	1.0	20	0.9427	72.5	71 - 131				
1,2-Dichloroethane	17.72	1.0	20	0	88.6	73 - 128				
cis-1,2-Dichloroethene	18.73	1.0	20	0	93.6	78 - 123				
Methylene chloride	17.95	2.0	20	0	89.7	74 - 124				
Trichloroethene	86.16	1.0	20	65.04	106	79 - 123				
Vinyl chloride	10.42	1.0	20	0	52.1	58 - 137				S
Surr: 1,2-Dichloroethane-d4	*45.67*	*1.0*	*50*	*0*	*91.3*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*51.3*	*1.0*	*50*	*0*	*103*	*85 - 114*				
Surr: Dibromofluoromethane	*47.51*	*1.0*	*50*	*0*	*95.0*	*80 - 119*				
Surr: Toluene-d8	*49.54*	*1.0*	*50*	*0*	*99.1*	*89 - 112*				

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Mar-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
WorkOrder: HS21011077

QC BATCH REPORT

Batch ID: R377477 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS21011077-06MSD** Units: **ug/L** Analysis Date: **04-Feb-2021 02:31**
Client ID: **16IW20-210127** Run ID: **VOA6_377477** SeqNo: **5943436** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	17.6	1.0	20	0	88.0	80 - 119	17.02	3.36	20	
1,1-Dichloroethene	13.02	1.0	20	0	65.1	71 - 131	13.99	7.17	20	S
1,2-Dichloroethane	17.47	1.0	20	0.9245	82.7	73 - 128	17.23	1.35	20	
cis-1,2-Dichloroethene	59.9	1.0	20	46.83	65.4	78 - 123	60.23	0.547	20	S
Methylene chloride	16.25	2.0	20	0	81.3	74 - 124	16.34	0.55	20	
Trichloroethene	31.18	1.0	20	13.06	90.6	79 - 123	32.33	3.64	20	
Vinyl chloride	16.06	1.0	20	7.169	44.5	58 - 137	16.54	2.91	20	S
Surr: 1,2-Dichloroethane-d4	*46.1*	*1.0*	*50*	*0*	*92.2*	*81 - 118*	*44.65*	*3.2*	*20*	
Surr: 4-Bromofluorobenzene	*51.36*	*1.0*	*50*	*0*	*103*	*85 - 114*	*52.85*	*2.86*	*20*	
Surr: Dibromofluoromethane	*46.68*	*1.0*	*50*	*0*	*93.4*	*80 - 119*	*46.61*	*0.154*	*20*	
Surr: Toluene-d8	*48.71*	*1.0*	*50*	*0*	*97.4*	*89 - 112*	*48.45*	*0.536*	*20*	

MSD Sample ID: **HS21011077-02MSD** Units: **ug/L** Analysis Date: **04-Feb-2021 03:13**
Client ID: **16WW57-210127** Run ID: **VOA6_377477** SeqNo: **5943438** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	18.15	1.0	20	0	90.7	80 - 119	19.34	6.37	20	
1,1-Dichloroethene	13.5	1.0	20	0.9427	62.8	71 - 131	15.44	13.4	20	S
1,2-Dichloroethane	16.97	1.0	20	0	84.8	73 - 128	17.72	4.31	20	
cis-1,2-Dichloroethene	17.45	1.0	20	0	87.3	78 - 123	18.73	7.07	20	
Methylene chloride	16.91	2.0	20	0	84.5	74 - 124	17.95	5.99	20	
Trichloroethene	80.4	1.0	20	65.04	76.8	79 - 123	86.16	6.92	20	S
Vinyl chloride	9.391	1.0	20	0	47.0	58 - 137	10.42	10.4	20	S
Surr: 1,2-Dichloroethane-d4	*44.69*	*1.0*	*50*	*0*	*89.4*	*81 - 118*	*45.67*	*2.16*	*20*	
Surr: 4-Bromofluorobenzene	*50.05*	*1.0*	*50*	*0*	*100*	*85 - 114*	*51.3*	*2.47*	*20*	
Surr: Dibromofluoromethane	*47.11*	*1.0*	*50*	*0*	*94.2*	*80 - 119*	*47.51*	*0.827*	*20*	
Surr: Toluene-d8	*48.54*	*1.0*	*50*	*0*	*97.1*	*89 - 112*	*49.54*	*2.05*	*20*	

The following samples were analyzed in this batch: HS21011077-01 HS21011077-02 HS21011077-03 HS21011077-04 HS21011077-05 HS21011077-06 HS21011077-07

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Mar-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
WorkOrder: HS21011077

QC BATCH REPORT

Batch ID: R377228 (0) **Instrument:** ManTech01 **Method:** ALKALINITY BY SM2320B

MBLK Sample ID: **WBLKW2-210131** Units: **mg/L** Analysis Date: **31-Jan-2021 18:39**
Client ID: Run ID: **ManTech01_377228** SeqNo: **5937870** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	5.00	5.00								U

LCS Sample ID: **WLCS2-210131** Units: **mg/L** Analysis Date: **31-Jan-2021 18:08**
Client ID: Run ID: **ManTech01_377228** SeqNo: **5937866** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	1023	5.00	1000	0	102	85 - 115				

LCSD Sample ID: **WLCSD2-210131** Units: **mg/L** Analysis Date: **31-Jan-2021 18:16**
Client ID: Run ID: **ManTech01_377228** SeqNo: **5937867** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	1025	5.00	1000	0	103	85 - 115	1023	0.248	20	

DUP Sample ID: **HS21011077-02DUP** Units: **mg/L** Analysis Date: **31-Jan-2021 18:50**
Client ID: **16WW57-210127** Run ID: **ManTech01_377228** SeqNo: **5937872** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	132.3	5.00					131.3	0.743	20	

The following samples were analyzed in this batch: HS21011077-02 HS21011077-05

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Mar-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
WorkOrder: HS21011077

QC BATCH REPORT

Batch ID: R377229 (0) **Instrument:** ManTech01 **Method:** ALKALINITY BY SM2320B

MBLK Sample ID: **WBLKW3-210131** Units: **mg/L** Analysis Date: **31-Jan-2021 22:00**
Client ID: Run ID: **ManTech01_377229** SeqNo: **5937904** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	5.00	5.00								U

LCS Sample ID: **LCS3-210131** Units: **mg/L** Analysis Date: **31-Jan-2021 21:45**
Client ID: Run ID: **ManTech01_377229** SeqNo: **5937902** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	1028	5.00	1000	0	103	85 - 115				

LCSD Sample ID: **LCSD3-210131** Units: **mg/L** Analysis Date: **31-Jan-2021 21:55**
Client ID: Run ID: **ManTech01_377229** SeqNo: **5937903** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	1029	5.00	1000	0	103	85 - 115	1028	0.072	20	

DUP Sample ID: **HS21011077-06DUP** Units: **mg/L** Analysis Date: **31-Jan-2021 22:18**
Client ID: **16IW20-210127** Run ID: **ManTech01_377229** SeqNo: **5937906** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	1114	5.00					1106	0.661	20	

The following samples were analyzed in this batch: HS21011077-06

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Mar-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
WorkOrder: HS21011077

QC BATCH REPORT

Batch ID: R377315 (0) **Instrument:** ICS-Integrion **Method:** ANIONS BY SW9056A

MBLK Sample ID: **MBLK-012821** Units: **mg/L** Analysis Date: **28-Jan-2021 12:48**
Client ID: Run ID: **ICS-Integrion_377315** SeqNo: **5939792** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	0.100	0.100								U
Nitrogen, Nitrate (As N)	0.100	0.100								U
Sulfate	0.500	0.500								U

LCS Sample ID: **LCS-012821** Units: **mg/L** Analysis Date: **28-Jan-2021 13:06**
Client ID: Run ID: **ICS-Integrion_377315** SeqNo: **5939793** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.608	0.100	4	0	90.2	80 - 120				
Nitrogen, Nitrate (As N)	3.898	0.100	4	0	97.5	80 - 120				
Sulfate	19.5	0.500	20	0	97.5	80 - 120				

MS Sample ID: **HS21011077-06MS** Units: **mg/L** Analysis Date: **28-Jan-2021 23:04**
Client ID: **16IW20-210127** Run ID: **ICS-Integrion_377315** SeqNo: **5939814** PrepDate: DF: **2**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	47.34	0.200	4	44.26	76.9	80 - 120				SEO
Nitrogen, Nitrate (As N)	4.09	0.200	4	0.0802	100	80 - 120				
Sulfate	121.6	1.00	20	104.8	83.7	80 - 120				O

MS Sample ID: **HS21011077-02MS** Units: **mg/L** Analysis Date: **28-Jan-2021 22:28**
Client ID: **16WW57-210127** Run ID: **ICS-Integrion_377315** SeqNo: **5939812** PrepDate: DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	14.15	0.500	10	4.956	91.9	80 - 120				
Nitrogen, Nitrate (As N)	11.89	0.500	10	0	119	80 - 120				
Sulfate	2444	2.50	50	2415	58.4	80 - 120				SEO

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Mar-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
WorkOrder: HS21011077

QC BATCH REPORT

Batch ID: **R377315 (0)** **Instrument:** **ICS-Integrion** **Method:** **ANIONS BY SW9056A**

MSD Sample ID: **HS21011077-06MSD** Units: **mg/L** Analysis Date: **28-Jan-2021 23:22**
Client ID: **16IW20-210127** Run ID: **ICS-Integrion_377315** SeqNo: **5939815** PrepDate: DF: **2**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	45.35	0.200	4	44.26	27.4	80 - 120	47.34	4.28	20	SEO
Nitrogen, Nitrate (As N)	3.947	0.200	4	0.0802	96.7	80 - 120	4.09	3.57	20	
Sulfate	115.5	1.00	20	104.8	53.3	80 - 120	121.6	5.13	20	SO

MSD Sample ID: **HS21011077-02MSD** Units: **mg/L** Analysis Date: **28-Jan-2021 22:46**
Client ID: **16WW57-210127** Run ID: **ICS-Integrion_377315** SeqNo: **5939813** PrepDate: DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	13.74	0.500	10	4.956	87.8	80 - 120	14.15	2.97	20	
Nitrogen, Nitrate (As N)	11.48	0.500	10	0	115	80 - 120	11.89	3.45	20	
Sulfate	2329	2.50	50	2415	-172	80 - 120	2444	4.82	20	SEO

The following samples were analyzed in this batch: HS21011077-02 HS21011077-05 HS21011077-06

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Mar-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
WorkOrder: HS21011077

QC BATCH REPORT

Batch ID: R378021 (0) **Instrument:** ICS-Integrion **Method:** ANIONS BY SW9056A

MBLK Sample ID: **MBLK-** Units: **mg/L** Analysis Date: **12-Feb-2021 02:24**
Client ID: Run ID: **ICS-Integrion_378021** SeqNo: **5955490** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	0.100	0.100								U
Sulfate	0.500	0.500								U

LCS Sample ID: **LCS-** Units: **mg/L** Analysis Date: **12-Feb-2021 02:42**
Client ID: Run ID: **ICS-Integrion_378021** SeqNo: **5955491** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.696	0.100	4	0	92.4	80 - 120				
Sulfate	20.04	0.500	20	0	100	80 - 120				

MS Sample ID: **HS21020154-02MS** Units: **mg/L** Analysis Date: **11-Feb-2021 23:23**
Client ID: Run ID: **ICS-Integrion_378021** SeqNo: **5955482** PrepDate: DF: **1000**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	1792	100	2000	90.4	85.1	80 - 120				
Sulfate	11350	500	10000	1869	94.8	80 - 120				

MSD Sample ID: **HS21020154-02MSD** Units: **mg/L** Analysis Date: **11-Feb-2021 23:41**
Client ID: Run ID: **ICS-Integrion_378021** SeqNo: **5955483** PrepDate: DF: **1000**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	1774	100	2000	90.4	84.2	80 - 120	1792	1.05	20	
Sulfate	11570	500	10000	1869	97.0	80 - 120	11350	1.9	20	

The following samples were analyzed in this batch: HS21011077-02 HS21011077-05 HS21011077-06

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Mar-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
WorkOrder: **HS21011077**

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

RIGHT SOLUTIONS | RIGHT PARTNER

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	20-030-0	26-Mar-2021
California	2919, 2020-2021	30-Apr-2021
Dept of Defense	PJLA L20-507-R2	22-Dec-2021
Florida	E87611-30-07/01/2020	30-Jun-2021
Illinois	2000322020-4	09-May-2021
Kansas	E-10352 2020-2021	31-Jul-2021
Kentucky	123043, 2020-2021	30-Apr-2021
Louisiana	03087, 2020-2021	30-Jun-2021
North Carolina	624-2021	31-Dec-2021
North Dakota	R-193 2020-2021	30-Apr-2021
Oklahoma	2020-165	31-Aug-2021
Texas	T104704231-20-26	30-Apr-2021

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Mar-21

Sample Receipt Checklist

Work Order ID: HS21011077 **Date/Time Received:** **28-Jan-2021 09:45**

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

Completed By: /S/ Paresh M. Giga (eSignature) 28-Jan-2021 13:14 (Date/Time) **Reviewed by:** /S/ Corey Grandits (eSignature) 29-Jan-2021 10:47 (Date/Time)

Matrices: **GW/SW/Water** Carrier name: **FedEx**

	Yes	No	
Shipping container/cooler in good condition?	☑	☐	Not Present ☐
Custody seals intact on shipping container/cooler?	☑	☐	Not Present ☐
Custody seals intact on sample bottles?	☐	☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	☐	☐	Not Present ☑
Chain of custody present?	☑	☐	1 Page(s)
Chain of custody signed when relinquished and received?	☑	☐	COC IDs:None
Samplers name present on COC?	☑	☐	
Chain of custody agrees with sample labels?	☑	☐	
Samples in proper container/bottle?	☑	☐	
Sample containers intact?	☑	☐	
Sufficient sample volume for indicated test?	☑	☐	
All samples received within holding time?	☑	☐	
Container/Temp Blank temperature in compliance?	☑	☐	

Temperature(s)/Thermometer(s):	0.8C U/C	IR31
Cooler(s)/Kit(s):	45563	
Date/Time sample(s) sent to storage:	1/28/2021 13:30	

	Yes	No	
Water - VOA vials have zero headspace?	☑	☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	☑	☐	N/A ☐
pH adjusted?	☐	☑	N/A ☐

pH adjusted by:

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

RIGHT SOLUTIONS | RIGHT PARTNER

CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd. Suite 210 Houston, TX. 77099 (281) 530-5656 ATTN: R.J Modashia 16LHAAP-210127-ALS

Page 1 of 1

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

Project No. 501032

Job: **LHAAP 16 January 2021**

Prepared By: Mike Martinez

P.O. Number

Field Sample I.D. Time	Sample Matrix	Date /	MS / MSD	No. OF CONTAINERS	VOC by SW 8260B	TOC by SM5310C	MEE by RSK 175	Anions (bromide, sulfate, nitrate) by SW9056 and Alkalinity by SM2320	Bromide by SW9056	Perchlorate by SW6850	Metals (arsenic, chromium, manganese, nickel, thallium) by SW6020				Remarks (Preservatives, etc.)
16LHAAP-210127-TBC0	LIQ	01-27-21 / 0715		2	2										
16GW57-210127	GW	01-27-21 / 0825	X	30	9	6	9	3		3					
16SW01-210127	SW	01-27-21 / 1030		5	3					1	1				
16SW02-210127	SW	01-27-21 / 1120		5	3					1	1				
16GW58-210127	GW	01-27-21 / 1157		10	3	2	3	1		1					
16IW20-210127	GW	01-27-21 / 1340		30	9	6	9	3		3					
16SW03-210127	SW	01-27-21 / 1440		5	3					1	1				

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

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
[signature]	01-27-21	1510									

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition
J. [illegible]	1/28/21	0945							

Remarks:

Cooler 45563 IR01
Temp 0.8°C CFO

Aptim Environmental & Infrastructure, Inc.
LHAAP 16 January 2021

HS21011077

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

RIGHT SOLUTIONS | RIGHT PARTNER

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

45563

CUSTODY SEAL

Date: 01-27-21 Time: 1578
Name:
Company:

Seal Broken By:
Date: 01/28/21

45563 JAN 28 2021

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

45563

CUSTODY SEAL

Date: 01-27-21 Time: 1578
Name:
Company:

Seal Broken By:
Date: 01/28/21

Fold and remove

ALS

45563

ORIGIN ID:SGRA (903) 930-6193
SCOTT BEESINGER
APTIM ENVIRONMENTAL & INFRASTRUCTURE
1203-B EAST GRAND AVE
PMB 202
MARSHALL, TX 75670
UNITED STATES US

SHIP DATE: 04JAN21
ACTWGT: 1.00 LB MA
CAD: 0221247 CAFE
DIMS: 26x14x14 IN

TO CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099
(281) 530-5656
REF: LHAPP 16 - BO75777 - RJ
RMA:

FedEx Express

FedEx TRK# 0221 9473 0838 9520

THU - 28 JAN AA
PRIORITY OVERNIGHT

AB SGRA

77099
TX-US
IAH

FID: 162785 27Jan2021 SGRA 56061/1136

RIGHT SOLUTIONS | RIGHT PARTNER

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

LABORATORY REPORT

March 15, 2021

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

RE: HS21011077

Dear RJ:

Your report P2100482 has been amended for the samples submitted to our laboratory on January 29, 2021. The data was revised to correct the sample IDs for all samples, "-21027" was changed to "-210127". The change has been indicated by the "Revised Report" footer located at the bottom right corner of each page.

All analyses were performed according to our laboratory's NELAP and DoD-ELAP-approved quality assurance program. The test results meet requirements of the current NELAP and DoD-ELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP and DoD-ELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

ALS | Environmental

By Hayden Akers at 6:11 pm, Mar 15, 2021

Hayden Akers
Project Manager

RIGHT SOLUTIONS | RIGHT PARTNER

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

Client: ALS Laboratory Group
Project: HS21011077

Service Request No: P2100482

CASE NARRATIVE

The samples were received intact under chain of custody on January 29, 2021 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

Methane, Ethene and Ethane Analysis

The samples were analyzed for methane, ethene, and ethane using a gas chromatograph equipped with a flame ionization detector (FID). A known amount of liquid was displaced by injecting 8.0 milliliters of helium creating a headspace in the sample vial. Each sample vial was agitated using a sonic disrupter for fifteen minutes and then allowed to equilibrate for at least two hours. A volume of the headspace was withdrawn using a gas-tight syringe and analyzed using a manual injection technique. The amount of dissolved gases (methane, ethene and ethane) in the original sample was calculated using Henry's Law. This method was performed with guidance from RSK 175. This method is included on the laboratory's NELAP and DoD-ELAP scope of accreditation. Any analytes flagged with an X are not included on the laboratory's NELAP or DoD-ELAP accreditation.

Manual integrations were performed on the following sample(s) and analyte(s). Refer to the raw data for additional information.

Sample Identification(s)	Analyte(s)
P2100482-002	Methane

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.

Use of ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.

RIGHT SOLUTIONS | RIGHT PARTNER

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

ALS Environmental – Simi Valley

CERTIFICATIONS, ACCREDITATIONS, AND REGISTRATIONS

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

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

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS ENVIRONMENTAL

DETAIL SUMMARY REPORT

Client: ALS Laboratory Group
Project ID: HS21011077

Service Request: P2100482

Date Received: 1/29/2021
Time Received: 10:00

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	RSK 175 - Gases
16WW57-210127	P2100482-001	Water	1/27/2021	09:25	X
16WW58-210127	P2100482-002	Water	1/27/2021	11:57	X
16IW20-210127	P2100482-003	Water	1/27/2021	13:40	X

RIGHT SOLUTIONS | RIGHT PARTNER

P2100482

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

(ALS)

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID:** **15560**

SUBCONTRACT TO:

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

Phone: +1 805 526 7161

INVOICE INFORMATION:

CUSTOMER INFORMATION:

Company:	ALS Houston Ste 210	**Company:**	ALS Houston
Contact:	RJ Modashia +1 281 530 5656	**Contact:**	Accounts Payable 81 530 5656
Address:	10450 Stancliff Rd,	**Address:**	10450 Stancliff Rd, Ste 210
Phone:		**Phone:**	+1 281
Email:	RJ.Modashia@alsglobal.com	**Reference:**	HS21011077
Alternate Contact:		**TSR:**	Sonia West
Email:			

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	HS21011077-02	16WW57-21027	Groundwater	27 Jan 2021 09:25
	MEE Only. Provide DOD LV II & IV pdf separate. EQuIS 5.0 - Longhorn		Equis EDD.	11 Feb 2021
2.	HS21011077-05	16WW58-210127	Groundwater	27 Jan 2021 11:57
	MEE Only. Provide DOD LV II & IV pdf separate. EQuIS 5.0 - Longhorn		Equis EDD.	Feb 2021
3.	HS21011077-06	16IW20-21027	Groundwater	27 Jan 2021 13:40
	MEE Only. Provide DOD LV II & IV pdf separate. EQuIS 5.0 - Longhorn		Equis EDD.	Feb 2021

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.
HS21011077-02 & HS21011077-06 = MS/MSD

QC Level: DOD IV (DoD Data Package)

Relinquished By:		Date/Time:	1/28/2021 1800
Received By:		Date/Time:	1/28/21 1000 2°C not
Cooler ID(s):		Temperature(s):	

ALS Environmental
Sample Acceptance Check Form

Client: ALS Laboratory Group Work order: P2100482
Project: HS21011077
Sample(s) received on: 1/29/21 Date opened: 1/29/21 by: ADAVID

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

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

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P2100482-001.01	40ml VOA HCL					
P2100482-001.02	40ml VOA HCL					
P2100482-001.03	40ml VOA HCL					
P2100482-001.04	40ml VOA HCL		1			CB 2/3/21
P2100482-001.05	40ml VOA HCL					
P2100482-001.06	40ml VOA HCL					
P2100482-002.01	40ml VOA HCL		1			CB 2/3/21
P2100482-002.02	40ml VOA HCL					
P2100482-002.03	40ml VOA HCL					
P2100482-002.04	40ml VOA HCL					
P2100482-002.05	40ml VOA HCL					
P2100482-002.06	40ml VOA HCL					
P2100482-003.01	40ml VOA HCL		1			CB 2/3/21
P2100482-003.02	40ml VOA HCL					
P2100482-003.03	40ml VOA HCL					

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

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Environmental
Sample Acceptance Check Form

Client: ALS Laboratory Group Work order: P2100482
Project: HS21011077
Sample(s) received on: 1/29/21 Date opened: 1/29/21 by: ADAVID

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P2100482-003.04	40ml VOA HCL					
P2100482-003.05	40ml VOA HCL					
P2100482-003.06	40ml VOA HCL					
P2100482-003.07	40ml VOA HCL					
P2100482-003.08	40ml VOA HCL					
P2100482-003.09	40ml VOA HCL					

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

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **16WW57-210127**
Client Project ID: **HS21011077**

ALS Project ID: P2100482
ALS Sample ID: P2100482-001

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

Date Collected: 1/27/21
Date Received: 1/29/21
Date Analyzed: 2/3/21
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	**0.86**	1.3	1.0	0.51	**J**
74-85-1	Ethene	0.55	1.0	0.55	0.24	**U**
74-84-0	Ethane	0.47	0.60	0.47	0.16	**U**

U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.
J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

RIGHT SOLUTIONS | RIGHT PARTNER

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **16WW58-210127**
Client Project ID: **HS21011077**

ALS Project ID: P2100482
ALS Sample ID: P2100482-002

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

Date Collected: 1/27/21
Date Received: 1/29/21
Date Analyzed: 2/3/21
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	**7.7**	1.3	1.0	0.51	
74-85-1	Ethene	**0.44**	1.0	0.55	0.24	**J**
74-84-0	Ethane	0.47	0.60	0.47	0.16	**U**

U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.
J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

RIGHT SOLUTIONS | RIGHT PARTNER

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **16IW20-210127**
Client Project ID: **HS21011077**

ALS Project ID: P2100482
ALS Sample ID: P2100482-003

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

Date Collected: 1/27/21
Date Received: 1/29/21
Date Analyzed: 2/3/21
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	**2,900**	1.3	1.0	0.51	
74-85-1	Ethene	**22**	1.0	0.55	0.24	
74-84-0	Ethane	**1.1**	0.60	0.47	0.16	

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

RIGHT SOLUTIONS | RIGHT PARTNER

March 09, 2021

Service Request No:E2100106

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

Laboratory Results for: HS21011077

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory January 28, 2021
For your reference, these analyses have been assigned our service request number **E2100106.**

Revision I - This report was revised to correct the sample IDs (ID required to end in 210127) for all samples in this service request with the exception of E2100106-004.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current TNI standards, where applicable, and except as noted in the laboratory case narrative provided. All results are intended to be considered in their entirety and ALS Environmental is not responsible for use of less than the complete final report. Results apply only to the items submitted to the laboratory, as received for analysis. In accordance with the current TNI Standard, a statement on the estimated uncertainty of measurement of any quantitative analysis will be supplied upon request.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Corey Grandits
Project Manager

ADDRESS 10450 Stancliff Rd., Suite 210, Houston, TX 77099
PHONE +1 281 530 5656 | FAX +1 281 530 5887
ALS Group USA, Corp.
dba ALS Environmental

RIGHT SOLUTIONS | RIGHT PARTNER

Certificate of Analysis

ALS Environmental - Houston HRMS
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Environmental

Client:	ALS Houston	**Service Request No.:**	E2100106
Project:	HS21011077	**Date Received:**	01/28/21
Sample Matrix:	W		

CASE NARRATIVE

All analyses were performed in adherence to the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier IV. When appropriate to the method, method blank results have been reported with each analytical test.

Sample Receipt

Six samples were received for analysis at ALS Environmental in Houston on 01/28/21.

The samples were received in good condition and are consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

Data Validation Notes and Discussion

Precision and Accuracy:

EQ2100045: Laboratory Control Spike/Duplicate Laboratory Control Spike (LCS/DLCS) samples were analyzed and reported in addition to a MS/MSD for this extraction batch. The LCS and DLCS recoveries are within QC limits. MS/MSD Internal Standard Area & recoveries are not within acceptance criteria due to sample matrix interference.

Samples E2100106-001/004/005; lowest practical dilution performed due to matrix interference.

DoD Certification is held for the method/matrix/analytes provided in this report.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.

Use of ALS group USA Corp dba ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.

RIGHT SOLUTIONS | RIGHT PARTNER

Client: ALS Environmental - US **Service Request:**E2100106
Project: HS21011077

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
E2100106-001	16WW57-210127	1/27/2021	0925
E2100106-002	16SW01-210127	1/27/2021	1030
E2100106-003	16SW02-210127	1/27/2021	1120
E2100106-004	16WW58-210127	1/27/2021	1157
E2100106-005	16IW20-210127	1/27/2021	1340
E2100106-006	16SW03-210127	1/27/2021	1440

RIGHT SOLUTIONS | RIGHT PARTNER

Service Request Summary

Folder #: **E2100106**
Client Name: ALS Environmental - US
Project Name: HS21011077
Project Number:

Report To: RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Houston, TX 77099-4338
USA
Phone Number: 281-530-5656
Cell Number:
Fax Number: 281-530-5887
E-mail: rj.modashia@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 01/28/21
Internal Due Date: 2/11/2021
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS21011077
EDD: No EDD Specified

10 125 mL-Glass Bottle NM AMBER Teflon Liner Unpreserved
Location: EHRMS-WIC 6B
Pressure Gas:

Lab Samp No.	Client Samp No	Matrix	Collected	HOUSTON ClO4 DOD/6850
E2100106-001	16WW57-210127	Ground Water	01/27/21 0925	**IV**
E2100106-002	16SW01-210127	Surface Water	01/27/21 1030	**IV**
E2100106-003	16SW02-210127	Surface Water	01/27/21 1120	**IV**
E2100106-004	16WW58-210127	Ground Water	01/27/21 1157	**IV**
E2100106-005	16IW20-210127	Ground Water	01/27/21 1340	**IV**
E2100106-006	16SW03-210127	Surface Water	01/27/21 1440	**IV**

RIGHT SOLUTIONS | RIGHT PARTNER

Service Request Summary

Folder #: **E2100106**
Client Name: ALS Environmental - US
Project Name: HS21011077
Project Number:

Report To: RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Houston, TX 77099-4338
USA
Phone Number: 281-530-5656
Cell Number:
Fax Number: 281-530-5887
E-mail: rj.modashia@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 01/28/21
Internal Due Date: 2/11/2021
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS21011077
EDD: No EDD Specified

10 125 mL-Glass Bottle NM AMBER Teflon Liner Unpreserved
Location: EHRMS-WIC 6B
Pressure Gas:

Test Comments:

Group	Test/Method	Samples	Comments
Semivoa GCMS	ClO4 DOD/6850	4	II Due 2/11,IV due 2/18
Semivoa GCMS	ClO4 DOD/6850	4	MS/MSD

RIGHT SOLUTIONS | RIGHT PARTNER

Data Qualifiers

Lab Standard

+	Possible Tedlar bag artifact.
A	TIC is a suspected aldol-condensation product
B	Analyte found in the associated method blank as well as in the sample.
BC	Reported results are not blank corrected.
BH	The back section of the tube yielded higher results than the front.
BT	Results indicated possible breakthrough; back section >=10% front section.
C	Result identification confirmed.
D	Compound identified in an analysis at a secondary dilution factor
D	Spike was diluted out
DE	Reported results are corrected for desorption efficiency.
E	Estimated value. Concentration above calibration range
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
H1	Sample analysis performed past holding time. See case narrative.
H2	Initial analysis within holding time. Reanalysis for the required dilution was past holding time.
H3	Sample was received and analyzed past holding time.
H4	Sample was extracted past required extraction holding time, but analyzed within analysis holding time. See case narrative.
I	Internal standard not within the specified limits. See case narrative.
J	Estimated Value. Concentration found below MRL.
K	A deflection in the QC ion may indicate interference with the quantitation of this ion. The concentration of this analyte should be considered as an estimate.
K	Analyte was detected above the method reporting limit prior to normalization.
K	The reference ion ratio was outside acceptance criteria, which may indicate a potential bias to this result.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
L1	Laboratory control sample recovery outside the specified limits; results may be biased high.
L2	Laboratory control sample recovery outside the specified limits; results may be biased low.
L3	Laboratory control sample recovery outside the specified limits.
M	Matrix interference; results may be biased high.
M	The duplicate injection precision not met.
M1	Matrix interference due to coelution with a non-target compound; results may be biased high.
N	Presumptive evidence of a compound for TICs that have been identified based on a mass spectral library search.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.

RIGHT SOLUTIONS | RIGHT PARTNER

Data Qualifiers

Lab Standard

O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
P	Indicates chlorodiphenyl ether interference present at the retention time of the target compound.
P	Pesticide/Aroclor target analyte > 40% difference for detected concentrations between GC columns
Q	Indicates as estimated value because the P and P + 2 theoretical abundance ratio does not meet method criteria.
R	Duplicate Precision not met.
R1	Duplicate precision not within the specified limits; however, the results are below the MRL and considered estimated.
S	Surrogate recovery not within specified limits.
S	The reported value was determined by the Method of Standard Additions (MSA).
T	Analyte is a tentatively identified compound, result is estimated.
U	Compound was analyzed for, but was not detected (ND).
V1	The continuing calibration verification standard was outside (biased high) the specified limits for this compound.
V2	The continuing calibration verification standard was outside (biased low) the specified limits for this compound.
W	Result quantified, but the corresponding peak was detected outside the generated retention time window.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
X	See case narrative.
Y	Recovery outside limits
Y	The chromatogram resembles a petroleum product but does not match the calibration standard.
Z	The chromatogram does not resemble a petroleum product.
i	The MRL/MDL has been elevated due to a matrix interference.

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Laboratory Group

Acronyms

Cal	Calibration
Conc	CONCentration
Dioxin(s)	Polychlorinated dibenzo-p-dioxin(s)
EDL	Estimated Detection Limit
EMPC	Estimated Maximum Possible Concentration
Flags	Data qualifiers
Furan(s)	Polychlorinated dibenzofuran(s)
g	Grams
ICAL	Initial CALibration
ID	IDentifier
Ions	Masses monitored for the analyte during data acquisition
L	Liter (s)
LCS	Laboratory Control Sample
DLCS	Duplicate Laboratory Control Sample
MB	Method Blank
MCL	Method Calibration Limit
MDL	Method Detection Limit
mL	Milliliters
MS	Matrix Spiked sample
DMS	Duplicate Matrix Spiked sample
NO	Number of peaks meeting all identification criteria
PCDD(s)	Polychlorinated dibenzo-p-dioxin(s)
PCDF(s)	Polychlorinated dibenzofuran(s)
ppb	Parts per billion
ppm	Parts per million
ppq	Parts per quadrillion
ppt	Parts per trillion
QA	Quality Assurance
QC	Quality Control
Ratio	Ratio of areas from monitored ions for an analyte
% Rec.	Percent recovery
RPD	Relative Percent Difference
RRF	Relative Response Factor
RT	Retention Time
SDG	Sample Delivery Group
S/N	Signal-to-noise ratio
TEF	Toxicity Equivalence Factor
TEQ	Toxicity Equivalence Quotient

RIGHT SOLUTIONS | RIGHT PARTNER

10450 Stancliff Rd, Houston, TX 77099 | 281-530-5656 | www.alsglobal.com

ALS Environmental

State Certifications, Accreditations, and Licenses

Agency	Number	Expire Date
American Association for Laboratory Accreditation	2897.01 2020	11/30/2021
Arizona Department of Health Services	AZ0793-2020	5/27/2021
Arkansas Department of Environmental Quality	20-030-0	3/26/2021
California Department of Health Services	2919-2020	4/30/2021
Department of Defense	A2LA 2897.01	11/30/2021
Florida Department of Health	E87611-2020	6/30/2021
Hawaii Department of Health	2020	4/30/2021
Illinois Environmental Protection Agency	2000322020-4	5/9/2021
Kansas Department of Health and Environment	E-10352-2020	7/31/2021
Louisiana Department of Environmental Quality	03087-2020	6/30/2021
Maine Department of Health and Human Services	2020016	6/5/2022
Maryland Department of the Environment	343-2020	6/30/2021
Michigan Depratment of Environmental Quality	9971-2020	4/30/2021
Nebraska Department of Health and Human Services	NE-OS-25-13 (2020)	4/30/2021
Nevada Department of Concervation and Natural Resources	TX026932021-1	7/31/2021
New Hampshire Environmental Laboratory Accreditation Program	209420	4/24/2021
New Jersey Department of Environmental Protection	TX008	6/30/2021
New York Department of Health	11707	3/31/2021
Oklahoma Department of Environmental Quality	2020-123	8/31/2021
Pennsylvania Department of Environmental Protection	014	6/30/2021
Tennessee Department of Environment and Concervation	04016-2020	4/30/2021
Texas Commision on Environmental Quality	T104704231-20-26	4/30/2021
United States Department of Agriculture	P330-19-00299	10/10/2022

RIGHT SOLUTIONS | RIGHT PARTNER

Chain of Custody

ALS Environmental - Houston HRMS
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

RIGHT SOLUTIONS | RIGHT PARTNER

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID: 15559**

SUBCONTRACT TO:

ALS Environmental
10450 Stancliff RoadSuite 210
Houston, TX 77084

Phone: +1 281 530 5656

CUSTOMER INFORMATION:

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

INVOICE INFORMATION:

Company: ALS Houston
Contact: Accounts Payable
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Reference: HS21011077
TSR: Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS21011077-02**	**16WW57-21027**	**Groundwater**	**27 Jan 2021 09:25**
	Provide Level II and Level IV reports on a seperate pdf.			11 Feb 2021
2.	**HS21011077-03**	**16SW01-21027**	**Surface Water**	**27 Jan 2021 10:30**
	Provide Level II and Level IV reports on a seperate pdf.			11 Feb 2021
3.	**HS21011077-04**	**16SW02-21027**	**Surface Water**	**27 Jan 2021 11:20**
	Provide Level II and Level IV reports on a seperate pdf.			11 Feb 2021
4.	**HS21011077-05**	**16WW58-210127**	**Groundwater**	**27 Jan 2021 11:57**
	Provide Level II and Level IV reports on a seperate pdf.			11 Feb 2021
5.	**HS21011077-06**	**16IW20-21027**	**Groundwater**	**27 Jan 2021 13:40**
	Provide Level II and Level IV reports on a seperate pdf.			11 Feb 2021
6.	**HS21011077-07**	**16SW03-21027**	**Surface Water**	**27 Jan 2021 14:40**
	Provide Level II and Level IV reports on a seperate pdf.			11 Feb 2021

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.
HS21011077-02 & HS21011077-06 = MS/MSD

QC Level: DOD IV (DoD Data Package)

RIGHT SOLUTIONS | RIGHT PARTNER

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID:** **15559**

Relinquished By:	J. [illegible]	Date/Time:	1/28/21 1430
Received By:	[illegible]	Date/Time:	1/28/21 1930
Cooler ID(s):	[illegible]	Temperature(s):	

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Environmental

Cooler Receipt Form

Project Chemist: CK

Client/Project: ALS-H

Thermometer ID: IR31

Date/Time Received: 1/28/21 Initials: CK Date/Time Logged in: 1/28/21 Initials: CK

1. Method of delivery: ○ US Mail ○ Fed Ex ○ UPS ○ DHL ☑ ALS Courier ○ Client
2. Samples received in: ☑ Cooler ○ Box ○ Envelope ○ Other
3. Were custody seals on coolers? ○ Yes ☑ No
   Were they intact? ○ Yes ○ No ☑ N/A
   Were they signed and dated? ○ Yes ○ No ☑ N/A
   If yes, how many and where?
4. Packing Material: ○ Inserts ☑ Baggies ○ Bubble Wrap ○ Gel Packs ☑ Wet Ice ○ Sleeves ○ Other
5. Foreign or Regulated Soil? ○ Yes ○ No Location of Sampling:

Cooler Tracking Number	COC ID	Date Opened	Time Opened	Opened By	Temp. °C	Temp Blank?
N/A		1/28/21	1930	CK	2.1	☒
						☐
						☐
						☐

6. Were custody papers properly filled out (ink, signed, dated, etc)? ☑ Yes ○ No
7. Did all bottles arrive in good condition (not broken, no signs of leakage)? ☑ Yes ○ No
8. Were all sample labels complete (i.e., sample ID, analysis, preservation, etc)? ☑ Yes ○ No
9. Were appropriate bottles/containers and volumes received for the requested tests? ☑ Yes ○ No
10. Did sample labels and tags agree with custody documents? ☑ Yes ○ No

Notes, Discrepancies, & Resolutions:

Service request Label:

RIGHT SOLUTIONS | RIGHT PARTNER

10450 Stancliff Rd., Suite 210
Houston, TX 77099
T: +1 713 266 1599
F: +1 713 266 1599
www.alsglobal.com

SAMPLE ACCEPTANCE POLICY

This policy outlines the criteria samples must meet to be accepted by ALS Environmental – Houston HRMS.

Cooler Custody Seals (desirable, mandatory if specified in SAP):

- ✓ Intact on outside of cooler, signed and dated

Chain-of-Custody (COC) documentation (mandatory):

The following is required on each COC:

- ✓ Sample ID, the location, date and time of collection, collector's name, preservation type, sample type, and any other special remarks concerning the sampleThe COC must be completed in ink.
- ✓ Signature and date of relinquishing party.

In the absence of a COC at sample receipt, the COC will be requested from the client.

Sample Integrity (mandatory):

Samples are inspected upon arrival to ensure that sample integrity was not compromised during transfer to the laboratory.

- ✓ Sample containers must arrive in good condition (not broken or leaking).
- ✓ Samples must be labeled appropriately, including Sample IDs, and requested test using durable labels and indelible ink.
- ✓ The correct type of sample bottle must be used for the method requested.
- ✓ An appropriate sample volume, or weight, must be received.
- ✓ Sample IDs and number of containers must reconcile with the COC.
- ✓ Samples must be received within the method defined holding time.

Temperature Requirement (varies by sample matrix):

- ✓ Aqueous and Non-aqueous samples must be shipped and stored cold, at 0 to 6ºC.
- ✓ Tissue samples must be shipped and stored frozen, at -20 to -10ºC.
- ✓ Air samples are shipped and stored cold, at 0 to 6ºC
- ✓ The sample temperature must be recorded on the COC

All cooler inspections are documented on the Cooler Receipt Form (CRF). A separate CRF is completed for each service request. Any samples not meeting the above criteria are noted on the CRF and the Project Manager notified. The Project Manager must resolve any sample integrity issues with the client prior to proceeding with the analysis. Such resolutions are documented in writing and filed with the project folder. Data associated with samples received outside of this acceptance policy will be qualified on the case narrative of the final report

RIGHT SOLUTIONS | RIGHT PARTNER

Preparation Information Benchsheets

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

RIGHT SOLUTIONS | RIGHT PARTNER

Preparation Information Benchsheet

Prep Run#: 373566 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
Team: Semivoa GCMS/JRODRIGUEZ **Prep Method:** Method **Prep Date/Time:** 2/1/21 08:52

#	Lab Code	Client ID	B#	Method /Test	pH	Cl	Matrix	Amt. Ext.	Sample Description
1	E2100103-001	16EW02-210126	.01	6850/ClO4 DOD			Ground Water	10mL	
2	E2100103-002	16IW03-210126	.01	6850/ClO4 DOD			Ground Water	10mL	
3	E2100103-003	16IW03-210126-FD	.01	6850/ClO4 DOD			Ground Water	10mL	
4	E2100103-004	16IW10-210126	.01	6850/ClO4 DOD			Ground Water	10mL	
5	E2100103-005	16IW10-210126-FD	.01	6850/ClO4 DOD			Ground Water	10mL	
6	E2100103-006	16IW09-210126	.01	6850/ClO4 DOD			Ground Water	10mL	
7	E2100104-001	PT Lot 8218-53	.03	6850/ClO4 DOD			Water	10mL	
8	E2100105-001	LH18/24-SP650_012621_BIX	.01	6850/ClO4 DOD			Water	10mL	
9	E2100106-001	16WW57-210127	.01	6850/ClO4 DOD			Ground Water	10mL	
10	E2100106-002	16SW01-210127	.01	6850/ClO4 DOD			Surface Water	10mL	
11	E2100106-003	16SW02-210127	.01	6850/ClO4 DOD			Surface Water	10mL	
12	E2100106-004	16WW58-210127	.01	6850/ClO4 DOD			Ground Water	10mL	
13	E2100106-005	16IW20-210127	.01	6850/ClO4 DOD			Ground Water	10mL	
14	E2100106-006	16SW03-210127	.01	6850/ClO4 DOD			Surface Water	10mL	
15	E2100107-001	LHAAP17_012521_H1	.01	6850/ClO4 DOD			Ground Water	10mL	
16	E2100107-002	LHAAP17_012521_H2	.01	6850/ClO4 DOD			Ground Water	10mL	
17	EQ2100045-01	MB		6850/ClO4 DOD			Liquid	10mL	
18	EQ2100045-02	LCS		6850/ClO4 DOD			Liquid	10mL	
19	EQ2100045-03	DLCS		6850/ClO4 DOD			Liquid	10mL	
20	EQ2100045-04	16WW57-210127 MS	.02	6850/ClO4 DOD			Liquid	10mL	
21	EQ2100045-05	16WW57-210127 DMS	.03	6850/ClO4 DOD			Liquid	10mL	
22	EQ2100045-06	16IW20-210127 MS	.02	6850/ClO4 DOD			Liquid	10mL	
23	EQ2100045-07	16IW20-210127 DMS	.03	6850/ClO4 DOD			Liquid	10mL	

Spiking Solutions

Name: Perchlorate Intermediate Stock1 Inventory ID 214035 Logbook Ref: Perchlorate Expires On: 05/23/2021

EQ2100045-02	1.00µL	EQ2100045-03	1.00µL	EQ2100045-04	1.00µL	EQ2100045-05	1.00µL	EQ2100045-06	1.00µL	EQ2100045-07	1.00µL

Name: Perchlorate Internal Standard 1ug/mL Inventory ID 214820 Logbook Ref: Perchlorate Internal Standard Expires On: 07/03/2021

E2100103-001	100.00µL	E2100103-002	100.00µL	E2100103-003	100.00µL	E2100103-004	100.00µL	E2100103-005	100.00µL	E2100103-006	100.00µL
E2100105-001	100.00µL	E2100106-001	100.00µL	E2100106-001.R	100.00µL	E2100106-002	100.00µL	E2100106-003	100.00µL	E2100106-004	100.00µL
E2100106-005	100.00µL	E2100106-005.R	100.00µL	E2100106-006	100.00µL	E2100107-001	100.00µL	E2100107-002	100.00µL	EQ2100045-01	100.00µL
EQ2100045-02	100.00µL	EQ2100045-03	100.00µL	EQ2100045-04	100.00µL	EQ2100045-05	100.00µL	EQ2100045-06	100.00µL	EQ2100045-07	100.00µL

Preparation Information Benchsheet

Prep Run#: 373566
Team: Semivoa GCMS/JRODRIGUEZ

Prep WorkFlow: GenExt28Day
Prep Method: Method

Status: Prepped
Prep Date/Time: 2/1/21 08:52

Preparation Steps

Step: Preparation
Started: 2/1/21 08:52
Finished: 2/1/21 09:28
By: GRIVERA
Comments

Comments:

Reviewed By: GR Date: 2/1/21

Chain of Custody

Relinquished By: Date:

Received By: Date:

Extracts Examined
Yes No

RIGHT SOLUTIONS | RIGHT PARTNER

Analytical Results

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100106
Project:	HS21011077	**Date Collected:**	1/27/21 0925
Sample Matrix:	Ground Water	**Date Received:**	1/28/21
Sample Name:	16WW57-210127	**Units:**	µg/L
Lab Code:	E2100106-001	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	1.00	0.500	0.250	10	2/ 1/21	2/2/21 11:56	373566	711866	

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100106
Project:	HS21011077	**Date Collected:**	1/27/21 1030
Sample Matrix:	Surface Water	**Date Received:**	1/28/21
Sample Name:	16SW01-210127	**Units:**	µg/L
Lab Code:	E2100106-002	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	2/ 1/21	2/1/21 16:20	373566	711817	

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100106
Project:	HS21011077	**Date Collected:**	1/27/21 1120
Sample Matrix:	Surface Water	**Date Received:**	1/28/21
Sample Name:	16SW02-210127	**Units:**	µg/L
Lab Code:	E2100106-003	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	2/ 1/21	2/1/21 16:46	373566	711817	

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100106
Project:	HS21011077	**Date Collected:**	1/27/21 1157
Sample Matrix:	Ground Water	**Date Received:**	1/28/21
Sample Name:	16WW58-210127	**Units:**	µg/L
Lab Code:	E2100106-004	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.500	0.250	0.125	5	2/ 1/21	2/2/21 12:04	373566	711866	

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100106
Project:	HS21011077	**Date Collected:**	1/27/21 1340
Sample Matrix:	Ground Water	**Date Received:**	1/28/21
Sample Name:	16IW20-210127	**Units:**	µg/L
Lab Code:	E2100106-005	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	1.00	0.500	0.250	10	2/ 1/21	2/2/21 12:12	373566	711866	

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100106
Project:	HS21011077	**Date Collected:**	1/27/21 1440
Sample Matrix:	Surface Water	**Date Received:**	1/28/21
Sample Name:	16SW03-210127	**Units:**	µg/L
Lab Code:	E2100106-006	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	2/ 1/21	2/1/21 17:10	373566	711817	

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100106
Project:	HS21011077	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	µg/L
Lab Code:	EQ2100045-01	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	2/ 1/21	2/1/21 14:14	373566	711817	

RIGHT SOLUTIONS | RIGHT PARTNER

Accuracy & Precision

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2100106
Project:	HS21011077	**Date Analyzed:**	2/ 1/21
Sample Matrix:	Ground Water		

Lab Control Sample Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method:	6850	**Units:**	µg/L
Prep Method:	Method	**Basis:**	NA
		Extraction Lot:	373566

	Lab Control Sample EQ2100045-02			Duplicate Lab Control Sample EQ2100045-03					
Analyte Name	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Perchlorate	0.0900	0.100	90	0.0846	0.100	85	84 - 119	6	15

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

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100106
Project:	HS21011077	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2100045-02	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.0900**	J	0.100	0.0500	0.0250	1	2/ 1/21	2/1/21 14:21	373566	711817	

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100106
Project:	HS21011077	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Duplicate Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2100045-03	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.0846**	J	0.100	0.0500	0.0250	1	2/ 1/21	2/1/21 14:29	373566	711817	

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2100106
Project:	HS21011077	**Date Collected:**	1/27/21
Sample Matrix:	Ground Water	**Date Received:**	1/28/21
		Date Analyzed:	2/ 1/21

Matrix Spike Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Sample Name:	16WW57-210127	**Units:**	µg/L
Lab Code:	E2100106-001	**Basis:**	NA

Analytical Method: 6850
Prep Method: Method

		16WW57-210127MS Matrix Spike EQ2100045-04				16WW57-210127DMS Duplicate Matrix Spike EQ2100045-05						
Analyte Name	**Sample Result**	**Result**	**Spike Amount**	**% Rec**		**Result**	**Spike Amount**	**% Rec**		**% Rec Limits**	**RPD**	**RPD Limit**
Perchlorate	ND	0.0527	0.100	53	*	0.0615	0.100	61	*	84 - 119	15	15

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

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

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100106
Project:	HS21011077	**Date Collected:**	1/27/21 0925
Sample Matrix:	Ground Water	**Date Received:**	1/28/21
Sample Name:	16WW57-210127	**Units:**	µg/L
Lab Code:	EQ2100045-04	**Basis:**	NA
Run Type:	Matrix Spike		

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.0527**	J	0.100	0.0500	0.0250	1	2/ 1/21	2/1/21 14:37	373566	711817	*

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100106
Project:	HS21011077	**Date Collected:**	1/27/21 0925
Sample Matrix:	Ground Water	**Date Received:**	1/28/21
Sample Name:	16WW57-210127	**Units:**	µg/L
Lab Code:	EQ2100045-05	**Basis:**	NA
Run Type:	Duplicate Matrix Spike		

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.0615**	J	0.100	0.0500	0.0250	1	2/ 1/21	2/1/21 14:45	373566	711817	*

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2100106
Project:	HS21011077	**Date Collected:**	1/27/21
Sample Matrix:	Ground Water	**Date Received:**	1/28/21
		Date Analyzed:	2/ 1/21

Matrix Spike Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Sample Name:	16IW20-210127	**Units:**	µg/L
Lab Code:	E2100106-005	**Basis:**	NA

Analytical Method: 6850
Prep Method: Method

		16IW20-210127MS				16IW20-210127DMS						
		Matrix Spike				**Duplicate Matrix Spike**						
		EQ2100045-06				EQ2100045-07						
Analyte Name	**Sample Result**	**Result**	**Spike Amount**	**% Rec**		**Result**	**Spike Amount**	**% Rec**		**% Rec Limits**	**RPD**	**RPD Limit**
Perchlorate	ND	0.0650	0.100	65	*	0.0731	0.100	73	*	84 - 119	12	15

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

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

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100106
Project:	HS21011077	**Date Collected:**	1/27/21 1340
Sample Matrix:	Ground Water	**Date Received:**	1/28/21
Sample Name:	16IW20-210127	**Units:**	µg/L
Lab Code:	EQ2100045-06	**Basis:**	NA
Run Type:	Matrix Spike		

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.0650**	J	0.100	0.0500	0.0250	1	2/ 1/21	2/1/21 14:53	373566	711817	*

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100106
Project:	HS21011077	**Date Collected:**	1/27/21 1340
Sample Matrix:	Ground Water	**Date Received:**	1/28/21
Sample Name:	16IW20-210127	**Units:**	µg/L
Lab Code:	EQ2100045-07	**Basis:**	NA
Run Type:	Duplicate Matrix Spike		

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.0731**	J	0.100	0.0500	0.0250	1	2/ 1/21	2/1/21 15:01	373566	711817	*

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

February 05, 2021

Analytical Report for Service Request No: K2100823

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

RE: ALS Houston DOD TOC

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory January 29, 2021
For your reference, these analyses have been assigned our service request number **K2100823.**

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
Qualifiers
State Certifications, Accreditations, And Licenses
Case Narrative
Chain of Custody
General Chemistry

RIGHT SOLUTIONS | RIGHT PARTNER

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.

RIGHT SOLUTIONS | RIGHT PARTNER

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.

RIGHT SOLUTIONS | RIGHT PARTNER

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.

RIGHT SOLUTIONS | RIGHT PARTNER

Case Narrative

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

RIGHT SOLUTIONS | RIGHT PARTNER

1317 South 13th Ave, Kelso, WA 98626 | 1-360-577-7222 | www.alsglobal.com

ALS Environmental

Client: ALS Environmental - US
Project: ALS Houston DOD TOC
Sample Matrix: Ground Water

Service Request: K2100823
Date Received: 01/29/2021

CASE NARRATIVE

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

Sample Receipt:

Three ground water samples were received for analysis at ALS Environmental on 01/29/2021. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The sample was stored at minimum in accordance with the analytical method requirements.

General Chemistry:

No significant anomalies were noted with this analysis.

Approved by Kelley Lovejoy Date 02/05/2021

RIGHT SOLUTIONS | RIGHT PARTNER

Chain of Custody

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

RIGHT SOLUTIONS | RIGHT PARTNER

1L2100823

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID:** **15558**

SUBCONTRACT TO:

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

Phone: +1 360 501 3312

CUSTOMER INFORMATION:

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

INVOICE INFORMATION:

Company: ALS Houston
Contact: Accounts Payable
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Reference: HS21011077
TSR: Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS21011077-02**	**16WW57-21027**	**Groundwater**	**27 Jan 2021 09:25**
	TOC: Provide Level II & DOD Level IV/EQuIS APTIM EDD			11 Feb 2021
2.	**HS21011077-05**	**16WW58-210127**	**Groundwater**	**27 Jan 2021 11:57**
	TOC: Provide Level II & DOD Level IV/EQuIS APTIM EDD			11 Feb 2021
3.	**HS21011077-06**	**16IW20-21027**	**Groundwater**	**27 Jan 2021 13:40**
	TOC: Provide Level II & DOD Level IV/EQuIS APTIM EDD			11 Feb 2021

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.
HS21011077-02 & HS21011077-06 =S/MSD

QC Level: DOD IV (DoD Data Package)

Relinquished By: Date/Time: 1/28/2021 1800

Received By: Date/Time: 1/29/21 1052

Cooler ID(s): Temperature(s):

PM KL

Cooler Receipt and Preservation Form

Client Alr-Houston Service Request K21 00823

Received: 112912 1 Opened: 112912 1 By: RR Unloaded: 112912 1 By: RR

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
4. Was a Temperature Blank present in cooler? NA Y N If yes, notate the temperature in the appropriate column below:
   If no, take the temperature of a representative sample bottle contained within the cooler; notate in the column "Sample Temp":
5. Were samples received within the method specified temperature ranges? NA Y N
   If no, were they received on ice and same day as collected? If not, notate the cooler # below and notify the PM. NA Y N

If applicable, tissue samples were received: *Frozen* *Partially Thawed* *Thawed*

Temp Blank	Sample Temp	IR Gun	Cooler #/COC ID / NA	Out of temp indicate with "X"	PM Notified If out of temp	Tracking Number NA	Filed
1.7	–	1202		—		9473083991142	

6. Packing material: *Inserts* *Baggies* *Bubble Wrap* *Gel Packs* *Wet Ice* *Dry Ice* *Sleeves* _____
7. Were custody papers properly filled out (ink, signed, etc.)? NA Y N
8. Were samples received in good condition (unbroken) NA Y N
9. Were all sample labels complete (ie, analysis, preservation, etc.)? NA Y N
10. Did all sample labels and tags agree with custody papers? NA Y N
11. Were appropriate bottles/containers and volumes received for the tests indicated? NA Y N
12. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* NA Y N
13. Were VOA vials received without headspace? *Indicate in the table below.* NA Y N
14. Was C12/Res negative? NA Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

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

Notes, Discrepancies, Resolutions: _____

RIGHT SOLUTIONS | RIGHT PARTNER

General Chemistry

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	K2100823
Project:	ALS Houston DOD TOC	**Date Collected:**	01/27/21
Sample Matrix:	Ground Water	**Date Received:**	01/29/21
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
16WW57-210127	K2100823-001	**12.6**	0.50	0.20	0.07	1	02/03/21 11:05	
16WW58-210127	K2100823-002	**3.53**	0.50	0.20	0.07	1	02/03/21 11:05	
16IW20-210127	K2100823-003	**20.1**	0.50	0.20	0.07	1	02/03/21 11:05	
Method Blank	K2100823-MB	ND U	0.50	0.20	0.07	1	02/03/21 11:05	

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K2100823
Project	ALS Houston DOD TOC	**Date Collected:**	01/27/21
Sample Matrix:	Ground Water	**Date Received:**	01/29/21
Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA

Replicate Sample Summary
Carbon, Total Organic

Sample Name:	Lab Code:	LOQ	LOD	MDL	Sample Result	Duplicate Result	Average	RPD	RPD Limit	Date Analyzed
16WW57-210127	K2100823-001DUP	0.50	0.20	0.07	12.6	12.9	12.8	2	10	02/03/21
16IW20-210127	K2100823-003DUP	0.50	0.20	0.07	20.1	20.1	20.1	<1	10	02/03/21

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.

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K2100823
Project:	ALS Houston DOD TOC	**Date Collected:**	01/27/21
Sample Matrix:	Ground Water	**Date Received:**	01/29/21
		Date Analyzed:	02/3/21
		Date Extracted:	NA

Duplicate Matrix Spike Summary
Carbon, Total Organic

Sample Name:	16WW57-210127	**Units:**	mg/L
Lab Code:	K2100823-001	**Basis:**	NA
Analysis Method:	SM 5310 C		
Prep Method:	None		

		Matrix Spike K2100823-001MS			Duplicate Matrix Spike K2100823-001DMS					
Analyte Name	**Sample Result**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Carbon, Total Organic	12.6	33.7	25.0	84	33.1	25.0	82 *	83-117	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.

Matrix Spike and Matrix Spike Duplicate Data is presented for information purposes only. The matrix may or may not be relevant to samples reported in this report. The laboratory evaluates system performance based on the LCS and LCSD control limits.

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K2100823
Project:	ALS Houston DOD TOC	**Date Collected:**	01/27/21
Sample Matrix:	Ground Water	**Date Received:**	01/29/21
		Date Analyzed:	02/3/21
		Date Extracted:	NA

Duplicate Matrix Spike Summary
Carbon, Total Organic

Sample Name:	16IW20-210127	**Units:**	mg/L
Lab Code:	K2100823-003	**Basis:**	NA
Analysis Method:	SM 5310 C		
Prep Method:	None		

		Matrix Spike K2100823-003MS				Duplicate Matrix Spike K2100823-003DMS					
Analyte Name	**Sample Result**	**Result**	**Spike Amount**	**% Rec**		**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Carbon, Total Organic	20.1	37.9	25.0	71 *		38.0	25.0	72 *	83-117	<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.

Matrix Spike and Matrix Spike Duplicate Data is presented for information purposes only. The matrix may or may not be relevant to samples reported in this report. The laboratory evaluates system performance based on the LCS and LCSD control limits.

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K2100823
Project:	ALS Houston DOD TOC	**Date Analyzed:**	02/03/21
Sample Matrix:	Ground Water	**Date Extracted:**	NA

Lab Control Sample Summary
Carbon, Total Organic

Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA
		Analysis Lot:	711915

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K2100823-LCS	25.9	25.0	104	83-117

RIGHT SOLUTIONS | RIGHT PARTNER

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

April 13, 2021

Vicki Graves
Aptim Environmental & Infrastucture, Inc.
2500 City West Blvd., Suite 1700
Houston, TX 77042

Work Order: **HS21020018**

Laboratory Results for: **LHAAP 16 January 2021**

Dear Vicki Graves ,

ALS Environmental received 10 sample(s) on Jan 30, 2021 for the analysis presented in the following report.

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

Regards,

Generated By: JUMOKE.LAWAL

RJ Modashia
Project Manager

ALS Houston, US Date: 13-Apr-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
Work Order: HS21020018

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS21020018-01	16LHAAP-210128-TB7	Water		28-Jan-2021 10:30	30-Jan-2021 10:10	☐
HS21020018-02	16WW27-210128	Groundwater		28-Jan-2021 12:00	30-Jan-2021 10:10	☐
HS21020018-03	16WW43-210128	Groundwater		28-Jan-2021 12:50	30-Jan-2021 10:10	☐
HS21020018-04	16WW23-210128	Groundwater		28-Jan-2021 13:55	30-Jan-2021 10:10	☐
HS21020018-05	16WW24-210128	Groundwater		28-Jan-2021 14:45	30-Jan-2021 10:10	☐
HS21020018-06	16WW42-210128	Groundwater		28-Jan-2021 15:33	30-Jan-2021 10:10	☐
HS21020018-07	16RW04-210128	Groundwater		28-Jan-2021 17:25	30-Jan-2021 10:10	☐
HS21020018-08	16RW05-210129	Groundwater		29-Jan-2021 11:05	30-Jan-2021 10:10	☐
HS21020018-09	16WW51-210129	Groundwater		29-Jan-2021 12:23	30-Jan-2021 10:10	☐
HS21020018-10	16WW49-210129	Groundwater		29-Jan-2021 16:05	30-Jan-2021 10:10	☐

Revision: 1

ALS Houston, US Date: 13-Apr-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
Work Order: HS21020018

CASE NARRATIVE

Work Order Comments

- REV01: Revised to correct samples IDs/collection dates for Perchlorate samples.

Work Order Comments

- The analysis for Perchlorate was subcontracted to our ALS Houston TX, High Resolution Lab. Final report attached.
- The analysis forTOC was subcontracted to ALS Environmental in Kelso, WA. Final report attached.

GCMS Volatiles by Method SW8260

Batch ID: R377575

Sample ID: HS21011150-06MS

- MS and MSD are for an unrelated sample

Batch ID: R377477

Sample ID: HS21011077-02MS, HS21011077-06MS

- MS and MSD are for an unrelated sample

WetChemistry by Method SW9056

Batch ID: R378103,R378137

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

ALS Houston, US Date: 13-Apr-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
Sample ID: 16LHAAP-210128-TB7
Collection Date: 28-Jan-2021 10:30

ANALYTICAL REPORT
WorkOrder:HS21020018
Lab ID:HS21020018-01
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	03-Feb-2021 23:42
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	03-Feb-2021 23:42
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	03-Feb-2021 23:42
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	03-Feb-2021 23:42
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	03-Feb-2021 23:42
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	03-Feb-2021 23:42
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	03-Feb-2021 23:42
Surr: 1,2-Dichloroethane-d4	*95.6*			**0**	*81-118*	*%REC*	*1*	*03-Feb-2021 23:42*
Surr: 4-Bromofluorobenzene	*103*			**0**	*85-114*	*%REC*	*1*	*03-Feb-2021 23:42*
Surr: Dibromofluoromethane	*98.1*			**0**	*80-119*	*%REC*	*1*	*03-Feb-2021 23:42*
Surr: Toluene-d8	*101*			**0**	*89-112*	*%REC*	*1*	*03-Feb-2021 23:42*

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

Revision: 1

ALS Houston, US Date: 13-Apr-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
Sample ID: 16WW27-210128
Collection Date: 28-Jan-2021 12:00

ANALYTICAL REPORT
WorkOrder:HS21020018
Lab ID:HS21020018-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	04-Feb-2021 04:16
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	04-Feb-2021 04:16
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	04-Feb-2021 04:16
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	04-Feb-2021 04:16
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	04-Feb-2021 04:16
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	04-Feb-2021 04:16
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	04-Feb-2021 04:16
Surr: 1,2-Dichloroethane-d4	*97.6*			**0**	*81-118*	*%REC*	*1*	*04-Feb-2021 04:16*
Surr: 4-Bromofluorobenzene	*101*			**0**	*85-114*	*%REC*	*1*	*04-Feb-2021 04:16*
Surr: Dibromofluoromethane	*96.8*			**0**	*80-119*	*%REC*	*1*	*04-Feb-2021 04:16*
Surr: Toluene-d8	*101*			**0**	*89-112*	*%REC*	*1*	*04-Feb-2021 04:16*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	22-Feb-2021 14:28

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

Revision: 1

ALS Houston, US Date: 13-Apr-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
Sample ID: 16WW43-210128
Collection Date: 28-Jan-2021 12:50

ANALYTICAL REPORT
WorkOrder:HS21020018
Lab ID:HS21020018-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	04-Feb-2021 04:37
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	04-Feb-2021 04:37
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	04-Feb-2021 04:37
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	04-Feb-2021 04:37
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	04-Feb-2021 04:37
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	04-Feb-2021 04:37
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	04-Feb-2021 04:37
Surr: 1,2-Dichloroethane-d4	*96.4*			**0**	*81-118*	*%REC*	*1*	*04-Feb-2021 04:37*
Surr: 4-Bromofluorobenzene	*101*			**0**	*85-114*	*%REC*	*1*	*04-Feb-2021 04:37*
Surr: Dibromofluoromethane	*97.5*			**0**	*80-119*	*%REC*	*1*	*04-Feb-2021 04:37*
Surr: Toluene-d8	*101*			**0**	*89-112*	*%REC*	*1*	*04-Feb-2021 04:37*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	22-Feb-2021 14:28

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

Revision: 1

ALS Houston, US Date: 13-Apr-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
Sample ID: 16WW23-210128
Collection Date: 28-Jan-2021 13:55

ANALYTICAL REPORT
WorkOrder:HS21020018
Lab ID:HS21020018-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	04-Feb-2021 04:58
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	04-Feb-2021 04:58
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	04-Feb-2021 04:58
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	04-Feb-2021 04:58
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	04-Feb-2021 04:58
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	04-Feb-2021 04:58
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	04-Feb-2021 04:58
Surr: 1,2-Dichloroethane-d4	*97.3*			**0**	*81-118*	*%REC*	*1*	*04-Feb-2021 04:58*
Surr: 4-Bromofluorobenzene	*101*			**0**	*85-114*	*%REC*	*1*	*04-Feb-2021 04:58*
Surr: Dibromofluoromethane	*97.0*			**0**	*80-119*	*%REC*	*1*	*04-Feb-2021 04:58*
Surr: Toluene-d8	*99.2*			**0**	*89-112*	*%REC*	*1*	*04-Feb-2021 04:58*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	22-Feb-2021 14:28

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

Revision: 1

ALS Houston, US Date: 13-Apr-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
Sample ID: 16WW24-210128
Collection Date: 28-Jan-2021 14:45

ANALYTICAL REPORT
WorkOrder:HS21020018
Lab ID:HS21020018-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	04-Feb-2021 05:19
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	04-Feb-2021 05:19
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	04-Feb-2021 05:19
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	04-Feb-2021 05:19
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	04-Feb-2021 05:19
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	04-Feb-2021 05:19
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	04-Feb-2021 05:19
Surr: 1,2-Dichloroethane-d4	*98.5*			**0**	*81-118*	*%REC*	*1*	*04-Feb-2021 05:19*
Surr: 4-Bromofluorobenzene	*103*			**0**	*85-114*	*%REC*	*1*	*04-Feb-2021 05:19*
Surr: Dibromofluoromethane	*98.2*			**0**	*80-119*	*%REC*	*1*	*04-Feb-2021 05:19*
Surr: Toluene-d8	*99.9*			**0**	*89-112*	*%REC*	*1*	*04-Feb-2021 05:19*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	22-Feb-2021 14:28

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

Revision: 1

ALS Houston, US Date: 13-Apr-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
Sample ID: 16WW42-210128
Collection Date: 28-Jan-2021 15:33

ANALYTICAL REPORT
WorkOrder:HS21020018
Lab ID:HS21020018-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	04-Feb-2021 05:40
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	04-Feb-2021 05:40
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	04-Feb-2021 05:40
cis-1,2-Dichloroethene	**98**		**0.20**	**0.50**	**1.0**	**ug/L**	1	04-Feb-2021 05:40
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	04-Feb-2021 05:40
Trichloroethene	**0.59**	J	**0.20**	**0.50**	**1.0**	**ug/L**	1	04-Feb-2021 05:40
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	04-Feb-2021 05:40
Surr: 1,2-Dichloroethane-d4	*100*			**0**	*81-118*	*%REC*	*1*	*04-Feb-2021 05:40*
Surr: 4-Bromofluorobenzene	*101*			**0**	*85-114*	*%REC*	*1*	*04-Feb-2021 05:40*
Surr: Dibromofluoromethane	*98.7*			**0**	*80-119*	*%REC*	*1*	*04-Feb-2021 05:40*
Surr: Toluene-d8	*102*			**0**	*89-112*	*%REC*	*1*	*04-Feb-2021 05:40*
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**2.03**		**0.0300**	**0.100**	**0.100**	**mg/L**	1	13-Feb-2021 01:39
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	22-Feb-2021 14:28
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	09-Feb-2021 17:16

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

ALS Houston, US Date: 13-Apr-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
Sample ID: 16RW04-210128
Collection Date: 28-Jan-2021 17:25

ANALYTICAL REPORT
WorkOrder:HS21020018
Lab ID:HS21020018-07
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	10	U	3.0	10	10	ug/L	10	04-Feb-2021 07:05
1,1-Dichloroethene	5.0	U	2.0	5.0	10	ug/L	10	04-Feb-2021 07:05
1,2-Dichloroethane	5.0	U	2.0	5.0	10	ug/L	10	04-Feb-2021 07:05
cis-1,2-Dichloroethene	**130**		**2.0**	**5.0**	**10**	**ug/L**	10	04-Feb-2021 07:05
Methylene chloride	20	U	4.0	20	20	ug/L	10	04-Feb-2021 07:05
Trichloroethene	**2,800**		**20**	**50**	**100**	**ug/L**	100	04-Feb-2021 07:26
Vinyl chloride	5.0	U	2.0	5.0	10	ug/L	10	04-Feb-2021 07:05
Surr: 1,2-Dichloroethane-d4	*97.7*			**0**	*81-118*	*%REC*	*10*	*04-Feb-2021 07:05*
Surr: 1,2-Dichloroethane-d4	*99.4*			**0**	*81-118*	*%REC*	*100*	*04-Feb-2021 07:26*
Surr: 4-Bromofluorobenzene	*103*			**0**	*85-114*	*%REC*	*10*	*04-Feb-2021 07:05*
Surr: 4-Bromofluorobenzene	*103*			**0**	*85-114*	*%REC*	*100*	*04-Feb-2021 07:26*
Surr: Dibromofluoromethane	*97.6*			**0**	*80-119*	*%REC*	*10*	*04-Feb-2021 07:05*
Surr: Dibromofluoromethane	*99.3*			**0**	*80-119*	*%REC*	*100*	*04-Feb-2021 07:26*
Surr: Toluene-d8	*99.8*			**0**	*89-112*	*%REC*	*10*	*04-Feb-2021 07:05*
Surr: Toluene-d8	*99.1*			**0**	*89-112*	*%REC*	*100*	*04-Feb-2021 07:26*
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**1.53**		**0.0300**	**0.100**	**0.100**	**mg/L**	1	13-Feb-2021 01:58
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	22-Feb-2021 14:28
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	09-Feb-2021 17:16

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

ALS Houston, US Date: 13-Apr-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
Sample ID: 16RW05-210129
Collection Date: 29-Jan-2021 11:05

ANALYTICAL REPORT
WorkOrder:HS21020018
Lab ID:HS21020018-08
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	04-Feb-2021 06:02
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	04-Feb-2021 06:02
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	04-Feb-2021 06:02
cis-1,2-Dichloroethene	**1.5**		**0.20**	**0.50**	**1.0**	**ug/L**	1	04-Feb-2021 06:02
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	04-Feb-2021 06:02
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	04-Feb-2021 06:02
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	04-Feb-2021 06:02
Surr: 1,2-Dichloroethane-d4	*94.4*			**0**	*81-118*	*%REC*	*1*	*04-Feb-2021 06:02*
Surr: 4-Bromofluorobenzene	*105*			**0**	*85-114*	*%REC*	*1*	*04-Feb-2021 06:02*
Surr: Dibromofluoromethane	*97.6*			**0**	*80-119*	*%REC*	*1*	*04-Feb-2021 06:02*
Surr: Toluene-d8	*98.8*			**0**	*89-112*	*%REC*	*1*	*04-Feb-2021 06:02*
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**45.8**		**0.300**	**1.00**	**1.00**	**mg/L**	10	15-Feb-2021 05:01
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	22-Feb-2021 14:28
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	09-Feb-2021 17:16

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

ALS Houston, US Date: 13-Apr-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
Sample ID: 16WW51-210129
Collection Date: 29-Jan-2021 12:23

ANALYTICAL REPORT
WorkOrder:HS21020018
Lab ID:HS21020018-09
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	04-Feb-2021 06:44
1,1-Dichloroethene	**1.3**		**0.20**	**0.50**	**1.0**	**ug/L**	1	04-Feb-2021 06:44
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	04-Feb-2021 06:44
cis-1,2-Dichloroethene	**86**		**0.20**	**0.50**	**1.0**	**ug/L**	1	04-Feb-2021 06:44
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	04-Feb-2021 06:44
Trichloroethene	**1,000**		**5.0**	**12**	**25**	**ug/L**	25	04-Feb-2021 18:19
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	04-Feb-2021 06:44
Surr: 1,2-Dichloroethane-d4	*96.7*			**0**	*81-118*	*%REC*	*1*	*04-Feb-2021 06:44*
Surr: 1,2-Dichloroethane-d4	*87.7*			**0**	*81-118*	*%REC*	*25*	*04-Feb-2021 18:19*
Surr: 4-Bromofluorobenzene	*104*			**0**	*85-114*	*%REC*	*1*	*04-Feb-2021 06:44*
Surr: 4-Bromofluorobenzene	*99.4*			**0**	*85-114*	*%REC*	*25*	*04-Feb-2021 18:19*
Surr: Dibromofluoromethane	*96.1*			**0**	*80-119*	*%REC*	*1*	*04-Feb-2021 06:44*
Surr: Dibromofluoromethane	*93.9*			**0**	*80-119*	*%REC*	*25*	*04-Feb-2021 18:19*
Surr: Toluene-d8	*99.0*			**0**	*89-112*	*%REC*	*1*	*04-Feb-2021 06:44*
Surr: Toluene-d8	*99.8*			**0**	*89-112*	*%REC*	*25*	*04-Feb-2021 18:19*
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**5.58**		**0.0300**	**0.100**	**0.100**	**mg/L**	1	13-Feb-2021 02:34
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	22-Feb-2021 14:28
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	09-Feb-2021 17:16

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

ALS Houston, US Date: 13-Apr-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
Sample ID: 16WW49-210129
Collection Date: 29-Jan-2021 16:05

ANALYTICAL REPORT
WorkOrder:HS21020018
Lab ID:HS21020018-10
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	04-Feb-2021 06:23
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	04-Feb-2021 06:23
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	04-Feb-2021 06:23
cis-1,2-Dichloroethene	**120**		**0.20**	**0.50**	**1.0**	**ug/L**	1	04-Feb-2021 06:23
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	04-Feb-2021 06:23
Trichloroethene	**2.5**		**0.20**	**0.50**	**1.0**	**ug/L**	1	04-Feb-2021 06:23
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	04-Feb-2021 06:23
Surr: 1,2-Dichloroethane-d4	*95.7*			**0**	*81-118*	*%REC*	*1*	*04-Feb-2021 06:23*
Surr: 4-Bromofluorobenzene	*104*			**0**	*85-114*	*%REC*	*1*	*04-Feb-2021 06:23*
Surr: Dibromofluoromethane	*98.4*			**0**	*80-119*	*%REC*	*1*	*04-Feb-2021 06:23*
Surr: Toluene-d8	*97.9*			**0**	*89-112*	*%REC*	*1*	*04-Feb-2021 06:23*
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**3.12**		**0.0300**	**0.100**	**0.100**	**mg/L**	1	13-Feb-2021 02:52
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	22-Feb-2021 14:28
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	09-Feb-2021 17:16

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

ALS Houston, US Date: 13-Apr-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
WorkOrder: HS21020018

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R377477 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS21020018-02	16WW27-210128	28 Jan 2021 12:00			04 Feb 2021 04:16	1
HS21020018-03	16WW43-210128	28 Jan 2021 12:50			04 Feb 2021 04:37	1
HS21020018-04	16WW23-210128	28 Jan 2021 13:55			04 Feb 2021 04:58	1
HS21020018-05	16WW24-210128	28 Jan 2021 14:45			04 Feb 2021 05:19	1
HS21020018-06	16WW42-210128	28 Jan 2021 15:33			04 Feb 2021 05:40	1
HS21020018-07	16RW04-210128	28 Jan 2021 17:25			04 Feb 2021 07:26	100
HS21020018-07	16RW04-210128	28 Jan 2021 17:25			04 Feb 2021 07:05	10
HS21020018-08	16RW05-210129	29 Jan 2021 11:05			04 Feb 2021 06:02	1
HS21020018-09	16WW51-210129	29 Jan 2021 12:23			04 Feb 2021 06:44	1
HS21020018-10	16WW49-210129	29 Jan 2021 16:05			04 Feb 2021 06:23	1
Batch ID: R377477 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS21020018-01	16LHAAP-210128-TB7	28 Jan 2021 10:30			03 Feb 2021 23:42	1
Batch ID: R377575 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS21020018-09	16WW51-210129	29 Jan 2021 12:23			04 Feb 2021 18:19	25
Batch ID: R377830 (0)	**Test Name :** SUBCONTRACT ANALYSIS - TOC ANALYSIS				**Matrix:** Groundwater	
HS21020018-06	16WW42-210128	28 Jan 2021 15:33			09 Feb 2021 17:16	1
HS21020018-07	16RW04-210128	28 Jan 2021 17:25			09 Feb 2021 17:16	1
HS21020018-08	16RW05-210129	29 Jan 2021 11:05			09 Feb 2021 17:16	1
HS21020018-09	16WW51-210129	29 Jan 2021 12:23			09 Feb 2021 17:16	1
HS21020018-10	16WW49-210129	29 Jan 2021 16:05			09 Feb 2021 17:16	1
Batch ID: R378103 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Groundwater	
HS21020018-06	16WW42-210128	28 Jan 2021 15:33			13 Feb 2021 01:39	1
HS21020018-07	16RW04-210128	28 Jan 2021 17:25			13 Feb 2021 01:58	1
HS21020018-09	16WW51-210129	29 Jan 2021 12:23			13 Feb 2021 02:34	1
HS21020018-10	16WW49-210129	29 Jan 2021 16:05			13 Feb 2021 02:52	1
Batch ID: R378137 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Groundwater	
HS21020018-08	16RW05-210129	29 Jan 2021 11:05			15 Feb 2021 05:01	10
Batch ID: R378371 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** Groundwater	
HS21020018-02	16WW27-210128	28 Jan 2021 12:00			22 Feb 2021 14:28	1
HS21020018-03	16WW43-210128	28 Jan 2021 12:50			22 Feb 2021 14:28	1
HS21020018-04	16WW23-210128	28 Jan 2021 13:55			22 Feb 2021 14:28	1
HS21020018-05	16WW24-210128	28 Jan 2021 14:45			22 Feb 2021 14:28	1
HS21020018-06	16WW42-210128	28 Jan 2021 15:33			22 Feb 2021 14:28	1
HS21020018-07	16RW04-210128	28 Jan 2021 17:25			22 Feb 2021 14:28	1
HS21020018-08	16RW05-210129	29 Jan 2021 11:05			22 Feb 2021 14:28	1
HS21020018-09	16WW51-210129	29 Jan 2021 12:23			22 Feb 2021 14:28	1
HS21020018-10	16WW49-210129	29 Jan 2021 16:05			22 Feb 2021 14:28	1

Revision: 1

ALS Houston, US Date: 13-Apr-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
WorkOrder: HS21020018

QC BATCH REPORT

Batch ID: R377477 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-210203** Units: **ug/L** Analysis Date: **03-Feb-2021 23:00**
Client ID: Run ID: **VOA6_377477** SeqNo: **5943426** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	1.0	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
Methylene chloride	2.0	2.0								U
Trichloroethene	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*47.08*	*1.0*	*50*	*0*	*94.2*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.89*	*1.0*	*50*	*0*	*102*	*85 - 114*				
Surr: Dibromofluoromethane	*48.52*	*1.0*	*50*	*0*	*97.0*	*80 - 119*				
Surr: Toluene-d8	*49.43*	*1.0*	*50*	*0*	*98.9*	*89 - 112*				

LCS Sample ID: **VLCSW-210203** Units: **ug/L** Analysis Date: **03-Feb-2021 22:18**
Client ID: Run ID: **VOA6_377477** SeqNo: **5943425** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	19.05	1.0	20	0	95.2	80 - 119				
1,1-Dichloroethene	16.48	1.0	20	0	82.4	71 - 131				
1,2-Dichloroethane	19.29	1.0	20	0	96.5	73 - 128				
cis-1,2-Dichloroethene	20.76	1.0	20	0	104	78 - 123				
Methylene chloride	20.8	2.0	20	0	104	74 - 124				
Trichloroethene	20.55	1.0	20	0	103	79 - 123				
Vinyl chloride	16.56	1.0	20	0	82.8	58 - 137				
Surr: 1,2-Dichloroethane-d4	*50.2*	*1.0*	*50*	*0*	*100*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*51.13*	*1.0*	*50*	*0*	*102*	*85 - 114*				
Surr: Dibromofluoromethane	*51.7*	*1.0*	*50*	*0*	*103*	*80 - 119*				
Surr: Toluene-d8	*47.46*	*1.0*	*50*	*0*	*94.9*	*89 - 112*				

Revision: 1

ALS Houston, US Date: 13-Apr-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
WorkOrder: HS21020018

QC BATCH REPORT

Batch ID: R377477 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS21011077-06MS** Units: **ug/L** Analysis Date: **04-Feb-2021 02:10**
Client ID: Run ID: **VOA6_377477** SeqNo: **5943435** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	17.02	1.0	20	0	85.1	80 - 119				
1,1-Dichloroethene	13.99	1.0	20	0	69.9	71 - 131				S
1,2-Dichloroethane	17.23	1.0	20	0.9245	81.5	73 - 128				
cis-1,2-Dichloroethene	60.23	1.0	20	46.83	67.0	78 - 123				S
Methylene chloride	16.34	2.0	20	0	81.7	74 - 124				
Trichloroethene	32.33	1.0	20	13.06	96.4	79 - 123				
Vinyl chloride	16.54	1.0	20	7.169	46.8	58 - 137				S
Surr: 1,2-Dichloroethane-d4	*44.65*	*1.0*	*50*	*0*	*89.3*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*52.85*	*1.0*	*50*	*0*	*106*	*85 - 114*				
Surr: Dibromofluoromethane	*46.61*	*1.0*	*50*	*0*	*93.2*	*80 - 119*				
Surr: Toluene-d8	*48.45*	*1.0*	*50*	*0*	*96.9*	*89 - 112*				

MS Sample ID: **HS21011077-02MS** Units: **ug/L** Analysis Date: **04-Feb-2021 02:52**
Client ID: Run ID: **VOA6_377477** SeqNo: **5943437** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	19.34	1.0	20	0	96.7	80 - 119				
1,1-Dichloroethene	15.44	1.0	20	0.9427	72.5	71 - 131				
1,2-Dichloroethane	17.72	1.0	20	0	88.6	73 - 128				
cis-1,2-Dichloroethene	18.73	1.0	20	0	93.6	78 - 123				
Methylene chloride	17.95	2.0	20	0	89.7	74 - 124				
Trichloroethene	86.16	1.0	20	65.04	106	79 - 123				
Vinyl chloride	10.42	1.0	20	0	52.1	58 - 137				S
Surr: 1,2-Dichloroethane-d4	*45.67*	*1.0*	*50*	*0*	*91.3*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*51.3*	*1.0*	*50*	*0*	*103*	*85 - 114*				
Surr: Dibromofluoromethane	*47.51*	*1.0*	*50*	*0*	*95.0*	*80 - 119*				
Surr: Toluene-d8	*49.54*	*1.0*	*50*	*0*	*99.1*	*89 - 112*				

Revision: 1

ALS Houston, US Date: 13-Apr-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
WorkOrder: HS21020018

QC BATCH REPORT

Batch ID: R377477 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS21011077-06MSD** Units: **ug/L** Analysis Date: **04-Feb-2021 02:31**
Client ID: Run ID: **VOA6_377477** SeqNo: **5943436** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	17.6	1.0	20	0	88.0	80 - 119	17.02	3.36	20	
1,1-Dichloroethene	13.02	1.0	20	0	65.1	71 - 131	13.99	7.17	20	S
1,2-Dichloroethane	17.47	1.0	20	0.9245	82.7	73 - 128	17.23	1.35	20	
cis-1,2-Dichloroethene	59.9	1.0	20	46.83	65.4	78 - 123	60.23	0.547	20	S
Methylene chloride	16.25	2.0	20	0	81.3	74 - 124	16.34	0.55	20	
Trichloroethene	31.18	1.0	20	13.06	90.6	79 - 123	32.33	3.64	20	
Vinyl chloride	16.06	1.0	20	7.169	44.5	58 - 137	16.54	2.91	20	S
Surr: 1,2-Dichloroethane-d4	*46.1*	*1.0*	*50*	*0*	*92.2*	*81 - 118*	*44.65*	*3.2*	*20*	
Surr: 4-Bromofluorobenzene	*51.36*	*1.0*	*50*	*0*	*103*	*85 - 114*	*52.85*	*2.86*	*20*	
Surr: Dibromofluoromethane	*46.68*	*1.0*	*50*	*0*	*93.4*	*80 - 119*	*46.61*	*0.154*	*20*	
Surr: Toluene-d8	*48.71*	*1.0*	*50*	*0*	*97.4*	*89 - 112*	*48.45*	*0.536*	*20*	

MSD Sample ID: **HS21011077-02MSD** Units: **ug/L** Analysis Date: **04-Feb-2021 03:13**
Client ID: Run ID: **VOA6_377477** SeqNo: **5943438** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	18.15	1.0	20	0	90.7	80 - 119	19.34	6.37	20	
1,1-Dichloroethene	13.5	1.0	20	0.9427	62.8	71 - 131	15.44	13.4	20	S
1,2-Dichloroethane	16.97	1.0	20	0	84.8	73 - 128	17.72	4.31	20	
cis-1,2-Dichloroethene	17.45	1.0	20	0	87.3	78 - 123	18.73	7.07	20	
Methylene chloride	16.91	2.0	20	0	84.5	74 - 124	17.95	5.99	20	
Trichloroethene	80.4	1.0	20	65.04	76.8	79 - 123	86.16	6.92	20	S
Vinyl chloride	9.391	1.0	20	0	47.0	58 - 137	10.42	10.4	20	S
Surr: 1,2-Dichloroethane-d4	*44.69*	*1.0*	*50*	*0*	*89.4*	*81 - 118*	*45.67*	*2.16*	*20*	
Surr: 4-Bromofluorobenzene	*50.05*	*1.0*	*50*	*0*	*100*	*85 - 114*	*51.3*	*2.47*	*20*	
Surr: Dibromofluoromethane	*47.11*	*1.0*	*50*	*0*	*94.2*	*80 - 119*	*47.51*	*0.827*	*20*	
Surr: Toluene-d8	*48.54*	*1.0*	*50*	*0*	*97.1*	*89 - 112*	*49.54*	*2.05*	*20*	

The following samples were analyzed in this batch:

HS21020018-01	HS21020018-02	HS21020018-03	HS21020018-04
HS21020018-05	HS21020018-06	HS21020018-07	HS21020018-08
HS21020018-09	HS21020018-10		

Revision: 1

ALS Houston, US Date: 13-Apr-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
WorkOrder: HS21020018

QC BATCH REPORT

Batch ID: R377575 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-210204** Units: **ug/L** Analysis Date: **04-Feb-2021 17:37**
Client ID: Run ID: **VOA6_377575** SeqNo: **5945452** 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	*42.31*	*1.0*	*50*	*0*	*84.6*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.68*	*1.0*	*50*	*0*	*101*	*85 - 114*				
Surr: Dibromofluoromethane	*45.63*	*1.0*	*50*	*0*	*91.3*	*80 - 119*				
Surr: Toluene-d8	*48.94*	*1.0*	*50*	*0*	*97.9*	*89 - 112*				

LCS Sample ID: **VLCSW-210204** Units: **ug/L** Analysis Date: **04-Feb-2021 17:58**
Client ID: Run ID: **VOA6_377575** SeqNo: **5945453** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Trichloroethene	21.57	1.0	20	0	108	79 - 123				
Surr: 1,2-Dichloroethane-d4	*48.85*	*1.0*	*50*	*0*	*97.7*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*52.67*	*1.0*	*50*	*0*	*105*	*85 - 114*				
Surr: Dibromofluoromethane	*50*	*1.0*	*50*	*0*	*100.0*	*80 - 119*				
Surr: Toluene-d8	*48.1*	*1.0*	*50*	*0*	*96.2*	*89 - 112*				

MS Sample ID: **HS21011150-06MS** Units: **ug/L** Analysis Date: **04-Feb-2021 21:07**
Client ID: Run ID: **VOA6_377575** SeqNo: **5945462** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Trichloroethene	707.7	1.0	20	763.7	-280	79 - 123				SEO
Surr: 1,2-Dichloroethane-d4	*45.24*	*1.0*	*50*	*0*	*90.5*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*56.59*	*1.0*	*50*	*0*	*113*	*85 - 114*				
Surr: Dibromofluoromethane	*47.37*	*1.0*	*50*	*0*	*94.7*	*80 - 119*				
Surr: Toluene-d8	*50.76*	*1.0*	*50*	*0*	*102*	*89 - 112*				

Revision: 1

ALS Houston, US Date: 13-Apr-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
WorkOrder: HS21020018

QC BATCH REPORT

Batch ID: **R377575 (0)** **Instrument:** **VOA6** **Method:** **VOLATILES ORGANICS BY METHOD 8260C**

MSD Sample ID: **HS21011150-06MSD** Units: **ug/L** Analysis Date: **04-Feb-2021 21:28**
Client ID: Run ID: **VOA6_377575** SeqNo: **5945463** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Trichloroethene	812	1.0	20	763.7	242	79 - 123	707.7	13.7	20	SEO
Surr: 1,2-Dichloroethane-d4	*58.23*	*1.0*	*50*	*0*	*116*	*81 - 118*	*45.24*	*25.1*	*20*	R
Surr: 4-Bromofluorobenzene	*58.88*	*1.0*	*50*	*0*	*118*	*85 - 114*	*56.59*	*3.97*	*20*	S
Surr: Dibromofluoromethane	*49.62*	*1.0*	*50*	*0*	*99.2*	*80 - 119*	*47.37*	*4.64*	*20*	
Surr: Toluene-d8	*49.63*	*1.0*	*50*	*0*	*99.3*	*89 - 112*	*50.76*	*2.26*	*20*	

The following samples were analyzed in this batch: HS21020018-09

Revision: 1

ALS Houston, US Date: 13-Apr-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
WorkOrder: HS21020018

QC BATCH REPORT

Batch ID: R378103 (0) **Instrument:** ICS-Integrion **Method:** ANIONS BY SW9056A

MBLK Sample ID: **MBLK-** Units: **mg/L** Analysis Date: **13-Feb-2021 05:35**
Client ID: Run ID: **ICS-Integrion_378103** SeqNo: **5957425** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	0.100	0.100								U

LCS Sample ID: **LCS-** Units: **mg/L** Analysis Date: **13-Feb-2021 05:53**
Client ID: Run ID: **ICS-Integrion_378103** SeqNo: **5957426** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.656	0.100	4	0	91.4	80 - 120				

MS Sample ID: **HS21020301-05MS** Units: **mg/L** Analysis Date: **12-Feb-2021 21:26**
Client ID: Run ID: **ICS-Integrion_378103** SeqNo: **5957406** PrepDate: DF: **1000**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	1739	100	2000	120.1	81.0	80 - 120				

MSD Sample ID: **HS21020301-05MSD** Units: **mg/L** Analysis Date: **12-Feb-2021 21:44**
Client ID: Run ID: **ICS-Integrion_378103** SeqNo: **5957407** PrepDate: DF: **1000**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	1750	100	2000	120.1	81.5	80 - 120	1739	0.619	20	

The following samples were analyzed in this batch: HS21020018-06 HS21020018-07 HS21020018-09 HS21020018-10

Revision: 1

ALS Houston, US Date: 13-Apr-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
WorkOrder: HS21020018

QC BATCH REPORT

Batch ID: R378137 (0) **Instrument:** ICS-Integrion **Method:** ANIONS BY SW9056A

MBLK Sample ID: **MBLK-** Units: **mg/L** Analysis Date: **15-Feb-2021 06:32**
Client ID: Run ID: **ICS-Integrion_378137** SeqNo: **5957924** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	0.100	0.100								U

LCS Sample ID: **LCS-** Units: **mg/L** Analysis Date: **15-Feb-2021 06:50**
Client ID: Run ID: **ICS-Integrion_378137** SeqNo: **5957925** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.658	0.100	4	0	91.4	80 - 120				

MS Sample ID: **HS21020425-02MS** Units: **mg/L** Analysis Date: **15-Feb-2021 02:00**
Client ID: Run ID: **ICS-Integrion_378137** SeqNo: **5957915** PrepDate: DF: **1000**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	1794	100	2000	48.7	87.3	80 - 120				

MSD Sample ID: **HS21020425-02MSD** Units: **mg/L** Analysis Date: **15-Feb-2021 02:19**
Client ID: Run ID: **ICS-Integrion_378137** SeqNo: **5957916** PrepDate: DF: **1000**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	1857	100	2000	48.7	90.4	80 - 120	1794	3.43	20	

The following samples were analyzed in this batch: HS21020018-08

Revision: 1

ALS Houston, US Date: 13-Apr-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
WorkOrder: **HS21020018**

QUALIFIERS, ACRONYMS, UNITS

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

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

ALS Houston, US Date: 13-Apr-21

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
California	2919, 2020-2021	30-Apr-2021
Dept of Defense	PJLA L20-507-R2	22-Dec-2021
Florida	E87611-30-07/01/2020	30-Jun-2021
Illinois	2000322020-4	09-May-2021
Kansas	E-10352 2020-2021	31-Jul-2021
Kentucky	123043, 2020-2021	30-Apr-2021
Louisiana	03087, 2020-2021	30-Jun-2021
North Carolina	624-2021	31-Dec-2021
North Dakota	R-193 2020-2021	30-Apr-2021
Oklahoma	2020-165	31-Aug-2021
Texas	T104704231-20-26	30-Apr-2021

ALS Houston, US Date: 13-Apr-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16 January 2021
Work Order: HS21020018

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS21020018-01	16LHAAP-210128-TB7	Login	2/1/2021 10:03:20 AM	NDR	VOA014
HS21020018-02	16WW27-210128	Login	2/1/2021 10:03:20 AM	NDR	WET219
HS21020018-02	16WW27-210128	Login	2/1/2021 10:03:20 AM	NDR	Sub
HS21020018-02	16WW27-210128	Login	2/1/2021 10:03:20 AM	NDR	VOA014
HS21020018-02	16WW27-210128	Login	2/1/2021 10:03:20 AM	NDR	Sub
HS21020018-02	16WW27-210128	Login	2/1/2021 10:03:20 AM	NDR	Sub

Revision: 1

ALS Houston, US Date: 13-Apr-21

Sample Receipt Checklist

Work Order ID: HS21020018 **Date/Time Received:** **30-Jan-2021 10:10**

Client Name: CBI-Houston **Received by:** **Paresh M. Giga**

Completed By: /S/ Nilesh D. Ranchod (eSignature) 01-Feb-2021 10:21 (Date/Time) **Reviewed by:** /S/ RJ Modashia (eSignature) 02-Feb-2021 09:31 (Date/Time)

Matrices: **GW** Carrier name: **FedEx**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:None
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	0.3C U/C	IR31
Cooler(s)/Kit(s):	46854	
Date/Time sample(s) sent to storage:	01/30/2021 14:00	

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: RJ Modashia LHAAP16-210128-ALS

Project: APTIM
LONGHORN ARMY AMMN. PLANT (LHAAP)
GROUNDWATER TREATMENT PLANT (GWTP)
KARNACK, TEXAS

Project No. 501032

Job: **LHAAP 16 January 2021**

Prepared By: Mike Martinez

P.O. Number

Field Sample I.D. Time	Sample Matrix	Date /	MS / MSD	No. OF CONTAINERS	VOC by SW 8260B	TOC by SM5310C	MEE by RSK 175	Anions (bromide, sulfate, nitrate) by SW9056 and Alkalinity by SM2320	Bromide by SW9056	Perchlorate by SW6850	Metals (arsenic, chromium, manganese, nickel, thallium) by SW6020				Remarks (Preservatives, etc.)
16 LHAAP-210128-TB7	LIQ	01-28-21 / 1030		2	2										
16 WW27-210128	GW	01-28-21 / 1200		4	3					1					
16 WW43-210128	GW	01-28-21 / 1250		4	3					1					
16 WW23-210128	GW	01-28-21 / 1355		4	3					1					
16 WW24-210128	GW	01-28-21 / 1445		4	3					1					
16 WW42-210128	GW	01-28-21 / 1533		7	3	2			1	1					
16 RW04-210128	GW	01-28-21 / 1725		7	3	2			1	1					
16 RW05-210129	GW	01-29-21 / 1105		7	3	2			1	1					

Additional Remarks: Standard TAT on all parameters. Please email results to Susan.Huang@aptim.com and invoices to fedinvoices@aptim.com

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
	01-28-21	1645		1/30/2021	10:10						

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition

Remarks:

OIC

46854 0.3°

#31

CIFOCS

(Word) S:\U-ces\Forms\Chain of Custody - BiWeekly

Aptim Environmental & Infrastucture, Inc.
LHAAP 16 January 2021

HS21020018

CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd. Suite 210 Houston, TX 77099 (281) 530-5656 ATTN: R.J Modashia LHAAP 16-210129-ALS

Project: APTIM
LONGHORN ARMY AMMN. PLANT (LHAAP)
GROUNDWATER TREATMENT PLANT (GWTP)
KARNACK, TEXAS

Project No. 501032

Job: **LHAAP 16 January 2021**

Prepared By: Mike Martinez

P.O. Number

Analyses

Field Sample I.D. Time	Sample Matrix	Date /	MS / MSD	No. OF CONTAINERS	VOC by SW 8260B	TOC by SM5310C	MEE by RSK 175	Anions (bromide, sulfate, nitrate) by SW9056 and Alkalinity by SM2320	Bromide by SW9056	Perchlorate by SW6850	Metals (arsenic, chromium, manganese, nickel, thallium) by SW6020				Remarks (Preservatives, etc.)
16GWW51-210129	GW	01-29-21/1223		7	3	2			1	1					
16GWW49-210129	GW	01-29-21/1605		7	3	2			1	1					

Additional Remarks: Standard TAT on all parameters. Please email results to Susan.Huang@aptim.com and invoices to fedinvoices@aptim.com

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
	01-29-21	1645		1/30/2021	10:10.						

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition

Remarks:

Aptim Environmental & Infrastucture, Inc.
LHAAP 16 January 2021

HS2102018

(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 5657

46654

CUSTODY SEAL
Date: 1-29-21 Time: 1700
Name: [illegible]
Company: ATM

Seal Broken By: PK
Date: 2-1-21

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099

46654

CUSTODY SEAL
Date: 1-29-21 Time: 1700
Name: [illegible]
Company: ATM

Seal Broken By: PK
Date: 2-1-21

FedEx
TRK# 0221 9473 0838 9483

SATURDAY 12:00P
PRIORITY OVERNIGHT

XC SGRA 46654

77099
TX-US IAH

April 13, 2021

Service Request No:E2100128

RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Suite 210
Houston, TX 77099-4338

Laboratory Results for: HS21020018

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory February 01, 2021
For your reference, these analyses have been assigned our service request number **E2100128.**

Revision I - This report was revised to correct the sample IDs to reflex the COC.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current TNI standards, where applicable, and except as noted in the laboratory case narrative provided. All results are intended to be considered in their entirety and ALS Environmental is not responsible for use of less than the complete final report. Results apply only to the items submitted to the laboratory, as received for analysis. In accordance with the current TNI Standard, a statement on the estimated uncertainty of measurement of any quantitative analysis will be supplied upon request.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Corey Grandits
Project Manager

ADDRESS 10450 Stancliff Rd., Suite 210, Houston, TX 77099
PHONE +1 281 530 5656 | FAX +1 281 530 5887
ALS Group USA, Corp.
dba ALS Environmental

Certificate of Analysis

ALS Environmental - Houston HRMS
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

ALS Environmental

Client:	ALS Houston	**Service Request No.:**	E2100128
Project:	HS21020018	**Date Received:**	02/01/21
Sample Matrix:	W		

CASE NARRATIVE

All analyses were performed in adherence to the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier II. When appropriate to the method, method blank results have been reported with each analytical test.

Sample Receipt

Nine samples were received for analysis at ALS Environmental in Houston on 02/01/21.

The samples were received in good condition and are consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

Data Validation Notes and Discussion

Precision and Accuracy:

EQ2100058: Laboratory Control Spike/Duplicate Laboratory Control Spike (LCS/DLCS) samples were analyzed and reported in lieu of a MS/MSD for this extraction batch. The LCS and DLCS recoveries are within QC limits.

Samples E2100128-001/003/004/006/007/008/009; lowest practical dilution performed due to matrix interference.

DoD Certification is held for the method/matrix/analytes provided in this report.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.

Use of ALS group USA Corp dba ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.

Client: ALS Environmental - US **Service Request:**E2100128
Project: HS21020018

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
E2100128-001	16WW27-210128	1/28/2021	1200
E2100128-002	16WW43-210128	1/28/2021	1250
E2100128-003	16WW23-210128	1/28/2021	1355
E2100128-004	16WW24-210128	1/28/2021	1445
E2100128-005	16WW42-210128	1/28/2021	1533
E2100128-006	16RW04-210128	1/28/2021	1725
E2100128-007	16RW05-210129	1/29/2021	1105
E2100128-008	16WW51-210129	1/29/2021	1223
E2100128-009	16WW49-210129	1/29/2021	1605

Service Request Summary

Folder #: **E2100128**
Client Name: ALS Environmental - US
Project Name: HS21020018
Project Number:

Report To: RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Houston, TX 77099-4338
USA
Phone Number: 281-530-5656
Cell Number:
Fax Number: 281-530-5887
E-mail: rj.modashia@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 02/01/21
Internal Due Date: 2/15/2021
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS21020018
EDD: No EDD Specified

9 125 mL-Glass Bottle NM AMBER Teflon Liner Unpreserved
Location: EHRMS-WIC 4A
Pressure Gas:

Lab Samp No.	Client Samp No	Matrix	Collected	HOUSTON ClO4 DOD/6850
E2100128-001	16WW27-210128	Ground Water	01/28/21 1200	**IV**
E2100128-002	16WW43-210128	Ground Water	01/28/21 1250	**IV**
E2100128-003	16WW23-210128	Ground Water	01/28/21 1355	**IV**
E2100128-004	16WW24-210128	Ground Water	01/28/21 1445	**IV**
E2100128-005	16WW42-210128	Ground Water	01/28/21 1533	**IV**
E2100128-006	16RW04-210128	Ground Water	01/28/21 1725	**IV**
E2100128-007	16RW05-210129	Ground Water	01/29/21 1105	**IV**
E2100128-008	16WW51-210129	Ground Water	01/29/21 1223	**IV**
E2100128-009	16WW49-210129	Ground Water	01/29/21 1605	**IV**

Service Request Summary

Folder #:	**E2100128**	Project Chemist:	Corey Grandits
Client Name:	ALS Environmental - US	Originating Lab:	HOUSTON
Project Name:	HS21020018	Logged By:	CGRANDITS
Project Number:		Date Received:	02/01/21
Report To:	RJ Modashia	Internal Due Date:	2/15/2021
	ALS Laboratory Group	QAP:	LAB QAP
	10450 Stancliff Road	Qualifier Set:	Lab Standard
	Houston, TX 77099-4338	Formset:	Lab Standard
	USA	Merged?:	Y
Phone Number:	281-530-5656	Report to MDL?:	Y
Cell Number:		P.O. Number:	HS21020018
Fax Number:	281-530-5887	EDD:	No EDD Specified
E-mail:	rj.modashia@alsglobal.com		

9 125 mL-Glass Bottle NM AMBER Teflon Liner Unpreserved

Location: EHRMS-WIC 4A

Pressure Gas:

Test Comments:

Group	Test/Method	Samples	Comments
Semivoa GCMS	ClO4 DOD/6850	9	II Due 2/15,IV due 2/22

Data Qualifiers

Lab Standard

+	Possible Tedlar bag artifact.
A	TIC is a suspected aldol-condensation product
B	Analyte found in the associated method blank as well as in the sample.
BC	Reported results are not blank corrected.
BH	The back section of the tube yielded higher results than the front.
BT	Results indicated possible breakthrough; back section >=10% front section.
C	Result identification confirmed.
D	Compound identified in an analysis at a secondary dilution factor
D	Spike was diluted out
DE	Reported results are corrected for desorption efficiency.
E	Estimated value. Concentration above calibration range
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
H1	Sample analysis performed past holding time. See case narrative.
H2	Initial analysis within holding time. Reanalysis for the required dilution was past holding time.
H3	Sample was received and analyzed past holding time.
H4	Sample was extracted past required extraction holding time, but analyzed within analysis holding time. See case narrative.
I	Internal standard not within the specified limits. See case narrative.
J	Estimated Value. Concentration found below MRL.
K	A deflection in the QC ion may indicate interference with the quantitation of this ion. The concentration of this analyte should be considered as an estimate.
K	Analyte was detected above the method reporting limit prior to normalization.
K	The reference ion ratio was outside acceptance criteria, which may indicate a potential bias to this result.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
L1	Laboratory control sample recovery outside the specified limits; results may be biased high.
L2	Laboratory control sample recovery outside the specified limits; results may be biased low.
L3	Laboratory control sample recovery outside the specified limits.
M	Matrix interference; results may be biased high.
M	The duplicate injection precision not met.
M1	Matrix interference due to coelution with a non-target compound; results may be biased high.
N	Presumptive evidence of a compound for TICs that have been identified based on a mass spectral library search.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.

Data Qualifiers

Lab Standard

O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
P	Indicates chlorodiphenyl ether interference present at the retention time of the target compound.
P	Pesticide/Aroclor target analyte > 40% difference for detected concentrations between GC columns
Q	Indicates as estimated value because the P and P + 2 theoretical abundance ratio does not meet method criteria.
R	Duplicate Precision not met.
R1	Duplicate precision not within the specified limits; however, the results are below the MRL and considered estimated.
S	Surrogate recovery not within specified limits.
S	The reported value was determined by the Method of Standard Additions (MSA).
T	Analyte is a tentatively identified compound, result is estimated.
U	Compound was analyzed for, but was not detected (ND).
V1	The continuing calibration verification standard was outside (biased high) the specified limits for this compound.
V2	The continuing calibration verification standard was outside (biased low) the specified limits for this compound.
W	Result quantified, but the corresponding peak was detected outside the generated retention time window.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
X	See case narrative.
Y	Recovery outside limits
Y	The chromatogram resembles a petroleum product but does not match the calibration standard.
Z	The chromatogram does not resemble a petroleum product.
i	The MRL/MDL has been elevated due to a matrix interference.

ALS Laboratory Group

Acronyms

Cal	Calibration
Conc	CONCentration
Dioxin(s)	Polychlorinated dibenzo-p-dioxin(s)
EDL	Estimated Detection Limit
EMPC	Estimated Maximum Possible Concentration
Flags	Data qualifiers
Furan(s)	Polychlorinated dibenzofuran(s)
g	Grams
ICAL	Initial CALibration
ID	IDentifier
Ions	Masses monitored for the analyte during data acquisition
L	Liter (s)
LCS	Laboratory Control Sample
DLCS	Duplicate Laboratory Control Sample
MB	Method Blank
MCL	Method Calibration Limit
MDL	Method Detection Limit
mL	Milliliters
MS	Matrix Spiked sample
DMS	Duplicate Matrix Spiked sample
NO	Number of peaks meeting all identification criteria
PCDD(s)	Polychlorinated dibenzo-p-dioxin(s)
PCDF(s)	Polychlorinated dibenzofuran(s)
ppb	Parts per billion
ppm	Parts per million
ppq	Parts per quadrillion
ppt	Parts per trillion
QA	Quality Assurance
QC	Quality Control
Ratio	Ratio of areas from monitored ions for an analyte
% Rec.	Percent recovery
RPD	Relative Percent Difference
RRF	Relative Response Factor
RT	Retention Time
SDG	Sample Delivery Group
S/N	Signal-to-noise ratio
TEF	Toxicity Equivalence Factor
TEQ	Toxicity Equivalence Quotient

10450 Stancliff Rd, Houston, TX 77099 | 281-530-5656 | www.alsglobal.com

ALS Environmental

State Certifications, Accreditations, and Licenses

Agency	Number	Expire Date
American Association for Laboratory Accreditation	2897.01 2020	11/30/2021
Arizona Department of Health Services	AZ0793-2020	5/27/2021
Arkansas Department of Environmental Quality	20-030-0	3/26/2021
California Department of Health Services	2919-2020	4/30/2021
Department of Defense	A2LA 2897.01	11/30/2021
Florida Department of Health	E87611-2020	6/30/2021
Hawaii Department of Health	2020	4/30/2021
Illinois Environmental Protection Agency	2000322020-4	5/9/2021
Kansas Department of Health and Environment	E-10352-2020	7/31/2021
Louisiana Department of Environmental Quality	03087-2020	6/30/2021
Maine Department of Health and Human Services	2020016	6/5/2022
Maryland Department of the Environment	343-2020	6/30/2021
Michigan Depratment of Environmental Quality	9971-2020	4/30/2021
Nebraska Department of Health and Human Services	NE-OS-25-13 (2020)	4/30/2021
Nevada Department of Concervation and Natural Resources	TX026932021-1	7/31/2021
New Hampshire Environmental Laboratory Accreditation Program	209420	4/24/2021
New Jersey Department of Environmental Protection	TX008	6/30/2021
New York Department of Health	11707	3/31/2021
Oklahoma Department of Environmental Quality	2020-123	8/31/2021
Pennsylvania Department of Environmental Protection	014	6/30/2021
Tennessee Department of Environment and Concervation	04016-2020	4/30/2021
Texas Commision on Environmental Quality	T104704231-20-26	4/30/2021
United States Department of Agriculture	P330-19-00299	10/10/2022

Chain of Custody

ALS Environmental - Houston HRMS
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID: 15576**

SUBCONTRACT TO:

ALS Environmental
10450 Stancliff RoadSuite 210
Houston, TX 77084

Phone: +1 281 530 5656

CUSTOMER INFORMATION:

Company:	ALS Houston
Contact:	RJ Modashia
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Email:	RJ.Modashia@alsglobal.com
Alternate Contact:	Jumoke M. Lawal
Email:	jumoke.lawal@alsglobal.com

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS21020018
TSR:	Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS21020018-02**	**16WW27-210128**	**Groundwater**	**28 Jan 2021 12:00**
	Provide Level II and Level IV reports on a seperate pdf.			15 Feb 2021
2.	**HS21020018-03**	**16WW43-210128**	**Groundwater**	**28 Jan 2021 12:50**
	Provide Level II and Level IV reports on a seperate pdf.			15 Feb 2021
3.	**HS21020018-04**	**16WW23-210128**	**Groundwater**	**28 Jan 2021 13:55**
	Provide Level II and Level IV reports on a seperate pdf.			15 Feb 2021
4.	**HS21020018-05**	**16WW24-210128**	**Groundwater**	**28 Jan 2021 14:45**
	Provide Level II and Level IV reports on a seperate pdf.			15 Feb 2021
5.	**HS21020018-06**	**16WW42-210128**	**Groundwater**	**28 Jan 2021 15:33**
	Provide Level II and Level IV reports on a seperate pdf.			15 Feb 2021
6.	**HS21020018-07**	**16RW04-210128**	**Groundwater**	**28 Jan 2021 17:25**
	Provide Level II and Level IV reports on a seperate pdf.			15 Feb 2021
7.	**HS21020018-08**	**16RW05-210129**	**Groundwater**	**29 Jan 2021 11:05**
	Provide Level II and Level IV reports on a seperate pdf.			15 Feb 2021
8.	**HS21020018-09**	**16WW51-210129**	**Groundwater**	**29 Jan 2021 12:23**
	Provide Level II and Level IV reports on a seperate pdf.			15 Feb 2021
9.	**HS21020018-10**	**16WW49-210129**	**Groundwater**	**29 Jan 2021 16:05**

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID: 15576**

LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
ANALYSIS REQUESTED			DUE DATE
Provide Level II and Level IV reports on a seperate pdf.			15 Feb 2021

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: DOD IV (DoD Data Package)

Relinquished By: _____ Date/Time: _____

Received By: _____ Date/Time: 2/1/21 1852

Cooler ID(s): _____ Temperature(s): _____

ALS Environmental

Cooler Receipt Form

Project Chemist: CG

Client/Project: ALS-H

Thermometer ID: 1231

Date/Time Received: 2/1/21 Initials: CG

Date/Time Logged in: 2/1/21 Initials: CG

1. Method of delivery: ○ US Mail ○ Fed Ex ○ UPS ○ DHL ✓ ALS Courier ○ Client
2. Samples received in: ✓ Cooler ○ Box ○ Envelope ○ Other
3. Were custody seals on coolers? ○ Yes ✓ No
   Were they intact? ○ Yes ○ No ✓ N/A
   Were they signed and dated? ○ Yes ○ No ✓ N/A
   If yes, how many and where?
4. Packing Material: ○ Inserts ✓ Baggies ○ Bubble Wrap ○ Gel Packs ✓ Wet Ice ○ Sleeves ○ Other
5. Foreign or Regulated Soil? ○ Yes ○ No Location of Sampling:

Cooler Tracking Number	COC ID	Date Opened	Time Opened	Opened By	Temp. °C	Temp Blank?
NA		2/1/21	1852	CG	3.9	☒
						☐
						☐
						☐

6. Were custody papers properly filled out (ink, signed, dated, etc)? ✓ Yes ○ No
7. Did all bottles arrive in good condition (not broken, no signs of leakage)? ✓ Yes ○ No
8. Were all sample labels complete (i.e., sample ID, analysis, preservation, etc)? ✓ Yes ○ No
9. Were appropriate bottles/containers and volumes received for the requested tests? ✓ Yes ○ No
10. Did sample labels and tags agree with custody documents? ✓ Yes ○ No

Notes, Discrepancies, & Resolutions:

Service request Label:

HS-HRMSCoolerReceipt R1.0

10450 Stancliff Rd., Suite 210
Houston, TX 77099
T: +1 713 266 1599
F: +1 713 266 1599
www.alsglobal.com

SAMPLE ACCEPTANCE POLICY

This policy outlines the criteria samples must meet to be accepted by ALS Environmental – Houston HRMS.

Cooler Custody Seals (desirable, mandatory if specified in SAP):

- ✓ Intact on outside of cooler, signed and dated

Chain-of-Custody (COC) documentation (mandatory):

The following is required on each COC:

- ✓ Sample ID, the location, date and time of collection, collector's name, preservation type, sample type, and any other special remarks concerning the sampleThe COC must be completed in ink.
- ✓ Signature and date of relinquishing party.

In the absence of a COC at sample receipt, the COC will be requested from the client.

Sample Integrity (mandatory):

Samples are inspected upon arrival to ensure that sample integrity was not compromised during transfer to the laboratory.

- ✓ Sample containers must arrive in good condition (not broken or leaking).
- ✓ Samples must be labeled appropriately, including Sample IDs, and requested test using durable labels and indelible ink.
- ✓ The correct type of sample bottle must be used for the method requested.
- ✓ An appropriate sample volume, or weight, must be received.
- ✓ Sample IDs and number of containers must reconcile with the COC.
- ✓ Samples must be received within the method defined holding time.

Temperature Requirement (varies by sample matrix):

- ✓ Aqueous and Non-aqueous samples must be shipped and stored cold, at 0 to 6ºC.
- ✓ Tissue samples must be shipped and stored frozen, at -20 to -10ºC.
- ✓ Air samples are shipped and stored cold, at 0 to 6ºC
- ✓ The sample temperature must be recorded on the COC

All cooler inspections are documented on the Cooler Receipt Form (CRF). A separate CRF is completed for each service request. Any samples not meeting the above criteria are noted on the CRF and the Project Manager notified. The Project Manager must resolve any sample integrity issues with the client prior to proceeding with the analysis. Such resolutions are documented in writing and filed with the project folder. Data associated with samples received outside of this acceptance policy will be qualified on the case narrative of the final report

Preparation Information Benchsheets

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

Preparation Information Benchsheet

Prep Run#: 373745 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
Team: Semivoa GCMS/JRODRIGUEZ **Prep Method:** Method **Prep Date/Time:** 2/4/21 08:41

#	Lab Code	Client ID	B#	Method /Test	pH	Cl	Matrix	Amt. Ext.	Sample Description
1	E2100128-001	16WW27-210128	.01	6850/ClO4 DOD			Ground Water	10mL	
2	E2100128-002	16WW43-210128	.01	6850/ClO4 DOD			Ground Water	10mL	
3	E2100128-003	16WW23-210128	.01	6850/ClO4 DOD			Ground Water	10mL	
4	E2100128-004	16WW24-210128	.01	6850/ClO4 DOD			Ground Water	10mL	
5	E2100128-005	16WW42-210128	.01	6850/ClO4 DOD			Ground Water	10mL	
6	E2100128-006	16RW04-210128	.01	6850/ClO4 DOD			Ground Water	10mL	
7	E2100128-007	16RW05-210129	.01	6850/ClO4 DOD			Ground Water	10mL	
8	E2100128-008	16WW51-210129	.01	6850/ClO4 DOD			Ground Water	10mL	
9	E2100128-009	16WW49-210129	.01	6850/ClO4 DOD			Ground Water	10mL	
10	E2100142-001	LH18/24-SP650_020221_BIX	.01	6850/ClO4 DOD			Water	10mL	
11	E2100143-001	LH18/24-SP140_020221	.01	6850/ClO4 DOD			Water	10mL	
12	E2100144-001	LH18/24-SP650_020221_BIX	.01	6850/ClO4 DOD			Water	10mL	
13	EQ2100058-01	MB		6850/ClO4 DOD			Liquid	10mL	
14	EQ2100058-02	LCS		6850/ClO4 DOD			Liquid	10mL	
15	EQ2100058-03	DLCS		6850/ClO4 DOD			Liquid	10mL	

Spiking Solutions

Name: Perchlorate Intermediate Stock1 Inventory ID 214035 Logbook Ref: Perchlorate Expires On: 05/23/2021

EQ2100058-02	1.00µL	EQ2100058-03	1.00µL

Name: Perchlorate Internal Standard 1ug/mL Inventory ID 214820 Logbook Ref: Perchlorate Internal Standard Expires On: 07/03/2021

E2100128-001	100.00µL	E2100128-002	100.00µL	E2100128-003	100.00µL	E2100128-004	100.00µL	E2100128-005	100.00µL	E2100128-006	100.00µL
E2100128-007	100.00µL	E2100128-008	100.00µL	E2100128-009	100.00µL	E2100142-001	100.00µL	E2100143-001	100.00µL	E2100144-001	100.00µL
EQ2100058-01	100.00µL	EQ2100058-02	100.00µL	EQ2100058-03	100.00µL						

Preparation Steps

Step: Preparation
Started: 2/4/21 08:41
Finished: 2/4/21 09:30
By: GRIVERA
Comments

Comments:

Preparation Information Benchsheet

Prep Run#: 373745
Team: Semivoa GCMS/JRODRIGUEZ

Prep WorkFlow: GenExt28Day
Prep Method: Method

Status: Prepped
Prep Date/Time: 2/4/21 08:41

Reviewed By: GR Date: 2/4/21

Chain of Custody

Relinquished By: _____ Date: _____

Received By: _____ Date: _____

Extracts Examined
Yes No

Analytical Results

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100128
Project:	HS21020018	**Date Collected:**	1/28/21 1200
Sample Matrix:	Ground Water	**Date Received:**	2/ 1/21
Sample Name:	16WW27-210128	**Units:**	µg/L
Lab Code:	E2100128-001	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	1.00	0.500	0.250	10	2/ 4/21	2/11/21 17:51	373745	712924	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100128
Project:	HS21020018	**Date Collected:**	1/28/21 1250
Sample Matrix:	Ground Water	**Date Received:**	2/ 1/21
Sample Name:	16WW43-210128	**Units:**	µg/L
Lab Code:	E2100128-002	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.0777**	J	0.100	0.0500	0.0250	1	2/ 4/21	2/10/21 20:33	373745	712836	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100128
Project:	HS21020018	**Date Collected:**	1/28/21 1355
Sample Matrix:	Ground Water	**Date Received:**	2/ 1/21
Sample Name:	16WW23-210128	**Units:**	µg/L
Lab Code:	E2100128-003	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.346**	J	1.00	0.500	0.250	10	2/ 4/21	2/11/21 17:58	373745	712924	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100128
Project:	HS21020018	**Date Collected:**	1/28/21 1445
Sample Matrix:	Ground Water	**Date Received:**	2/ 1/21
Sample Name:	16WW24-210128	**Units:**	µg/L
Lab Code:	E2100128-004	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	1.00	0.500	0.250	10	2/ 4/21	2/12/21 10:41	373745	712935	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100128
Project:	HS21020018	**Date Collected:**	1/28/21 1533
Sample Matrix:	Ground Water	**Date Received:**	2/ 1/21
Sample Name:	16WW42-210128	**Units:**	µg/L
Lab Code:	E2100128-005	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	2/ 4/21	2/10/21 20:57	373745	712836	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100128
Project:	HS21020018	**Date Collected:**	1/28/21 1725
Sample Matrix:	Ground Water	**Date Received:**	2/ 1/21
Sample Name:	16RW04-210128	**Units:**	µg/L
Lab Code:	E2100128-006	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.328**	J	1.00	0.500	0.250	10	2/ 4/21	2/12/21 10:49	373745	712935	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100128
Project:	HS21020018	**Date Collected:**	1/29/21 1105
Sample Matrix:	Ground Water	**Date Received:**	2/ 1/21
Sample Name:	16RW05-210129	**Units:**	µg/L
Lab Code:	E2100128-007	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	1.00	0.500	0.250	10	2/ 4/21	2/11/21 18:30	373745	712924	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100128
Project:	HS21020018	**Date Collected:**	1/29/21 1223
Sample Matrix:	Ground Water	**Date Received:**	2/ 1/21
Sample Name:	16WW51-210129	**Units:**	µg/L
Lab Code:	E2100128-008	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	1.00	0.500	0.250	10	2/ 4/21	2/11/21 18:38	373745	712924	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100128
Project:	HS21020018	**Date Collected:**	1/29/21 1605
Sample Matrix:	Ground Water	**Date Received:**	2/ 1/21
Sample Name:	16WW49-210129	**Units:**	µg/L
Lab Code:	E2100128-009	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	1.00	0.500	0.250	10	2/ 4/21	2/12/21 11:05	373745	712935	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100128
Project:	HS21020018	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	µg/L
Lab Code:	EQ2100058-01	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	2/ 4/21	2/10/21 20:02	373745	712836	

Accuracy & Precision

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2100128
Project:	HS21020018	**Date Analyzed:**	2/11/21
Sample Matrix:	Ground Water		

Lab Control Sample Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method:	6850	**Units:**	µg/L
Prep Method:	Method	**Basis:**	NA
		Extraction Lot:	373745

	Lab Control Sample EQ2100058-02			Duplicate Lab Control Sample EQ2100058-03					
Analyte Name	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Perchlorate	0.0901	0.100	90	0.0917	0.100	92	84 - 119	2	15

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100128
Project:	HS21020018	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2100058-02	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.0901**	J	0.100	0.0500	0.0250	1	2/ 4/21	2/11/21 15:19	373745	712924	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100128
Project:	HS21020018	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Duplicate Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2100058-03	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.0917**	J	0.100	0.0500	0.0250	1	2/ 4/21	2/11/21 15:27	373745	712924	

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

February 08, 2021

Analytical Report for Service Request No: K2100949

RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Suite 210
Houston, TX 77099-4338

RE: HS21020018

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory February 02, 2021
For your reference, these analyses have been assigned our service request number **K2100949.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please contact me if you have any questions. My extension is 3350. You may also contact me via email at Kelley.Lovejoy@alsglobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

for Kelley Lovejoy
Project Manager

RIGHT SOLUTIONS | RIGHT PARTNER

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
Qualifiers
State Certifications, Accreditations, And Licenses
Case Narrative
Chain of Custody
General Chemistry

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated value.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.
H	The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

Metals Data Qualifiers

#	The control limit criteria is not applicable. See case narrative.
J	The result is an estimated value.
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
M	The duplicate injection precision was not met.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
S	The reported value was determined by the Method of Standard Additions (MSA).
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
+	The correlation coefficient for the MSA is less than 0.995.
Q	See case narrative. One or more quality control criteria was outside the limits.

Organic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
A	A tentatively identified compound, a suspected aldol-condensation product.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
C	The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
D	The reported result is from a dilution.
E	The result is an estimated value.
J	The result is an estimated value.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
P	The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.

Additional Petroleum Hydrocarbon Specific Qualifiers

F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
Y	The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
Z	The chromatographic fingerprint does not resemble a petroleum product.

ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso
State Certifications, Accreditations, and Licenses

Agency	Web Site	Number
Alaska DEH	http://dec.alaska.gov/eh/lab/cs/csapproval.htm	UST-040
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0339
Arkansas - DEQ	http://www.adeq.state.ar.us/techsvs/labcert.htm	88-0637
California DHS (ELAP)	http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx	2795
DOD ELAP	http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm	L16-58-R4
Florida DOH	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E87412
Hawaii DOH	http://health.hawaii.gov/	-
ISO 17025	http://www.pjlabs.com/	L16-57
Louisiana DEQ	http://www.deq.louisiana.gov/page/la-lab-accreditation	03016
Maine DHS	http://www.maine.gov/dhhs/	WA01276
Minnesota DOH	http://www.health.state.mn.us/accreditation	053-999-457
Nevada DEP	http://ndep.nv.gov/bsdw/labservice.htm	WA01276
New Jersey DEP	http://www.nj.gov/dep/enforcement/oqa.html	WA005
New York - DOH	https://www.wadsworth.org/regulatory/elap	12060
North Carolina DEQ	https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification	605
Oklahoma DEQ	http://www.deq.state.ok.us/CSDnew/labcert.htm	9801
Oregon – DEQ (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	WA100010
South Carolina DHEC	http://www.scdhec.gov/environment/EnvironmentalLabCertification/	61002
Texas CEQ	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704427
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C544
Wyoming (EPA Region 8)	https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water-	-
Kelso Laboratory Website	www.alsglobal.com	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at www.ALSGlobal.com or at the accreditation bodies web site.
Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/anlayte is offered by that state.

Case Narrative

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

1317 South 13th Ave, Kelso, WA 98626 | 1-360-577-7222 | www.alsglobal.com

ALS Environmental

Client: ALS Environmental - US
Project: HS21020018
Sample Matrix: Ground Water

Service Request: K2100949
Date Received: 02/02/2021

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples for the Tier level II requested by the client.

Sample Receipt:

Five ground water samples were received for analysis at ALS Environmental on 02/02/2021. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The samples were stored at minimum in accordance with the analytical method requirements.

General Chemistry:

No significant anomalies were noted with this analysis.

Approved by _____ Date 02/08/2021

Chain of Custody

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

K2100949

PCL XL error
Warning: IllegalMediaSize

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID: 15575**

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:	HS21020018
TSR:	Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS21020018-06**	**16WW42-210128**	**Groundwater**	**28 Jan 2021 15:33**
	TOC: Provide Level II & DOD Level IV/EQuIS APTIM EDD			15 Feb 2021
2.	**HS21020018-07**	**16RW04-210128**	**Groundwater**	**28 Jan 2021 17:25**
	TOC: Provide Level II & DOD Level IV/EQuIS APTIM EDD			15 Feb 2021
3.	**HS21020018-08**	**16RW05-210129**	**Groundwater**	**29 Jan 2021 11:05**
	TOC: Provide Level II & DOD Level IV/EQuIS APTIM EDD			15 Feb 2021
4.	**HS21020018-09**	**16WW51-210129**	**Groundwater**	**29 Jan 2021 12:23**
	TOC: Provide Level II & DOD Level IV/EQuIS APTIM EDD			15 Feb 2021
5.	**HS21020018-10**	**16WW49-210129**	**Groundwater**	**29 Jan 2021 16:05**
	TOC: Provide Level II & DOD Level IV/EQuIS APTIM EDD			15 Feb 2021

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: DOD IV (DoD Data Package)

Rec by: N Pedersen ALS 2/2/21 1000

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID:** **15575**

Relinquished By:	J. Murray	Date/Time:	02/01/21 18:00
Received By:	MRedersen	Date/Time:	2/2/21 1000
Cooler ID(s):		Temperature(s):	

PM KL

Cooler Receipt and Preservation Form

Client AB Houston Service Request K21 00949

Received: 2/2/21 Opened: 2/2/21 By: AP Unloaded: 2/2/21 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
4. Was a Temperature Blank present in cooler? NA Y N If yes, notate the temperature in the appropriate column below:
   If no, take the temperature of a representative sample bottle contained within the cooler; notate in the column "Sample Temp":
5. Were samples received within the method specified temperature ranges? NA Y N
   If no, were they received on ice and same day as collected? If not, notate the cooler # below and notify the PM. NA Y N

If applicable, tissue samples were received: *Frozen* *Partially Thawed* *Thawed*

Temp Blank	Sample Temp	IR Gun	Cooler #/COC ID / NA	Out of temp indicate with "X"	PM Notified if out of temp	Tracking Number NA	Filed
4.4	—	1R02	15575	—	—	9473 0839 9727	

6. Packing material: *Inserts* *Baggies* *Bubble Wrap* *Gel Packs* *Wet Ice* *Dry Ice* *Sleeves* _____
7. Were custody papers properly filled out (ink, signed, etc.)? NA Y N
8. Were samples received in good condition (unbroken) NA Y N
9. Were all sample labels complete (ie, analysis, preservation, etc.)? NA Y N
10. Did all sample labels and tags agree with custody papers? NA Y N
11. Were appropriate bottles/containers and volumes received for the tests indicated? NA Y N
12. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* NA Y N
13. Were VOA vials received without headspace? *Indicate in the table below.* NA Y N
14. Was C12/Res negative? NA Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count Bottle Type	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:**	K2100949
Project:	HS21020018	**Date Collected:**	01/28/21 - 01/29/21
Sample Matrix:	Ground Water	**Date Received:**	02/2/21
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
16WW42-210128	K2100949-001	**2.12**	0.50	0.20	0.07	1	02/04/21 18:00	
16RW04-210128	K2100949-002	**2.84**	0.50	0.20	0.07	1	02/04/21 18:00	
16RW05-210129	K2100949-003	**34.8**	0.50	0.20	0.07	1	02/04/21 18:00	
16WW51-210129	K2100949-004	**3.90**	0.50	0.20	0.07	1	02/04/21 18:00	
16WW49-210129	K2100949-005	**3.81**	0.50	0.20	0.07	1	02/04/21 18:00	
Method Blank	K2100949-MB	ND U	0.50	0.20	0.07	1	02/04/21 18:00	

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K2100949
Project:	HS21020018	**Date Analyzed:**	02/04/21
Sample Matrix:	Ground Water	**Date Extracted:**	NA

Lab Control Sample Summary
Carbon, Total Organic

Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA
		Analysis Lot:	712206

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K2100949-LCS	25.4	25.0	101	83-117

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

February 22, 2021

Susan Huang
Aptim Environmental & Infrastucture, Inc.
2500 City West Blvd., Suite 1700
Houston, TX 77042

Work Order: **HS21020193**

Laboratory Results for: **Longhorn Army Ammunition Plant LHAAP 16 January 2021**

Dear Susan Huang,

ALS Environmental received 11 sample(s) on Feb 03, 2021 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL

RJ Modashia
Project Manager

ALS Houston, US Date: 22-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 January 2021
Work Order: HS21020193

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS21020193-01	16PM14-210202	Groundwater		02-Feb-2021 07:45	03-Feb-2021 09:30	☐
HS21020193-02	16PM06-210202	Groundwater		02-Feb-2021 08:30	03-Feb-2021 09:30	☐
HS21020193-03	16RW10-210202	Groundwater		02-Feb-2021 09:15	03-Feb-2021 09:30	☐
HS21020193-04	16RW09-210202	Groundwater		02-Feb-2021 10:00	03-Feb-2021 09:30	☐
HS21020193-05	16EW04-210202	Groundwater		02-Feb-2021 10:45	03-Feb-2021 09:30	☐
HS21020193-06	16EW08-210202	Groundwater		02-Feb-2021 11:30	03-Feb-2021 09:30	☐
HS21020193-07	16EW03-210202	Groundwater		02-Feb-2021 12:15	03-Feb-2021 09:30	☐
HS21020193-08	16EW07-210202	Groundwater		02-Feb-2021 13:00	03-Feb-2021 09:30	☐
HS21020193-09	16EW06-210202	Groundwater		02-Feb-2021 13:45	03-Feb-2021 09:30	☐
HS21020193-10	16EW06-210202-FD	Groundwater		02-Feb-2021 13:45	03-Feb-2021 09:30	☐
HS21020193-11	Trip Blank - 210202	Water	CG 121520 -122	02-Feb-2021 00:00	03-Feb-2021 09:30	☐

ALS Houston, US Date: 22-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 January 2021
Work Order: HS21020193

CASE NARRATIVE

Work Order Comments

- The analysis for Perchlorate was subcontracted to ALS Houston High-Res Lab. Final report attached.

  The analysis for TOC was subcontracted to ALS Kelso, WA. Final report attached.

GCMS Volatiles by Method SW8260

Batch ID: R377575

Sample ID: 16PM06-210202 (HS21020193-02)

- Surrogates ,1,2-Dichloroethane-d4, 4-Bromofluorobenzene and Toluene-d8 failure due to matrix.

- Surrogate ,1,2-Dichloroethane-d4 failure due to matrix.

Sample ID: 16PM14-210202 (HS21020193-01)

- Surrogate ,1,2-Dichloroethane-d4 failure due to matrix.

Sample ID: HS21011150-06MS

- MS and MSD are for an unrelated sample

Batch ID: R378003

Sample ID: 16EW06-210202 (HS21020193-09)

- Lowest practical dilution for sample HS21020193-09 due to matrix.

Sample ID: 16EW06-210202-FD (HS21020193-10)

- Lowest practical dilution for sample HS21020193-10 due to matrix.

Sample ID: 16EW07-210202 (HS21020193-08)

- Lowest practical dilution for sample HS21020193-08 due to matrix.

Sample ID: 16RW09-210202 (HS21020193-04)

- Lowest practical dilution for sample HS21020193-04 due to matrix.

Batch ID: R377708

Sample ID: HS21020268-05MS

- MS and MSD are for an unrelated sample

WetChemistry by Method SW9056

Batch ID: R378283

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

ALS Houston, US Date: 22-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.

ANALYTICAL REPORT

Project: Longhorn Army Ammunition Plant LHAAP 16 January 2021 WorkOrder:HS21020193

Sample ID: 16PM14-210202 Lab ID:HS21020193-01

Collection Date: 02-Feb-2021 07:45 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	10	U	3.0	10	10	ug/L	10	05-Feb-2021 00:38
1,1-Dichloroethene	**18**		**2.0**	**5.0**	**10**	**ug/L**	10	05-Feb-2021 00:38
1,2-Dichloroethane	**23**		**2.0**	**5.0**	**10**	**ug/L**	10	05-Feb-2021 00:38
cis-1,2-Dichloroethene	**3,500**		**20**	**50**	**100**	**ug/L**	100	05-Feb-2021 00:59
Methylene chloride	20	U	4.0	20	20	ug/L	10	05-Feb-2021 00:38
Trichloroethene	**3,800**		**20**	**50**	**100**	**ug/L**	100	05-Feb-2021 00:59
Vinyl chloride	**130**		**2.0**	**5.0**	**10**	**ug/L**	10	05-Feb-2021 00:38
Surr: 1,2-Dichloroethane-d4	*127*	*S*		**0**	*81-118*	*%REC*	*10*	*05-Feb-2021 00:38*
Surr: 1,2-Dichloroethane-d4	*112*			**0**	*81-118*	*%REC*	*100*	*05-Feb-2021 00:59*
Surr: 4-Bromofluorobenzene	*109*			**0**	*85-114*	*%REC*	*10*	*05-Feb-2021 00:38*
Surr: 4-Bromofluorobenzene	*108*			**0**	*85-114*	*%REC*	*100*	*05-Feb-2021 00:59*
Surr: Dibromofluoromethane	*99.1*			**0**	*80-119*	*%REC*	*10*	*05-Feb-2021 00:38*
Surr: Dibromofluoromethane	*101*			**0**	*80-119*	*%REC*	*100*	*05-Feb-2021 00:59*
Surr: Toluene-d8	*102*			**0**	*89-112*	*%REC*	*10*	*05-Feb-2021 00:38*
Surr: Toluene-d8	*103*			**0**	*89-112*	*%REC*	*100*	*05-Feb-2021 00:59*
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**7.54**		**1.50**	**5.00**	**5.00**	**mg/L**	50	20-Feb-2021 06:21
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	22-Feb-2021 17:39
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	17-Feb-2021 09:31

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 22-Feb-21

Client:	Aptim Environmental & Infrastucture, Inc.	**ANALYTICAL REPORT**
Project:	Longhorn Army Ammunition Plant LHAAP 16 January 2021	WorkOrder:HS21020193
Sample ID:	16PM06-210202	Lab ID:HS21020193-02
Collection Date:	02-Feb-2021 08:30	Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	25	U	7.5	25	25	ug/L	25	05-Feb-2021 01:20
1,1-Dichloroethene	**65**		**5.0**	**12**	**25**	**ug/L**	25	05-Feb-2021 01:20
1,2-Dichloroethane	**40**		**5.0**	**12**	**25**	**ug/L**	25	05-Feb-2021 01:20
cis-1,2-Dichloroethene	**33,000**		**50**	**120**	**250**	**ug/L**	250	05-Feb-2021 01:41
Methylene chloride	50	U	10	50	50	ug/L	25	05-Feb-2021 01:20
Trichloroethene	**49,000**		**50**	**120**	**250**	**ug/L**	250	05-Feb-2021 01:41
Vinyl chloride	**790**		**5.0**	**12**	**25**	**ug/L**	25	05-Feb-2021 01:20
Surr: 1,2-Dichloroethane-d4	*123*	*S*		**0**	*81-118*	*%REC*	*250*	*05-Feb-2021 01:41*
Surr: 1,2-Dichloroethane-d4	*126*	*S*		**0**	*81-118*	*%REC*	*25*	*05-Feb-2021 01:20*
Surr: 4-Bromofluorobenzene	*126*	*S*		**0**	*85-114*	*%REC*	*25*	*05-Feb-2021 01:20*
Surr: 4-Bromofluorobenzene	*103*			**0**	*85-114*	*%REC*	*250*	*05-Feb-2021 01:41*
Surr: Dibromofluoromethane	*99.5*			**0**	*80-119*	*%REC*	*25*	*05-Feb-2021 01:20*
Surr: Dibromofluoromethane	*99.8*			**0**	*80-119*	*%REC*	*250*	*05-Feb-2021 01:41*
Surr: Toluene-d8	*113*	*S*		**0**	*89-112*	*%REC*	*25*	*05-Feb-2021 01:20*
Surr: Toluene-d8	*99.7*			**0**	*89-112*	*%REC*	*250*	*05-Feb-2021 01:41*
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**6.17**		**1.50**	**5.00**	**5.00**	**mg/L**	50	20-Feb-2021 06:39
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	22-Feb-2021 17:39
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	17-Feb-2021 09:31

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 22-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.

ANALYTICAL REPORT

Project: Longhorn Army Ammunition Plant LHAAP 16 January 2021 WorkOrder:HS21020193

Sample ID: 16RW10-210202 Lab ID:HS21020193-03

Collection Date: 02-Feb-2021 09:15 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	10	U	3.0	10	10	ug/L	10	08-Feb-2021 20:53
1,1-Dichloroethene	**14**		**2.0**	**5.0**	**10**	**ug/L**	10	08-Feb-2021 20:53
1,2-Dichloroethane	**66**		**2.0**	**5.0**	**10**	**ug/L**	10	08-Feb-2021 20:53
cis-1,2-Dichloroethene	**1,200**		**2.0**	**5.0**	**10**	**ug/L**	10	08-Feb-2021 20:53
Methylene chloride	20	U	4.0	20	20	ug/L	10	08-Feb-2021 20:53
Trichloroethene	**5,300**		**20**	**50**	**100**	**ug/L**	100	08-Feb-2021 21:14
Vinyl chloride	**50**		**2.0**	**5.0**	**10**	**ug/L**	10	08-Feb-2021 20:53
Surr: 1,2-Dichloroethane-d4	*115*			**0**	*81-118*	*%REC*	*10*	*08-Feb-2021 20:53*
Surr: 1,2-Dichloroethane-d4	*114*			**0**	*81-118*	*%REC*	*100*	*08-Feb-2021 21:14*
Surr: 4-Bromofluorobenzene	*97.0*			**0**	*85-114*	*%REC*	*10*	*08-Feb-2021 20:53*
Surr: 4-Bromofluorobenzene	*96.8*			**0**	*85-114*	*%REC*	*100*	*08-Feb-2021 21:14*
Surr: Dibromofluoromethane	*96.4*			**0**	*80-119*	*%REC*	*100*	*08-Feb-2021 21:14*
Surr: Dibromofluoromethane	*96.9*			**0**	*80-119*	*%REC*	*10*	*08-Feb-2021 20:53*
Surr: Toluene-d8	*105*			**0**	*89-112*	*%REC*	*10*	*08-Feb-2021 20:53*
Surr: Toluene-d8	*105*			**0**	*89-112*	*%REC*	*100*	*08-Feb-2021 21:14*
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**7.40**		**0.300**	**1.00**	**1.00**	**mg/L**	10	20-Feb-2021 06:58
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	22-Feb-2021 17:39
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	17-Feb-2021 09:31

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 22-Feb-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP 16 January 2021 WorkOrder:HS21020193
Sample ID: 16RW09-210202 Lab ID:HS21020193-04
Collection Date: 02-Feb-2021 10:00 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	5.0	U	1.5	5.0	5.0	ug/L	5	11-Feb-2021 15:54
1,1-Dichloroethene	**6.8**		**1.0**	**2.5**	**5.0**	**ug/L**	5	11-Feb-2021 15:54
1,2-Dichloroethane	2.5	U	1.0	2.5	5.0	ug/L	5	11-Feb-2021 15:54
cis-1,2-Dichloroethene	**230**		**1.0**	**2.5**	**5.0**	**ug/L**	5	11-Feb-2021 15:54
Methylene chloride	10	U	2.0	10	10	ug/L	5	11-Feb-2021 15:54
Trichloroethene	**690**		**1.0**	**2.5**	**5.0**	**ug/L**	5	11-Feb-2021 15:54
Vinyl chloride	**25**		**1.0**	**2.5**	**5.0**	**ug/L**	5	11-Feb-2021 15:54
Surr: 1,2-Dichloroethane-d4	*117*			**0**	*81-118*	*%REC*	*5*	*11-Feb-2021 15:54*
Surr: 4-Bromofluorobenzene	*93.5*			**0**	*85-114*	*%REC*	*5*	*11-Feb-2021 15:54*
Surr: Dibromofluoromethane	*99.3*			**0**	*80-119*	*%REC*	*5*	*11-Feb-2021 15:54*
Surr: Toluene-d8	*107*			**0**	*89-112*	*%REC*	*5*	*11-Feb-2021 15:54*
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**5.84**		**0.300**	**1.00**	**1.00**	**mg/L**	10	20-Feb-2021 07:16
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	22-Feb-2021 17:39
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	17-Feb-2021 09:31

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 22-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.

ANALYTICAL REPORT

Project: Longhorn Army Ammunition Plant LHAAP 16 January 2021 WorkOrder:HS21020193

Sample ID: 16EW04-210202 Lab ID:HS21020193-05

Collection Date: 02-Feb-2021 10:45 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	10	U	3.0	10	10	ug/L	10	08-Feb-2021 21:35
1,1-Dichloroethene	**16**		**2.0**	**5.0**	**10**	**ug/L**	10	08-Feb-2021 21:35
1,2-Dichloroethane	**13**		**2.0**	**5.0**	**10**	**ug/L**	10	08-Feb-2021 21:35
cis-1,2-Dichloroethene	**4,800**		**20**	**50**	**100**	**ug/L**	100	08-Feb-2021 21:56
Methylene chloride	20	U	4.0	20	20	ug/L	10	08-Feb-2021 21:35
Trichloroethene	**17,000**		**20**	**50**	**100**	**ug/L**	100	08-Feb-2021 21:56
Vinyl chloride	**29**		**2.0**	**5.0**	**10**	**ug/L**	10	08-Feb-2021 21:35
Surr: 1,2-Dichloroethane-d4	*113*			**0**	*81-118*	*%REC*	*10*	*08-Feb-2021 21:35*
Surr: 1,2-Dichloroethane-d4	*112*			**0**	*81-118*	*%REC*	*100*	*08-Feb-2021 21:56*
Surr: 4-Bromofluorobenzene	*97.4*			**0**	*85-114*	*%REC*	*10*	*08-Feb-2021 21:35*
Surr: 4-Bromofluorobenzene	*97.3*			**0**	*85-114*	*%REC*	*100*	*08-Feb-2021 21:56*
Surr: Dibromofluoromethane	*96.7*			**0**	*80-119*	*%REC*	*10*	*08-Feb-2021 21:35*
Surr: Dibromofluoromethane	*97.5*			**0**	*80-119*	*%REC*	*100*	*08-Feb-2021 21:56*
Surr: Toluene-d8	*105*			**0**	*89-112*	*%REC*	*10*	*08-Feb-2021 21:35*
Surr: Toluene-d8	*105*			**0**	*89-112*	*%REC*	*100*	*08-Feb-2021 21:56*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	22-Feb-2021 17:39

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 22-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.

ANALYTICAL REPORT

Project: Longhorn Army Ammunition Plant LHAAP 16 January 2021 WorkOrder:HS21020193

Sample ID: 16EW08-210202 Lab ID:HS21020193-06

Collection Date: 02-Feb-2021 11:30 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	08-Feb-2021 20:32
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	08-Feb-2021 20:32
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	08-Feb-2021 20:32
cis-1,2-Dichloroethene	**1.00**	J	**0.20**	**0.50**	**1.0**	**ug/L**	1	08-Feb-2021 20:32
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	08-Feb-2021 20:32
Trichloroethene	**3.1**		**0.20**	**0.50**	**1.0**	**ug/L**	1	08-Feb-2021 20:32
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	08-Feb-2021 20:32
Surr: 1,2-Dichloroethane-d4	*114*			**0**	*81-118*	*%REC*	*1*	*08-Feb-2021 20:32*
Surr: 4-Bromofluorobenzene	*99.0*			**0**	*85-114*	*%REC*	*1*	*08-Feb-2021 20:32*
Surr: Dibromofluoromethane	*99.8*			**0**	*80-119*	*%REC*	*1*	*08-Feb-2021 20:32*
Surr: Toluene-d8	*103*			**0**	*89-112*	*%REC*	*1*	*08-Feb-2021 20:32*
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**7.93**		**0.300**	**1.00**	**1.00**	**mg/L**	10	20-Feb-2021 07:34
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	22-Feb-2021 17:39
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	17-Feb-2021 09:31

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 22-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.

ANALYTICAL REPORT

Project: Longhorn Army Ammunition Plant LHAAP 16 January 2021 WorkOrder:HS21020193

Sample ID: 16EW03-210202 Lab ID:HS21020193-07

Collection Date: 02-Feb-2021 12:15 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	5.0	U	1.5	5.0	5.0	ug/L	5	11-Feb-2021 15:12
1,1-Dichloroethene	**4.0**	J	**1.0**	**2.5**	**5.0**	**ug/L**	5	11-Feb-2021 15:12
1,2-Dichloroethane	2.5	U	1.0	2.5	5.0	ug/L	5	11-Feb-2021 15:12
cis-1,2-Dichloroethene	**1,100**		**5.0**	**12**	**25**	**ug/L**	25	11-Feb-2021 15:33
Methylene chloride	10	U	2.0	10	10	ug/L	5	11-Feb-2021 15:12
Trichloroethene	**290**		**1.0**	**2.5**	**5.0**	**ug/L**	5	11-Feb-2021 15:12
Vinyl chloride	**780**		**1.0**	**2.5**	**5.0**	**ug/L**	5	11-Feb-2021 15:12
Surr: 1,2-Dichloroethane-d4	*117*			**0**	*81-118*	*%REC*	*5*	*11-Feb-2021 15:12*
Surr: 1,2-Dichloroethane-d4	*117*			**0**	*81-118*	*%REC*	*25*	*11-Feb-2021 15:33*
Surr: 4-Bromofluorobenzene	*93.2*			**0**	*85-114*	*%REC*	*5*	*11-Feb-2021 15:12*
Surr: 4-Bromofluorobenzene	*93.5*			**0**	*85-114*	*%REC*	*25*	*11-Feb-2021 15:33*
Surr: Dibromofluoromethane	*98.0*			**0**	*80-119*	*%REC*	*5*	*11-Feb-2021 15:12*
Surr: Dibromofluoromethane	*98.0*			**0**	*80-119*	*%REC*	*25*	*11-Feb-2021 15:33*
Surr: Toluene-d8	*103*			**0**	*89-112*	*%REC*	*5*	*11-Feb-2021 15:12*
Surr: Toluene-d8	*104*			**0**	*89-112*	*%REC*	*25*	*11-Feb-2021 15:33*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	22-Feb-2021 17:39

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 22-Feb-21

Client:	Aptim Environmental & Infrastucture, Inc.	**ANALYTICAL REPORT**
Project:	Longhorn Army Ammunition Plant LHAAP 16 January 2021	WorkOrder:HS21020193
Sample ID:	16EW07-210202	Lab ID:HS21020193-08
Collection Date:	02-Feb-2021 13:00	Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	500	U	150	500	500	ug/L	500	11-Feb-2021 13:48
1,1-Dichloroethene	250	U	100	250	500	ug/L	500	11-Feb-2021 13:48
1,2-Dichloroethane	250	U	100	250	500	ug/L	500	11-Feb-2021 13:48
cis-1,2-Dichloroethene	250	U	100	250	500	ug/L	500	11-Feb-2021 13:48
Methylene chloride	1,000	U	200	1000	1000	ug/L	500	11-Feb-2021 13:48
Trichloroethene	250	U	100	250	500	ug/L	500	11-Feb-2021 13:48
Vinyl chloride	250	U	100	250	500	ug/L	500	11-Feb-2021 13:48
Surr: 1,2-Dichloroethane-d4	*111*			**0**	*81-118*	*%REC*	*500*	*11-Feb-2021 13:48*
Surr: 4-Bromofluorobenzene	*95.7*			**0**	*85-114*	*%REC*	*500*	*11-Feb-2021 13:48*
Surr: Dibromofluoromethane	*97.3*			**0**	*80-119*	*%REC*	*500*	*11-Feb-2021 13:48*
Surr: Toluene-d8	*104*			**0**	*89-112*	*%REC*	*500*	*11-Feb-2021 13:48*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	22-Feb-2021 17:39

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 22-Feb-21

Client:	Aptim Environmental & Infrastucture, Inc.	**ANALYTICAL REPORT**
Project:	Longhorn Army Ammunition Plant LHAAP 16 January 2021	WorkOrder:HS21020193
Sample ID:	16EW06-210202	Lab ID:HS21020193-09
Collection Date:	02-Feb-2021 13:45	Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	500	U	150	500	500	ug/L	500	11-Feb-2021 14:09
1,1-Dichloroethene	250	U	100	250	500	ug/L	500	11-Feb-2021 14:09
1,2-Dichloroethane	250	U	100	250	500	ug/L	500	11-Feb-2021 14:09
cis-1,2-Dichloroethene	**400**	J	**100**	**250**	**500**	**ug/L**	500	11-Feb-2021 14:09
Methylene chloride	1,000	U	200	1000	1000	ug/L	500	11-Feb-2021 14:09
Trichloroethene	250	U	100	250	500	ug/L	500	11-Feb-2021 14:09
Vinyl chloride	**250**	J	**100**	**250**	**500**	**ug/L**	500	11-Feb-2021 14:09
Surr: 1,2-Dichloroethane-d4	*113*			**0**	*81-118*	*%REC*	*500*	*11-Feb-2021 14:09*
Surr: 4-Bromofluorobenzene	*94.6*			**0**	*85-114*	*%REC*	*500*	*11-Feb-2021 14:09*
Surr: Dibromofluoromethane	*96.0*			**0**	*80-119*	*%REC*	*500*	*11-Feb-2021 14:09*
Surr: Toluene-d8	*103*			**0**	*89-112*	*%REC*	*500*	*11-Feb-2021 14:09*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	22-Feb-2021 17:39

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 22-Feb-21

Client:	Aptim Environmental & Infrastucture, Inc.	**ANALYTICAL REPORT**
Project:	Longhorn Army Ammunition Plant LHAAP 16 January 2021	WorkOrder:HS21020193
Sample ID:	16EW06-210202-FD	Lab ID:HS21020193-10
Collection Date:	02-Feb-2021 13:45	Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	500	U	150	500	500	ug/L	500	11-Feb-2021 14:30
1,1-Dichloroethene	250	U	100	250	500	ug/L	500	11-Feb-2021 14:30
1,2-Dichloroethane	250	U	100	250	500	ug/L	500	11-Feb-2021 14:30
cis-1,2-Dichloroethene	**520**		**100**	**250**	**500**	**ug/L**	500	11-Feb-2021 14:30
Methylene chloride	1,000	U	200	1000	1000	ug/L	500	11-Feb-2021 14:30
Trichloroethene	250	U	100	250	500	ug/L	500	11-Feb-2021 14:30
Vinyl chloride	**240**	J	**100**	**250**	**500**	**ug/L**	500	11-Feb-2021 14:30
Surr: 1,2-Dichloroethane-d4	*117*			**0**	*81-118*	*%REC*	*500*	*11-Feb-2021 14:30*
Surr: 4-Bromofluorobenzene	*98.9*			**0**	*85-114*	*%REC*	*500*	*11-Feb-2021 14:30*
Surr: Dibromofluoromethane	*98.7*			**0**	*80-119*	*%REC*	*500*	*11-Feb-2021 14:30*
Surr: Toluene-d8	*103*			**0**	*89-112*	*%REC*	*500*	*11-Feb-2021 14:30*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	22-Feb-2021 17:39

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 22-Feb-21

Client:	Aptim Environmental & Infrastucture, Inc.	**ANALYTICAL REPORT**
Project:	Longhorn Army Ammunition Plant LHAAP 16 January 2021	WorkOrder:HS21020193
Sample ID:	Trip Blank - 210202	Lab ID:HS21020193-11
Collection Date:	02-Feb-2021 00:00	Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	08-Feb-2021 14:55
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	08-Feb-2021 14:55
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	08-Feb-2021 14:55
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	08-Feb-2021 14:55
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	08-Feb-2021 14:55
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	08-Feb-2021 14:55
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	08-Feb-2021 14:55
Surr: 1,2-Dichloroethane-d4	*111*			**0**	*81-118*	*%REC*	*1*	*08-Feb-2021 14:55*
Surr: 4-Bromofluorobenzene	*101*			**0**	*85-114*	*%REC*	*1*	*08-Feb-2021 14:55*
Surr: Dibromofluoromethane	*95.4*			**0**	*80-119*	*%REC*	*1*	*08-Feb-2021 14:55*
Surr: Toluene-d8	*105*			**0**	*89-112*	*%REC*	*1*	*08-Feb-2021 14:55*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 22-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 January 2021
WorkOrder: HS21020193

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R377575 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS21020193-01	16PM14-210202	02 Feb 2021 07:45			05 Feb 2021 00:59	100
HS21020193-01	16PM14-210202	02 Feb 2021 07:45			05 Feb 2021 00:38	10
HS21020193-02	16PM06-210202	02 Feb 2021 08:30			05 Feb 2021 01:41	250
HS21020193-02	16PM06-210202	02 Feb 2021 08:30			05 Feb 2021 01:20	25
Batch ID: R377708 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS21020193-11	Trip Blank - 210202	02 Feb 2021 00:00			08 Feb 2021 14:55	1
Batch ID: R377708 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS21020193-03	16RW10-210202	02 Feb 2021 09:15			08 Feb 2021 21:14	100
HS21020193-03	16RW10-210202	02 Feb 2021 09:15			08 Feb 2021 20:53	10
HS21020193-05	16EW04-210202	02 Feb 2021 10:45			08 Feb 2021 21:56	100
HS21020193-05	16EW04-210202	02 Feb 2021 10:45			08 Feb 2021 21:35	10
HS21020193-06	16EW08-210202	02 Feb 2021 11:30			08 Feb 2021 20:32	1
Batch ID: R378003 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS21020193-04	16RW09-210202	02 Feb 2021 10:00			11 Feb 2021 15:54	5
HS21020193-07	16EW03-210202	02 Feb 2021 12:15			11 Feb 2021 15:33	25
HS21020193-07	16EW03-210202	02 Feb 2021 12:15			11 Feb 2021 15:12	5
HS21020193-08	16EW07-210202	02 Feb 2021 13:00			11 Feb 2021 13:48	500
HS21020193-09	16EW06-210202	02 Feb 2021 13:45			11 Feb 2021 14:09	500
HS21020193-10	16EW06-210202-FD	02 Feb 2021 13:45			11 Feb 2021 14:30	500
Batch ID: R378155 (0)	**Test Name :** SUBCONTRACT ANALYSIS - TOC ANALYSIS				**Matrix:** Groundwater	
HS21020193-01	16PM14-210202	02 Feb 2021 07:45			17 Feb 2021 09:31	1
HS21020193-02	16PM06-210202	02 Feb 2021 08:30			17 Feb 2021 09:31	1
HS21020193-03	16RW10-210202	02 Feb 2021 09:15			17 Feb 2021 09:31	1
HS21020193-04	16RW09-210202	02 Feb 2021 10:00			17 Feb 2021 09:31	1
HS21020193-06	16EW08-210202	02 Feb 2021 11:30			17 Feb 2021 09:31	1
Batch ID: R378283 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Groundwater	
HS21020193-01	16PM14-210202	02 Feb 2021 07:45			20 Feb 2021 06:21	50
HS21020193-02	16PM06-210202	02 Feb 2021 08:30			20 Feb 2021 06:39	50
HS21020193-03	16RW10-210202	02 Feb 2021 09:15			20 Feb 2021 06:58	10
HS21020193-04	16RW09-210202	02 Feb 2021 10:00			20 Feb 2021 07:16	10
HS21020193-06	16EW08-210202	02 Feb 2021 11:30			20 Feb 2021 07:34	10

ALS Houston, US Date: 22-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 January 2021
WorkOrder: HS21020193

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R378409 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** Groundwater	
HS21020193-01	16PM14-210202	02 Feb 2021 07:45			22 Feb 2021 17:39	1
HS21020193-02	16PM06-210202	02 Feb 2021 08:30			22 Feb 2021 17:39	1
HS21020193-03	16RW10-210202	02 Feb 2021 09:15			22 Feb 2021 17:39	1
HS21020193-04	16RW09-210202	02 Feb 2021 10:00			22 Feb 2021 17:39	1
HS21020193-05	16EW04-210202	02 Feb 2021 10:45			22 Feb 2021 17:39	1
HS21020193-06	16EW08-210202	02 Feb 2021 11:30			22 Feb 2021 17:39	1
HS21020193-07	16EW03-210202	02 Feb 2021 12:15			22 Feb 2021 17:39	1
HS21020193-08	16EW07-210202	02 Feb 2021 13:00			22 Feb 2021 17:39	1
HS21020193-09	16EW06-210202	02 Feb 2021 13:45			22 Feb 2021 17:39	1
HS21020193-10	16EW06-210202-FD	02 Feb 2021 13:45			22 Feb 2021 17:39	1

ALS Houston, US Date: 22-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 January 2021
WorkOrder: HS21020193

QC BATCH REPORT

Batch ID: R377575 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-210204** Units: **ug/L** Analysis Date: **04-Feb-2021 17:37**
Client ID: Run ID: **VOA6_377575** SeqNo: **5945452** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	1.0	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
Methylene chloride	2.0	2.0								U
Trichloroethene	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*42.31*	*1.0*	*50*	*0*	*84.6*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.68*	*1.0*	*50*	*0*	*101*	*85 - 114*				
Surr: Dibromofluoromethane	*45.63*	*1.0*	*50*	*0*	*91.3*	*80 - 119*				
Surr: Toluene-d8	*48.94*	*1.0*	*50*	*0*	*97.9*	*89 - 112*				

LCS Sample ID: **VLCSW-210204** Units: **ug/L** Analysis Date: **04-Feb-2021 17:58**
Client ID: Run ID: **VOA6_377575** SeqNo: **5945453** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	20.61	1.0	20	0	103	80 - 119				
1,1-Dichloroethene	14.21	1.0	20	0	71.1	71 - 131				
1,2-Dichloroethane	19.85	1.0	20	0	99.2	73 - 128				
cis-1,2-Dichloroethene	20.72	1.0	20	0	104	78 - 123				
Methylene chloride	19.52	2.0	20	0	97.6	74 - 124				
Trichloroethene	21.57	1.0	20	0	108	79 - 123				
Vinyl chloride	15.72	1.0	20	0	78.6	58 - 137				
Surr: 1,2-Dichloroethane-d4	*48.85*	*1.0*	*50*	*0*	*97.7*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*52.67*	*1.0*	*50*	*0*	*105*	*85 - 114*				
Surr: Dibromofluoromethane	*50*	*1.0*	*50*	*0*	*100.0*	*80 - 119*				
Surr: Toluene-d8	*48.1*	*1.0*	*50*	*0*	*96.2*	*89 - 112*				

ALS Houston, US Date: 22-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 January 2021
WorkOrder: HS21020193

QC BATCH REPORT

Batch ID: R377575 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS21011150-06MS** Units: **ug/L** Analysis Date: **04-Feb-2021 21:07**
Client ID: Run ID: **VOA6_377575** SeqNo: **5945462** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	19.77	1.0	20	0	98.9	80 - 119				
1,1-Dichloroethene	19.06	1.0	20	5.861	66.0	71 - 131				S
1,2-Dichloroethane	27	1.0	20	5.76	106	73 - 128				
cis-1,2-Dichloroethene	19.32	1.0	20	1.34	89.9	78 - 123				
Methylene chloride	17.05	2.0	20	0	85.3	74 - 124				
Trichloroethene	707.7	1.0	20	763.7	-280	79 - 123				SEO
Vinyl chloride	8.879	1.0	20	0	44.4	58 - 137				S
Surr: 1,2-Dichloroethane-d4	*45.24*	*1.0*	*50*	*0*	*90.5*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*56.59*	*1.0*	*50*	*0*	*113*	*85 - 114*				
Surr: Dibromofluoromethane	*47.37*	*1.0*	*50*	*0*	*94.7*	*80 - 119*				
Surr: Toluene-d8	*50.76*	*1.0*	*50*	*0*	*102*	*89 - 112*				

MSD Sample ID: **HS21011150-06MSD** Units: **ug/L** Analysis Date: **04-Feb-2021 21:28**
Client ID: Run ID: **VOA6_377575** SeqNo: **5945463** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	21.49	1.0	20	0	107	80 - 119	19.77	8.31	20	
1,1-Dichloroethene	23.16	1.0	20	5.861	86.5	71 - 131	19.06	19.4	20	
1,2-Dichloroethane	27.4	1.0	20	5.76	108	73 - 128	27	1.45	20	
cis-1,2-Dichloroethene	18.59	1.0	20	1.34	86.2	78 - 123	19.32	3.86	20	
Methylene chloride	15.65	2.0	20	0	78.3	74 - 124	17.05	8.56	20	
Trichloroethene	812	1.0	20	763.7	242	79 - 123	707.7	13.7	20	SEO
Vinyl chloride	12.58	1.0	20	0	62.9	58 - 137	8.879	34.5	20	R
Surr: 1,2-Dichloroethane-d4	*58.23*	*1.0*	*50*	*0*	*116*	*81 - 118*	*45.24*	*25.1*	*20*	R
Surr: 4-Bromofluorobenzene	*58.88*	*1.0*	*50*	*0*	*118*	*85 - 114*	*56.59*	*3.97*	*20*	S
Surr: Dibromofluoromethane	*49.62*	*1.0*	*50*	*0*	*99.2*	*80 - 119*	*47.37*	*4.64*	*20*	
Surr: Toluene-d8	*49.63*	*1.0*	*50*	*0*	*99.3*	*89 - 112*	*50.76*	*2.26*	*20*	

The following samples were analyzed in this batch: HS21020193-01 HS21020193-02

ALS Houston, US Date: 22-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 January 2021
WorkOrder: HS21020193

QC BATCH REPORT

Batch ID: R377708 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-210208** Units: **ug/L** Analysis Date: **08-Feb-2021 13:51**
Client ID: Run ID: **VOA6_377708** SeqNo: **5949509** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	1.0	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
Methylene chloride	2.0	2.0								U
Trichloroethene	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*57.71*	*1.0*	*50*	*0*	*115*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.31*	*1.0*	*50*	*0*	*101*	*85 - 114*				
Surr: Dibromofluoromethane	*48.11*	*1.0*	*50*	*0*	*96.2*	*80 - 119*				
Surr: Toluene-d8	*52.48*	*1.0*	*50*	*0*	*105*	*89 - 112*				

LCS Sample ID: **VLCSW-210208** Units: **ug/L** Analysis Date: **08-Feb-2021 13:09**
Client ID: Run ID: **VOA6_377708** SeqNo: **5949508** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	21.01	1.0	20	0	105	80 - 119				
1,1-Dichloroethene	20.42	1.0	20	0	102	71 - 131				
1,2-Dichloroethane	24.55	1.0	20	0	123	73 - 128				
cis-1,2-Dichloroethene	19.44	1.0	20	0	97.2	78 - 123				
Methylene chloride	17.63	2.0	20	0	88.1	74 - 124				
Trichloroethene	19.9	1.0	20	0	99.5	79 - 123				
Vinyl chloride	21.38	1.0	20	0	107	58 - 137				
Surr: 1,2-Dichloroethane-d4	*58.89*	*1.0*	*50*	*0*	*118*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*52.64*	*1.0*	*50*	*0*	*105*	*85 - 114*				
Surr: Dibromofluoromethane	*51.17*	*1.0*	*50*	*0*	*102*	*80 - 119*				
Surr: Toluene-d8	*47.56*	*1.0*	*50*	*0*	*95.1*	*89 - 112*				

ALS Houston, US Date: 22-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 January 2021
WorkOrder: HS21020193

QC BATCH REPORT

Batch ID: R377708 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS21020268-05MS** Units: **ug/L** Analysis Date: **08-Feb-2021 16:40**
Client ID: Run ID: **VOA6_377708** SeqNo: **5949517** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	18.71	1.0	20	0	93.5	80 - 119				
1,1-Dichloroethene	19	1.0	20	0.8417	90.8	71 - 131				
1,2-Dichloroethane	21.85	1.0	20	0.7247	106	73 - 128				
cis-1,2-Dichloroethene	55.15	1.0	20	36.73	92.1	78 - 123				
Methylene chloride	14.4	2.0	20	0	72.0	74 - 124				S
Trichloroethene	412.6	1.0	20	375.3	187	79 - 123				SEO
Vinyl chloride	14.71	1.0	20	2.001	63.6	58 - 137				
Surr: 1,2-Dichloroethane-d4	*56.69*	*1.0*	*50*	*0*	*113*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*51.13*	*1.0*	*50*	*0*	*102*	*85 - 114*				
Surr: Dibromofluoromethane	*47.81*	*1.0*	*50*	*0*	*95.6*	*80 - 119*				
Surr: Toluene-d8	*50.18*	*1.0*	*50*	*0*	*100*	*89 - 112*				

MSD Sample ID: **HS21020268-05MSD** Units: **ug/L** Analysis Date: **08-Feb-2021 17:01**
Client ID: Run ID: **VOA6_377708** SeqNo: **5949518** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	19.66	1.0	20	0	98.3	80 - 119	18.71	4.99	20	
1,1-Dichloroethene	18	1.0	20	0.8417	85.8	71 - 131	19	5.42	20	
1,2-Dichloroethane	21.99	1.0	20	0.7247	106	73 - 128	21.85	0.62	20	
cis-1,2-Dichloroethene	54.58	1.0	20	36.73	89.3	78 - 123	55.15	1.03	20	
Methylene chloride	13.89	2.0	20	0	69.5	74 - 124	14.4	3.56	20	S
Trichloroethene	394.4	1.0	20	375.3	95.8	79 - 123	412.6	4.49	20	EO
Vinyl chloride	13.85	1.0	20	2.001	59.3	58 - 137	14.71	6.02	20	
Surr: 1,2-Dichloroethane-d4	*58.53*	*1.0*	*50*	*0*	*117*	*81 - 118*	*56.69*	*3.2*	*20*	
Surr: 4-Bromofluorobenzene	*52.76*	*1.0*	*50*	*0*	*106*	*85 - 114*	*51.13*	*3.14*	*20*	
Surr: Dibromofluoromethane	*48.55*	*1.0*	*50*	*0*	*97.1*	*80 - 119*	*47.81*	*1.52*	*20*	
Surr: Toluene-d8	*51.38*	*1.0*	*50*	*0*	*103*	*89 - 112*	*50.18*	*2.36*	*20*	

The following samples were analyzed in this batch: HS21020193-03 HS21020193-05 HS21020193-06 HS21020193-11

ALS Houston, US Date: 22-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 January 2021
WorkOrder: HS21020193

QC BATCH REPORT

Batch ID: R378003 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-210211** Units: **ug/L** Analysis Date: **11-Feb-2021 13:06**
Client ID: Run ID: **VOA6_378003** SeqNo: **5955152** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	1.0	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
Methylene chloride	2.0	2.0								U
Trichloroethene	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*53.42*	*1.0*	*50*	*0*	*107*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*49.65*	*1.0*	*50*	*0*	*99.3*	*85 - 114*				
Surr: Dibromofluoromethane	*47.55*	*1.0*	*50*	*0*	*95.1*	*80 - 119*				
Surr: Toluene-d8	*52.54*	*1.0*	*50*	*0*	*105*	*89 - 112*				

LCS Sample ID: **VLCSW-210211** Units: **ug/L** Analysis Date: **11-Feb-2021 12:24**
Client ID: Run ID: **VOA6_378003** SeqNo: **5955151** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	20.26	1.0	20	0	101	80 - 119				
1,1-Dichloroethene	18.4	1.0	20	0	92.0	71 - 131				
1,2-Dichloroethane	22.77	1.0	20	0	114	73 - 128				
cis-1,2-Dichloroethene	17.09	1.0	20	0	85.5	78 - 123				
Methylene chloride	14.85	2.0	20	0	74.3	74 - 124				
Trichloroethene	19.54	1.0	20	0	97.7	79 - 123				
Vinyl chloride	18.44	1.0	20	0	92.2	58 - 137				
Surr: 1,2-Dichloroethane-d4	*56.72*	*1.0*	*50*	*0*	*113*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*49.59*	*1.0*	*50*	*0*	*99.2*	*85 - 114*				
Surr: Dibromofluoromethane	*47.83*	*1.0*	*50*	*0*	*95.7*	*80 - 119*				
Surr: Toluene-d8	*45.43*	*1.0*	*50*	*0*	*90.9*	*89 - 112*				

ALS Houston, US Date: 22-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 January 2021
WorkOrder: HS21020193

QC BATCH REPORT

Batch ID: R378003 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS21020441-02MS** Units: **ug/L** Analysis Date: **11-Feb-2021 18:22**
Client ID: Run ID: **VOA6_378003** SeqNo: **5955167** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	19.24	1.0	20	0	96.2	80 - 119				
1,1-Dichloroethene	17.55	1.0	20	0	87.8	71 - 131				
1,2-Dichloroethane	20.4	1.0	20	0	102	73 - 128				
cis-1,2-Dichloroethene	20.09	1.0	20	0	100	78 - 123				
Methylene chloride	16.4	2.0	20	0	82.0	74 - 124				
Trichloroethene	19.96	1.0	20	0	99.8	79 - 123				
Vinyl chloride	12.45	1.0	20	0	62.3	58 - 137				
Surr: 1,2-Dichloroethane-d4	*54.35*	*1.0*	*50*	*0*	*109*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*53.68*	*1.0*	*50*	*0*	*107*	*85 - 114*				
Surr: Dibromofluoromethane	*46.81*	*1.0*	*50*	*0*	*93.6*	*80 - 119*				
Surr: Toluene-d8	*50.34*	*1.0*	*50*	*0*	*101*	*89 - 112*				

MSD Sample ID: **HS21020441-02MSD** Units: **ug/L** Analysis Date: **11-Feb-2021 18:43**
Client ID: Run ID: **VOA6_378003** SeqNo: **5955168** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	20	1.0	20	0	100	80 - 119	19.24	3.89	20	
1,1-Dichloroethene	17.72	1.0	20	0	88.6	71 - 131	17.55	0.941	20	
1,2-Dichloroethane	20.96	1.0	20	0	105	73 - 128	20.4	2.72	20	
cis-1,2-Dichloroethene	17.26	1.0	20	0	86.3	78 - 123	20.09	15.2	20	
Methylene chloride	16.82	2.0	20	0	84.1	74 - 124	16.4	2.51	20	
Trichloroethene	18.32	1.0	20	0	91.6	79 - 123	19.96	8.56	20	
Vinyl chloride	11.99	1.0	20	0	59.9	58 - 137	12.45	3.81	20	
Surr: 1,2-Dichloroethane-d4	*54.68*	*1.0*	*50*	*0*	*109*	*81 - 118*	*54.35*	*0.607*	*20*	
Surr: 4-Bromofluorobenzene	*49.48*	*1.0*	*50*	*0*	*99.0*	*85 - 114*	*53.68*	*8.15*	*20*	
Surr: Dibromofluoromethane	*48.05*	*1.0*	*50*	*0*	*96.1*	*80 - 119*	*46.81*	*2.62*	*20*	
Surr: Toluene-d8	*50.95*	*1.0*	*50*	*0*	*102*	*89 - 112*	*50.34*	*1.21*	*20*	

The following samples were analyzed in this batch: HS21020193-04 HS21020193-07 HS21020193-08 HS21020193-09 HS21020193-10

ALS Houston, US Date: 22-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 January 2021
WorkOrder: HS21020193

QC BATCH REPORT

Batch ID: R378283 (0) **Instrument:** ICS-Integrion **Method:** ANIONS BY SW9056A

MBLK Sample ID: **MBLK-** Units: **mg/L** Analysis Date: **19-Feb-2021 16:08**
Client ID: Run ID: **ICS-Integrion_378283** SeqNo: **5961010** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	0.100	0.100								U

LCS Sample ID: **LCS-** Units: **mg/L** Analysis Date: **19-Feb-2021 16:26**
Client ID: Run ID: **ICS-Integrion_378283** SeqNo: **5961011** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.94	0.100	4	0	98.5	80 - 120				

MS Sample ID: **HS21020464-01MS** Units: **mg/L** Analysis Date: **19-Feb-2021 20:40**
Client ID: Run ID: **ICS-Integrion_378283** SeqNo: **5961019** PrepDate: DF: **20**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	41.01	2.00	40	3.222	94.5	80 - 120				

MS Sample ID: **HS21020268-05MS** Units: **mg/L** Analysis Date: **20-Feb-2021 10:17**
Client ID: Run ID: **ICS-Integrion_378283** SeqNo: **5961036** PrepDate: DF: **20**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	46.46	2.00	40	8.444	95.0	80 - 120				

MSD Sample ID: **HS21020464-01MSD** Units: **mg/L** Analysis Date: **19-Feb-2021 20:59**
Client ID: Run ID: **ICS-Integrion_378283** SeqNo: **5961020** PrepDate: DF: **20**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	40.32	2.00	40	3.222	92.8	80 - 120	41.01	1.69	20	

MSD Sample ID: **HS21020268-05MSD** Units: **mg/L** Analysis Date: **20-Feb-2021 10:36**
Client ID: Run ID: **ICS-Integrion_378283** SeqNo: **5961037** PrepDate: DF: **20**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	46.56	2.00	40	8.444	95.3	80 - 120	46.46	0.224	20	

The following samples were analyzed in this batch: HS21020193-01 HS21020193-02 HS21020193-03 HS21020193-04 HS21020193-06

ALS Houston, US Date: 22-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 January 2021
WorkOrder: **HS21020193**

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	20-030-0	26-Mar-2021
California	2919, 2020-2021	30-Apr-2021
Dept of Defense	PJLA L20-507	22-Dec-2021
Florida	E87611-30-07/01/2020	30-Jun-2021
Illinois	2000322020-4	09-May-2021
Kansas	E-10352 2020-2021	31-Jul-2021
Kentucky	123043, 2020-2021	30-Apr-2021
Louisiana	03087, 2020-2021	30-Jun-2021
North Carolina	624-2021	31-Dec-2021
North Dakota	R-193 2020-2021	30-Apr-2021
Oklahoma	2020-165	31-Aug-2021
Texas	T104704231-20-26	30-Apr-2021

ALS Houston, US Date: 22-Feb-21

Sample Receipt Checklist

Work Order ID: HS21020193 **Date/Time Received:** **03-Feb-2021 09:30**

Client Name: CBI-Houston **Received by:** **Nilesh D. Ranchod**

Completed By: /S/ Jared R. Makan (eSignature) 03-Feb-2021 23:54 (Date/Time) **Reviewed by:** /S/ RJ Modashia (eSignature) 04-Feb-2021 11:17 (Date/Time)

Matrices: **Water** Carrier name: **FedEx Priority Overnight**

	Yes	No	
Shipping container/cooler in good condition?	☑	☐	Not Present ☐
Custody seals intact on shipping container/cooler?	☑	☐	Not Present ☐
Custody seals intact on sample bottles?	☐	☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	☐	☐	Not Present ☑
Chain of custody present?	☑	☐	2 Page(s)
Chain of custody signed when relinquished and received?	☑	☐	
Samplers name present on COC?	☑	☐	
Chain of custody agrees with sample labels?	☑	☐	
Samples in proper container/bottle?	☑	☐	
Sample containers intact?	☐	☑	
Sufficient sample volume for indicated test?	☑	☐	
All samples received within holding time?	☑	☐	
Container/Temp Blank temperature in compliance?	☑	☐	

Temperature(s)/Thermometer(s): 1.2°C UC/C IR31

Cooler(s)/Kit(s): 46596

Date/Time sample(s) sent to storage: 02/03/2021 21:55

	Yes	No	
Water - VOA vials have zero headspace?	☐	☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	☑	☐	N/A ☐
pH adjusted?	☐	☑	N/A ☐

pH adjusted by:

Login Notes: One of the two vials received for the Trip Blank was received broken.

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 Modashin

Project: APTIM
LONGHORN ARMY AMMN. PLANT (LHAAP)
GROUNDWATER TREATMENT PLANT (GWTP)
KARNACK, TEXAS

Project No. 501032

Job: **LHAAP 16 January 2021**

Prepared By: Scott Bressinger

P.O. Number

Field Sample I.D. Time	Sample Matrix	Date /	MS / MSD	No. OF CONTAINERS	VOC by SW 8260B	TOC by SM5310C	MEE by RSK 175	Anions (bromide, sulfate, nitrate) by SW9056 and Alkalinity by SM2320	Bromide by SW9056	Perchlorate by SW6850	Metals (arsenic, chromium, manganese, nickel, thallium) by SW6020				Remarks (Preservatives, etc.)	Lab I.D.#
16PM14-210202	WG	2/2/21/ 0745		7	X	X			X	X						
16PM06-210202	WG	2/2/21/ 0830		7	X	X			X	X						
16RW10-210202	WG	2/2/21/ 0915		7	X	X			X	X						
16RW09-210202	WG	2/2/21/ 1000		7	X	X			X	X						
16EW04-210202	WG	2/2/21/ 1045		4	X					X						
16EW08-210202	WG	2/2/21/ 1130		7	X	X			X	X						
16EW03-210202	WG	2/2/21/ 1215		4	X					X						
16EW07-210202	WG	2/2/21/ 1300		4	X					X						

Additional Remarks: Standard TAT on all parameters. Please email results to Susan.Huang@aptim.com and invoices to fedinvoices@aptim.com

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Bressinger	2/2/21	1430	[illegible]	2/3/21	0923						

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition

Remarks:

HS21020193

Aptim Environmental & Infrastucture, Inc.
Longhorn Army Ammunition Plant LHAAP 16 Januar

(Word) S:\1-cos\Forms\Chain of Custody - BiWeekly

CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd. Suite 210 Houston, TX. 77099 (281) 530-5656 ATTN: R.J Modashia

Project: APTIM
LONGHORN ARMY AMMN. PLANT (LHAAP)
GROUNDWATER TREATMENT PLANT (GWTP)
KARNACK, TEXAS

Project No. 501032

Job: **LHAAP 16 January 2021**

Prepared By: Scott Beesinger

P.O. Number

Field Sample I.D. Time	Sample Matrix	Date /	MS / MSD	No. OF CONTAINERS	VOC by SW 8260B	TOC by SM5310C	MEE by RSK 175	Anions (bromide, sulfate, nitrate) by SW9056 and Alkalinity by SM2320	Bromide by SW9056	Perchlorate by SW6850	Metals (arsenic, chromium, manganese, nickel, thallium) by SW6020				Remarks (Preservatives, etc.)	Lab I.D.#
16EW06-210202	WG	2/2/21/1345		4	X					X						
16EW06-210202-FD	WG	2/2/21/1345		4	X					X						
TRIP BLANK-210202	W	2/2/21		2	X											

Additional Remarks: Standard TAT on all parameters. Please email results to Susan.Huang@aptim.com and invoices to fedinvoices@aptim.com

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	2/2/21	1430	[illegible]	2/3/21	[illegible]						

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition

Remarks:

HS21020193

Aptim Environmental & Infrastucture, Inc.
Longhorn Army Ammunition Plant LHAAP 16 Januar

(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

46596

CUSTODY SEAL

Date: 2/3/21 Time: 1730
Name: Scott Beesinger
Company: BHATA

Seal Broken By: SM
Date: 02/03/21

46596 FED 0 3 202

Must Deliver Next Business Day
Time and Tempature Sensitive!

46596

ORIGIN ID:SGRA (903) 930-6193
SCOTT BEESINGER
APTIM
1203-B EAST GRAND AVE.
PMB202
MARSHALL, TX 75670
UNITED STATES US

SHIP DATE: 10SEP20
ACTWGT: 1.00 LB MAN
CAD: 300130/CAFE3211
DIMS: 19x16x13 IN

TO CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099
(281) 530-5656
REF: LHAAP 16-BO 73884-RJ
RMA:

FedEx Express

FedEx
TRK# 0221 1891 8880 4543

WED - 03 FEB AA
PRIORITY OVERNIGHT

AB SGRA

77099
TX-US
IAH

FIN: 167785 02Feb2021 GGGA 560G1/B698/1023

February 22, 2021

Service Request No:E2100145

RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Suite 210
Houston, TX 77099-4338

Laboratory Results for: HS21020193

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory February 04, 2021
For your reference, these analyses have been assigned our service request number **E2100145.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current TNI standards, where applicable, and except as noted in the laboratory case narrative provided. All results are intended to be considered in their entirety and ALS Environmental is not responsible for use of less than the complete final report. Results apply only to the items submitted to the laboratory, as received for analysis. In accordance with the current TNI Standard, a statement on the estimated uncertainty of measurement of any quantitative analysis will be supplied upon request.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Corey Grandits
Project Manager

ADDRESS 10450 Stancliff Rd., Suite 210, Houston, TX 77099
PHONE +1 281 530 5656 | FAX +1 281 530 5887
ALS Group USA, Corp.
dba ALS Environmental

Certificate of Analysis

ALS Environmental - Houston HRMS
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

ALS Environmental

Client:	ALS Houston	**Service Request No.:**	E2100145
Project:	HS21020193	**Date Received:**	02/04/21
Sample Matrix:	W		

CASE NARRATIVE

All analyses were performed in adherence to the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier II. When appropriate to the method, method blank results have been reported with each analytical test.

Sample Receipt

Ten samples were received for analysis at ALS Environmental in Houston on 02/04/21.

The samples were received in good condition and are consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

Data Validation Notes and Discussion

Precision and Accuracy:

EQ2100068: Laboratory Control Spike/Duplicate Laboratory Control Spike (LCS/DLCS) samples were analyzed and reported in addition to a MS/MSD for this extraction batch. The LCS and DLCS RDP exceeded the upper control limit, the individual recoveries are within QC limits. MS/MSD performed on an unrelated sample.

EQ2100069: Laboratory Control Spike/Duplicate Laboratory Control Spike (LCS/DLCS) samples were analyzed and reported in lieu of a MS/MSD for this extraction batch. The LCS and DLCS recoveries are within QC limits.

Samples E2100145-001/002/004/005/007; lowest practical dilution performed due to matrix interference.

DoD Certification is held for the method/matrix/analytes provided in this report.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.

Use of ALS group USA Corp dba ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.

Client: ALS Environmental - US **Service Request:**E2100145
Project: HS21020193

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
E2100145-001	16PM14-210202	2/2/2021	0745
E2100145-002	16PM06-210202	2/2/2021	0830
E2100145-003	16RW10-210202	2/2/2021	0915
E2100145-004	16RW09-210202	2/2/2021	1000
E2100145-005	16EW04-210202	2/2/2021	1045
E2100145-006	16EW08-210202	2/2/2021	1130
E2100145-007	16EW03-210202	2/2/2021	1215
E2100145-008	16EW07-210202	2/2/2021	1300
E2100145-009	16EW06-210202	2/2/2021	1345
E2100145-010	16EW06-210202-FD	2/2/2021	1345

Service Request Summary

Folder #: **E2100145**
Client Name: ALS Environmental - US
Project Name: HS21020193
Project Number:

Report To: RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Houston, TX 77099-4338
USA
Phone Number: 281-530-5656
Cell Number:
Fax Number: 281-530-5887
E-mail: rj.modashia@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 02/04/21
Internal Due Date: 2/17/2021
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS21020193
EDD: No EDD Specified

10 125 mL-Plastic Bottle Plastic
Location: EHRMS-WIC 4B
Pressure Gas:

Lab Samp No.	Client Samp No	Matrix	Collected	HOUSTON CIO4 DOD/6850
E2100145-001	16PM14-210202	Water	02/02/21 0745	**IV**
E2100145-002	16PM06-210202	Water	02/02/21 0830	**IV**
E2100145-003	16RW10-210202	Water	02/02/21 0915	**IV**
E2100145-004	16RW09-210202	Water	02/02/21 1000	**IV**
E2100145-005	16EW04-210202	Water	02/02/21 1045	**IV**
E2100145-006	16EW08-210202	Water	02/02/21 1130	**IV**
E2100145-007	16EW03-210202	Water	02/02/21 1215	**IV**
E2100145-008	16EW07-210202	Misc. Solid	02/02/21 1300	**IV**
E2100145-009	16EW06-210202	Misc. Solid	02/02/21 1345	**IV**
E2100145-010	16EW06-210202-FD	Misc. Solid	02/02/21 1345	**IV**

Service Request Summary

Folder #:	**E2100145**	Project Chemist:	Corey Grandits
Client Name:	ALS Environmental - US	Originating Lab:	HOUSTON
Project Name:	HS21020193	Logged By:	CGRANDITS
Project Number:		Date Received:	02/04/21
		Internal Due Date:	2/17/2021
Report To:	RJ Modashia	QAP:	LAB QAP
	ALS Laboratory Group	Qualifier Set:	Lab Standard
	10450 Stancliff Road	Formset:	Lab Standard
	Houston, TX 77099-4338 USA	Merged?:	Y
Phone Number:	281-530-5656	Report to MDL?:	Y
Cell Number:		P.O. Number:	HS21020193
Fax Number:	281-530-5887	EDD:	No EDD Specified
E-mail:	rj.modashia@alsglobal.com		

10 125 mL-Plastic Bottle Plastic

Location: EHRMS-WIC 4B

Pressure Gas:

Test Comments:

Group	Test/Method	Samples	Comments
Semivoa GCMS	ClO4 DOD/6850	10	Level II due 2/17, IV due 2/24

Data Qualifiers

Lab Standard

+	Possible Tedlar bag artifact.
A	TIC is a suspected aldol-condensation product
B	Analyte found in the associated method blank as well as in the sample.
BC	Reported results are not blank corrected.
BH	The back section of the tube yielded higher results than the front.
BT	Results indicated possible breakthrough; back section >=10% front section.
C	Result identification confirmed.
D	Compound identified in an analysis at a secondary dilution factor
D	Spike was diluted out
DE	Reported results are corrected for desorption efficiency.
E	Estimated value. Concentration above calibration range
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
H1	Sample analysis performed past holding time. See case narrative.
H2	Initial analysis within holding time. Reanalysis for the required dilution was past holding time.
H3	Sample was received and analyzed past holding time.
H4	Sample was extracted past required extraction holding time, but analyzed within analysis holding time. See case narrative.
I	Internal standard not within the specified limits. See case narrative.
J	Estimated Value. Concentration found below MRL.
K	A deflection in the QC ion may indicate interference with the quantitation of this ion. The concentration of this analyte should be considered as an estimate.
K	Analyte was detected above the method reporting limit prior to normalization.
K	The reference ion ratio was outside acceptance criteria, which may indicate a potential bias to this result.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
L1	Laboratory control sample recovery outside the specified limits; results may be biased high.
L2	Laboratory control sample recovery outside the specified limits; results may be biased low.
L3	Laboratory control sample recovery outside the specified limits.
M	Matrix interference; results may be biased high.
M	The duplicate injection precision not met.
M1	Matrix interference due to coelution with a non-target compound; results may be biased high.
N	Presumptive evidence of a compound for TICs that have been identified based on a mass spectral library search.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.

Data Qualifiers

Lab Standard

O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
P	Indicates chlorodiphenyl ether interference present at the retention time of the target compound.
P	Pesticide/Aroclor target analyte > 40% difference for detected concentrations between GC columns
Q	Indicates as estimated value because the P and P + 2 theoretical abundance ratio does not meet method criteria.
R	Duplicate Precision not met.
R1	Duplicate precision not within the specified limits; however, the results are below the MRL and considered estimated.
S	Surrogate recovery not within specified limits.
S	The reported value was determined by the Method of Standard Additions (MSA).
T	Analyte is a tentatively identified compound, result is estimated.
U	Compound was analyzed for, but was not detected (ND).
V1	The continuing calibration verification standard was outside (biased high) the specified limits for this compound.
V2	The continuing calibration verification standard was outside (biased low) the specified limits for this compound.
W	Result quantified, but the corresponding peak was detected outside the generated retention time window.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
X	See case narrative.
Y	Recovery outside limits
Y	The chromatogram resembles a petroleum product but does not match the calibration standard.
Z	The chromatogram does not resemble a petroleum product.
i	The MRL/MDL has been elevated due to a matrix interference.

ALS Laboratory Group

Acronyms

Cal	Calibration
Conc	CONCentration
Dioxin(s)	Polychlorinated dibenzo-p-dioxin(s)
EDL	Estimated Detection Limit
EMPC	Estimated Maximum Possible Concentration
Flags	Data qualifiers
Furan(s)	Polychlorinated dibenzofuran(s)
g	Grams
ICAL	Initial CALibration
ID	IDentifier
Ions	Masses monitored for the analyte during data acquisition
L	Liter (s)
LCS	Laboratory Control Sample
DLCS	Duplicate Laboratory Control Sample
MB	Method Blank
MCL	Method Calibration Limit
MDL	Method Detection Limit
mL	Milliliters
MS	Matrix Spiked sample
DMS	Duplicate Matrix Spiked sample
NO	Number of peaks meeting all identification criteria
PCDD(s)	Polychlorinated dibenzo-p-dioxin(s)
PCDF(s)	Polychlorinated dibenzofuran(s)
ppb	Parts per billion
ppm	Parts per million
ppq	Parts per quadrillion
ppt	Parts per trillion
QA	Quality Assurance
QC	Quality Control
Ratio	Ratio of areas from monitored ions for an analyte
% Rec.	Percent recovery
RPD	Relative Percent Difference
RRF	Relative Response Factor
RT	Retention Time
SDG	Sample Delivery Group
S/N	Signal-to-noise ratio
TEF	Toxicity Equivalence Factor
TEQ	Toxicity Equivalence Quotient

10450 Stancliff Rd, Houston, TX 77099 | 281-530-5656 | www.alsglobal.com

ALS Environmental

State Certifications, Accreditations, and Licenses

Agency	Number	Expire Date
American Association for Laboratory Accreditation	2897.01 2020	11/30/2021
Arizona Department of Health Services	AZ0793-2020	5/27/2021
Arkansas Department of Environmental Quality	20-030-0	3/26/2021
California Department of Health Services	2919-2020	4/30/2021
Department of Defense	A2LA 2897.01	11/30/2021
Florida Department of Health	E87611-2020	6/30/2021
Hawaii Department of Health	2020	4/30/2021
Illinois Environmental Protection Agency	2000322020-4	5/9/2021
Kansas Department of Health and Environment	E-10352-2020	7/31/2021
Louisiana Department of Environmental Quality	03087-2020	6/30/2021
Maine Department of Health and Human Services	2020016	6/5/2022
Maryland Department of the Environment	343-2020	6/30/2021
Michigan Depratment of Environmental Quality	9971-2020	4/30/2021
Nebraska Department of Health and Human Services	NE-OS-25-13 (2020)	4/30/2021
Nevada Department of Concervation and Natural Resources	TX026932021-1	7/31/2021
New Hampshire Environmental Laboratory Accreditation Program	209420	4/24/2021
New Jersey Department of Environmental Protection	TX008	6/30/2021
New York Department of Health	11707	3/31/2021
Oklahoma Department of Environmental Quality	2020-123	8/31/2021
Pennsylvania Department of Environmental Protection	014	6/30/2021
Tennessee Department of Environment and Concervation	04016-2020	4/30/2021
Texas Commision on Environmental Quality	T104704231-20-26	4/30/2021
United States Department of Agriculture	P330-19-00299	10/10/2022

Chain of Custody

ALS Environmental - Houston HRMS
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID: 15610**

SUBCONTRACT TO:

ALS Environmental
10450 Stancliff RoadSuite 210
Houston, TX 77084 **Phone:** +1 281 530 5656

CUSTOMER INFORMATION:

Company:	ALS Houston
Contact:	RJ Modashia
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Email:	RJ.Modashia@alsglobal.com
Alternate Contact:	Jumoke M. Lawal
Email:	jumoke.lawal@alsglobal.com

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS21020193
TSR:	Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS21020193-01**	**16PM14-210202**	**Groundwater**	**02 Feb 2021 07:45**
	Provide Level II and Level IV reports on a seperate pdf.			15 Feb 2021
2.	**HS21020193-02**	**16PM06-210202**	**Groundwater**	**02 Feb 2021 08:30**
	Provide Level II and Level IV reports on a seperate pdf.			15 Feb 2021
3.	**HS21020193-03**	**16RW10-210202**	**Groundwater**	**02 Feb 2021 09:15**
	Provide Level II and Level IV reports on a seperate pdf.			15 Feb 2021
4.	**HS21020193-04**	**16RW09-210202**	**Groundwater**	**02 Feb 2021 10:00**
	Provide Level II and Level IV reports on a seperate pdf.			15 Feb 2021
5.	**HS21020193-05**	**16EW04-210202**	**Groundwater**	**02 Feb 2021 10:45**
	Provide Level II and Level IV reports on a seperate pdf.			15 Feb 2021
6.	**HS21020193-06**	**16EW08-210202**	**Groundwater**	**02 Feb 2021 11:30**
	Provide Level II and Level IV reports on a seperate pdf.			15 Feb 2021
7.	**HS21020193-07**	**16EW03-210202**	**Groundwater**	**02 Feb 2021 12:15**
	Provide Level II and Level IV reports on a seperate pdf.			15 Feb 2021
8.	**HS21020193-08**	**16EW07-210202**	**Groundwater**	**02 Feb 2021 13:00**
	Provide Level II and Level IV reports on a seperate pdf.			15 Feb 2021
9.	**HS21020193-09**	**16EW06-210202**	**Groundwater**	**02 Feb 2021 13:45**

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID: 15610**

LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
ANALYSIS REQUESTED			DUE DATE
	Provide Level II and Level IV reports on a seperate pdf.		15 Feb 2021
10. HS21020193-10	**16EW06-210202-FD**	**Groundwater**	**02 Feb 2021 13:45**
	Provide Level II and Level IV reports on a seperate pdf.		15 Feb 2021

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. Murray Date/Time: 2/4/21

Received By: Date/Time: 2/4/21 1459

Cooler ID(s): Temperature(s):

ALS Environmental

Cooler Receipt Form

Project Chemist: CA

Client/Project: ALS-H

Thermometer ID: IR31

Date/Time Received: 2/4/21 Initials: CA Date/Time Logged in: 2/4/21 Initials: CA

1. Method of delivery: ○ US Mail ○ Fed Ex ○ UPS ○ DHL ☑ ALS Courier ○ Client
2. Samples received in: ☑ Cooler ○ Box ○ Envelope ○ Other
3. Were custody seals on coolers? ○ Yes ☑ No
   Were they intact? ○ Yes ○ No ☑ N/A
   Were they signed and dated? ○ Yes ○ No ☑ N/A
   If yes, how many and where?
4. Packing Material: ○ Inserts ☑ Baggies ○ Bubble Wrap ○ Gel Packs ☑ Wet Ice ○ Sleeves ○ Other
5. Foreign or Regulated Soil? ○ Yes ○ No Location of Sampling:

Cooler Tracking Number	COC ID	Date Opened	Time Opened	Opened By	Temp. °C	Temp Blank?
NA		2/4/21	1454	CA	1.7	☒
						☐
						☐
						☐

6. Were custody papers properly filled out (ink, signed, dated, etc)? ☑ Yes ○ No
7. Did all bottles arrive in good condition (not broken, no signs of leakage)? ☑ Yes ○ No
8. Were all sample labels complete (i.e., sample ID, analysis, preservation, etc)? ☑ Yes ○ No
9. Were appropriate bottles/containers and volumes received for the requested tests? ☑ Yes ○ No
10. Did sample labels and tags agree with custody documents? ☑ Yes ○ No

Notes, Discrepancies, & Resolutions:

Service request Label:

10450 Stancliff Rd., Suite 210
Houston, TX 77099
T: +1 713 266 1599
F: +1 713 266 1599
www.alsglobal.com

SAMPLE ACCEPTANCE POLICY

This policy outlines the criteria samples must meet to be accepted by ALS Environmental – Houston HRMS.

Cooler Custody Seals (desirable, mandatory if specified in SAP):

- ✓ Intact on outside of cooler, signed and dated

Chain-of-Custody (COC) documentation (mandatory):

The following is required on each COC:

- ✓ Sample ID, the location, date and time of collection, collector's name, preservation type, sample type, and any other special remarks concerning the sampleThe COC must be completed in ink.
- ✓ Signature and date of relinquishing party.

In the absence of a COC at sample receipt, the COC will be requested from the client.

Sample Integrity (mandatory):

Samples are inspected upon arrival to ensure that sample integrity was not compromised during transfer to the laboratory.

- ✓ Sample containers must arrive in good condition (not broken or leaking).
- ✓ Samples must be labeled appropriately, including Sample IDs, and requested test using durable labels and indelible ink.
- ✓ The correct type of sample bottle must be used for the method requested.
- ✓ An appropriate sample volume, or weight, must be received.
- ✓ Sample IDs and number of containers must reconcile with the COC.
- ✓ Samples must be received within the method defined holding time.

Temperature Requirement (varies by sample matrix):

- ✓ Aqueous and Non-aqueous samples must be shipped and stored cold, at 0 to 6ºC.
- ✓ Tissue samples must be shipped and stored frozen, at -20 to -10ºC.
- ✓ Air samples are shipped and stored cold, at 0 to 6ºC
- ✓ The sample temperature must be recorded on the COC

All cooler inspections are documented on the Cooler Receipt Form (CRF). A separate CRF is completed for each service request. Any samples not meeting the above criteria are noted on the CRF and the Project Manager notified. The Project Manager must resolve any sample integrity issues with the client prior to proceeding with the analysis. Such resolutions are documented in writing and filed with the project folder. Data associated with samples received outside of this acceptance policy will be qualified on the case narrative of the final report

Preparation Information Benchsheets

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

Preparation Information Benchsheet

Prep Run#: 374035 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
Team: Semivoa GCMS/GRIVERA **Prep Method:** Method **Prep Date/Time:** 2/10/21 09:54

#	Lab Code	Client ID	B#	Method /Test	pH	Cl	Matrix	Amt. Ext.	Sample Description
1	E2100104-001	PT Lot 8218-53	.03	6850/ClO4 DOD			Water	10mL	
2	E2100145-001	16PM14-210202	.01	6850/ClO4 DOD			Water	10.000mL	
3	E2100145-002	16PM06-210202	.01	6850/ClO4 DOD			Water	10.000mL	
4	E2100145-003	16RW10-210202	.01	6850/ClO4 DOD			Water	10.000mL	
5	E2100145-004	16RW09-210202	.01	6850/ClO4 DOD			Water	10.000mL	
6	E2100145-005	16EW04-210202	.01	6850/ClO4 DOD			Water	10.000mL	
7	E2100145-006	16EW08-210202	.01	6850/ClO4 DOD			Water	10.000mL	
8	E2100145-007	16EW03-210202	.01	6850/ClO4 DOD			Water	10.000mL	
9	E2100149-001	16RW11-210203	.01	6850/ClO4 DOD			Water	10mL	
10	E2100149-002	16WW40-210203	.01	6850/ClO4 DOD			Water	10mL	
11	E2100149-003	16WW40-210203-FD	.01	6850/ClO4 DOD			Water	10mL	
12	E2100149-004	16WW12-210203	.01	6850/ClO4 DOD			Water	10mL	
13	E2100149-005	16WW39-210203	.01	6850/ClO4 DOD			Water	10mL	
14	E2100149-006	16WW21-210203	.01	6850/ClO4 DOD			Water	10mL	
15	E2100149-007	16WW21-210203-FD	.01	6850/ClO4 DOD			Water	10mL	
16	E2100149-008	16WW34-210203	.01	6850/ClO4 DOD			Water	10mL	
17	E2100149-009	16WW34-210203-FD	.01	6850/ClO4 DOD			Water	10mL	
18	E2100149-010	16WW33-210203	.01	6850/ClO4 DOD			Water	10mL	
19	EQ2100068-01	MB		6850/ClO4 DOD			Liquid	10mL	
20	EQ2100068-02	LCS		6850/ClO4 DOD			Liquid	10mL	
21	EQ2100068-03	DLCS		6850/ClO4 DOD			Liquid	10mL	
22	EQ2100068-04	16WW39-210203 MS	.01	6850/ClO4 DOD			Liquid	10mL	
23	EQ2100068-05	16WW39-210203 DMS	.01	6850/ClO4 DOD			Liquid	10mL	

Spiking Solutions

Name: Perchlorate Intermediate Stock1 Inventory ID 214035 Logbook Ref: Perchlorate Expires On: 05/23/2021

EQ2100068-02	1.00µL	EQ2100068-03	1.00µL	EQ2100068-04	1.00µL	EQ2100068-05	1.00µL

Name: Perchlorate Internal Standard 1ug/mL Inventory ID 214820 Logbook Ref: Perchlorate Internal Standard Expires On: 07/03/2021

E2100104-001	100.00µL	E2100145-001	100.00µL	E2100145-002	100.00µL	E2100145-003	100.00µL	E2100145-004	100.00µL	E2100145-005	100.00µL
E2100145-006	100.00µL	E2100145-007	100.00µL	E2100149-001	100.00µL	E2100149-002	100.00µL	E2100149-003	100.00µL	E2100149-004	100.00µL
E2100149-005	100.00µL	E2100149-006	100.00µL	E2100149-007	100.00µL	E2100149-008	100.00µL	E2100149-009	100.00µL	E2100149-010	100.00µL
EQ2100068-01	100.00µL	EQ2100068-02	100.00µL	EQ2100068-03	100.00µL	EQ2100068-04	100.00µL	EQ2100068-05	100.00µL		

Preparation Information Benchsheet

Prep Run#: 374035
Team: Semivoa GCMS/GRIVERA

Prep WorkFlow: GenExt28Day
Prep Method: Method

Status: Prepped
Prep Date/Time: 2/10/21 09:54

Preparation Steps

Step: Preparation
Started: 2/10/21 09:54
Finished: 2/10/21 10:30
By: GRIVERA
Comments

Comments:

Reviewed By: GR Date: 2/10/21

Chain of Custody

Relinquished By: Date:

Received By: Date:

Extracts Examined
Yes No

Preparation Information Benchsheet

Prep Run#: 374037 **Prep WorkFlow:** Gen CLO4 **Status:** Prepped
Team: Semivoa GCMS/GRIVERA **Prep Method:** Method **Prep Date/Time:** 2/10/21 10:48

#	Lab Code	Client ID	B#	Method /Test	pH	Cl	Matrix	Amt. Ext.	Sample Description
1	E2100016-003	LOD Perchlorate Solid	.01	6850/ClO4			Soil	1.001g	
2	E2100016-004	LOQ Perchlorate Solid	.01	6850/ClO4			Soil	1.002g	
3	E2100145-008	16EW07-210202	.02	6850/ClO4 DOD			Misc. Solid	1.015g	
4	E2100145-009	16EW06-210202	.02	6850/ClO4 DOD			Misc. Solid	1.011g	
5	E2100145-010	16EW06-210202-FD	.02	6850/ClO4 DOD			Misc. Solid	1.012g	
6	EQ2100069-01	MB		6850/ClO4 DOD			Solid	1.002g	
7	EQ2100069-02	LCS		6850/ClO4 DOD			Solid	1.041g	
8	EQ2100069-03	DLCS		6850/ClO4 DOD			Solid	1.051g	

Spiking Solutions

Name: Perchlorate Intermediate Stock1 Inventory ID 214035 Logbook Ref: Perchlorate Expires On: 05/23/2021

EQ2100069-02	100.00µL	EQ2100069-02	100.00µL	EQ2100069-03	100.00µL	EQ2100069-03	100.00µL

Name: Perchlorate Internal Standard 1ug/mL Inventory ID 214820 Logbook Ref: Perchlorate Internal Standard Expires On: 07/03/2021

E2100016-004	100.00µL	E2100145-008	100.00µL	E2100145-009	100.00µL	E2100145-010	100.00µL	EQ2100069-01	100.00µL	EQ2100069-01	100.00µL
EQ2100069-02	100.00µL	EQ2100069-02	100.00µL	EQ2100069-03	100.00µL	EQ2100069-03	100.00µL				

Preparation Steps

Step: Extraction
Started: 2/10/21 10:48
Finished: 2/10/21 11:00
By: GRIVERA
Comments

Comments: _____

Reviewed By: GR Date: 2/10/21

Chain of Custody

Relinquished By: _____ Date: _____ Extracts Examined
Received By: _____ Date: _____ Yes No

Analytical Results

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100145
Project:	HS21020193	**Date Collected:**	2/ 2/21 0745
Sample Matrix:	Water	**Date Received:**	2/ 4/21
Sample Name:	16PM14-210202	**Units:**	µg/L
Lab Code:	E2100145-001	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.648**	J	1.00	0.500	0.250	10	2/10/21	2/12/21 09:40	374035	712935	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100145
Project:	HS21020193	**Date Collected:**	2/ 2/21 0830
Sample Matrix:	Water	**Date Received:**	2/ 4/21
Sample Name:	16PM06-210202	**Units:**	µg/L
Lab Code:	E2100145-002	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	1.00	0.500	0.250	10	2/10/21	2/12/21 09:47	374035	712935	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100145
Project:	HS21020193	**Date Collected:**	2/ 2/21 0915
Sample Matrix:	Water	**Date Received:**	2/ 4/21
Sample Name:	16RW10-210202	**Units:**	µg/L
Lab Code:	E2100145-003	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**125**		1.00	0.500	0.250	10	2/10/21	2/12/21 11:32	374035	712935	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100145
Project:	HS21020193	**Date Collected:**	2/ 2/21 1000
Sample Matrix:	Water	**Date Received:**	2/ 4/21
Sample Name:	16RW09-210202	**Units:**	µg/L
Lab Code:	E2100145-004	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.459**	J	1.00	0.500	0.250	10	2/10/21	2/12/21 09:55	374035	712935	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100145
Project:	HS21020193	**Date Collected:**	2/ 2/21 1045
Sample Matrix:	Water	**Date Received:**	2/ 4/21
Sample Name:	16EW04-210202	**Units:**	µg/L
Lab Code:	E2100145-005	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	1.00	0.500	0.250	10	2/10/21	2/11/21 16:47	374035	712924	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100145
Project:	HS21020193	**Date Collected:**	2/ 2/21 1130
Sample Matrix:	Water	**Date Received:**	2/ 4/21
Sample Name:	16EW08-210202	**Units:**	µg/L
Lab Code:	E2100145-006	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	2/10/21	2/10/21 18:11	374035	712832	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100145
Project:	HS21020193	**Date Collected:**	2/ 2/21 1215
Sample Matrix:	Water	**Date Received:**	2/ 4/21
Sample Name:	16EW03-210202	**Units:**	µg/L
Lab Code:	E2100145-007	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	1.00	0.500	0.250	10	2/10/21	2/11/21 16:55	374035	712924	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100145
Project:	HS21020193	**Date Collected:**	2/ 2/21 1300
Sample Matrix:	Misc. Solid	**Date Received:**	2/ 4/21
Sample Name:	16EW07-210202	**Units:**	µg/Kg
Lab Code:	E2100145-008	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.985	0.750	0.300	1	2/10/21	2/10/21 22:55	374037	712768	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100145
Project:	HS21020193	**Date Collected:**	2/ 2/21 1345
Sample Matrix:	Misc. Solid	**Date Received:**	2/ 4/21
Sample Name:	16EW06-210202	**Units:**	µg/Kg
Lab Code:	E2100145-009	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.989	0.750	0.300	1	2/10/21	2/10/21 23:03	374037	712768	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100145
Project:	HS21020193	**Date Collected:**	2/ 2/21 1345
Sample Matrix:	Misc. Solid	**Date Received:**	2/ 4/21
Sample Name:	16EW06-210202-FD	**Units:**	µg/Kg
Lab Code:	E2100145-010	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.988	0.750	0.300	1	2/10/21	2/10/21 23:11	374037	712768	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100145
Project:	HS21020193	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	µg/L
Lab Code:	EQ2100068-01	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	2/10/21	2/10/21 16:36	374035	712832	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100145
Project:	HS21020193	**Date Collected:**	NA
Sample Matrix:	Misc. Solid	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	µg/Kg
Lab Code:	EQ2100069-01	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.998	0.750	0.300	1	2/10/21	2/10/21 22:16	374037	712768	

Accuracy & Precision

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2100145
Project:	HS21020193	**Date Analyzed:**	2/11/21
Sample Matrix:	Water		

Lab Control Sample Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method:	6850	**Units:**	µg/L
Prep Method:	Method	**Basis:**	As Received
		Extraction Lot:	374035

	Lab Control Sample EQ2100068-02			Duplicate Lab Control Sample EQ2100068-03						
Analyte Name	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**		**RPD Limit**
Perchlorate	0.0871	0.100	87	0.110	0.100	110	84 - 119	23	*	15

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100145
Project:	HS21020193	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2100068-02	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.0871**	J	0.100	0.0500	0.0250	1	2/10/21	2/11/21 16:00	374035	712924	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100145
Project:	HS21020193	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Duplicate Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2100068-03	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.110**		0.100	0.0500	0.0250	1	2/10/21	2/11/21 16:08	374035	712924	

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2100145
Project:	HS21020193	**Date Analyzed:**	2/10/21
Sample Matrix:	Misc. Solid		

Lab Control Sample Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method:	6850	**Units:**	µg/Kg
Prep Method:	Method	**Basis:**	As Received
		Extraction Lot:	374037

	Lab Control Sample EQ2100069-02			Duplicate Lab Control Sample EQ2100069-03					
Analyte Name	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Perchlorate	89.8	96.1	93	92.9	95.1	98	84 - 121	3	15

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100145
Project:	HS21020193	**Date Collected:**	NA
Sample Matrix:	Misc. Solid	**Date Received:**	NA
Sample Name:	Lab Control Sample	**Units:**	µg/Kg
Lab Code:	EQ2100069-02	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**89.8**		0.961	0.750	0.300	1	2/10/21	2/10/21 22:24	374037	712768	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100145
Project:	HS21020193	**Date Collected:**	NA
Sample Matrix:	Misc. Solid	**Date Received:**	NA
Sample Name:	Duplicate Lab Control Sample	**Units:**	µg/Kg
Lab Code:	EQ2100069-03	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**92.9**		0.951	0.750	0.300	1	2/10/21	2/10/21 22:31	374037	712768	

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

February 16, 2021

Analytical Report for Service Request No: K2101158

RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Suite 210
Houston, TX 77099-4338

RE: ALS Houston DOD TOC

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory February 05, 2021
For your reference, these analyses have been assigned our service request number **K2101158.**

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
Qualifiers
State Certifications, Accreditations, And Licenses
Case Narrative
Chain of Custody
General Chemistry
Raw Data
    General Chemistry

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated value.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.
H	The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

Metals Data Qualifiers

#	The control limit criteria is not applicable. See case narrative.
J	The result is an estimated value.
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
M	The duplicate injection precision was not met.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
S	The reported value was determined by the Method of Standard Additions (MSA).
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
+	The correlation coefficient for the MSA is less than 0.995.
Q	See case narrative. One or more quality control criteria was outside the limits.

Organic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
A	A tentatively identified compound, a suspected aldol-condensation product.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
C	The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
D	The reported result is from a dilution.
E	The result is an estimated value.
J	The result is an estimated value.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
P	The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.

Additional Petroleum Hydrocarbon Specific Qualifiers

F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
Y	The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
Z	The chromatographic fingerprint does not resemble a petroleum product.

ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso
State Certifications, Accreditations, and Licenses

Agency	Web Site	Number
Alaska DEH	http://dec.alaska.gov/eh/lab/cs/csapproval.htm	UST-040
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0339
Arkansas - DEQ	http://www.adeq.state.ar.us/techsvs/labcert.htm	88-0637
California DHS (ELAP)	http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx	2795
DOD ELAP	http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm	L16-58-R4
Florida DOH	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E87412
Hawaii DOH	http://health.hawaii.gov/	-
ISO 17025	http://www.pjlabs.com/	L16-57
Louisiana DEQ	http://www.deq.louisiana.gov/page/la-lab-accreditation	03016
Maine DHS	http://www.maine.gov/dhhs/	WA01276
Minnesota DOH	http://www.health.state.mn.us/accreditation	053-999-457
Nevada DEP	http://ndep.nv.gov/bsdw/labservice.htm	WA01276
New Jersey DEP	http://www.nj.gov/dep/enforcement/oqa.html	WA005
New York - DOH	https://www.wadsworth.org/regulatory/elap	12060
North Carolina DEQ	https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification	605
Oklahoma DEQ	http://www.deq.state.ok.us/CSDnew/labcert.htm	9801
Oregon – DEQ (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	WA100010
South Carolina DHEC	http://www.scdhec.gov/environment/EnvironmentalLabCertification/	61002
Texas CEQ	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704427
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C544
Wyoming (EPA Region 8)	https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water-	-
Kelso Laboratory Website	www.alsglobal.com	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at www.ALSGlobal.com or at the accreditation bodies web site.
Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/anlayte is offered by that state.

Case Narrative

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

1317 South 13th Ave, Kelso, WA 98626 | 1-360-577-7222 | www.alsglobal.com

ALS Environmental

Client: ALS Environmental - US
Project: ALS Houston DOD TOC
Sample Matrix: Ground Water

Service Request: K2101158
Date Received: 02/05/2021

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples for the Tier level IV requested by the client.

Sample Receipt:

Five ground water samples were received for analysis at ALS Environmental on 02/05/2021. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The samples were stored at minimum in accordance with the analytical method requirements.

General Chemistry:

No significant anomalies were noted with this analysis.

Approved by Kelley Lovejoy Date 02/16/2021

Chain of Custody

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

K2101158

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID: 15609**

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:	HS21020193
TSR:	Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS21020193-01**	**16PM14-210202**	**Groundwater**	**02 Feb 2021 07:45**
	TOC: Provide Level II & DOD Level IV/EQuIS APTIM EDD			15 Feb 2021
2.	**HS21020193-02**	**16PM06-210202**	**Groundwater**	**02 Feb 2021 08:30**
	TOC: Provide Level II & DOD Level IV/EQuIS APTIM EDD			15 Feb 2021
3.	**HS21020193-03**	**16RW10-210202**	**Groundwater**	**02 Feb 2021 09:15**
	TOC: Provide Level II & DOD Level IV/EQuIS APTIM EDD			15 Feb 2021
4.	**HS21020193-04**	**16RW09-210202**	**Groundwater**	**02 Feb 2021 10:00**
	TOC: Provide Level II & DOD Level IV/EQuIS APTIM EDD			15 Feb 2021
5.	**HS21020193-06**	**16EW08-210202**	**Groundwater**	**02 Feb 2021 11:30**
	TOC: Provide Level II & DOD Level IV/EQuIS APTIM EDD			15 Feb 2021

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: DOD IV (DoD Data Package)

K2101158

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID:** **15609**

Relinquished By: J Musselman Date/Time: 2/4/21 18:00

Received By: Date/Time: 2/5/21 1015

Cooler ID(s): Temperature(s):

PM KK

Cooler Receipt and Preservation Form

Client Air Hamtm Service Request K21 01158

Received: 215721 Opened: 215721 By: BR Unloaded: 215721 By: BR

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? Front
   If present, were custody seals intact? Y N If present, were they signed and dated? Y N
4. Was a Temperature Blank present in cooler? NA Y N If yes, notate the temperature in the appropriate column below:
   If no, take the temperature of a representative sample bottle contained within the cooler; notate in the column "Sample Temp":
5. Were samples received within the method specified temperature ranges? NA Y N
   If no, were they received on ice and same day as collected? If not, notate the cooler # below and notify the PM. NA Y N

If applicable, tissue samples were received: *Frozen* *Partially Thawed* *Thawed*

Temp Blank	Sample Temp	IR Gun	Cooler #/COC ID / NA	Out of temp indicate with "X"	PM Notified If out of temp	Tracking Number NA	Filed
0.5	—	1R02		—		9473084007168	

6. Packing material: *Inserts* *Baggies* *Bubble Wrap* *Gel Packs* *Wet Ice* *Dry Ice* *Sleeves* _____
7. Were custody papers properly filled out (ink, signed, etc.)? NA Y N
8. Were samples received in good condition (unbroken) NA Y N
9. Were all sample labels complete (ie, analysis, preservation, etc.)? NA Y N
10. Did all sample labels and tags agree with custody papers? NA Y N
11. Were appropriate bottles/containers and volumes received for the tests indicated? NA Y N
12. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* NA Y N
13. Were VOA vials received without headspace? *Indicate in the table below.* NA Y N
14. Was C12/Res negative? NA Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count Bottle Type	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:**	K2101158
Project:	ALS Houston DOD TOC	**Date Collected:**	02/2/21
Sample Matrix:	Ground Water	**Date Received:**	02/5/21
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
16PM14-210202	K2101158-001	**9.84**	0.50	0.20	0.07	1	02/10/21 17:05	
16PM06-210202	K2101158-002	**8.53**	0.50	0.20	0.07	1	02/10/21 17:05	
16RW10-210202	K2101158-003	**3.24**	0.50	0.20	0.07	1	02/10/21 17:05	
16RW09-210202	K2101158-004	**2.28**	0.50	0.20	0.07	1	02/10/21 17:05	
16EW08-210202	K2101158-005	**445**	5.0	2.0	0.7	10	02/10/21 17:05	
Method Blank	K2101158-MB	ND U	0.50	0.20	0.07	1	02/10/21 17:05	

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K2101158
Project:	ALS Houston DOD TOC	**Date Analyzed:**	02/10/21
Sample Matrix:	Ground Water	**Date Extracted:**	NA

Lab Control Sample Summary
Carbon, Total Organic

Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA
		Analysis Lot:	712738

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K2101158-LCS	25.2	25.0	101	83-117

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

February 22, 2021

Susan Huang
Aptim Environmental & Infrastucture, Inc.
2500 City West Blvd., Suite 1700
Houston, TX 77042

Work Order: **HS21020268**

Laboratory Results for: **Longhorn Army Ammunition Plant LHAAP 16 January 2021**

Dear Susan Huang,

ALS Environmental received 11 sample(s) on Feb 04, 2021 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL

RJ Modashia
Project Manager

ALS Houston, US Date: 22-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 January 2021
Work Order: HS21020268

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS21020268-01	16RW11-210203	Groundwater		03-Feb-2021 07:35	04-Feb-2021 09:45	☐
HS21020268-02	16WW40-210203	Groundwater		03-Feb-2021 08:20	04-Feb-2021 09:45	☐
HS21020268-03	16WW40-210203-FD	Groundwater		03-Feb-2021 08:20	04-Feb-2021 09:45	☐
HS21020268-04	16WW12-210203	Groundwater		03-Feb-2021 09:05	04-Feb-2021 09:45	☐
HS21020268-05	16WW39-210203	Groundwater		03-Feb-2021 09:45	04-Feb-2021 09:45	☐
HS21020268-06	16WW21-210203	Groundwater		03-Feb-2021 10:40	04-Feb-2021 09:45	☐
HS21020268-07	16WW21-210203-FD	Groundwater		03-Feb-2021 10:40	04-Feb-2021 09:45	☐
HS21020268-08	16WW34-210203	Groundwater		03-Feb-2021 11:35	04-Feb-2021 09:45	☐
HS21020268-09	16WW34-210203-FD	Groundwater		03-Feb-2021 11:35	04-Feb-2021 09:45	☐
HS21020268-10	16WW33-210203	Groundwater		03-Feb-2021 12:20	04-Feb-2021 09:45	☐
HS21020268-11	Trip Blank-210203	Water	CG 121520 -120	03-Feb-2021 00:00	04-Feb-2021 09:45	☐

ALS Houston, US Date: 22-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 January 2021
Work Order: HS21020268

CASE NARRATIVE

Work Order Comments

- The analysis for Perchlorate was subcontracted to ALS Houston High-Res Lab. Final report attached.

  The analysis for TOC was subcontracted to ALS Kelso, WA. Final report attached.

GCMS Volatiles by Method SW8260

Batch ID: R378003

Sample ID: 16WW40-210203 (HS21020268-02)

- Surrogate ,1,2-Dichloroethane-d4 failure due to matrix.. Confirmed by re-analysis @ dilution.

Batch ID: R377691

Sample ID: HS21020249-04MS

- MS and MSD are for an unrelated sample

Batch ID: R377708

Sample ID: 16WW39-210203(HS21020268-05MS)

- MS and or MSD failed QC limit due to suspect matrix effect

WetChemistry by Method SW9056

Batch ID: R378283

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

ALS Houston, US Date: 22-Feb-21

Client:	Aptim Environmental & Infrastucture, Inc.	**ANALYTICAL REPORT**
Project:	Longhorn Army Ammunition Plant LHAAP 16 January 2021	WorkOrder:HS21020268
Sample ID:	16RW11-210203	Lab ID:HS21020268-01
Collection Date:	03-Feb-2021 07:35	Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	07-Feb-2021 20:14
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	07-Feb-2021 20:14
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	07-Feb-2021 20:14
cis-1,2-Dichloroethene	**0.92**	J	**0.20**	**0.50**	**1.0**	**ug/L**	1	07-Feb-2021 20:14
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	07-Feb-2021 20:14
Trichloroethene	**2.2**		**0.20**	**0.50**	**1.0**	**ug/L**	1	07-Feb-2021 20:14
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	07-Feb-2021 20:14
Surr: 1,2-Dichloroethane-d4	*117*			**0**	*81-118*	*%REC*	*1*	*07-Feb-2021 20:14*
Surr: 4-Bromofluorobenzene	*106*			**0**	*85-114*	*%REC*	*1*	*07-Feb-2021 20:14*
Surr: Dibromofluoromethane	*97.1*			**0**	*80-119*	*%REC*	*1*	*07-Feb-2021 20:14*
Surr: Toluene-d8	*108*			**0**	*89-112*	*%REC*	*1*	*07-Feb-2021 20:14*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	22-Feb-2021 17:28

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 22-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.

ANALYTICAL REPORT

Project: Longhorn Army Ammunition Plant LHAAP 16 January 2021 WorkOrder:HS21020268

Sample ID: 16WW40-210203 Lab ID:HS21020268-02

Collection Date: 03-Feb-2021 08:20 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	5.0	U	1.5	5.0	5.0	ug/L	5	11-Feb-2021 16:36
1,1-Dichloroethene	**5.3**		**1.0**	**2.5**	**5.0**	**ug/L**	5	11-Feb-2021 16:36
1,2-Dichloroethane	**7.0**		**1.0**	**2.5**	**5.0**	**ug/L**	5	11-Feb-2021 16:36
cis-1,2-Dichloroethene	**150**		**1.0**	**2.5**	**5.0**	**ug/L**	5	11-Feb-2021 16:36
Methylene chloride	10	U	2.0	10	10	ug/L	5	11-Feb-2021 16:36
Trichloroethene	**1,500**		**5.0**	**12**	**25**	**ug/L**	25	11-Feb-2021 16:58
Vinyl chloride	**4.4**	J	**1.0**	**2.5**	**5.0**	**ug/L**	5	11-Feb-2021 16:36
Surr: 1,2-Dichloroethane-d4	*119*	*S*		**0**	*81-118*	*%REC*	*5*	*11-Feb-2021 16:36*
Surr: 1,2-Dichloroethane-d4	*116*			**0**	*81-118*	*%REC*	*25*	*11-Feb-2021 16:58*
Surr: 4-Bromofluorobenzene	*97.6*			**0**	*85-114*	*%REC*	*5*	*11-Feb-2021 16:36*
Surr: 4-Bromofluorobenzene	*97.5*			**0**	*85-114*	*%REC*	*25*	*11-Feb-2021 16:58*
Surr: Dibromofluoromethane	*97.1*			**0**	*80-119*	*%REC*	*5*	*11-Feb-2021 16:36*
Surr: Dibromofluoromethane	*96.5*			**0**	*80-119*	*%REC*	*25*	*11-Feb-2021 16:58*
Surr: Toluene-d8	*100*			**0**	*89-112*	*%REC*	*25*	*11-Feb-2021 16:58*
Surr: Toluene-d8	*103*			**0**	*89-112*	*%REC*	*5*	*11-Feb-2021 16:36*
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**9.31**		**1.50**	**5.00**	**5.00**	**mg/L**	50	20-Feb-2021 09:05
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	22-Feb-2021 17:28
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	17-Feb-2021 09:31

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 22-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.

ANALYTICAL REPORT

Project: Longhorn Army Ammunition Plant LHAAP 16 January 2021 WorkOrder:HS21020268

Sample ID: 16WW40-210203-FD Lab ID:HS21020268-03

Collection Date: 03-Feb-2021 08:20 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	5.0	U	1.5	5.0	5.0	ug/L	5	11-Feb-2021 17:19
1,1-Dichloroethene	**4.3**	J	**1.0**	**2.5**	**5.0**	**ug/L**	5	11-Feb-2021 17:19
1,2-Dichloroethane	**6.8**		**1.0**	**2.5**	**5.0**	**ug/L**	5	11-Feb-2021 17:19
cis-1,2-Dichloroethene	**160**		**1.0**	**2.5**	**5.0**	**ug/L**	5	11-Feb-2021 17:19
Methylene chloride	10	U	2.0	10	10	ug/L	5	11-Feb-2021 17:19
Trichloroethene	**1,400**		**5.0**	**12**	**25**	**ug/L**	25	11-Feb-2021 17:40
Vinyl chloride	**4.5**	J	**1.0**	**2.5**	**5.0**	**ug/L**	5	11-Feb-2021 17:19
Surr: 1,2-Dichloroethane-d4	*117*			**0**	*81-118*	*%REC*	*5*	*11-Feb-2021 17:19*
Surr: 1,2-Dichloroethane-d4	*116*			**0**	*81-118*	*%REC*	*25*	*11-Feb-2021 17:40*
Surr: 4-Bromofluorobenzene	*99.3*			**0**	*85-114*	*%REC*	*25*	*11-Feb-2021 17:40*
Surr: 4-Bromofluorobenzene	*95.2*			**0**	*85-114*	*%REC*	*5*	*11-Feb-2021 17:19*
Surr: Dibromofluoromethane	*98.0*			**0**	*80-119*	*%REC*	*25*	*11-Feb-2021 17:40*
Surr: Dibromofluoromethane	*95.8*			**0**	*80-119*	*%REC*	*5*	*11-Feb-2021 17:19*
Surr: Toluene-d8	*104*			**0**	*89-112*	*%REC*	*5*	*11-Feb-2021 17:19*
Surr: Toluene-d8	*104*			**0**	*89-112*	*%REC*	*25*	*11-Feb-2021 17:40*
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**8.78**		**1.50**	**5.00**	**5.00**	**mg/L**	50	20-Feb-2021 09:23
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	22-Feb-2021 17:28
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	17-Feb-2021 09:31

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 22-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.

ANALYTICAL REPORT

Project: Longhorn Army Ammunition Plant LHAAP 16 January 2021 WorkOrder:HS21020268

Sample ID: 16WW12-210203 Lab ID:HS21020268-04

Collection Date: 03-Feb-2021 09:05 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	08-Feb-2021 16:19
1,1-Dichloroethene	**3.2**		**0.20**	**0.50**	**1.0**	**ug/L**	1	08-Feb-2021 16:19
1,2-Dichloroethane	**4.3**		**0.20**	**0.50**	**1.0**	**ug/L**	1	08-Feb-2021 16:19
cis-1,2-Dichloroethene	**84**		**0.20**	**0.50**	**1.0**	**ug/L**	1	08-Feb-2021 16:19
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	08-Feb-2021 16:19
Trichloroethene	**1,100**		**5.0**	**12**	**25**	**ug/L**	25	11-Feb-2021 14:51
Vinyl chloride	**4.8**		**0.20**	**0.50**	**1.0**	**ug/L**	1	08-Feb-2021 16:19
Surr: 1,2-Dichloroethane-d4	*111*			**0**	*81-118*	*%REC*	*1*	*08-Feb-2021 16:19*
Surr: 1,2-Dichloroethane-d4	*115*			**0**	*81-118*	*%REC*	*25*	*11-Feb-2021 14:51*
Surr: 4-Bromofluorobenzene	*96.5*			**0**	*85-114*	*%REC*	*1*	*08-Feb-2021 16:19*
Surr: 4-Bromofluorobenzene	*93.3*			**0**	*85-114*	*%REC*	*25*	*11-Feb-2021 14:51*
Surr: Dibromofluoromethane	*94.4*			**0**	*80-119*	*%REC*	*1*	*08-Feb-2021 16:19*
Surr: Dibromofluoromethane	*99.7*			**0**	*80-119*	*%REC*	*25*	*11-Feb-2021 14:51*
Surr: Toluene-d8	*103*			**0**	*89-112*	*%REC*	*1*	*08-Feb-2021 16:19*
Surr: Toluene-d8	*105*			**0**	*89-112*	*%REC*	*25*	*11-Feb-2021 14:51*
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**5.70**		**0.600**	**2.00**	**2.00**	**mg/L**	20	20-Feb-2021 09:41
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	22-Feb-2021 17:28
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	17-Feb-2021 09:31

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 22-Feb-21

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP 16 January 2021 WorkOrder:HS21020268
Sample ID: 16WW39-210203 Lab ID:HS21020268-05
Collection Date: 03-Feb-2021 09:45 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	08-Feb-2021 15:16
1,1-Dichloroethene	**0.84**	J	**0.20**	**0.50**	**1.0**	**ug/L**	1	08-Feb-2021 15:16
1,2-Dichloroethane	**0.72**	J	**0.20**	**0.50**	**1.0**	**ug/L**	1	08-Feb-2021 15:16
cis-1,2-Dichloroethene	**37**		**0.20**	**0.50**	**1.0**	**ug/L**	1	08-Feb-2021 15:16
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	08-Feb-2021 15:16
Trichloroethene	**300**		**1.0**	**2.5**	**5.0**	**ug/L**	5	08-Feb-2021 17:22
Vinyl chloride	**2.0**		**0.20**	**0.50**	**1.0**	**ug/L**	1	08-Feb-2021 15:16
Surr: 1,2-Dichloroethane-d4	*114*			**0**	*81-118*	*%REC*	*1*	*08-Feb-2021 15:16*
Surr: 1,2-Dichloroethane-d4	*110*			**0**	*81-118*	*%REC*	*5*	*08-Feb-2021 17:22*
Surr: 4-Bromofluorobenzene	*99.1*			**0**	*85-114*	*%REC*	*1*	*08-Feb-2021 15:16*
Surr: 4-Bromofluorobenzene	*98.7*			**0**	*85-114*	*%REC*	*5*	*08-Feb-2021 17:22*
Surr: Dibromofluoromethane	*94.4*			**0**	*80-119*	*%REC*	*5*	*08-Feb-2021 17:22*
Surr: Dibromofluoromethane	*98.1*			**0**	*80-119*	*%REC*	*1*	*08-Feb-2021 15:16*
Surr: Toluene-d8	*103*			**0**	*89-112*	*%REC*	*1*	*08-Feb-2021 15:16*
Surr: Toluene-d8	*108*			**0**	*89-112*	*%REC*	*5*	*08-Feb-2021 17:22*
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**8.44**		**0.600**	**2.00**	**2.00**	**mg/L**	20	20-Feb-2021 09:59
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	22-Feb-2021 17:28
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	17-Feb-2021 09:31

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 22-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.

ANALYTICAL REPORT

Project: Longhorn Army Ammunition Plant LHAAP 16 January 2021 WorkOrder:HS21020268

Sample ID: 16WW21-210203 Lab ID:HS21020268-06

Collection Date: 03-Feb-2021 10:40 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	07-Feb-2021 20:35
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	07-Feb-2021 20:35
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	07-Feb-2021 20:35
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	07-Feb-2021 20:35
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	07-Feb-2021 20:35
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	07-Feb-2021 20:35
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	07-Feb-2021 20:35
Surr: 1,2-Dichloroethane-d4	*116*			**0**	*81-118*	*%REC*	*1*	*07-Feb-2021 20:35*
Surr: 4-Bromofluorobenzene	*99.8*			**0**	*85-114*	*%REC*	*1*	*07-Feb-2021 20:35*
Surr: Dibromofluoromethane	*95.8*			**0**	*80-119*	*%REC*	*1*	*07-Feb-2021 20:35*
Surr: Toluene-d8	*103*			**0**	*89-112*	*%REC*	*1*	*07-Feb-2021 20:35*
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**0.578**		**0.0300**	**0.100**	**0.100**	**mg/L**	1	20-Feb-2021 10:54
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	22-Feb-2021 17:28
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	17-Feb-2021 09:31

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 22-Feb-21

Client:	Aptim Environmental & Infrastucture, Inc.	**ANALYTICAL REPORT**
Project:	Longhorn Army Ammunition Plant LHAAP 16 January 2021	WorkOrder:HS21020268
Sample ID:	16WW21-210203-FD	Lab ID:HS21020268-07
Collection Date:	03-Feb-2021 10:40	Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	07-Feb-2021 20:56
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	07-Feb-2021 20:56
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	07-Feb-2021 20:56
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	07-Feb-2021 20:56
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	07-Feb-2021 20:56
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	07-Feb-2021 20:56
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	07-Feb-2021 20:56
Surr: 1,2-Dichloroethane-d4	*115*			**0**	*81-118*	*%REC*	*1*	*07-Feb-2021 20:56*
Surr: 4-Bromofluorobenzene	*102*			**0**	*85-114*	*%REC*	*1*	*07-Feb-2021 20:56*
Surr: Dibromofluoromethane	*95.1*			**0**	*80-119*	*%REC*	*1*	*07-Feb-2021 20:56*
Surr: Toluene-d8	*104*			**0**	*89-112*	*%REC*	*1*	*07-Feb-2021 20:56*
ANIONS BY SW9056A		**Method:SW9056**						Analyst: YP
Bromide	**0.620**		**0.0300**	**0.100**	**0.100**	**mg/L**	1	20-Feb-2021 11:12
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	22-Feb-2021 17:28
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	17-Feb-2021 09:31

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 22-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.

ANALYTICAL REPORT

Project: Longhorn Army Ammunition Plant LHAAP 16 January 2021 WorkOrder:HS21020268

Sample ID: 16WW34-210203 Lab ID:HS21020268-08

Collection Date: 03-Feb-2021 11:35 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	08-Feb-2021 19:28
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	08-Feb-2021 19:28
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	08-Feb-2021 19:28
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	08-Feb-2021 19:28
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	08-Feb-2021 19:28
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	08-Feb-2021 19:28
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	08-Feb-2021 19:28
Surr: 1,2-Dichloroethane-d4	*113*			**0**	*81-118*	*%REC*	*1*	*08-Feb-2021 19:28*
Surr: 4-Bromofluorobenzene	*96.8*			**0**	*85-114*	*%REC*	*1*	*08-Feb-2021 19:28*
Surr: Dibromofluoromethane	*98.0*			**0**	*80-119*	*%REC*	*1*	*08-Feb-2021 19:28*
Surr: Toluene-d8	*104*			**0**	*89-112*	*%REC*	*1*	*08-Feb-2021 19:28*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	22-Feb-2021 17:28

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 22-Feb-21

Client:	Aptim Environmental & Infrastucture, Inc.	**ANALYTICAL REPORT**
Project:	Longhorn Army Ammunition Plant LHAAP 16 January 2021	WorkOrder:HS21020268
Sample ID:	16WW34-210203-FD	Lab ID:HS21020268-09
Collection Date:	03-Feb-2021 11:35	Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	08-Feb-2021 19:49
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	08-Feb-2021 19:49
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	08-Feb-2021 19:49
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	08-Feb-2021 19:49
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	08-Feb-2021 19:49
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	08-Feb-2021 19:49
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	08-Feb-2021 19:49
Surr: 1,2-Dichloroethane-d4	*114*			**0**	*81-118*	*%REC*	*1*	*08-Feb-2021 19:49*
Surr: 4-Bromofluorobenzene	*95.3*			**0**	*85-114*	*%REC*	*1*	*08-Feb-2021 19:49*
Surr: Dibromofluoromethane	*97.7*			**0**	*80-119*	*%REC*	*1*	*08-Feb-2021 19:49*
Surr: Toluene-d8	*107*			**0**	*89-112*	*%REC*	*1*	*08-Feb-2021 19:49*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	22-Feb-2021 17:28

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 22-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.

ANALYTICAL REPORT

Project: Longhorn Army Ammunition Plant LHAAP 16 January 2021 WorkOrder:HS21020268

Sample ID: 16WW33-210203 Lab ID:HS21020268-10

Collection Date: 03-Feb-2021 12:20 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	08-Feb-2021 20:11
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	08-Feb-2021 20:11
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	08-Feb-2021 20:11
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	08-Feb-2021 20:11
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	08-Feb-2021 20:11
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	08-Feb-2021 20:11
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	08-Feb-2021 20:11
Surr: 1,2-Dichloroethane-d4	*111*			**0**	*81-118*	*%REC*	*1*	*08-Feb-2021 20:11*
Surr: 4-Bromofluorobenzene	*93.2*			**0**	*85-114*	*%REC*	*1*	*08-Feb-2021 20:11*
Surr: Dibromofluoromethane	*96.5*			**0**	*80-119*	*%REC*	*1*	*08-Feb-2021 20:11*
Surr: Toluene-d8	*106*			**0**	*89-112*	*%REC*	*1*	*08-Feb-2021 20:11*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: GR
Subcontract Analysis	See Attached		0	0		NA	1	22-Feb-2021 17:28

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 22-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.

ANALYTICAL REPORT

Project: Longhorn Army Ammunition Plant LHAAP 16 January 2021 WorkOrder:HS21020268

Sample ID: Trip Blank-210203 Lab ID:HS21020268-11

Collection Date: 03-Feb-2021 00:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	08-Feb-2021 18:25
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	08-Feb-2021 18:25
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	08-Feb-2021 18:25
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	08-Feb-2021 18:25
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	08-Feb-2021 18:25
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	08-Feb-2021 18:25
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	08-Feb-2021 18:25
Surr: 1,2-Dichloroethane-d4	*108*			**0**	*81-118*	*%REC*	*1*	*08-Feb-2021 18:25*
Surr: 4-Bromofluorobenzene	*96.5*			**0**	*85-114*	*%REC*	*1*	*08-Feb-2021 18:25*
Surr: Dibromofluoromethane	*97.0*			**0**	*80-119*	*%REC*	*1*	*08-Feb-2021 18:25*
Surr: Toluene-d8	*107*			**0**	*89-112*	*%REC*	*1*	*08-Feb-2021 18:25*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 22-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 January 2021
WorkOrder: HS21020268

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R377691 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS21020268-01	16RW11-210203	03 Feb 2021 07:35			07 Feb 2021 20:14	1
HS21020268-06	16WW21-210203	03 Feb 2021 10:40			07 Feb 2021 20:35	1
HS21020268-07	16WW21-210203-FD	03 Feb 2021 10:40			07 Feb 2021 20:56	1
Batch ID: R377708 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS21020268-11	Trip Blank-210203	03 Feb 2021 00:00			08 Feb 2021 18:25	1
Batch ID: R377708 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS21020268-04	16WW12-210203	03 Feb 2021 09:05			08 Feb 2021 16:19	1
HS21020268-05	16WW39-210203	03 Feb 2021 09:45			08 Feb 2021 17:22	5
HS21020268-05	16WW39-210203	03 Feb 2021 09:45			08 Feb 2021 15:16	1
HS21020268-08	16WW34-210203	03 Feb 2021 11:35			08 Feb 2021 19:28	1
HS21020268-09	16WW34-210203-FD	03 Feb 2021 11:35			08 Feb 2021 19:49	1
HS21020268-10	16WW33-210203	03 Feb 2021 12:20			08 Feb 2021 20:11	1
Batch ID: R378003 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS21020268-02	16WW40-210203	03 Feb 2021 08:20			11 Feb 2021 16:58	25
HS21020268-02	16WW40-210203	03 Feb 2021 08:20			11 Feb 2021 16:36	5
HS21020268-03	16WW40-210203-FD	03 Feb 2021 08:20			11 Feb 2021 17:40	25
HS21020268-03	16WW40-210203-FD	03 Feb 2021 08:20			11 Feb 2021 17:19	5
HS21020268-04	16WW12-210203	03 Feb 2021 09:05			11 Feb 2021 14:51	25
Batch ID: R378155 (0)	**Test Name :** SUBCONTRACT ANALYSIS - TOC ANALYSIS				**Matrix:** Groundwater	
HS21020268-02	16WW40-210203	03 Feb 2021 08:20			17 Feb 2021 09:31	1
HS21020268-03	16WW40-210203-FD	03 Feb 2021 08:20			17 Feb 2021 09:31	1
HS21020268-04	16WW12-210203	03 Feb 2021 09:05			17 Feb 2021 09:31	1
HS21020268-05	16WW39-210203	03 Feb 2021 09:45			17 Feb 2021 09:31	1
HS21020268-06	16WW21-210203	03 Feb 2021 10:40			17 Feb 2021 09:31	1
HS21020268-07	16WW21-210203-FD	03 Feb 2021 10:40			17 Feb 2021 09:31	1
Batch ID: R378283 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Groundwater	
HS21020268-02	16WW40-210203	03 Feb 2021 08:20			20 Feb 2021 09:05	50
HS21020268-03	16WW40-210203-FD	03 Feb 2021 08:20			20 Feb 2021 09:23	50
HS21020268-04	16WW12-210203	03 Feb 2021 09:05			20 Feb 2021 09:41	20
HS21020268-05	16WW39-210203	03 Feb 2021 09:45			20 Feb 2021 09:59	20
HS21020268-06	16WW21-210203	03 Feb 2021 10:40			20 Feb 2021 10:54	1
HS21020268-07	16WW21-210203-FD	03 Feb 2021 10:40			20 Feb 2021 11:12	1

ALS Houston, US Date: 22-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 January 2021
WorkOrder: HS21020268

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R378408 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** Groundwater	
HS21020268-01	16RW11-210203	03 Feb 2021 07:35			22 Feb 2021 17:28	1
HS21020268-02	16WW40-210203	03 Feb 2021 08:20			22 Feb 2021 17:28	1
HS21020268-03	16WW40-210203-FD	03 Feb 2021 08:20			22 Feb 2021 17:28	1
HS21020268-04	16WW12-210203	03 Feb 2021 09:05			22 Feb 2021 17:28	1
HS21020268-05	16WW39-210203	03 Feb 2021 09:45			22 Feb 2021 17:28	1
HS21020268-06	16WW21-210203	03 Feb 2021 10:40			22 Feb 2021 17:28	1
HS21020268-07	16WW21-210203-FD	03 Feb 2021 10:40			22 Feb 2021 17:28	1
HS21020268-08	16WW34-210203	03 Feb 2021 11:35			22 Feb 2021 17:28	1
HS21020268-09	16WW34-210203-FD	03 Feb 2021 11:35			22 Feb 2021 17:28	1
HS21020268-10	16WW33-210203	03 Feb 2021 12:20			22 Feb 2021 17:28	1

ALS Houston, US Date: 22-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 January 2021
WorkOrder: HS21020268

QC BATCH REPORT

Batch ID: R377691 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-210207** Units: **ug/L** Analysis Date: **07-Feb-2021 13:13**
Client ID: Run ID: **VOA6_377691** SeqNo: **5947823** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	1.0	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
Methylene chloride	2.0	2.0								U
Trichloroethene	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*58.27*	*1.0*	*50*	*0*	*117*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.2*	*1.0*	*50*	*0*	*100*	*85 - 114*				
Surr: Dibromofluoromethane	*47.82*	*1.0*	*50*	*0*	*95.6*	*80 - 119*				
Surr: Toluene-d8	*51.31*	*1.0*	*50*	*0*	*103*	*89 - 112*				

LCS Sample ID: **VLCSW-210207** Units: **ug/L** Analysis Date: **07-Feb-2021 12:10**
Client ID: Run ID: **VOA6_377691** SeqNo: **5947822** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	19.62	1.0	20	0	98.1	80 - 119				
1,1-Dichloroethene	18.36	1.0	20	0	91.8	71 - 131				
1,2-Dichloroethane	23.69	1.0	20	0	118	73 - 128				
cis-1,2-Dichloroethene	18.78	1.0	20	0	93.9	78 - 123				
Methylene chloride	17.36	2.0	20	0	86.8	74 - 124				
Trichloroethene	18.71	1.0	20	0	93.5	79 - 123				
Vinyl chloride	18.63	1.0	20	0	93.1	58 - 137				
Surr: 1,2-Dichloroethane-d4	*57.29*	*1.0*	*50*	*0*	*115*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.67*	*1.0*	*50*	*0*	*101*	*85 - 114*				
Surr: Dibromofluoromethane	*46.9*	*1.0*	*50*	*0*	*93.8*	*80 - 119*				
Surr: Toluene-d8	*45.02*	*1.0*	*50*	*0*	*90.0*	*89 - 112*				

ALS Houston, US Date: 22-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 January 2021
WorkOrder: HS21020268

QC BATCH REPORT

Batch ID: R377691 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS21020249-04MS** Units: **ug/L** Analysis Date: **07-Feb-2021 14:58**
Client ID: Run ID: **VOA6_377691** SeqNo: **5947988** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	20.28	1.0	20	0	101	80 - 119				
1,1-Dichloroethene	14.55	1.0	20	0	72.7	71 - 131				
1,2-Dichloroethane	19.19	1.0	20	0	96.0	73 - 128				
cis-1,2-Dichloroethene	14.83	1.0	20	0	74.2	78 - 123				S
Methylene chloride	13.6	2.0	20	0	68.0	74 - 124				S
Trichloroethene	26.98	1.0	20	5.071	110	79 - 123				
Vinyl chloride	10.05	1.0	20	0	50.2	58 - 137				S
Surr: 1,2-Dichloroethane-d4	*54.54*	*1.0*	*50*	*0*	*109*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*56.8*	*1.0*	*50*	*0*	*114*	*85 - 114*				
Surr: Dibromofluoromethane	*49.4*	*1.0*	*50*	*0*	*98.8*	*80 - 119*				
Surr: Toluene-d8	*50.03*	*1.0*	*50*	*0*	*100*	*89 - 112*				

MSD Sample ID: **HS21020249-04MSD** Units: **ug/L** Analysis Date: **07-Feb-2021 15:19**
Client ID: Run ID: **VOA6_377691** SeqNo: **5947989** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	19.53	1.0	20	0	97.7	80 - 119	20.28	3.75	20	
1,1-Dichloroethene	10.99	1.0	20	0	54.9	71 - 131	14.55	27.9	20	SR
1,2-Dichloroethane	24.35	1.0	20	0	122	73 - 128	19.19	23.7	20	R
cis-1,2-Dichloroethene	16.47	1.0	20	0	82.4	78 - 123	14.83	10.5	20	
Methylene chloride	11.04	2.0	20	0	55.2	74 - 124	13.6	20.8	20	SR
Trichloroethene	28.2	1.0	20	5.071	116	79 - 123	26.98	4.45	20	
Vinyl chloride	8.067	1.0	20	0	40.3	58 - 137	10.05	21.9	20	SR
Surr: 1,2-Dichloroethane-d4	*51.91*	*1.0*	*50*	*0*	*104*	*81 - 118*	*54.54*	*4.94*	*20*	
Surr: 4-Bromofluorobenzene	*57.54*	*1.0*	*50*	*0*	*115*	*85 - 114*	*56.8*	*1.31*	*20*	S
Surr: Dibromofluoromethane	*47.11*	*1.0*	*50*	*0*	*94.2*	*80 - 119*	*49.4*	*4.75*	*20*	
Surr: Toluene-d8	*48.14*	*1.0*	*50*	*0*	*96.3*	*89 - 112*	*50.03*	*3.86*	*20*	

The following samples were analyzed in this batch: HS21020268-01 HS21020268-06 HS21020268-07

ALS Houston, US Date: 22-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 January 2021
WorkOrder: HS21020268

QC BATCH REPORT

Batch ID: R377708 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-210208** Units: **ug/L** Analysis Date: **08-Feb-2021 13:51**
Client ID: Run ID: **VOA6_377708** SeqNo: **5949509** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	1.0	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
Methylene chloride	2.0	2.0								U
Trichloroethene	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*57.71*	*1.0*	*50*	*0*	*115*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.31*	*1.0*	*50*	*0*	*101*	*85 - 114*				
Surr: Dibromofluoromethane	*48.11*	*1.0*	*50*	*0*	*96.2*	*80 - 119*				
Surr: Toluene-d8	*52.48*	*1.0*	*50*	*0*	*105*	*89 - 112*				

LCS Sample ID: **VLCSW-210208** Units: **ug/L** Analysis Date: **08-Feb-2021 13:09**
Client ID: Run ID: **VOA6_377708** SeqNo: **5949508** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	21.01	1.0	20	0	105	80 - 119				
1,1-Dichloroethene	20.42	1.0	20	0	102	71 - 131				
1,2-Dichloroethane	24.55	1.0	20	0	123	73 - 128				
cis-1,2-Dichloroethene	19.44	1.0	20	0	97.2	78 - 123				
Methylene chloride	17.63	2.0	20	0	88.1	74 - 124				
Trichloroethene	19.9	1.0	20	0	99.5	79 - 123				
Vinyl chloride	21.38	1.0	20	0	107	58 - 137				
Surr: 1,2-Dichloroethane-d4	*58.89*	*1.0*	*50*	*0*	*118*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*52.64*	*1.0*	*50*	*0*	*105*	*85 - 114*				
Surr: Dibromofluoromethane	*51.17*	*1.0*	*50*	*0*	*102*	*80 - 119*				
Surr: Toluene-d8	*47.56*	*1.0*	*50*	*0*	*95.1*	*89 - 112*				

ALS Houston, US Date: 22-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 January 2021
WorkOrder: HS21020268

QC BATCH REPORT

Batch ID: R377708 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS21020268-05MS** Units: **ug/L** Analysis Date: **08-Feb-2021 16:40**
Client ID: **16WW39-210203** Run ID: **VOA6_377708** SeqNo: **5949517** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	18.71	1.0	20	0	93.5	80 - 119				
1,1-Dichloroethene	19	1.0	20	0.8417	90.8	71 - 131				
1,2-Dichloroethane	21.85	1.0	20	0.7247	106	73 - 128				
cis-1,2-Dichloroethene	55.15	1.0	20	36.73	92.1	78 - 123				
Methylene chloride	14.4	2.0	20	0	72.0	74 - 124				S
Trichloroethene	412.6	1.0	20	375.3	187	79 - 123				SEO
Vinyl chloride	14.71	1.0	20	2.001	63.6	58 - 137				
Surr: 1,2-Dichloroethane-d4	*56.69*	*1.0*	*50*	*0*	*113*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*51.13*	*1.0*	*50*	*0*	*102*	*85 - 114*				
Surr: Dibromofluoromethane	*47.81*	*1.0*	*50*	*0*	*95.6*	*80 - 119*				
Surr: Toluene-d8	*50.18*	*1.0*	*50*	*0*	*100*	*89 - 112*				

MSD Sample ID: **HS21020268-05MSD** Units: **ug/L** Analysis Date: **08-Feb-2021 17:01**
Client ID: **16WW39-210203** Run ID: **VOA6_377708** SeqNo: **5949518** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	19.66	1.0	20	0	98.3	80 - 119	18.71	4.99	20	
1,1-Dichloroethene	18	1.0	20	0.8417	85.8	71 - 131	19	5.42	20	
1,2-Dichloroethane	21.99	1.0	20	0.7247	106	73 - 128	21.85	0.62	20	
cis-1,2-Dichloroethene	54.58	1.0	20	36.73	89.3	78 - 123	55.15	1.03	20	
Methylene chloride	13.89	2.0	20	0	69.5	74 - 124	14.4	3.56	20	S
Trichloroethene	394.4	1.0	20	375.3	95.8	79 - 123	412.6	4.49	20	EO
Vinyl chloride	13.85	1.0	20	2.001	59.3	58 - 137	14.71	6.02	20	
Surr: 1,2-Dichloroethane-d4	*58.53*	*1.0*	*50*	*0*	*117*	*81 - 118*	*56.69*	*3.2*	*20*	
Surr: 4-Bromofluorobenzene	*52.76*	*1.0*	*50*	*0*	*106*	*85 - 114*	*51.13*	*3.14*	*20*	
Surr: Dibromofluoromethane	*48.55*	*1.0*	*50*	*0*	*97.1*	*80 - 119*	*47.81*	*1.52*	*20*	
Surr: Toluene-d8	*51.38*	*1.0*	*50*	*0*	*103*	*89 - 112*	*50.18*	*2.36*	*20*	

The following samples were analyzed in this batch: HS21020268-04 HS21020268-05 HS21020268-08 HS21020268-09 HS21020268-10 HS21020268-11

ALS Houston, US Date: 22-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 January 2021
WorkOrder: HS21020268

QC BATCH REPORT

Batch ID: R378003 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-210211** Units: **ug/L** Analysis Date: **11-Feb-2021 13:06**
Client ID: Run ID: **VOA6_378003** SeqNo: **5955152** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	1.0	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
Methylene chloride	2.0	2.0								U
Trichloroethene	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*53.42*	*1.0*	*50*	*0*	*107*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*49.65*	*1.0*	*50*	*0*	*99.3*	*85 - 114*				
Surr: Dibromofluoromethane	*47.55*	*1.0*	*50*	*0*	*95.1*	*80 - 119*				
Surr: Toluene-d8	*52.54*	*1.0*	*50*	*0*	*105*	*89 - 112*				

LCS Sample ID: **VLCSW-210211** Units: **ug/L** Analysis Date: **11-Feb-2021 12:24**
Client ID: Run ID: **VOA6_378003** SeqNo: **5955151** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	20.26	1.0	20	0	101	80 - 119				
1,1-Dichloroethene	18.4	1.0	20	0	92.0	71 - 131				
1,2-Dichloroethane	22.77	1.0	20	0	114	73 - 128				
cis-1,2-Dichloroethene	17.09	1.0	20	0	85.5	78 - 123				
Methylene chloride	14.85	2.0	20	0	74.3	74 - 124				
Trichloroethene	19.54	1.0	20	0	97.7	79 - 123				
Vinyl chloride	18.44	1.0	20	0	92.2	58 - 137				
Surr: 1,2-Dichloroethane-d4	*56.72*	*1.0*	*50*	*0*	*113*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*49.59*	*1.0*	*50*	*0*	*99.2*	*85 - 114*				
Surr: Dibromofluoromethane	*47.83*	*1.0*	*50*	*0*	*95.7*	*80 - 119*				
Surr: Toluene-d8	*45.43*	*1.0*	*50*	*0*	*90.9*	*89 - 112*				

ALS Houston, US Date: 22-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 January 2021
WorkOrder: HS21020268

QC BATCH REPORT

Batch ID: R378003 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS21020441-02MS** Units: **ug/L** Analysis Date: **11-Feb-2021 18:22**
Client ID: Run ID: **VOA6_378003** SeqNo: **5955167** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	19.24	1.0	20	0	96.2	80 - 119				
1,1-Dichloroethene	17.55	1.0	20	0	87.8	71 - 131				
1,2-Dichloroethane	20.4	1.0	20	0	102	73 - 128				
cis-1,2-Dichloroethene	20.09	1.0	20	0	100	78 - 123				
Methylene chloride	16.4	2.0	20	0	82.0	74 - 124				
Trichloroethene	19.96	1.0	20	0	99.8	79 - 123				
Vinyl chloride	12.45	1.0	20	0	62.3	58 - 137				
Surr: 1,2-Dichloroethane-d4	*54.35*	*1.0*	*50*	*0*	*109*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*53.68*	*1.0*	*50*	*0*	*107*	*85 - 114*				
Surr: Dibromofluoromethane	*46.81*	*1.0*	*50*	*0*	*93.6*	*80 - 119*				
Surr: Toluene-d8	*50.34*	*1.0*	*50*	*0*	*101*	*89 - 112*				

MSD Sample ID: **HS21020441-02MSD** Units: **ug/L** Analysis Date: **11-Feb-2021 18:43**
Client ID: Run ID: **VOA6_378003** SeqNo: **5955168** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	20	1.0	20	0	100	80 - 119	19.24	3.89	20	
1,1-Dichloroethene	17.72	1.0	20	0	88.6	71 - 131	17.55	0.941	20	
1,2-Dichloroethane	20.96	1.0	20	0	105	73 - 128	20.4	2.72	20	
cis-1,2-Dichloroethene	17.26	1.0	20	0	86.3	78 - 123	20.09	15.2	20	
Methylene chloride	16.82	2.0	20	0	84.1	74 - 124	16.4	2.51	20	
Trichloroethene	18.32	1.0	20	0	91.6	79 - 123	19.96	8.56	20	
Vinyl chloride	11.99	1.0	20	0	59.9	58 - 137	12.45	3.81	20	
Surr: 1,2-Dichloroethane-d4	*54.68*	*1.0*	*50*	*0*	*109*	*81 - 118*	*54.35*	*0.607*	*20*	
Surr: 4-Bromofluorobenzene	*49.48*	*1.0*	*50*	*0*	*99.0*	*85 - 114*	*53.68*	*8.15*	*20*	
Surr: Dibromofluoromethane	*48.05*	*1.0*	*50*	*0*	*96.1*	*80 - 119*	*46.81*	*2.62*	*20*	
Surr: Toluene-d8	*50.95*	*1.0*	*50*	*0*	*102*	*89 - 112*	*50.34*	*1.21*	*20*	

The following samples were analyzed in this batch: HS21020268-02 HS21020268-03 HS21020268-04

ALS Houston, US Date: 22-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 January 2021
WorkOrder: HS21020268

QC BATCH REPORT

Batch ID: R378283 (0) **Instrument:** ICS-Integrion **Method:** ANIONS BY SW9056A

MBLK Sample ID: **MBLK-** Units: **mg/L** Analysis Date: **19-Feb-2021 16:08**
Client ID: Run ID: **ICS-Integrion_378283** SeqNo: **5961010** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	0.100	0.100								U

LCS Sample ID: **LCS-** Units: **mg/L** Analysis Date: **19-Feb-2021 16:26**
Client ID: Run ID: **ICS-Integrion_378283** SeqNo: **5961011** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.94	0.100	4	0	98.5	80 - 120				

MS Sample ID: **HS21020464-01MS** Units: **mg/L** Analysis Date: **19-Feb-2021 20:40**
Client ID: Run ID: **ICS-Integrion_378283** SeqNo: **5961019** PrepDate: DF: **20**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	41.01	2.00	40	3.222	94.5	80 - 120				

MS Sample ID: **HS21020268-05MS** Units: **mg/L** Analysis Date: **20-Feb-2021 10:17**
Client ID: **16WW39-210203** Run ID: **ICS-Integrion_378283** SeqNo: **5961036** PrepDate: DF: **20**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	46.46	2.00	40	8.444	95.0	80 - 120				

MSD Sample ID: **HS21020464-01MSD** Units: **mg/L** Analysis Date: **19-Feb-2021 20:59**
Client ID: Run ID: **ICS-Integrion_378283** SeqNo: **5961020** PrepDate: DF: **20**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	40.32	2.00	40	3.222	92.8	80 - 120	41.01	1.69	20	

MSD Sample ID: **HS21020268-05MSD** Units: **mg/L** Analysis Date: **20-Feb-2021 10:36**
Client ID: **16WW39-210203** Run ID: **ICS-Integrion_378283** SeqNo: **5961037** PrepDate: DF: **20**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	46.56	2.00	40	8.444	95.3	80 - 120	46.46	0.224	20	

The following samples were analyzed in this batch: HS21020268-02 HS21020268-03 HS21020268-04 HS21020268-05 HS21020268-06 HS21020268-07

ALS Houston, US Date: 22-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 January 2021
WorkOrder: **HS21020268**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

ALS Houston, US Date: 22-Feb-21

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	20-030-0	26-Mar-2021
California	2919, 2020-2021	30-Apr-2021
Dept of Defense	PJLA L20-507	22-Dec-2021
Florida	E87611-30-07/01/2020	30-Jun-2021
Illinois	2000322020-4	09-May-2021
Kansas	E-10352 2020-2021	31-Jul-2021
Kentucky	123043, 2020-2021	30-Apr-2021
Louisiana	03087, 2020-2021	30-Jun-2021
North Carolina	624-2021	31-Dec-2021
North Dakota	R-193 2020-2021	30-Apr-2021
Oklahoma	2020-165	31-Aug-2021
Texas	T104704231-20-26	30-Apr-2021

ALS Houston, US Date: 22-Feb-21

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 16 January 2021
Work Order: HS21020268

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS21020268-01	16RW11-210203	Login	2/4/2021 10:13:55 PM	JRM	Sub
HS21020268-01	16RW11-210203	Login	2/4/2021 10:13:55 PM	JRM	WET259
HS21020268-01	16RW11-210203	Login	2/4/2021 10:13:55 PM	JRM	VOA116
HS21020268-01	16RW11-210203	Login	2/4/2021 10:13:55 PM	JRM	Sub

ALS Houston, US Date: 22-Feb-21

Sample Receipt Checklist

Work Order ID: HS21020268 **Date/Time Received:** **04-Feb-2021 09:45**

Client Name: CBI-Houston **Received by:** **Nilesh D. Ranchod**

Completed By: /S/ Jared R. Makan (eSignature) 04-Feb-2021 23:13 (Date/Time) **Reviewed by:** /S/ Corey Grandits (eSignature) 05-Feb-2021 14:08 (Date/Time)

Matrices: **Water** Carrier name: **FedEx Priority Overnight**

	Yes	No	Not Present
Shipping container/cooler in good condition?	☑	☐	☐
Custody seals intact on shipping container/cooler?	☑	☐	☐
Custody seals intact on sample bottles?	☐	☐	☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	☐	☐	☑
Chain of custody present?	☑	☐	2 Page(s)
Chain of custody signed when relinquished and received?	☑	☐	
Samplers name present on COC?	☑	☐	
Chain of custody agrees with sample labels?	☐	☑	
Samples in proper container/bottle?	☑	☐	
Sample containers intact?	☑	☐	
Sufficient sample volume for indicated test?	☑	☐	
All samples received within holding time?	☑	☐	
Container/Temp Blank temperature in compliance?	☑	☐	

Temperature(s)/Thermometer(s):	0.8°C UC/C	IR31
Cooler(s)/Kit(s):	46596	
Date/Time sample(s) sent to storage:	02/03/2021 21:15	

	Yes	No	
Water - VOA vials have zero headspace?	☐	☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	☑	☐	N/A ☐
pH adjusted?	☐	☑	N/A ☐
pH adjusted by:			

Login Notes:
Sample ID differs:
COC has two samples with the ID 16WW40-210203
One set of bottles labeled 16WW40-210203-FD
Sample logged in as 16WW40-210203-FD per bottles.

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stanelliff Rd. Suite 210 Houston, TX. 77099 (281) 530-5656 ATTN: R.J Modashia

Project: APTIM
LONGHORN ARMY AMMN. PLANT (LHAAP)
GROUNDWATER TREATMENT PLANT (GWTP)
KARNACK, TEXAS

Project No. 501032

Job: **LHAAP 16 January 2021**

Prepared By: Scott Beesinger

P.O. Number

Field Sample I.D. Time	Sample Matrix	Date /	MS / MSD	No. OF CONTAINERS	VOC by SW 8260B	TOC by SM5310C	MEE by RSK 175	Anions (bromide, sulfate, nitrate) by SW9056 and Alkalinity by SM2320	Bromide by SW9056	Perchlorate by SW6850	Metals (arsenic, chromium, manganese, nickel, thallium) by SW6020				Remarks (Preservatives, etc.)	Lab I.D.#
16RW11-210203	WG	2/3/21/0735		4	X					X						
16WW40-210203	WG	2/3/21/0820		7	X	X			X	X						
16WW40-210203	WG	2/3/21/0820		7	X	X			X	X						
16WW12-210203	WG	2/3/21/0905		7	X	X			X	X						
16WW39-210203	WG	2/3/21/0945		7	X	X			X	X						
16WW39-210203-MS	WG	2/3/21/0945		7	X	X			X	X						
16WW39-210203-MSD	WG	2/3/21/0945		7	X	X			X	X						
16WW21-210203	WG	2/3/21/1040		7	X	X			X	X						

Additional Remarks: Standard TAT on all parameters. Please email results to Susan.Huang@aptim.com and invoices to fedinvoices@aptim.com

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	2/3/21	1430	Na	2/4/21	0945						

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition

Remarks:

HS21020268

Aptim Environmental & Infrastucture, Inc.
Longhorn Army Ammunition Plant LHAAP 16 Januar

45661 Temp 0/C 0.8

(Word) S:\U-ces\Forms\Chain of

CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd. Suite 210 Houston, TX. 77099 (281) 530-5656 ATTN: RJ Modashia

Project: APTIM
LONGHORN ARMY AMMN. PLANT (LHAAP)
GROUNDWATER TREATMENT PLANT (GWTP)
KARNACK, TEXAS

Project No. 501032

Job: **LHAAP 16 January 2021**

Prepared By: Scott Beesinger

P.O. Number

Field Sample I.D. / Time	Sample Matrix	Date /	MS / MSD	No. OF CONTAINERS	VOC by SW 8260B	TOC by SM5310C	MEE by RSK 175	Anions (bromide, sulfate, nitrate) by SW9056 and Alkalinity by SM2320	Bromide by SW9056	Perchlorate by SW6850	Metals (arsenic, chromium, manganese, nickel, thallium) by SW6020				Remarks (Preservatives, etc.)	Lab I.D.#
16WW21-210203-FD	WG	2/3/21/1040		7	X	X			X	X						
16WW34-210203	WG	2/3/21/1135		4	X					X						
16WW34-210203-FD	WG	2/3/21/1135		4	X					X						
16WW33-210203	WG	2/3/21/1220		4	X					X						
TRIP BLANK-210203	W	2/3/21		2	X											

Additional Remarks: Standard TAT on all parameters. Please email results to Susan.Huang@aptim.com and invoices to fedinvoices@aptim.com

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	2/3/21	1430	NA	2/4/21	09:45						

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition

Remarks:

HS21020268

Aptim Environmental & Infrastucture, Inc.
Longhorn Army Ammunition Plant LHAAP 16 Januar

Cooler # 45661 Temp 0.8 BR# 31 CLP0.0

(Word) S:\t-ccs\Forms\CH

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

45661

CUSTODY SEAL

Date: 2/3/21 Time: 1430
Name: Scott Beesinger
Company: BHATT

Seal Broken By:
Date:

45661 FEB 3 4 2021

Must Deliver Next Business Day
Time and Tempature Sensitive!

45661

ORIGIN ID:SGRA (903) 930-6193
SCOTT BEESINGER
APTIM
1203-B EAST GRAND AVE.
PMB202
MARSHALL, TX 75670
UNITED STATES US

SHIP DATE: 18SEP20
ACTWGT: 1.00 LB MAN
CAD: 300130/CAFE3211
DIMS: 19x16x13 IN

TO CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099
(281) 530-5656
REF: LHAAP 15-BO 73884-RJ

RMA:

FedEx Express

FedEx
TRK# 0221 1891 8880 4521

THU - 04 FEB 10:30A
PRIORITY OVERNIGHT

AB SGRA

77099
TX-US IAH

February 22, 2021

Service Request No:E2100149

RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Suite 210
Houston, TX 77099-4338

Laboratory Results for: HS21020268

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory February 05, 2021
For your reference, these analyses have been assigned our service request number **E2100149.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current TNI standards, where applicable, and except as noted in the laboratory case narrative provided. All results are intended to be considered in their entirety and ALS Environmental is not responsible for use of less than the complete final report. Results apply only to the items submitted to the laboratory, as received for analysis. In accordance with the current TNI Standard, a statement on the estimated uncertainty of measurement of any quantitative analysis will be supplied upon request.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Corey Grandits
Project Manager

ADDRESS 10450 Stancliff Rd., Suite 210, Houston, TX 77099
PHONE +1 281 530 5656 | FAX +1 281 530 5887
ALS Group USA, Corp.
dba ALS Environmental

Certificate of Analysis

ALS Environmental - Houston HRMS
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

ALS Environmental

Client:	ALS Houston	**Service Request No.:**	E2100149
Project:	HS21020268	**Date Received:**	02/05/21
Sample Matrix:	W		

CASE NARRATIVE

All analyses were performed in adherence to the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier II. When appropriate to the method, method blank results have been reported with each analytical test.

Sample Receipt

Ten samples were received for analysis at ALS Environmental in Houston on 02/05/21.

The samples were received in good condition and are consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

Data Validation Notes and Discussion

Precision and Accuracy:

EQ2100068: Laboratory Control Spike/Duplicate Laboratory Control Spike (LCS/DLCS) samples were analyzed and reported in addition to a MS/MSD for this extraction batch. The LCS and DLCS RDP exceeded the upper control limit, the individual recoveries are within QC limits. MS/MSD recoveries above QC limits (3.64 ug/L in parent sample).

Samples E2100149-001/002/003/005; lowest practical dilution performed due to matrix interference.

DoD Certification is held for the method/matrix/analytes provided in this report.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.

Use of ALS group USA Corp dba ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.

Client: ALS Environmental - US **Service Request:**E2100149
Project: HS21020268

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
E2100149-001	16RW11-210203	2/3/2021	0735
E2100149-002	16WW40-210203	2/3/2021	0820
E2100149-003	16WW40-210203-FD	2/3/2021	0820
E2100149-004	16WW12-210203	2/3/2021	0905
E2100149-005	16WW39-210203	2/3/2021	0945
E2100149-006	16WW21-210203	2/3/2021	1040
E2100149-007	16WW21-210203-FD	2/3/2021	1040
E2100149-008	16WW34-210203	2/3/2021	1135
E2100149-009	16WW34-210203-FD	2/3/2021	1135
E2100149-010	16WW33-210203	2/3/2021	1220

Service Request Summary

Folder #: **E2100149**
Client Name: ALS Environmental - US
Project Name: HS21020268
Project Number:

Report To: RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Houston, TX 77099-4338
USA
Phone Number: 281-530-5656
Cell Number:
Fax Number: 281-530-5887
E-mail: rj.modashia@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 02/05/21
Internal Due Date: 2/18/2021
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS21020268
EDD: No EDD Specified

12 125 mL-Plastic Bottle Plastic
Location: EHRMS-WIC 4B
Pressure Gas:

Lab Samp No.	Client Samp No	Matrix	Collected	HOUSTON ClO4 DOD/6850
E2100149-001	16RW11-210203	Water	02/03/21 0735	**IV**
E2100149-002	16WW40-210203	Water	02/03/21 0820	**IV**
E2100149-003	16WW40-210203-FD	Water	02/03/21 0820	**IV**
E2100149-004	16WW12-210203	Water	02/03/21 0905	**IV**
E2100149-005	16WW39-210203	Water	02/03/21 0945	**IV**
E2100149-006	16WW21-210203	Water	02/03/21 1040	**IV**
E2100149-007	16WW21-210203-FD	Water	02/03/21 1040	**IV**
E2100149-008	16WW34-210203	Water	02/03/21 1135	**IV**
E2100149-009	16WW34-210203-FD	Water	02/03/21 1135	**IV**
E2100149-010	16WW33-210203	Water	02/03/21 1220	**IV**

Service Request Summary

Folder #:	**E2100149**	Project Chemist:	Corey Grandits
Client Name:	ALS Environmental - US	Originating Lab:	HOUSTON
Project Name:	HS21020268	Logged By:	CGRANDITS
Project Number:		Date Received:	02/05/21
		Internal Due Date:	2/18/2021
Report To:	RJ Modashia	QAP:	LAB QAP
	ALS Laboratory Group	Qualifier Set:	Lab Standard
	10450 Stancliff Road	Formset:	Lab Standard
	Houston, TX 77099-4338 USA	Merged?:	Y
Phone Number:	281-530-5656	Report to MDL?:	Y
Cell Number:		P.O. Number:	HS21020268
Fax Number:	281-530-5887	EDD:	No EDD Specified
E-mail:	rj.modashia@alsglobal.com		

12 125 mL-Plastic Bottle Plastic

Location: EHRMS-WIC 4B

Pressure Gas:

Test Comments:

Group	Test/Method	Samples	Comments
Semivoa GCMS	ClO4 DOD/6850	9	Level II due 2/18,IV due 2/25
Semivoa GCMS	ClO4 DOD/6850	1	MS/MSD

Data Qualifiers

Lab Standard

+	Possible Tedlar bag artifact.
A	TIC is a suspected aldol-condensation product
B	Analyte found in the associated method blank as well as in the sample.
BC	Reported results are not blank corrected.
BH	The back section of the tube yielded higher results than the front.
BT	Results indicated possible breakthrough; back section >=10% front section.
C	Result identification confirmed.
D	Compound identified in an analysis at a secondary dilution factor
D	Spike was diluted out
DE	Reported results are corrected for desorption efficiency.
E	Estimated value. Concentration above calibration range
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
H1	Sample analysis performed past holding time. See case narrative.
H2	Initial analysis within holding time. Reanalysis for the required dilution was past holding time.
H3	Sample was received and analyzed past holding time.
H4	Sample was extracted past required extraction holding time, but analyzed within analysis holding time. See case narrative.
I	Internal standard not within the specified limits. See case narrative.
J	Estimated Value. Concentration found below MRL.
K	A deflection in the QC ion may indicate interference with the quantitation of this ion. The concentration of this analyte should be considered as an estimate.
K	Analyte was detected above the method reporting limit prior to normalization.
K	The reference ion ratio was outside acceptance criteria, which may indicate a potential bias to this result.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
L1	Laboratory control sample recovery outside the specified limits; results may be biased high.
L2	Laboratory control sample recovery outside the specified limits; results may be biased low.
L3	Laboratory control sample recovery outside the specified limits.
M	Matrix interference; results may be biased high.
M	The duplicate injection precision not met.
M1	Matrix interference due to coelution with a non-target compound; results may be biased high.
N	Presumptive evidence of a compound for TICs that have been identified based on a mass spectral library search.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.

Data Qualifiers

Lab Standard

O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
P	Indicates chlorodiphenyl ether interference present at the retention time of the target compound.
P	Pesticide/Aroclor target analyte > 40% difference for detected concentrations between GC columns
Q	Indicates as estimated value because the P and P + 2 theoretical abundance ratio does not meet method criteria.
R	Duplicate Precision not met.
R1	Duplicate precision not within the specified limits; however, the results are below the MRL and considered estimated.
S	Surrogate recovery not within specified limits.
S	The reported value was determined by the Method of Standard Additions (MSA).
T	Analyte is a tentatively identified compound, result is estimated.
U	Compound was analyzed for, but was not detected (ND).
V1	The continuing calibration verification standard was outside (biased high) the specified limits for this compound.
V2	The continuing calibration verification standard was outside (biased low) the specified limits for this compound.
W	Result quantified, but the corresponding peak was detected outside the generated retention time window.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
X	See case narrative.
Y	Recovery outside limits
Y	The chromatogram resembles a petroleum product but does not match the calibration standard.
Z	The chromatogram does not resemble a petroleum product.
i	The MRL/MDL has been elevated due to a matrix interference.

ALS Laboratory Group

Acronyms

Cal	Calibration
Conc	CONCentration
Dioxin(s)	Polychlorinated dibenzo-p-dioxin(s)
EDL	Estimated Detection Limit
EMPC	Estimated Maximum Possible Concentration
Flags	Data qualifiers
Furan(s)	Polychlorinated dibenzofuran(s)
g	Grams
ICAL	Initial CALibration
ID	IDentifier
Ions	Masses monitored for the analyte during data acquisition
L	Liter (s)
LCS	Laboratory Control Sample
DLCS	Duplicate Laboratory Control Sample
MB	Method Blank
MCL	Method Calibration Limit
MDL	Method Detection Limit
mL	Milliliters
MS	Matrix Spiked sample
DMS	Duplicate Matrix Spiked sample
NO	Number of peaks meeting all identification criteria
PCDD(s)	Polychlorinated dibenzo-p-dioxin(s)
PCDF(s)	Polychlorinated dibenzofuran(s)
ppb	Parts per billion
ppm	Parts per million
ppq	Parts per quadrillion
ppt	Parts per trillion
QA	Quality Assurance
QC	Quality Control
Ratio	Ratio of areas from monitored ions for an analyte
% Rec.	Percent recovery
RPD	Relative Percent Difference
RRF	Relative Response Factor
RT	Retention Time
SDG	Sample Delivery Group
S/N	Signal-to-noise ratio
TEF	Toxicity Equivalence Factor
TEQ	Toxicity Equivalence Quotient

10450 Stancliff Rd, Houston, TX 77099 | 281-530-5656 | www.alsglobal.com

ALS Environmental

State Certifications, Accreditations, and Licenses

Agency	Number	Expire Date
American Association for Laboratory Accreditation	2897.01 2020	11/30/2021
Arizona Department of Health Services	AZ0793-2020	5/27/2021
Arkansas Department of Environmental Quality	20-030-0	3/26/2021
California Department of Health Services	2919-2020	4/30/2021
Department of Defense	A2LA 2897.01	11/30/2021
Florida Department of Health	E87611-2020	6/30/2021
Hawaii Department of Health	2020	4/30/2021
Illinois Environmental Protection Agency	2000322020-4	5/9/2021
Kansas Department of Health and Environment	E-10352-2020	7/31/2021
Louisiana Department of Environmental Quality	03087-2020	6/30/2021
Maine Department of Health and Human Services	2020016	6/5/2022
Maryland Department of the Environment	343-2020	6/30/2021
Michigan Depratment of Environmental Quality	9971-2020	4/30/2021
Nebraska Department of Health and Human Services	NE-OS-25-13 (2020)	4/30/2021
Nevada Department of Concervation and Natural Resources	TX026932021-1	7/31/2021
New Hampshire Environmental Laboratory Accreditation Program	209420	4/24/2021
New Jersey Department of Environmental Protection	TX008	6/30/2021
New York Department of Health	11707	3/31/2021
Oklahoma Department of Environmental Quality	2020-123	8/31/2021
Pennsylvania Department of Environmental Protection	014	6/30/2021
Tennessee Department of Environment and Concervation	04016-2020	4/30/2021
Texas Commision on Environmental Quality	T104704231-20-26	4/30/2021
United States Department of Agriculture	P330-19-00299	10/10/2022

Chain of Custody

ALS Environmental - Houston HRMS
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense**

COC ID: **15620**

SUBCONTRACT TO:

ALS Environmental
10450 Stancliff RoadSuite 210
Houston, TX 77084

Phone: +1 281 530 5656

CUSTOMER INFORMATION:

Company: ALS Houston
Contact: RJ Modashia
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Email: RJ.Modashia@alsglobal.com
Alternate Contact: Jumoke M. Lawal
Email: jumoke.lawal@alsglobal.com

INVOICE INFORMATION:

Company: ALS Houston
Contact: Accounts Payable
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Reference: HS21020268
TSR: Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS21020268-01**	**16RW11-210203**	**Groundwater**	**03 Feb 2021 07:35**
	Provide Level II and Level IV reports on a seperate pdf.			18 Feb 2021
2.	**HS21020268-02**	**16WW40-210203**	**Groundwater**	**03 Feb 2021 08:20**
	Provide Level II and Level IV reports on a seperate pdf.			18 Feb 2021
3.	**HS21020268-03**	**16WW40-210203-FD**	**Groundwater**	**03 Feb 2021 08:20**
	Provide Level II and Level IV reports on a seperate pdf.			18 Feb 2021
4.	**HS21020268-04**	**16WW12-210203**	**Groundwater**	**03 Feb 2021 09:05**
	Provide Level II and Level IV reports on a seperate pdf.			18 Feb 2021
5.	**HS21020268-05**	**16WW39-210203**	**Groundwater**	**03 Feb 2021 09:45**
	Provide Level II and Level IV reports on a seperate pdf.			18 Feb 2021
6.	**HS21020268-06**	**16WW21-210203**	**Groundwater**	**03 Feb 2021 10:40**
	Provide Level II and Level IV reports on a seperate pdf.			18 Feb 2021
7.	**HS21020268-07**	**16WW21-210203-FD**	**Groundwater**	**03 Feb 2021 10:40**
	Provide Level II and Level IV reports on a seperate pdf.			18 Feb 2021
8.	**HS21020268-08**	**16WW34-210203**	**Groundwater**	**03 Feb 2021 11:35**
	Provide Level II and Level IV reports on a seperate pdf.			18 Feb 2021
9.	**HS21020268-09**	**16WW34-210203-FD**	**Groundwater**	**03 Feb 2021 11:35**

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID: 15620**

LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
ANALYSIS REQUESTED			DUE DATE
	Provide Level II and Level IV reports on a seperate pdf.		18 Feb 2021
10. HS21020268-10	**16WW33-210203**	**Groundwater**	**03 Feb 2021 12:20**
	Provide Level II and Level IV reports on a seperate pdf.		18 Feb 2021

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. MacGrill Date/Time: 2/5/21

Received By: [illegible] Date/Time: 2/5/21 1311

Cooler ID(s): Temperature(s):

ALS Environmental

Cooler Receipt Form

Project Chemist: CG

Client/Project: ALS-H

Thermometer ID: 1831

Date/Time Received: 2/5/21 Initials: CG

Date/Time Logged in: 2/5/21 Initials: CG

1. Method of delivery: ○ US Mail ○ Fed Ex ○ UPS ○ DHL ☑ ALS Courier ○ Client
2. Samples received in: ☑ Cooler ○ Box ○ Envelope ○ Other
3. Were custody seals on coolers? ○ Yes ☑ No
   Were they intact? ○ Yes ○ No ☑ N/A
   Were they signed and dated? ○ Yes ○ No ☑ N/A
   If yes, how many and where?
4. Packing Material: ○ Inserts ☑ Baggies ○ Bubble Wrap ○ Gel Packs ☑ Wet Ice ○ Sleeves ○ Other
5. Foreign or Regulated Soil? ○ Yes ○ No Location of Sampling:

Cooler Tracking Number	COC ID	Date Opened	Time Opened	Opened By	Temp. °C	Temp Blank?
NA		2/5/21	1311	CG	2.2	☒
						☐
						☐
						☐

6. Were custody papers properly filled out (ink, signed, dated, etc)? ☑ Yes ○ No
7. Did all bottles arrive in good condition (not broken, no signs of leakage)? ☑ Yes ○ No
8. Were all sample labels complete (i.e., sample ID, analysis, preservation, etc)? ☑ Yes ○ No
9. Were appropriate bottles/containers and volumes received for the requested tests? ☑ Yes ○ No
10. Did sample labels and tags agree with custody documents? ☑ Yes ○ No

Notes, Discrepancies, & Resolutions:

Service request Label:

HS-HRMSCoolerReceipt R1.0

10450 Stancliff Rd., Suite 210
Houston, TX 77099
T: +1 713 266 1599
F: +1 713 266 1599
www.alsglobal.com

SAMPLE ACCEPTANCE POLICY

This policy outlines the criteria samples must meet to be accepted by ALS Environmental – Houston HRMS.

Cooler Custody Seals (desirable, mandatory if specified in SAP):

- ✓ Intact on outside of cooler, signed and dated

Chain-of-Custody (COC) documentation (mandatory):

The following is required on each COC:

- ✓ Sample ID, the location, date and time of collection, collector's name, preservation type, sample type, and any other special remarks concerning the sampleThe COC must be completed in ink.
- ✓ Signature and date of relinquishing party.

In the absence of a COC at sample receipt, the COC will be requested from the client.

Sample Integrity (mandatory):

Samples are inspected upon arrival to ensure that sample integrity was not compromised during transfer to the laboratory.

- ✓ Sample containers must arrive in good condition (not broken or leaking).
- ✓ Samples must be labeled appropriately, including Sample IDs, and requested test using durable labels and indelible ink.
- ✓ The correct type of sample bottle must be used for the method requested.
- ✓ An appropriate sample volume, or weight, must be received.
- ✓ Sample IDs and number of containers must reconcile with the COC.
- ✓ Samples must be received within the method defined holding time.

Temperature Requirement (varies by sample matrix):

- ✓ Aqueous and Non-aqueous samples must be shipped and stored cold, at 0 to 6ºC.
- ✓ Tissue samples must be shipped and stored frozen, at -20 to -10ºC.
- ✓ Air samples are shipped and stored cold, at 0 to 6ºC
- ✓ The sample temperature must be recorded on the COC

All cooler inspections are documented on the Cooler Receipt Form (CRF). A separate CRF is completed for each service request. Any samples not meeting the above criteria are noted on the CRF and the Project Manager notified. The Project Manager must resolve any sample integrity issues with the client prior to proceeding with the analysis. Such resolutions are documented in writing and filed with the project folder. Data associated with samples received outside of this acceptance policy will be qualified on the case narrative of the final report

Preparation Information Benchsheets

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

Preparation Information Benchsheet

Prep Run#: 374035 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
Team: Semivoa GCMS/GRIVERA **Prep Method:** Method **Prep Date/Time:** 2/10/21 09:54

#	Lab Code	Client ID	B#	Method /Test	pH	Cl	Matrix	Amt. Ext.	Sample Description
1	E2100104-001	PT Lot 8218-53	.03	6850/ClO4 DOD			Water	10mL	
2	E2100145-001	16PM14-210202	.01	6850/ClO4 DOD			Water	10.000mL	
3	E2100145-002	16PM06-210202	.01	6850/ClO4 DOD			Water	10.000mL	
4	E2100145-003	16RW10-210202	.01	6850/ClO4 DOD			Water	10.000mL	
5	E2100145-004	16RW09-210202	.01	6850/ClO4 DOD			Water	10.000mL	
6	E2100145-005	16EW04-210202	.01	6850/ClO4 DOD			Water	10.000mL	
7	E2100145-006	16EW08-210202	.01	6850/ClO4 DOD			Water	10.000mL	
8	E2100145-007	16EW03-210202	.01	6850/ClO4 DOD			Water	10.000mL	
9	E2100149-001	16RW11-210203	.01	6850/ClO4 DOD			Water	10mL	
10	E2100149-002	16WW40-210203	.01	6850/ClO4 DOD			Water	10mL	
11	E2100149-003	16WW40-210203-FD	.01	6850/ClO4 DOD			Water	10mL	
12	E2100149-004	16WW12-210203	.01	6850/ClO4 DOD			Water	10mL	
13	E2100149-005	16WW39-210203	.01	6850/ClO4 DOD			Water	10mL	
14	E2100149-006	16WW21-210203	.01	6850/ClO4 DOD			Water	10mL	
15	E2100149-007	16WW21-210203-FD	.01	6850/ClO4 DOD			Water	10mL	
16	E2100149-008	16WW34-210203	.01	6850/ClO4 DOD			Water	10mL	
17	E2100149-009	16WW34-210203-FD	.01	6850/ClO4 DOD			Water	10mL	
18	E2100149-010	16WW33-210203	.01	6850/ClO4 DOD			Water	10mL	
19	EQ2100068-01	MB		6850/ClO4 DOD			Liquid	10mL	
20	EQ2100068-02	LCS		6850/ClO4 DOD			Liquid	10mL	
21	EQ2100068-03	DLCS		6850/ClO4 DOD			Liquid	10mL	
22	EQ2100068-04	16WW39-210203 MS	.01	6850/ClO4 DOD			Liquid	10mL	
23	EQ2100068-05	16WW39-210203 DMS	.01	6850/ClO4 DOD			Liquid	10mL	

Spiking Solutions

Name: Perchlorate Intermediate Stock1 Inventory ID 214035 Logbook Ref: Perchlorate Expires On: 05/23/2021

EQ2100068-02	1.00µL	EQ2100068-03	1.00µL	EQ2100068-04	1.00µL	EQ2100068-05	1.00µL

Name: Perchlorate Internal Standard 1ug/mL Inventory ID 214820 Logbook Ref: Perchlorate Internal Standard Expires On: 07/03/2021

E2100104-001	100.00µL	E2100145-001	100.00µL	E2100145-002	100.00µL	E2100145-003	100.00µL	E2100145-004	100.00µL	E2100145-005	100.00µL
E2100145-006	100.00µL	E2100145-007	100.00µL	E2100149-001	100.00µL	E2100149-002	100.00µL	E2100149-003	100.00µL	E2100149-004	100.00µL
E2100149-005	100.00µL	E2100149-006	100.00µL	E2100149-007	100.00µL	E2100149-008	100.00µL	E2100149-009	100.00µL	E2100149-010	100.00µL
EQ2100068-01	100.00µL	EQ2100068-02	100.00µL	EQ2100068-03	100.00µL	EQ2100068-04	100.00µL	EQ2100068-05	100.00µL		

Preparation Information Benchsheet

Prep Run#: 374035
Team: Semivoa GCMS/GRIVERA

Prep WorkFlow: GenExt28Day
Prep Method: Method

Status: Prepped
Prep Date/Time: 2/10/21 09:54

Preparation Steps

Step: Preparation
Started: 2/10/21 09:54
Finished: 2/10/21 10:30
By: GRIVERA
Comments

Comments:

Reviewed By: GR Date: 2/10/21

Chain of Custody

Relinquished By: Date:

Received By: Date:

Extracts Examined
Yes No

Analytical Results

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100149
Project:	HS21020268	**Date Collected:**	2/ 3/21 0735
Sample Matrix:	Water	**Date Received:**	2/ 5/21
Sample Name:	16RW11-210203	**Units:**	µg/L
Lab Code:	E2100149-001	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.500	0.250	0.125	5	2/10/21	2/11/21 17:03	374035	712924	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100149
Project:	HS21020268	**Date Collected:**	2/ 3/21 0820
Sample Matrix:	Water	**Date Received:**	2/ 5/21
Sample Name:	16WW40-210203	**Units:**	µg/L
Lab Code:	E2100149-002	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**1.31**	J	2.00	1.00	0.500	20	2/10/21	2/12/21 10:18	374035	712935	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100149
Project:	HS21020268	**Date Collected:**	2/ 3/21 0820
Sample Matrix:	Water	**Date Received:**	2/ 5/21
Sample Name:	16WW40-210203-FD	**Units:**	µg/L
Lab Code:	E2100149-003	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.850**	J	2.00	1.00	0.500	20	2/10/21	2/12/21 10:25	374035	712935	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100149
Project:	HS21020268	**Date Collected:**	2/ 3/21 0905
Sample Matrix:	Water	**Date Received:**	2/ 5/21
Sample Name:	16WW12-210203	**Units:**	µg/L
Lab Code:	E2100149-004	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**24.1**		2.00	1.00	0.500	20	2/10/21	2/12/21 10:33	374035	712935	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100149
Project:	HS21020268	**Date Collected:**	2/ 3/21 0945
Sample Matrix:	Water	**Date Received:**	2/ 5/21
Sample Name:	16WW39-210203	**Units:**	µg/L
Lab Code:	E2100149-005	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**3.64**		1.00	0.500	0.250	10	2/10/21	2/12/21 11:24	374035	712935	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100149
Project:	HS21020268	**Date Collected:**	2/ 3/21 1040
Sample Matrix:	Water	**Date Received:**	2/ 5/21
Sample Name:	16WW21-210203	**Units:**	µg/L
Lab Code:	E2100149-006	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	2/10/21	2/10/21 19:06	374035	712832	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100149
Project:	HS21020268	**Date Collected:**	2/ 3/21 1040
Sample Matrix:	Water	**Date Received:**	2/ 5/21
Sample Name:	16WW21-210203-FD	**Units:**	µg/L
Lab Code:	E2100149-007	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	2/10/21	2/10/21 19:14	374035	712832	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100149
Project:	HS21020268	**Date Collected:**	2/ 3/21 1135
Sample Matrix:	Water	**Date Received:**	2/ 5/21
Sample Name:	16WW34-210203	**Units:**	µg/L
Lab Code:	E2100149-008	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	2/10/21	2/10/21 19:30	374035	712832	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100149
Project:	HS21020268	**Date Collected:**	2/ 3/21 1135
Sample Matrix:	Water	**Date Received:**	2/ 5/21
Sample Name:	16WW34-210203-FD	**Units:**	µg/L
Lab Code:	E2100149-009	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	2/10/21	2/10/21 19:38	374035	712832	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100149
Project:	HS21020268	**Date Collected:**	2/ 3/21 1220
Sample Matrix:	Water	**Date Received:**	2/ 5/21
Sample Name:	16WW33-210203	**Units:**	µg/L
Lab Code:	E2100149-010	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	2/10/21	2/10/21 19:46	374035	712832	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100149
Project:	HS21020268	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	µg/L
Lab Code:	EQ2100068-01	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	2/10/21	2/10/21 16:36	374035	712832	

Accuracy & Precision

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2100149
Project:	HS21020268	**Date Analyzed:**	2/11/21
Sample Matrix:	Water		

Lab Control Sample Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method:	6850	**Units:**	µg/L
Prep Method:	Method	**Basis:**	As Received
		Extraction Lot:	374035

	Lab Control Sample EQ2100068-02			Duplicate Lab Control Sample EQ2100068-03						
Analyte Name	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**		**RPD Limit**
Perchlorate	0.0871	0.100	87	0.110	0.100	110	84 - 119	23	*	15

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100149
Project:	HS21020268	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2100068-02	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.0871**	J	0.100	0.0500	0.0250	1	2/10/21	2/11/21 16:00	374035	712924	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100149
Project:	HS21020268	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Duplicate Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2100068-03	**Basis:**	As Received

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.110**		0.100	0.0500	0.0250	1	2/10/21	2/11/21 16:08	374035	712924	

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2100149
Project:	HS21020268	**Date Collected:**	2/3/21
Sample Matrix:	Water	**Date Received:**	2/5/21
		Date Analyzed:	2/12/21

Matrix Spike Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Sample Name:	16WW39-210203	**Units:**	µg/L
Lab Code:	E2100149-005	**Basis:**	As Received

Analytical Method: 6850
Prep Method: Method

		16WW39-210203MS **Matrix Spike** EQ2100068-04				16WW39-210203DMS **Duplicate Matrix Spike** EQ2100068-05					
Analyte Name	**Sample Result**	**Result**	**Spike Amount**	**% Rec**		**Result**	**Spike Amount**	**% Rec**		**% Rec Limits**	**RPD**	**RPD Limit**
Perchlorate	3.64	3.76	0.100	121	#	3.78	0.100	146	#	84 - 119	<1	15

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100149
Project:	HS21020268	**Date Collected:**	2/ 3/21 0945
Sample Matrix:	Water	**Date Received:**	2/ 5/21
Sample Name:	16WW39-210203	**Units:**	µg/L
Lab Code:	EQ2100068-04	**Basis:**	As Received
Run Type:	Matrix Spike		

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**3.76**		1.00	0.500	0.250	10	2/10/21	2/12/21 11:40	374035	712935	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2100149
Project:	HS21020268	**Date Collected:**	2/ 3/21 0945
Sample Matrix:	Water	**Date Received:**	2/ 5/21
Sample Name:	16WW39-210203	**Units:**	µg/L
Lab Code:	EQ2100068-05	**Basis:**	As Received
Run Type:	Duplicate Matrix Spike		

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**3.78**		1.00	0.500	0.250	10	2/10/21	2/12/21 11:48	374035	712935	

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

February 16, 2021

Analytical Report for Service Request No: K2101244

RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Suite 210
Houston, TX 77099-4338

RE: ALS Houston DOD TOC / HS21020268

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory February 09, 2021
For your reference, these analyses have been assigned our service request number **K2101244.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please contact me if you have any questions. My extension is 3350. You may also contact me via email at Kelley.Lovejoy@alsglobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

for Kelley Lovejoy
Project Manager

RIGHT SOLUTIONS | RIGHT PARTNER

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
Qualifiers
State Certifications, Accreditations, And Licenses
Case Narrative
Chain of Custody
General Chemistry

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated value.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.
H	The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

Metals Data Qualifiers

#	The control limit criteria is not applicable. See case narrative.
J	The result is an estimated value.
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
M	The duplicate injection precision was not met.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
S	The reported value was determined by the Method of Standard Additions (MSA).
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
+	The correlation coefficient for the MSA is less than 0.995.
Q	See case narrative. One or more quality control criteria was outside the limits.

Organic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
A	A tentatively identified compound, a suspected aldol-condensation product.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
C	The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
D	The reported result is from a dilution.
E	The result is an estimated value.
J	The result is an estimated value.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
P	The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.

Additional Petroleum Hydrocarbon Specific Qualifiers

F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
Y	The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
Z	The chromatographic fingerprint does not resemble a petroleum product.

ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso
State Certifications, Accreditations, and Licenses

Agency	Web Site	Number
Alaska DEH	http://dec.alaska.gov/eh/lab/cs/csapproval.htm	UST-040
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0339
Arkansas - DEQ	http://www.adeq.state.ar.us/techsvs/labcert.htm	88-0637
California DHS (ELAP)	http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx	2795
DOD ELAP	http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm	L16-58-R4
Florida DOH	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E87412
Hawaii DOH	http://health.hawaii.gov/	-
ISO 17025	http://www.pjlabs.com/	L16-57
Louisiana DEQ	http://www.deq.louisiana.gov/page/la-lab-accreditation	03016
Maine DHS	http://www.maine.gov/dhhs/	WA01276
Minnesota DOH	http://www.health.state.mn.us/accreditation	053-999-457
Nevada DEP	http://ndep.nv.gov/bsdw/labservice.htm	WA01276
New Jersey DEP	http://www.nj.gov/dep/enforcement/oqa.html	WA005
New York - DOH	https://www.wadsworth.org/regulatory/elap	12060
North Carolina DEQ	https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification	605
Oklahoma DEQ	http://www.deq.state.ok.us/CSDnew/labcert.htm	9801
Oregon – DEQ (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	WA100010
South Carolina DHEC	http://www.scdhec.gov/environment/EnvironmentalLabCertification/	61002
Texas CEQ	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704427
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C544
Wyoming (EPA Region 8)	https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water-	-
Kelso Laboratory Website	www.alsglobal.com	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at www.ALSGlobal.com or at the accreditation bodies web site.
Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/anlayte is offered by that state.

Case Narrative

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

1317 South 13th Ave, Kelso, WA 98626 | 1-360-577-7222 | www.alsglobal.com

ALS Environmental

Client: ALS Environmental - US
Project: ALS Houston DOD TOC
Sample Matrix: Ground Water

Service Request: K2101244
Date Received: 02/09/2021

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples for the Tier level II requested by the client.

Sample Receipt:

Six ground water samples were received for analysis at ALS Environmental on 02/09/2021. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The samples were stored at minimum in accordance with the analytical method requirements.

General Chemistry:

No significant anomalies were noted with this analysis.

Approved by Noe D. Daniel Date 02/16/2021

Chain of Custody

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

K2101244

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID:** **15619**

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:	HS21020268
TSR:	Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS21020268-02**	**16WW40-210203**	**Groundwater**	**03 Feb 2021 08:20**
	TOC: Provide Level II & DOD Level IV/EQuIS APTIM EDD			18 Feb 2021
2.	**HS21020268-03**	**16WW40-210203-FD**	**Groundwater**	**03 Feb 2021 08:20**
	TOC: Provide Level II & DOD Level IV/EQuIS APTIM EDD			18 Feb 2021
3.	**HS21020268-04**	**16WW12-210203**	**Groundwater**	**03 Feb 2021 09:05**
	TOC: Provide Level II & DOD Level IV/EQuIS APTIM EDD			18 Feb 2021
4.	**HS21020268-05**	**16WW39-210203**	**Groundwater**	**03 Feb 2021 09:45**
	TOC: Provide Level II & DOD Level IV/EQuIS APTIM EDD			18 Feb 2021
5.	**HS21020268-06**	**16WW21-210203**	**Groundwater**	**03 Feb 2021 10:40**
	TOC: Provide Level II & DOD Level IV/EQuIS APTIM EDD			18 Feb 2021
6.	**HS21020268-07**	**16WW21-210203-FD**	**Groundwater**	**03 Feb 2021 10:40**
	TOC: Provide Level II & DOD Level IV/EQuIS APTIM EDD			18 Feb 2021

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: DOD IV (DoD Data Package)

HS 21020268-05 = MS/MSD.

K2101244

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID: 15619**

Relinquished By: Date/Time: 2/8/2021 1800

Received By: D Monroe ALS Kelso Date/Time: 2/9/21 1030

Cooler ID(s): Temperature(s):

PM KL

Cooler Receipt and Preservation Form

Client ALS- Houston Service Request K21 01244

Received: 2/9/21 Opened: 2/9/21 By: KL Unloaded: 2/9/21 By: K

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
4. Was a Temperature Blank present in cooler? NA Y N If yes, notate the temperature in the appropriate column below:
   If no, take the temperature of a representative sample bottle contained within the cooler; notate in the column "Sample Temp":
5. Were samples received within the method specified temperature ranges? NA Y N
   If no, were they received on ice and same day as collected? If not, notate the cooler # below and notify the PM. NA Y N

If applicable, tissue samples were received: *Frozen* *Partially Thawed* *Thawed*

Temp Blank	Sample Temp	IR Gun	Cooler #/COC ID / NA	Out of temp indicate with "X"	PM Notified If out of temp	Tracking Number NA	Filed
1.3		TK01	15619	—	—	9473084013 08	

6. Packing material: *Inserts* *Baggies* *Bubble Wrap* *Gel Packs* *Wet Ice* *Dry Ice* *Sleeves* _____
7. Were custody papers properly filled out (ink, signed, etc.)? NA Y N
8. Were samples received in good condition (unbroken) NA Y N
9. Were all sample labels complete (ie, analysis, preservation, etc.)? NA Y N
10. Did all sample labels and tags agree with custody papers? NA Y N
11. Were appropriate bottles/containers and volumes received for the tests indicated? NA Y N
12. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* NA Y N
13. Were VOA vials received without headspace? *Indicate in the table below.* NA Y N
14. Was C12/Res negative? NA Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count Bottle Type	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:**	K2101244
Project:	ALS Houston DOD TOC/HS21020268	**Date Collected:**	02/3/21
Sample Matrix:	Ground Water	**Date Received:**	02/9/21
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
16WW40-210203	K2101244-001	**7.61**	0.50	0.20	0.07	1	02/10/21 17:05	
16WW40-210203-FD	K2101244-002	**7.57**	0.50	0.20	0.07	1	02/10/21 17:05	
16WW12-210203	K2101244-003	**3.73**	0.50	0.20	0.07	1	02/10/21 17:05	
16WW39-210203	K2101244-004	**1.62**	0.50	0.20	0.07	1	02/10/21 17:05	
16WW21-210203	K2101244-005	ND U	0.50	0.20	0.07	1	02/10/21 17:05	
16WW21-210203-FD	K2101244-006	ND U	0.50	0.20	0.07	1	02/10/21 17:05	
Method Blank	K2101244-MB	ND U	0.50	0.20	0.07	1	02/10/21 17:05	

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K2101244
Project	ALS Houston DOD TOC/HS21020268	**Date Collected:**	02/03/21
Sample Matrix:	Ground Water	**Date Received:**	02/09/21
		Date Analyzed:	02/10/21

Replicate Sample Summary
General Chemistry Parameters

Sample Name:	16WW39-210203	**Units:**	mg/L
Lab Code:	K2101244-004	**Basis:**	NA

Analyte Name	Analysis Method	LOQ	LOD	MDL	Sample Result	Duplicate Sample K2101244-004DUP Result	Average	RPD	RPD Limit
Carbon, Total Organic	SM 5310 C	0.50	0.20	0.07	1.62	1.84	1.73	13 #	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:**	K2101244
Project:	ALS Houston DOD TOC/HS21020268	**Date Collected:**	02/03/21
Sample Matrix:	Ground Water	**Date Received:**	02/09/21
		Date Analyzed:	02/10/21
		Date Extracted:	NA

Matrix Spike Summary
Carbon, Total Organic

Sample Name:	16WW39-210203	**Units:**	mg/L
Lab Code:	K2101244-004	**Basis:**	NA
Analysis Method:	SM 5310 C		
Prep Method:	None		

Matrix Spike
K2101244-004MS

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Carbon, Total Organic	1.62	23.7	25.0	88	83-117

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Matrix Spike and Matrix Spike Duplicate Data is presented for information purposes only. The matrix may or may not be relevant to samples reported in this report. The laboratory evaluates system performance based on the LCS and LCSD control limits.

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K2101244
Project:	ALS Houston DOD TOC/HS21020268	**Date Analyzed:**	02/10/21
Sample Matrix:	Ground Water	**Date Extracted:**	NA

Lab Control Sample Summary
Carbon, Total Organic

Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA
		Analysis Lot:	712738

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K2101244-LCS	25.2	25.0	101	83-117

Appendix E

Well Rehabilitation

SAFETY DATA SHEET
SCRUD REMOVER PART A

1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: **SCRUD REMOVER PART A**
GENERAL USE: **Treatment of (bio)fouled wells and aquifers**

MANUFACTURER:

Redox Tech, LLC
200 Quade Drive
Cary, NC 27513
919-678-0140

EMERGENCY TELEPHONE:

Within USA and Canada: 1-800-424-9300
+1 703-527-3887 (collect calls accepted)

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: Product is not suitable for ingestion. Will cause irritation upon exposure to eyes. Long term contact to skin may cause some drying and minor irritation.

3. COMPOSITION INFORMATION ON INGREDIENTS

Proprietary mixture of salts, solvents and surfactants.

4. FIRST AID MEASURES

EYES: Immediately flush with water for up to 15 minutes. If irritation persists, seek medical attention.

SKIN: Rinse with water. May result in dry skin because the material sequesters fat. If irritation persists, seek medical attention.

INGESTION: Not recommended for ingestion. Material is extremely bitter. If material is accidentally ingested, drink several liters of water and see a physician immediately.

INHALATION: No first aid required.

5. FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA: Deluge with water

FIRE/EXPLOSION HAZARDS: Product is combustible

FIRE FIGHTING PROCEDURES: Use flooding with plenty of water, carbon dioxide or other inert gasses. Wear full protective clothing and self-contained breathing apparatus. Deluging with water is the best method to control combustion of the product.

FLAMMABILITY LIMITS: the material is flammable. Flash point of 68F

SENSITIVITY TO IMPACT: non-sensitive

SENSITIVITY TO STATIC DISCHARGE: non-sensitive

6. ACCIDENTAL RELEASE MEASURES

Confine and collect spill. Transfer to an approved DOT container and properly dispose. Do not dispose of or rinse material into sewer, stormwater or surface water. Discharge of product to surface water could result in depressed dissolved oxygen levels and subsequent biological impacts.

7. HANDLING AND STORAGE

HANDLING: Protective gloves and safety glasses are recommended.

STORAGE: Keep in cool place. Use first in, first out storage system. Keep container tightly closed when not in use. Avoid contamination of opened product.

8. EXPOSURE CONTROLS – PERSONAL PROTECTION

EXPOSURE LIMITS

Chemical Name	ACGIH	OSHA	Supplier
SCRUD REMOVER	**1000 ppm**	**1000 ppm**	**NA**
Proprietary AMR additives (Optional)	**NA**	**NA**	**Provectus Environ. Products**

ENGINEERING CONTROLS: None are required

PERSONAL PROTECTIVE EQUIPMENT

EYES and FACE: Safety goggles
RESPIRATOR: none necessary
PROTECTIVE CLOTHING: None necessary
GLOVES: rubber, latex or neoprene recommended but not required

9. PHYSICAL AND CHEMICAL PROPERTIES

Odor:	mild pleasant organic odor; garlic possible
Appearance:	clear
Auto-ignition Temperature	300 C
Boiling Point	80 C
Melting Point	NA
Density	0.85 gram/cc
Solubility	infinite
pH	>8

10. STABILITY AND REACTIVITY

CONDITIONS TO AVOID: Do not contact with strong oxidizers
STABILITY: product is stable
POLYMERIZATION: will not occur
INCOMPATIBLE MATERIALS: strong oxidizers
HAZARDOUS DECOMPOSITION PRODUCTS: none

11. TOXICOLOGICAL INFORMATION

Acute Toxicity
A: General Product Information
Acute exposure may cause mild skin and eye irritation.
B: Component Analysis - LD50/LC50

No information available.

B: Component Analysis - TDLo/LDLo
TDLo (Oral-Man) none

Carcinogenicity
A: General Product Information
No information available.
B: Component Carcinogenicity
Product is not listed by ACGIH, IARC, OSHA, NIOSH, or NTP.

Epidemiology
No information available.

Neurotoxicity
No information available.

12. ECOLOGICAL INFORMATION

Ecotoxicity: Discharge to water may cause depressed dissolved oxygen and subsequent ecological stresses
Environmental Fate: No potential for food chain concentration

13. DISPOSAL CONSIDERATIONS

DISPOSAL METHOD: Material is not considered hazardous, but consult with local, state and federal agencies prior to disposal to ensure all applicable laws are met.

14. TRANSPORT INFORMATION

NOTE: The shipping classification information in this section (Section 14) is meant as a guide to the overall classification of the product. However, transportation classifications may be subject to change with changes in package size. Consult shipper requirements under I.M.O., I.C.A.O. (I.A.T.A.) and 49 CFR to assure regulatory compliance.

US DOT Information
Shipping Name: Compounds, cleaning liquid
Hazard Class: 3
UN/NA #: NA 1993
Packing Group: II
Required Label(s): Flammable liquid

INTERNATIONAL MARITIME DANGEROUS GOODS (IMDG)

Material is not regulated under IMDG

15. REGULATORY INFORMATION

UNITED STATES

SARA TITLE III
SECTION 311 No Hazard for Immediate health Hazard
SECTION 312 No Threshold Quantity
SECTION 313 Not listed

CERCLA NOT REGULATED UNDER CERCLA

TSCA NOT REGULATED UNDER TSCA

CANADA (WHIMS): NOT REGULATED

16. OTHER INFORMATION

HMIS:

Health	0
Flammability	3
Physical Hazard	0
Personal Protection	E

E: Safety Glasses, gloves

SAFETY DATA SHEET
SCRUD REMOVER - PART B

1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: **SCRUD REMOVER – PART B**
GENERAL USE: **Treatment of (bio)fouled wells and aquifers**

MANUFACTURER:
Redox Tech, LLC
200 Quade Drive
Cary, NC 27513
919-678-0140

EMERGENCY TELEPHONE:
Within USA and Canada: 1-800-424-9300
+1 703-527-3887 (collect calls accepted)

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: Product is generally recognized as safe. May cause irritation exposure to eyes. Long term contact to skin may cause some drying and minor irritation.

3. COMPOSITION INFORMATION ON INGREDIENTS

Proprietary mixture of fatty acids, glycerol, hydrolyzed vegetable oil, emulsifying agent, nutrient salt, and organic deoxygenating agent.

4. FIRST AID MEASURES

EYES: Immediately flush with water for up to 15 minutes. If irritation persists, seek medical attention.

SKIN: Rinse with water. Irritation is unlikely, but if irritation occurs or persists, seek medical attention.

INGESTION: Generally safe to ingest but not recommended.

INHALATION: No first aid required.

5. FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA: Deluge with water

FIRE/EXPLOSION HAZARDS: Product is combustible only at temperatures above 600C

FIRE FIGHTING PROCEDURES: Use flooding with plenty of water, carbon dioxide or other inert gasses. Wear full protective clothing and self-contained breathing apparatus. Deluging with water is the best method to control combustion of the product.

FLAMMABILITY LIMITS: non-combustible

SENSITIVITY TO IMPACT: non-sensitive

SENSITIVITY TO STATIC DISCHARGE: non-sensitive

6. ACCIDENTAL RELEASE MEASURES

Confine and collect spill. Transfer to an approved DOT container and properly dispose. Do not dispose of or rinse material into sewer, stormwater or surface water. Discharge of product to surface water could result in depressed dissolved oxygen levels and subsequent biological impacts.

7. HANDLING AND STORAGE

HANDLING: Protective gloves and safety glasses are recommended.

STORAGE: Keep dry. Use first in, first out storage system. Keep container tightly closed when not in use. Avoid contamination of opened product. Avoid contact with reducing agents.

8. EXPOSURE CONTROLS – PERSONAL PROTECTION

EXPOSURE LIMITS

Chemical Name	ACGIH	OSHA	Supplier
ABC®	**NA**	**NA**	**NA**
Proprietary additives	**NA**	**NA**	**NA**
Proprietary AMR additives (Optional)	**NA**	**NA**	**Provectus Environ. Products**

ENGINEERING CONTROLS: None are required
PERSONAL PROTECTIVE EQUIPMENT

EYES and FACE: Safety glasses recommended
RESPIRATOR: none necessary
PROTECTIVE CLOTHING: None necessary
GLOVES: rubber, latex or neoprene recommended but not required

9. PHYSICAL AND CHEMICAL PROPERTIES

Odor:	none to mild pleasant organic odor; garlic possible
Appearance:	milky
Auto-ignition Temperature	Non-combustible
Boiling Point	>600 C
Melting Point	NA
Density	0.90 gram/cc
Solubility	infinite
pH	6-8

10. STABILITY AND REACTIVITY

CONDITIONS TO AVOID: Do not contact with strong oxidizers
STABILITY: product is stable
POLYMERIZATION: will not occur
INCOMPATIBLE MATERIALS: strong oxidizers
HAZARDOUS DECOMPOSITION PRODUCTS:

11. TOXICOLOGICAL INFORMATION

Acute Toxicity
A: General Product Information
Acute exposure may cause mild skin and eye irritation.
B: Component Analysis - LD50/LC50

No information available.

B: Component Analysis - TDLo/LDLo
TDLo (Oral-Man) none

Carcinogenicity
A: General Product Information
No information available.
B: Component Carcinogenicity
Product is not listed by ACGIH, IARC, OSHA, NIOSH, or NTP.

Epidemiology
No information available.

Neurotoxicity
No information available.

12. ECOLOGICAL INFORMATION

Ecotoxicity: Discharge to water may cause depressed dissolved oxygen and subsequent ecological stresses
Environmental Fate: No potential for food chain concentration

13. DISPOSAL CONSIDERATIONS

DISPOSAL METHOD: Material is not considered hazardous, but consult with local, state and federal agencies prior to disposal to ensure all applicable laws are met.

14. TRANSPORT INFORMATION

NOTE: The shipping classification information in this section (Section 14) is meant as a guide to the overall classification of the product. However, transportation classifications may be subject to change with changes in package size. Consult shipper requirements under I.M.O., I.C.A.O. (I.A.T.A.) and 49 CFR to assure regulatory compliance.

US DOT Information
Shipping Name: Not Regulated
Hazard Class: Not Classified
UN/NA #: Not Classified
Packing Group: None
Required Label(s): None

50th Edition International Air Transport Association (IATA):
Not hazardous and not regulated

INTERNATIONAL MARITIME DANGEROUS GOODS (IMDG)

Material is not regulated under IMDG

15. REGULATORY INFORMATION

UNITED STATES

SARA TITLE III
SECTION 311 No Hazard for Immediate health Hazard
SECTION 312 No Threshold Quantity
SECTION 313 Not listed

CERCLA NOT REGULATED UNDER CERCLA

TSCA NOT REGULATED UNDER TSCA

CANADA (WHIMS): NOT REGULATED

16. OTHER INFORMATION

HMIS:

Health	0
Flammability	0
Physical Hazard	0
Personal Protection	E

E: Safety Glasses, gloves

provectus ENVIRONMENTAL PRODUCTS™

REDOX TECH, LLC

"Providing Innovative In Situ Soil and Groundwater Treatment"

Scrud Remover™

In Situ Remedy for Wells and Aquifers Fouled from certain EVO Amendments

PROBLEM STATEMENT

Application of certain emulsified vegetable oil (EVO) substrates can cause well clogging and aquifer fouling (**Photograph 1**). These negative effects can be long-lasting and wide-ranging. For example, at an active US DOD facility in southern California significant well clogging by thickly coagulated EVO "crud" was observed more than 6 years post-application of a common EVO amendment (personal communication – NOREAS; see inset of fouled well). In addition, aquifer fouling by EVO "scum" is probable at some unknown distance from the points of injection. This scum/crud is collective referred to herein as "Scrud".

Photograph 1: EVO Scum (left) and EVO Crud (right) recovered from EVO-Treated Injection well, Six years after Initial EVO applications.

The scrud formation phenomenon can have significant, negative impact on:

1. Accurate, Defensible Monitoring: fouled and otherwise occluded wells may not yield formation water representative of *in situ* conditions, and the scrud can sequester contaminants that will eventually release and rebound;

2. Remedial Efficacy: many EVO field applications are designed for repeat injections though dedicated wells. If the wells are compromised they cannot serve the designed purpose without replacement or extensive redevelopment, which represents added time and expense;

Scrud Remover™, Provect-IR®, Provect-OX®, Provect-OX2™, Provect-GS™, Provect-IRM®, ABC-CH4®, ERD-CH4 Ole Ego™, EZVI-CH4™ AquaGate®-CH4 and Provect-CH4® are trademarks of Provectus Environmental Products, Inc. and/or our affiliates.
V7 – October 25, 2018 • Copyright ©2018 Provectus Environmental Products, Inc.

3. Remedial Performance: aquifer fouling can limit amendment distribution, induce unpredictable changes in aquifer hydrology and biogeochemistry, and increase remediation times.

Efforts to physically flush with water the EVO amendments from injection wells immediately following their application can help prevent the formation of well crud, but they likely have minimal effect on the formation of aquifer scum. And not all EVO-type substrates elicit the extreme response noted above. For example, amendments rich in fatty acids and low in "butterfat" such as ABC® based products (Redox Tech) and ERD CH4® products (Provectus) have not had well crud reports from over 300 field applications.

Unfortunately, there are no established procedures or measurements to predict situations were well crud and/or aquifer scum formation will be most problematic. Intuitively, aquifers with harder water (*e.g.,* magnesium / calcium > 150 ppm) and elevated concentrations of sodium (*e.g.*, > 200 ppm) and/or iron (*e.g.*, > 25 ppm) would be most susceptible to scrud formation.

TRADITIONAL WELL REHABILITATION PROCESSES

Effective removal of coagulated EVO crud and scum often requires specialized mitigation technologies, as conventional approaches have been mostly ineffective and costly.

- Physical Rehabilitation: Conventional means of aggressive physical scrubbing followed by extensive development. Depending on degree of fouling and well construction, this can be a labor-intensive (between 2 to 8 hours per well) and costly process that could exceed $5,000 per well.

- pH Treatment: The utilization of caustic (pH>10) or acid (pH<2) conditions does not solubilize all EVO cruds evaluated to date. Moreover, there are inherent potential health and safety issues with material handling, and the creation of pH extremes is simply not conducive to desired aquifer biological attenuation processes.

- Heat Treatment: Heated water >60 °C (140 °F) can solubilize some forms of EVO crud. However, upon cooling the crud will again coagulate hence heat will have less impact on aquifer scum. To avoid simple relocation of the problem from crud to scum the heated water must be quickly removed, and multiple heating events will likely be required. Moreover, the process can be difficult to implement, and will likely incur high implementation cost.

- Oxidation: The use of chemical oxidants such as hydrogen peroxide can solubilize some forms of EVO crud. However, the addition of oxidants is counterproductive to reductive dechlorination reactions.

- Surfactant Flushing: In our studies, ionic or non-ionic surfactants are not consistently robust for solubilizing well crud, especially at ambient temperatures.

SCRUD REMOVER™ TECHNOLOGY DESCRIPTION

Scrud Remover™ was developed by Redox Tech, LLC (Cary, NC) and Provectus Environmental Products, Inc. (Freeport, IL) in response to industry demand for a safe, effective means of rehabilitating wells and injection points rendered ineffective or useless by extensive fouling post high-fat EVO application. Like all

Scrud Remover™, Provect-IR®, Provect-OX®, Provect-OX2™, Provect-GS™, Provect-IRM®, ABC-CH4®, ERD-CH4 Ole Ego™, EZVI-CH4™ AquaGate®-CH4 and Provect-CH4® are trademarks of Provectus Environmental Products, Inc. and/or our affiliates.
V7 – October 25, 2018 • Copyright ©2018 Provectus Environmental Products, Inc.

our environmental products, Scrud Remover™ was developed by experienced remedial practitioners with a focus on safety, effectiveness, reliability, ease-of-use, and cost. The efficacy of Scrud Remover™ is enhanced by heat, but heating is not required.

Antimethanogenic Scrud Remover™ Where applicable, antimethanogenic reagent (AMR) technology is uniquely integrated into Scrud Remover™. While other materials to dissolve scrud will predictably follow, these will likely contain very readily biodegradable organic compounds that will rapidly ferment and liberate methane. In areas sensitive to potential plume migration, vapor intrusion, and other consequences associated with excessive methanogenesis the integrated use of AMR technology may be an important technical differentiator.

SCRUD REMOVER™ MODE OF ACTION

Scrud Remover™ was developed through extensive testing of commercially available cleaning agents, ionic and nonionic surfactants, solvents, acids, bases and chelating agents. Individually, none of the materials were always effective at removing the scrud. Also, when some of the heated products dissolved the scrud, the scrud reformed upon cooling. Scrud Remover™ is a proprietary, environmentally friendly, multi-faceted product that removes scrud under ambient conditions (no heat required). To our knowledge, no other similar product exists in the marketplace.

SCRUD REMOVER™ APPLICATION GUIDELINES

1. Physically remove as much of the residual EVO and crud by bailing or pumping. Dispose as regulations require.

2. Prepare specialized anaerobic chase water composed of 5 USG Scrud Remover Part B (supplied with Scrud Remover) to 95 USG water.

3. Well Crud Removal
   - For a 1-inch well, add at least 0.25 USG of neat Scrud Remover™ per 1 linear foot of well screen. Let stand for 90 minutes. Flush with a minimum 2 USG of specialized chase water per 1 linear foot of well screen.
   - For a 2-inch well, add at least 1 USG of neat Scrud Remover™ per 1 linear foot of well screen. Let stand for 90 minutes. Flush with a minimum 4 USG of specialized chase water per 1 linear foot of well screen.
   - For a 4-inch well, add at least 4 USG of neat Scrud Remover™ per 1 linear foot of well screen. Let stand for 90 minutes. Flush with a minimum 16 USG of specialized chase water per 1 linear foot of well screen.
   - For a 6-inch well, we add at least 9 USG of neat Scrud Remover™ per 1 linear foot of well screen. Let stand for 90 minutes. Flush with a minimum 36 USG of specialized chase water per 1 linear foot of well screen.

   A follow-up injection test / falling head test is recommended to confirm to document well improvement. Repeat treatment as needed.

Scrud Remover™, Provect-IR®, Provect-OX®, Provect-OX2™, Provect-GS™, Provect-IRM®, ABC-CH4®, ERD-CH4 Ole Ego™, EZVI-CH4™ AquaGate®-CH4 and Provect-CH4® are trademarks of Provectus Environmental Products, Inc. and/or our affiliates.
V7 – October 25, 2018 • Copyright ©2018 Provectus Environmental Products, Inc.

4. Aquifer Scum Treatment
   - For a 1-inch well, add at least 5 USG of neat Scrud Remover™ per 1 linear foot of well screen. For a 2-inch well, add at least 20 USG of neat Scrud Remover™ per 1 linear foot of well screen. For a 4-inch well, add at least 40 USG of neat Scrud Remover™ per 1 linear foot of well screen. For a 6-inch well, we add at least 60 USG of neat Scrud Remover™ per 1 linear foot of well screen.
   - Flush with specialized chase water targeting >2.5 percent of the estimated pore volume within the radius of influence.

   A follow-up injection test / falling head test is recommended to confirm renewed permeability. Repeat treatment as needed.

SCRUD REMOVER™ ORDERING INFORMATION

Scrud Remover™ is available in 5 USG pails, 50 USG drums, and totes (275 to 330 usg) and ships with requisite amount of Scrud Remover Part B needed to prepare specialized anaerobic chase water. All orders are processed through Redox Tech, LLC at the following address:

REDOX TECH, LLC
"Providing Innovative In Situ Soil and Groundwater Treatment"

200 Quade Drive
Cary, NC 27513
Phone: (919) 678.0140 Fax: (919) 678.0150
www.redox-tech.com

CONTACT US FOR A COMPLIMENTARY SITE EVALUATION

PROVECTUS ENVIRONMENTAL PRODUCTS, INC.

2871 West Forest Road, Suite 2 | Freeport, IL 61032

Tel: (815) 650-2230 | Fax: (815) 650-2232 | Info@Provectusenv.com

Multiple remedial contracting options available via strategic providers

Turn-Key, Risk-Reward, Pay-for Performance, Remedial Guarantees/Warranties

Scrud Remover™, Provect-IR®, Provect-OX®, Provect-OX2™, Provect-GS™, Provect-IRM®, ABC-CH4®, ERD-CH4 Ole Ego™, EZVI-CH4™ AquaGate®-CH4 and Provect-CH4® are trademarks of Provectus Environmental Products, Inc. and/or our affiliates.
V7 – October 25, 2018 • Copyright ©2018 Provectus Environmental Products, Inc.

Subject: **Final Monthly Managers' Meeting (MMM), Longhorn Army Ammunition Plant (LHAAP)**
Location of Meeting: **WebEx Conference Call**
Date of Meeting: **15 February 2022 – 11:00 AM Central Standard Time (CST)**

Attendees:
Army BRAC: Rose M. Zeiler (RMZ)
USEPA: Brian Follin (BF) and Patty Ging with USGS in support of the USEPA
TCEQ: April Palmie (AP)
USACE: Aaron Williams (AW) and Chelsea Montoya
AEC: Lena Sierocinski, Ana Nieves, and Mike Bowlby (MB)
Bhate: Kim Nemmers (KN) and Zack Beck (ZB)
APTIM: William Foss (WF) and Praveen Srivastav (PS)
TLI: Kyra Donnell (KD)
HDR: Phil Werner (PW)
USFWS: Paul Bruckwicki (PB)

Defense Environmental Restoration Program (DERP) Performance-Based Remediation (PBR) Update

- Action items from previous call were completed ahead of the meeting.

Groundwater Treatment Plant (GWTP) – KN stated that Scott Beesinger (SB) had a right knee replacement surgery on 14 February 2022. KN said that SB's surgery went well and would return in a couple weeks. ZB stated that the inline pH probe estimated delivery date was revised to 9 March 2022. ZB explained that the inline pH probe allows automated monitoring and buffering of pH within the fluidized bed reactor (FBR). ZB explained that, until the pH probe is replaced, the GWTP operators continue to monitor pH via a hand held meter and manually adjust the acid feed to buffer pH in the FBR as necessary. ZB stated that treated effluent is currently being discharged to the Intermediate Range Nuclear Forces (INF) pond following ion exchange vessel (IX) treatment. ZB stated that a weekly perchlorate effluent sample is collected on a port between the two IX vessels to confirm treatment of perchlorate. The weekly sampling has confirmed that perchlorate is either not detected or well below the perchlorate protective concentration level (PCL) of 17 micrograms per liter (µg/L) before it is discharged to the INF pond. ZB explained that the GWTP had been freeze protected with no major issues due to freezing temperatures to date.

Field Work – WF stated that the Year 3 Semiannual Event #1 performance groundwater sampling at LHAAP-04 was completed in February 2022. PS said that LHAAP-04 has moved to semi-annual beginning with the February event. WF said that the annual LHAAP-46 groundwater sampling was ongoing and would be completed soon. ZB confirmed that the LHAAP-46 sampling was nearly complete and should be finished by 16 February 2022.

KN asked everyone to refer to the Document and Issues (DI) Tracking Table dated 15 February 2022.

- **Task 1** (Project Management) – KN said that the January 2021 MMM minutes and the Restoration Advisory Board (RAB) meeting minutes had been issued to the regulators for review. KN said that the next RAB meeting is schedule for 15 June 2022. KN stated that the RAB meeting minutes from the October 2021 meeting have been approved and are being added to the Administrative Record (AR).
- **Task 4** (LHAAP-04) –PS stated that the Year 3 Semiannual 1, Remedial Action – Operation (RA-O) Sampling Event groundwater sampling was completed in February 2022. The validated data for the event will be provided for the April 2022 MMM.

- **Task 5** (LHAAP-12) – PS said that the annual sampling event at LHAAP-12 was completed in December 2021. The validated data for the December 2021 event is included in this month's validated data package. WF noted the one monitoring well that has consistently had trichloroethene (TCE) above the maximum contaminant limit (MCL) (5 µg/L) at LHAAP-12 (monitoring well 12WW24). WF stated that TCE has been trending down for several years at 12WW24. As of December 2021, the detected TCE concentration at 12WW24 was just barely above the MCL at 5.5 µg/L. WF stated that he anticipated the TCE concentration to continue the decreasing trend to below MCL.
- **Task 6** (LHAAP-16) – PS stated that the Year 2 Quarter 4 groundwater sampling was completed in January 2022. The validated data will be presented at the March 2022 MMM. PS said that the Year 1 RA-O Report regulatory comments were received on 14 January 2022. PS said that responses to comments are being prepared and that the Army has requested an extension until 7 March 2022.
- **Task 9** (LHAAP-37) – PS said that the Draft Final Year 4 RA-O Report was submitted on 25 January 2022. PS said that the Year 5 semi-annual RA-O sampling event was completed in November 2021, and the validated data package is included in this meeting. WF said that the LHAAP-37 data has been fairly stable in the main body of the plume. WF said that monitoring well 35BWW16, east of the site, has been fluctuating above and below the MCL for tetrachloroethene (PCE) (5 µg/L), and is back below the MCL at 4.8 µg/L as of November 2021. However, WF noted that persistent eastward migration of contaminants is not being observed in this area. WF then discussed a second monitoring well, 35BWW25, in the north portion of the site, where there is a persistent presence of TCE above the MCL at 10 µg/L in November 2021 and 8.5 µg/L in May 2021. WF stated that consideration may be given to installing a well downgradient to monitor the boundary of the plume or looking for an appropriate LHAAP-47 well to use. RMZ said that this is a key well to monitor as there is a building LHAAP-46A just north of 35BWW25 with high TCE levels.
- **Task 10** (LHAAP-46) – PS said that the Draft Final Year 7 RA-O Report was submitted on 31 January 2022. PS said that the Year 8 RA-O groundwater sampling is being completed in February 2022 with the validated data to be presented at the April 2022 MMM.
- **Task 11** (LHAAP-50) **–** PS stated the Year 2 Quarter 3 sampling was completed in January 2022 and anticipates the validated data will be presented at the March 2022 MMM. The Year 7 RA-O Report comments were received from the regulators on 1 February 2022 and responses are currently under preparation.
- **Task 12** (LHAAP-58) – KN stated that the responses to comments on the Year 7 RA-O Report were issued to the regulators on 25 January 2022. KN stated that the western plume sampling was completed in December 2021 and that both plumes will be sampled in June 2022. KN stated that the validated results from the December 2021 groundwater sampling of the western plume were anticipated to be available for the March 2022 MMM.
- **Task 13** (LHAAP-67) – PS stated that the Final Year 7 RA-O Report has been posted to the AR. PS stated that the Year 8 Annual RA-O sampling was completed in November 2021 and that the validated data is included in this month's data package. WF said there are three wells of interest including 67WW12, which is to the far northeast of the site. WF said that 67WW12 is a cross-gradient well that had 1,1-dichloroethene (1,1-DCE) detected above the MCL (7 µg/L) during the Year 7 RA-O sampling event but was detected slightly below the MCL in November 2021 at 6.5 µg/L. WF said that there are no definitive signs of plume migration in this area. WF then discussed the newer wells to the north and northwest of the site (67WW17 and 67WW18), which are both below the MCL and bound the plume in the downgradient direction.

- **Task 14** (LHAAP-001-R and –003-R) – KN said there are upcoming Land Use Control (LUC) inspections to be completed, which involve inspection of warning signs.
- **Task 16** (GWTP) **–** KN said that the 3rd Quarter 2021 GWTP Report comments were received from the regulators and that the 4th Quarter 2021 GWTP 2021 was being prepared. The 4th Quarter 2021 GWTP Report will include the analytical data from semi-annual groundwater sampling completed in December 2021 and will incorporate comments received on the 3rd Quarter 2021 GWTP Report.
- **Task 17** (LHAAP-18/24) – KN said that the December 2021 semi-annual groundwater sampling analytical results for LHAAP-18/24 are included in the validated data package. ZB said that for the December 2021 sampling event the 6 new wells (1824DPTMW01 – 1824DPTMW06), installed by HDR, Inc. (HDR) in 2021, were added to the December 2021 sampling event and replaced 6 existing wells normally sampled in December 2021. ZB said that these wells were only planned for sampling in December 2021 to collect additional perchlorate information. ZB said that the very high perchlorate detections were noted in two of the Shallow Zone wells (1824DPTMW02 and 1824DPTMW05). ZB stated that perchlorate was detected in groundwater from 1824DPTMW02, located outside of the interception-collection trenches (ICT) boundary to the northeast, at 107,000 µg/L and in groundwater from 1824DPTMW05, within the ICT boundary, at 402,000 µg/L. ZB stated that groundwater collected from 1824DPTMW06, installed in the Wilcox Formation, had perchlorate detected at a very low concentration below the PCL (17 µg/L) at an estimated concentration of 0.828 µg/L.
- **Task 18** (Surface Water) – KN stated that there was no new information to report regarding surface water sampling.
- **Task 19:** (2021 LUC Management Plan) – No discussion.
- **Administrative Record (AR) –** PS said that compiling of the July – September 2021 AR documents is ongoing.

Update on other DERP Sites:

- **LHAAP 18/24 –** PW stated that the regulatory comments on the Draft Pre-Design Investigation (PDI) Report were received in January 2022 and are currently being addressed. The draft final PDI Report is on schedule for submittal on 24 February 2022. PW said that the 30-percent (Conceptual Design) LHAAP-18/24 Remedial Design (RD) is in development and on track for regulatory submittal in April 2022.
- **LHAAP-29** – PW said that a Technical Memorandum / Presentation of Reanalysis Results and Additional Sample Rationale to fill data gaps was submitted to Texas Commission on Environmental Quality (TCEQ) and United States Environmental Protection Agency (USEPA) on 31 January 2022, and discussions are ongoing. PW briefly explained the issues with the analytical results from the primary laboratory not meeting the screening levels and the re-analyses by a secondary laboratory. MB asked if the RD is the next step for LHAAP-29. AW explained that the PDI data collected will be used in development of the LHAAP-29 RD.
- **LHAAP-47** – PW said that comments from the Regulators on the Revised Draft Record of Decision are currently being addressed. PW stated that Army requested an extension for Army legal review.
- **LHAAP-17** - KD provided a summary and an update to the LHAAP-17 field work to date. KD stated that all at the 4,000 cubic yards (CY) of soil scoped to be excavated has been completed and that the soil has nearly all been sifted, exported or staged for export. KD said that only 2 days of siting operations remain to be completed. KD said that backfilling of the completed excavation has been started but not completed due in part to the availability of

haul trucks for both export and import clean backfill. KD said that over 14,000 pounds (lbs.) of munition debris have been accumulated; some of which has been exported offsite. She stated that over 30,000 lbs. of non-munitions related debris has been accumulated. KD said that a total of 80 munitions items have been collected and that 62 of those items were detonated on 2 February 2022. KD said that, as of 11 February 2022, an additional 18 munitions items have been collected to be part of a planned demolition event sometime in the near future.

KD said that water management continues to be an issue within Area H. KD said that water from Area H was pumped into a frac tank, but perchlorate results from this water indicates that the water cannot be discharged to the ground. KD said that a plan is being devised to finish dewatering Area H. All of the areas have been excavated or over-excavated with the exception of Area J, the north wall of Area M and the south portion of Area H. KD explained that a contract modification is needed to complete these excavations. KD explained that a survey will be completed to mark the extents achieved to date. KD explained that a surface clearance will be performed followed by a geophysical survey once backfill operations are completed to identify any metallic subsurface anomalies. KD said that field work is expected to continue into March 2022 for the current mobilization, and a remobilization is pending the contract modification. RMZ asked for a clarification on the timing of the geophysical work; KD stated that the work is anticipated to be completed in March 2022 at this time.

KD said that a change page to the Time Critical Removal Action Unified Federal Policy-Quality Assurance Project Plan is going to be submitted. KD said that the change page is in relation to the physical size of the metallic debris that will be removed from the surface.

Transfer Update: PB stated that he is trying to discuss a distribution line lease termination with Mr. Dave Allerd, but not having any luck reaching him. PB said that the gate on Tyler had been fixed, signage placed and the gate locked. He said that another gate across bridge towards the HMX area was closed and locked. PS said that he has not heard from SB regarding any unauthorized entry that he is aware of since January 2022.

Schedule Next Managers' Meeting: The next MMM will be held on Wednesday,16 March 2022 at 10:00 am Central Daylight Time (CDT) via a WebEx. KN said that she is not available for the 16 March 2022 MMM and that ZB will be leading the call.

Meeting concluded at approximately 11:45 am CST.

ACRONYM LIST

AP	April Palmie
APTIM	APTIM Federal Services, LLC
AR	Administrative Record
AW	Aaron Williams
BF	Brian Follin
Bhate	Bhate Environmental Associates, Inc.
BRAC	Base Realignment and Closure
CDT	Central Daylight Time
CST	Central Standard Time
CY	Cubic Yards
1,1-DCE	1,1-Dichoroethene
DERP	Defense Environmental Restoration Program
DI	Documents and Issues
FBR	Fluizided Bed Reactor
GWTP	Groundwater Treatment Plant
HDR	HDR, Inc.ICT Interception-collection trenches
INF	Intermediate Range Nuclear Forces
IX	Ion Exchange
KN	Kim Nemmers
Lbs.	Pounds
LHAAP	Longhorn Army Ammunition Plant
LUC	Land use control
MB	Mike Bowlby
MCL	Maximum Contaminant Level
µg/L	Micrograms per Liter
MMM	Monthly Managers' Meeting
PB	Paul Bruckwicki
PBR	Performance-Based Remediation
PCE	Tetrachloroethene
PCL	Protective Concentration Levels
PS	Praveen Srivastav
PW	Phil Werner
RAB	Restoration Advisory Board
RA-O	Remedial Action – Operation
RD	Remedial Design
RMZ	Rose M. Zeiler
TCE	Trichloroethene
TCEQ	Texas Commission on Environmental Quality
TLI	TLI Solutions
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
USFWS	United Fish and Wildlife Service
WF	William (Bill) Foss
ZB	Zack Beck

LHAAP Validated Data Packages for
February 2022 Monthly Manager's Meeting

GWTP Effluent	*Weekly Perchlorate Sampling –December 2021/January 2022* Perchlorate (6850)
GWTP Effluent	*Bi-Weekly Sampling - December 2021/January 2022* Volatile Organic Compounds (8260C) Anions (9056A)
GWTP Effluent	*Weekly Sampling – December 2021/January 2022* Ammonia (350.3) Ortho-Phosphate (365.3) Total Organic Carbon (415.1)
GWTP Effluent	*Monthly Sampling - January 2022* Volatile Organic Compounds (8260C) Metals (6020A) Hexavalent Chromium (7196A) 1,4-Dioxane (8270D-SIM) Perchlorate (6850)
GWTP Influent	*Monthly Sampling – January 2022* Metals (6020A) Perchlorate (6850) Hexavalent Chromium (7196A)
GWTP Quarterly	*Influent and Effluent – December 2021* Oil and Grease (1664A) Perchlorate (6850) Metals (6020A/7470A) 1,4-Dioxane (8270D-SIM) Chemical Oxygen Demand (410.4) Volatile Organic Compounds (8260C) Anions (9056A)
LHAAP-12	*Year 14 Annual Sampling-December 2021* Field Measurements (Dissolved Oxygen, Oxidation Reduction Potential, Ferrous Iron, and pH) Volatile Organic Compounds (8260)
LHAAP-35B(37)	*Remedial Action-Operation Monitoring (Year 5, Semiannual #1)-November 2021* Volatile Organic Compounds (8260C) Dissolved Gases (RSK-175) Nitrate, Chloride, and Sulfate (9056A) Total Organic Carbon (SM5310B) Field Measurements (Dissolved Oxygen, Oxidation Reduction Potential, Ferrous Iron, and pH)
LHAAP-67	*Year 8 Annual RA(O) Sampling-November 2021* Volatile Organic Compounds (8260C) Dissolved Gases (RSK-175) Nitrate, Chloride, and Sulfate (9056A) Total Organic Carbon (SM5310B) Field Measurements (Dissolved Oxygen, Oxidation Reduction Potential, Ferrous Iron, and pH)
LHAAP-18/24	*Annual Sampling – December 2021* Perchlorate (6850) Metals (6020A/7470) Volatile Organic Compounds (8260C) 1,4- Dioxane (8270D SIM)

GWTP Weekly/Effluent Perchlorate Sampling - January 2022

Location ID: Sample Date:	Units	Daily Maximum Conc	PCL	LH18/24-SP650_010522_AIX 1/5/22	LH18/24-SP650_010522_AIX 1/5/22	LH18/24-SP650_011122_AIX 1/11/22	LH18/24-SP650_011922_AIX 1/19/22	LH18/24-SP650_012522_AIX 1/25/22
Location Description								
				Weekly	Monthly Eff	Weekly	Weekly	Weekly
Perchlorate (6850)								
Perchlorate	µg/L	589	17	**0.117 J**	**0.0890 J**	**0.0882 J**	< 0.0500 U	< 0.0500 U

µg/L - micrograms per liter

BIX - before ion exchange/AIX - after ion exchange

U- Undetected: The analyte was analyzed for, but not detected and reported to the limit of detection.

J - estimated value between the detection limit and limit of quantitation

GWTP Bi-Weekly Sampling - January 2022

Location ID: Sample Date:	Units	(Bayou) Daily Maximum Conc	(INF pond) MCL	LH18/24-SP650_011122 1/11/22	LH18/24-SP650_012522 1/25/22
Location Description				**GWTP – Collected from a spigot on the discharge of effluent TK-650. Sampled Biweekly.**	
Volatile Organic Compounds (8260C)					
1,1,1-Trichloroethane	µg/L	7,230	200	< 0.50 U	< 0.50 U
1,1,2-Trichloroethane	µg/L	216.9	5	< 1.0 U	< 1.0 U
1,1-Dichloroethane	µg/L	14,032	NV	< 0.50 U	< 0.50 U
1,1-Dichloroethene	µg/L	253	7	< 0.50 U	< 0.50 U
1,2-Dichloroethane	µg/L	181	5	< 0.50 U	< 0.50 U
1,2-Dichloropropane	µg/L	5	5	< 1.0 U	< 1.0 U
Acetone	µg/L	2,395	NV	< 2.0 U	< 2.0 U
Benzene	µg/L	181	5	< 0.50 U	< 0.50 U
Carbon tetrachloride	µg/L	181	5	< 1.0 U	< 1.0 U
Chlorobenzene	µg/L	47,180	100	< 1.0 U	< 1.0 U
Chloroform	µg/L	3,615	NV	< 0.50 U	< 0.50 U
cis-1,2-Dichloroethene	µg/L	NV	70	**1.6**	**1.3**
Ethylbenzene	µg/L	57,025	700	< 1.0 U	< 1.0 U
m,p-Xylene	µg/L	83.6	NV	< 1.0 U	< 1.0 U
Methylene chloride	µg/L	1,699	5	< 1.0 U	< 1.0 U
o-Xylene	µg/L	83.6	NV	< 1.0 U	< 1.0 U
Styrene	µg/L	5,987	100	< 1.0 U	< 1.0 U
Tetrachloroethene	µg/L	180.7	5	< 1.0 U	< 1.0 U
Toluene	µg/L	4,189	10	< 0.50 U	< 0.50 U
Trichloroethene	µg/L	181	5	< 0.50 U	< 0.50 U
Vinyl chloride	µg/L	72	2	< 0.50 U	< 0.50 U
Anions (9056)					
Chloride	mg/L	NV	NV	**799**	**929**
Sulfate	mg/L	NV	NV	**33.7**	**56.5**

µg/L - micrograms per liter

mg/L - milligrams per liter

U- Undetected: The analyte was analyzed for, but not detected and reported to the limit of detection.

NV - No Value

GWTP Weekly Sampling - January 2022

Location ID: Sample Date:	Units	Daily Maximum Conc	LH18/24-SP650_010522 1/5/22	LH18/24-SP650_011122 1/11/22	LH18/24-SP650_011922 1/19/22	LH18/24-SP650_012522 1/25/22
Location Description			**GWTP–Collected from a spigot on the discharge of effluent TK-650. Sampled Weekly.**			
Ammonia as N (350.3)						
Ammonia as N	mg/L	NV	**60**	**57**	**49**	**32**
Ortho-Phosphate (365.3)						
Ortho-Phosphate	mg/L	NV	**9.27**	**4.45**	**11.2**	**12.6**
Organic Carbon (415.1)						
Total Organic Carbon (TOC)	mg/L	NV	**7.91**	**3.84**	**14.7**	**23.6**

mg/L - milligrams per liter

NV - No Value

GWTP Monthly Effluent Sampling - January 2022

Location ID: Sample Date:	Units	Daily Maximum Conc	(INF pond) MCL	LH18/24-SP650_010522 1/5/22
Location Description				GWTP – Collected from a spigot on the discharge of effluent TK-650. Sampled monthly
Volatile Organic Compounds (8260C)				
1,1,1-Trichloroethane	µg/L	7,230	200	< 0.50 U
1,1,2-Trichloroethane	µg/L	216.9	5	< 1.0 U
1,1-Dichloroethane	µg/L	14,032	NV	< 0.50 U
1,1-Dichloroethene	µg/L	253	7	< 0.50 U
1,2-Dichloroethane	µg/L	181	5	< 0.50 U
1,2-Dichloropropane	µg/L	5	5	< 1.0 U
Acetone	µg/L	2,395	NV	< 2.0 U
Benzene	µg/L	181	5	< 0.50 U
Carbon tetrachloride	µg/L	181	5	< 1.0 U
Chlorobenzene	µg/L	47,180	100	< 1.0 U
Chloroform	µg/L	3,615	NV	< 0.50 U
cis-1,2-dichloroethene	µg/L	NV	70	**1.6**
Ethylbenzene	µg/L	57,025	700	< 1.0 U
m,p-Xylene	µg/L	83.6	NV	< 1.0 U
Methylene chloride	µg/L	1,699	5	< 2.0 U
o-Xylene	µg/L	83.6	NV	< 1.0 U
Styrene	µg/L	5,987	100	< 1.0 U
Tetrachloroethene	µg/L	180.7	5	< 1.0 U
Toluene	µg/L	4,189	10	< 0.50 U
Trichloroethene	µg/L	181	5	< 0.50 U
Vinyl chloride	µg/L	72	2	< 0.50 U
Metals (6020A)				
Barium	mg/L	2	2	**0.375**
Lead	mg/L	0.0046	0.015	< 0.00100 U
Selenium	mg/L	0.012	0.05	< 0.00250 U
Silver	mg/L	0.003	0.1	< 0.000500 U
Hexavalent Chromium (7196A)				
Hexavalent Chromium	mg/L	0.1244	NV	< 0.0100 U
Semi-Volatile Organic Compounds (8270D SIM)				
1,4-Dioxane	µg/L	134.2	NV	**11**

µg/L - micrograms per liter

mg/L - milligrams per liter

U- Undetected: The analyte was analyzed for, but not detected and reported to the limit of detection.

NV - no value

GWTP Monthly Influent Sampling - January 2022

Location ID: Sample Date:	Units	LH18/24-SP140_010522 1/5/22
Location Description		**GWTP – Collected from a spigot on the influent to TK-140. Sampled Monthly.**
Metals (6020A)		
Selenium	mg/L	< 0.00250 U
Silver	mg/L	< 0.000500 U
Hexavalent Chromium (7196A)		
Hexavalent Chromium	mg/L	< 0.0100 U
Perchlorate (6850)		
Perchlorate	µg/L	**10,700**

mg/L - milligrams per liter

µg/L - micrograms per liter

U- Undetected: The analyte was analyzed for, but not detected and reported to the limit of detection.

GWTP Weekly/Effluent Perchlorate Sampling - December 2021

Location ID: Sample Date:	Units	Daily Maximum Conc	PCL	LH18/24-SP650_120321_AIX 12/3/21	LH18/24-SP650_121421_AIX 12/14/21	LH18/24-SP650_122121_AIX 12/21/21	LH18/24-SP650_121421_AIX 12/14/21	LH18/24-SP650_122821_AIX 12/28/21
Location Description								
				Weekly	Weekly	Weekly	Quarterly Eff	Weekly
Perchlorate (6850)								
Perchlorate	µg/L	589	17	< 0.0500 U	< 0.250 U	**0.168**	< 0.250 U	**0.0932 J**

µg/L - micrograms per liter

AIX - after ion exchange

U- Undetected: The analyte was analyzed for, but not detected and reported to the limit of detection.

J - estimated value between the detection limit and limit of quantitation and/or due to quality contol issues

GWTP Bi-Weekly Sampling - December 2021

Location ID: Sample Date:	Units	(Bayou) Daily Maximum Conc	(INF pond) MCL	LH18/24-SP650_122821 12/28/21
Location Description				GWTP – Collected from a spigot on the discharge of effluent TK-650. Sampled Biweekly.
Volatile Organic Compounds (8260C)				
1,1,1-Trichloroethane	µg/L	7,230	200	< 0.50 U
1,1,2-Trichloroethane	µg/L	216.9	5	< 1.0 U
1,1-Dichloroethane	µg/L	14,032	NV	< 0.50 U
1,1-Dichloroethene	µg/L	253	7	< 0.50 U
1,2-Dichloroethane	µg/L	181	5	< 0.50 U
1,2-Dichloropropane	µg/L	5	5	< 1.0 U
Acetone	µg/L	2,395	NV	< 2.0 U
Benzene	µg/L	181	5	< 0.50 U
Carbon tetrachloride	µg/L	181	5	< 1.0 U
Chlorobenzene	µg/L	47,180	100	< 1.0 U
Chloroform	µg/L	3,615	NV	< 0.50 U
cis-1,2-Dichloroethene	µg/L	NV	70	**2.1**
Ethylbenzene	µg/L	57,025	700	< 1.0 U
m,p-Xylene	µg/L	83.6	NV	< 1.0 U
Methylene chloride	µg/L	1,699	5	< 1.0 U
o-Xylene	µg/L	83.6	NV	< 1.0 U
Styrene	µg/L	5,987	100	< 1.0 U
Tetrachloroethene	µg/L	180.7	5	< 1.0 U
Toluene	µg/L	4,189	10	< 0.50 U
Trichloroethene	µg/L	181	5	< 0.50 U
Vinyl chloride	µg/L	72	2	< 0.50 U
Anions (9056)				
Chloride	mg/L	NV	NV	**794**
Sulfate	mg/L	NV	NV	**21.5**

µg/L - micrograms per liter

mg/L - milligrams per liter

U- Undetected: The analyte was analyzed for, but not detected and reported to the limit of detection.

NV - No Value

NA -not analyzed

GWTP Weekly Sampling - December 2021

Location ID: Sample Date:	Units	Daily Maximum Conc	LH18/24-SP650_121421 12/14/21	LH18/24-SP650_122121 12/21/21	LH18/24-SP650_122821 12/28/21
Location Description			**GWTP–Collected from a spigot on the discharge of effluent TK-650. Sampled Weekly.**		
Ammonia as N (350.3)					
Ammonia as N	mg/L	NV	**120**	**72**	**90**
Ortho-Phosphate (365.3)					
Ortho-Phosphate	mg/L	NV	**9.65**	**11.1**	**7.2**
Organic Carbon (SM5310C)					
Total Organic Carbon (TOC)	mg/L	NV	**12.6**	**8.04**	**14.5**

mg/L - milligrams per liter

NV - No Value

GWTP Quarterly Effluent Sampling - December 2021

Location ID: Sample Date:	Units	Daily Maximum Conc	(INF pond) MCL	LH18/24-SP650_121421 12/14/21
Location Description				GWTP – Collected from a spigot on the discharge of effluent TK-650. Sampled quarterly
Oil and Grease (1664A)				
Oil & Grease	mg/L	15	NV	**0.900 J**
Chemical Oxygen Demand (410.4)				
Chemical Oxygen Demand	mg/L	200	NV	**35.0**
Volatile Organic Compounds (8260C)				
1,1,1-Trichloroethane	µg/L	7,230	200	< 0.50 U
1,1,2-Trichloroethane	µg/L	216.9	5	< 1.0 U
1,1-Dichloroethane	µg/L	14,032	NV	< 0.50 U
1,1-Dichloroethene	µg/L	253	7	< 0.50 U
1,2-Dichloroethane	µg/L	181	5	< 0.50 U
1,2-Dichloropropane	µg/L	5	5	< 1.0 U
Acetone	µg/L	2,395	NV	< 2.0 U
Benzene	µg/L	181	5	< 0.50 U
Carbon tetrachloride	µg/L	181	5	< 1.0 U
Chlorobenzene	µg/L	47,180	100	< 1.0 U
Chloroform	µg/L	3,615	NV	< 0.50 U
cis-1,2-dichloroethene	mg/L	NV	70	**2.3**
Ethylbenzene	µg/L	57,025	700	< 1.0 U
m,p-Xylene	µg/L	83.6	NV	< 1.0 U
Methylene chloride	µg/L	1,699	5	< 2.0 U
o-Xylene	µg/L	83.6	NV	< 1.0 U
Styrene	µg/L	5,987	100	< 1.0 U
Tetrachloroethene	µg/L	180.7	5	< 1.0 U
Toluene	µg/L	4,189	10	< 0.50 U
Trichloroethene	µg/L	181	5	< 0.50 U
Vinyl chloride	µg/L	72	2	< 0.50 U
Metals (6020A)				
Aluminum	mg/L	1.644	NV	0.00892 UB
Antimony	mg/L	NV	0.006	< 0.00100 U
Arsenic	mg/L	0.722	0.01	**0.000608 J**
Barium	mg/L	2	2	**0.425**
Beryllium	mg/L	NV	0.004	< 0.000500 U
Cadmium	mg/L	0.0034	0.005	< 0.000500 U
Calcium	mg/L	NV	NV	**43.1**
Chromium	mg/L	0.752	0.1	**0.000596 J**
Cobalt	mg/L	11.495	NV	**0.000178 J**
Iron	mg/L	2.395	NV	**0.0167 J**
Lead	mg/L	0.0046	0.015	< 0.00100 U
Magnesium	mg/L	NV	NV	**17.8**
Manganese	mg/L	15.494	NV	**0.0648**
Nickel	mg/L	0.184	NV	**0.000987 J**
Potassium	mg/L	NV	NV	**1.97**
Selenium	mg/L	0.012	0.05	< 0.00250 U
Silver	mg/L	0.003	NV	< 0.000500 U
Sodium	mg/L	NV	NV	**523**
Thallium	mg/L	NV	NV	< 0.000500 U
Vanadium	mg/L	3.592	NV	**0.00183 J**
Zinc	mg/L	0.31	NV	**0.00641**
Mercury	mg/L	NV	0.002	< 0.000100 U
Anions (9056)				
Chloride	mg/L	NV	NV	**939**
Sulfate	mg/L	NV	NV	**27.0**
Semi-Volatile Organic Compounds (8270D SIM)				
1,4-Dioxane	µg/L	134.2	NV	**3.6**

µg/L - micrograms per liter

mg/L - milligrams per liter

J - estimated value between the detection limit and limit of quantitation and/or due to quality contol issues

NV - No Value

U- Undetected: The analyte was analyzed for, but not detected and reported to the limit of detection.

UB - considered an artifact of blank contamination

GWTP Quarterly Influent Sampling - December 2021

Location ID: Sample Date:	Units	LH18/24-SP140_121421 12/14/21
Location Description		**GWTP – Collected from a spigot on the influent to TK-140. Sampled Quarterly.**
Oil and Grease (1664A)		
Oil & Grease	mg/L	< 1.00 U
Chemical Oxygen Demand (410.4)		
Chemical Oxygen Demand	mg/L	**7.00 J**
Perchlorate (6850)		
Perchlorate	µg/L	**9,910**
Volatile Organic Compounds (8260C)		
1,1,1,2-Tetrachloroethane	µg/L	< 5.0 U
1,1,1-Trichloroethane	µg/L	< 2.5 U
1,1,2,2-Tetrachloroethane	µg/L	< 5.0 U
1,1,2-Trichloroethane	µg/L	< 5.0 U
1,1-Dichloroethane	µg/L	**3.8 J**
1,1-Dichloroethene	µg/L	< 2.5 U
1,1-Dichloropropene	µg/L	< 5.0 U
1,2,3-Trichlorobenzene	µg/L	< 5.0 U
1,2,3-Trichloropropane	µg/L	< 5.0 U
1,2,4-Trichlorobenzene	µg/L	< 5.0 U
1,2,4-Trimethylbenzene	µg/L	< 5.0 U
1,2-Dibromo-3-chloropropane	µg/L	< 5.0 U
1,2-Dibromoethane	µg/L	< 2.5 U
1,2-Dichlorobenzene	µg/L	< 5.0 U
1,2-Dichloroethane	µg/L	**24**
1,2-Dichloropropane	µg/L	< 5.0 U
1,3,5-Trimethylbenzene	µg/L	< 5.0 U
1,3-Dichlorobenzene	µg/L	< 5.0 U
1,3-Dichloropropane	µg/L	< 5.0 U
1,4-Dichlorobenzene	µg/L	< 5.0 U
2,2-Dichloropropane	µg/L	< 2.5 U
2-Butanone	µg/L	< 5.0 U
2-Chlorotoluene	µg/L	< 5.0 U
2-Hexanone	µg/L	< 10 U
4-Chlorotoluene	µg/L	< 5.0 U
4-Isopropyltoluene	µg/L	< 5.0 U
4-Methyl-2-pentanone	µg/L	< 10 U
Acetone	µg/L	< 10 U
Benzene	µg/L	< 2.5 U
Bromobenzene	µg/L	< 5.0 U
Bromochloromethane	µg/L	< 2.5 U
Bromodichloromethane	µg/L	< 2.5 U
Bromoform	µg/L	< 5.0 U
Bromomethane	µg/L	< 5.0 U
Carbon disulfide	µg/L	< 10 U
Carbon tetrachloride	µg/L	**4.0 J**
Chlorobenzene	µg/L	< 5.0 U
Chloroethane	µg/L	< 5.0 U
Chloroform	µg/L	**7.5**
Chloromethane	µg/L	< 2.5 U
cis-1,2-Dichloroethene	µg/L	**810**
cis-1,3-Dichloropropene	µg/L	< 2.5 U
Dibromochloromethane	µg/L	< 5.0 U
Dibromomethane	µg/L	< 2.5 U
Dichlorodifluoromethane	µg/L	< 5.0 U
Ethylbenzene	µg/L	< 5.0 U
Hexachlorobutadiene	µg/L	< 5.0 U
Isopropylbenzene	µg/L	< 5.0 U
m,p-Xylene	µg/L	< 5.0 U
Methylene chloride	µg/L	**610**
Naphthalene	µg/L	< 5.0 U
n-Butylbenzene	µg/L	< 5.0 U
n-Propylbenzene	µg/L	< 5.0 U
o-Xylene	µg/L	< 5.0 U
sec-Butylbenzene	µg/L	< 5.0 U
Styrene	µg/L	< 5.0 U
tert-Butylbenzene	µg/L	< 5.0 U
Tetrachloroethene	µg/L	< 5.0 U
Toluene	µg/L	< 2.5 U
trans-1,2-Dichloroethene	µg/L	**3.2 J**
trans-1,3-Dichloropropene	µg/L	< 2.5 U
Trichloroethene	µg/L	**3,100**
Trichlorofluoromethane	µg/L	< 5.0 U
Vinyl chloride	µg/L	**9.4**

GWTP Quarterly Influent Sampling - December 2021

Location ID: Sample Date:	Units	LH18/24-SP140_121421 12/14/21
Location Description		GWTP – Collected from a spigot on the influent to TK-140. Sampled Quarterly.
Metals (6020A)		
Aluminum	mg/L	**0.0776**
Antimony	mg/L	**0.000624 J**
Arsenic	mg/L	**0.00143 J**
Barium	mg/L	**0.383**
Beryllium	mg/L	< 0.000500 U
Cadmium	mg/L	< 0.000500 U
Calcium	mg/L	**28.0**
Chromium	mg/L	**0.00153 J**
Cobalt	mg/L	**0.00117 J**
Iron	mg/L	**0.197 J**
Lead	mg/L	< 0.00100 U
Magnesium	mg/L	**19.1**
Manganese	mg/L	**0.0614**
Nickel	mg/L	**0.00884**
Potassium	mg/L	**1.49**
Selenium	mg/L	< 0.00250 U
Silver	mg/L	< 0.000500 U
Sodium	mg/L	**237**
Thallium	mg/L	< 0.000500 U
Vanadium	mg/L	**0.00245 J**
Zinc	mg/L	**0.0225**
Mercury	mg/L	< 0.000100 U
Anions (9056)		
Chloride	mg/L	**320**
Sulfate	mg/L	**35.3**
Semi-Volatile Organic Compounds (8270D SIM)		
1,4-Dioxane	µg/L	**13**

µg/L - micrograms per liter

mg/L - milligrams per liter

J -estimated value between the detection limit and limit of quantitation and/or due to quality contol issues

U- Undetected: The analyte was analyzed for, but not detected and reported to the limit of detection.

LHAAP-12 Year 14 Annual RA-O Sampling
December 2021

		Location Code	12WW10R		12WW20		12WW21				12WW24	
		Sample ID	12WW10R-211228		12WW20-211228		12WW21-211228		12WW21-211228-FD		12WW24-211228	
		Sample Date	12/28/2021		12/28/2021		12/28/2021		12/28/2021		12/28/2021	
		Location Description	Shallow Zone, Unimpacted, Outside Site Boundary		Shallow Zone, unimpacted, outside site boundary		Shallow Zone, unimpacted, outside site boundary				Shallow Zone, impacted, outside site boundary	
Parameter	**Units**	**MCL**	**Result**	**Val Qual**	**Result**	**Val Qual**	**Result**	**Val Qual**	**Result**	**Val Qual**	**Result**	**Val Qual**
Field Measurements												
Dissolved Oxygen	mg/L	NV	0.21		0.27		0.25		0.25		0.17	
Oxidation Reduction Potential	mV	NV	138		124		226		226		60	
pH	Std Units	NV	5.68		4.82		5.3		5.3		5.41	
Volatile Organic Compounds by EPA Method 8260												
cis-1,2-Dichloroethene	µg/L	70	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	7.7	
Trichloroethene	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	**5.5**	
Vinyl chloride	µg/L	2	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U

Notes:

Blue highlighting Indicates concentrations above the MCL

U - Undetected: The analyte was analyzed for, but not detected.

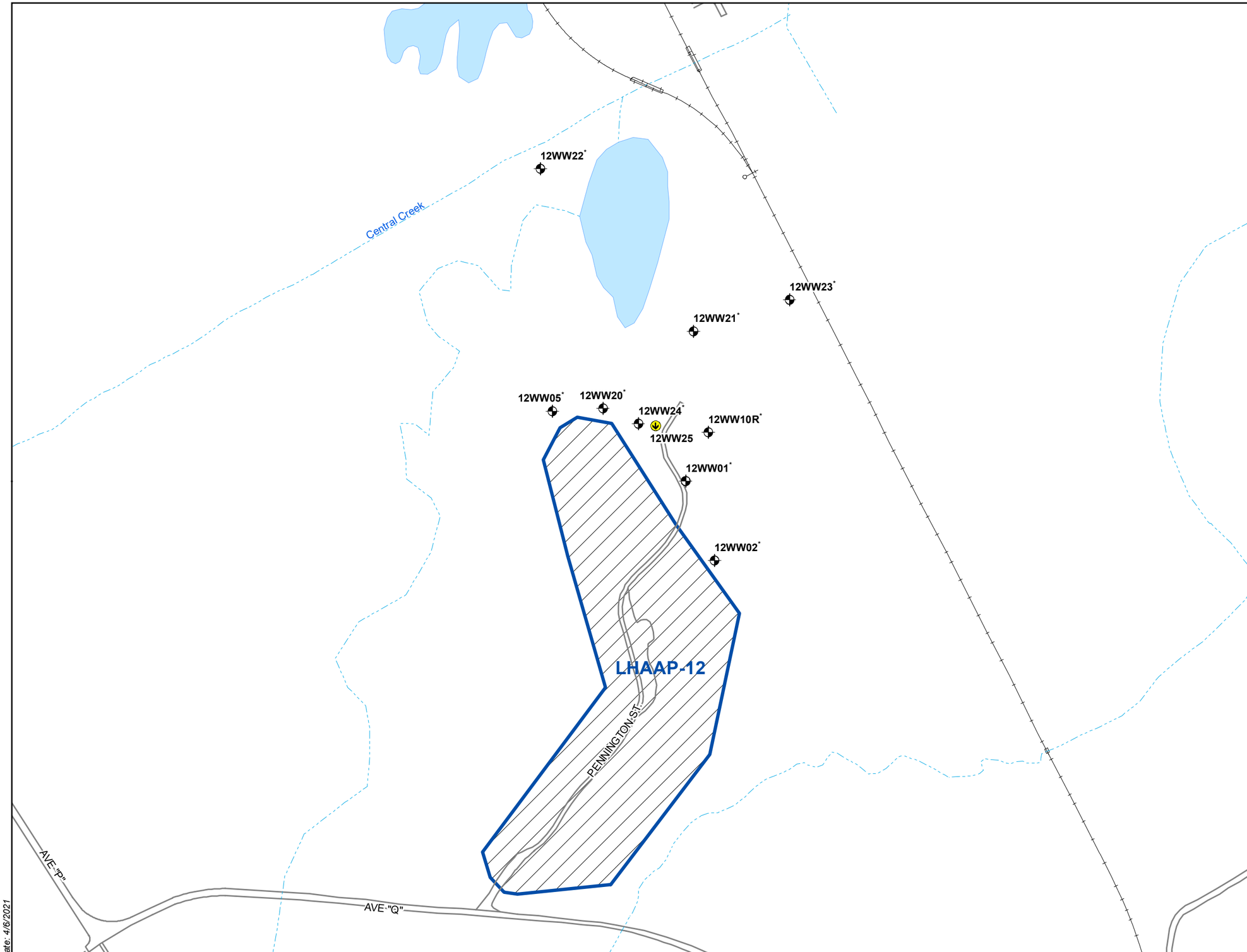
MCL - Maximum Contaminant Limit

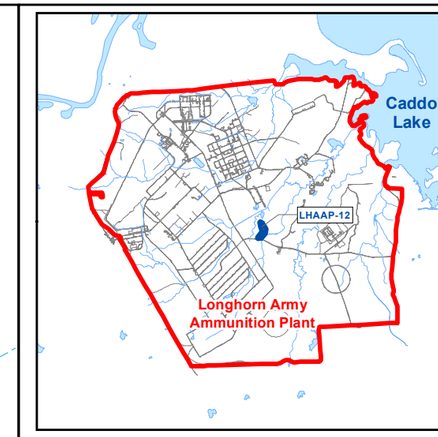
ug/L - micrograms per liter

Std Units - Standard pH Units

mg/L - milligrams per liter

mV - millivolts





Monitoring Well

2014 direct push technology (DPT) Location (This was a DPT boring grab groundwater sample, no well was subsequently installed)

Stream

Road

Site Boundary

Landfill Cap Area

Railroad

Note:
1. Each well has 5'x5' concrete surface monument surrounded by bollards. Each well has a polyvinyl chloride riser.
2. * Gauged for water levels.

N

0 125 250 Feet

U.S. ARMY CORP OF ENGINEERS
TULSA DISTRICT
TULSA, OKLAHOMA

bhate APTIM

Figure 2-1

Groundwater Monitoring Well Locations
LHAAP-12
2020 Annual RA-O Report

LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

Date: 4/6/2021

Document Path: F:\Projects\Longhorn\LHAAP\Documents\Mxd\LHAAP12\RAO\2020\LHAAP12_GWMonitoringWellLocations.mxd

LHAAP-35B(37) Remedial Action - Operation Monitoring
Year 5, Semiannual Event #1
November 2021

		Location Code	35BWW01		35BWW03		35BWW04		35BWW05		35BWW06		35BWW07			
		Sample ID	35BWW01-211115		35BWW03-211115		35BWW04-211117		35BWW05-211115		35BWW06-211115		35BWW07-211117		35BWW07-211117-FD	
		Sample Date	11/15/2021		11/15/2021		11/17/2021		11/15/2021		11/15/2021		11/17/2021		11/17/2021	
		Location Description:	Shallow zone, unimpacted, within site boundary		Shallow zone, unimpacted, within site boundary		Shallow zone, impacted, within site boundary		Shallow zone, impacted, within site boundary		Lower shallow zone, unimpacted, within site boundary		Shallow zone, unimpacted downgradient			
Analyte	**Units**	**MCL**	**Result**	**Val Qual**	**Result**	**Val Qual**	**Result**	**Val Qual**	**Result**	**Val Qual**	**Result**	**Val Qual**	**Result**	**Val Qual**	**Result**	**Val Qual**
Field Measurements																
Dissolved oxygen	mg/L	NV	0.67		1.57		1.18		0.35		0.38		0.44		0.44	
Ferrous Iron	mg/L	NV	NM		NM		0		NM		NM		NM		NM	
Oxidation-Reduction Potential	mV	NV	258		43		240		191		109		80		80	
pH	Std. Units	NV	4.76		6.02		5.71		5.35		5.65		5.52		5.52	
Dissolved Gases (RSK175)																
Carbon dioxide	µg/L	NV	NA		NA		376,000		NA		NA		NA		NA	
Ethane	µg/L	NV	NA		NA		< 0.5	U	NA		NA		NA		NA	
Ethylene	µg/L	NV	NA		NA		< 0.5	UJ	NA		NA		NA		NA	
Methane	µg/L	NV	NA		NA		2.55		NA		NA		NA		NA	
General Chemistry (9056A/SM5310C)																
Chloride	mg/L	NV	NA		NA		3.56		NA		NA		NA		NA	
Nitrate	mg/L	NV	NA		NA		0.116		NA		NA		NA		NA	
Sulfate	mg/L	NV	NA		NA		27.6		NA		NA		NA		NA	
Total organic carbon	mg/L	NV	NA		NA		4.06		NA		NA		NA		NA	
Volatile Organic Compounds (8260C)																
1,1-Dichloroethene	µg/L	7	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
cis-1,2-Dichloroethene	µg/L	70	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Tetrachloroethene	µg/L	5	< 1	U	< 1	U	**6.3**		1.8		< 1	U	< 1	U	< 1	U
Trichloroethene	µg/L	5	< 0.5	U	< 0.5	U	0.88	J	3.5		< 0.5	U	< 0.5	U	< 0.5	U
Vinyl chloride	µg/L	2	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U

Notes:

Blue Highlighting Indicates concentrations above the MCL

J - Estimated: The analyte was positively identified, the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.

U - Undetected: The analyte was analyzed for, but not detected.

UJ - Undetected estimated: The analyte was analyzed for but, was not detected. Even though the analyte was not detected, certain discrepancies in meeting analyte specific quality control were not met.

MCL - Maximum Contaminant Limit, shown for contaminants of concern

Val Qual - validation qualifier

mg/L - milligrams per liter

ug/L - micrograms per liter

Std. Units - standard pH units

mV - millivolts

ID - identification

NV - MCL value not established and/or analyte is not a contaminant of concern

NA - not analyzed

NM - not measured

FD - field duplicate

LHAAP-35B(37) Remedial Action - Operation Monitoring
Year 5, Semiannual Event #1
November 2021

		Location Code	35BWW08		35BWW09		35BWW10		35BWW11		35BWW12		35BWW13		35BWW14	
		Sample ID	35BWW08-211117		35BWW09-211115		35BWW10-211115		35BWW11-211117		35BWW12-211122		35BWW13-211117		35BWW14-211122	
		Sample Date	11/7/2021		11/15/2021		11/15/2021		11/17/2021		11/22/2021		11/17/2021		11/22/2021	
		Location Description:	Shallow zone, unimpacted, within site boundary		Shallow zone, impacted outside site boundary		Shallow, impacted, within site boundary		Shallow zone, unimpacted, within site boundary		Shallow zone, impacted, within site boundary		Shallow zone, unimpacted, crossgradient		Shallow zone, impacted, within site boundary	
Analyte	**Units**	**MCL**	**Result**	**Val Qual**	**Result**	**Val Qual**	**Result**	**Val Qual**	**Result**	**Val Qual**	**Result**	**Val Qual**	**Result**	**Val Qual**	**Result**	**Val Qual**
Field Measurements																
Dissolved oxygen	mg/L	NV	1.33		0.5		2.91		0.49		0.32		2.12		0.53	
Ferrous Iron	mg/L	NV	0.26		NM		NM		NM		2.73		NM		0.48	
Oxidation-Reduction Potential	mV	NV	260		149		235		119		211		342		223	
pH	Std. Units	NV	5.54		5.98		5.55		5.48		5.25		4.06		5.63	
Dissolved Gases (RSK175)																
Carbon dioxide	µg/L	NV	555,000		NA		NA		NA		595,000		NA		535,000	
Ethane	µg/L	NV	< 0.5	U	NA		NA		NA		< 0.5	UJ	NA		< 0.5	U
Ethylene	µg/L	NV	0.889	J	NA		NA		NA		0.71	J	NA		1.76	J
Methane	µg/L	NV	1.34		NA		NA		NA		1.18	J	NA		1.03	
General Chemistry (9056A/SM5310C)																
Chloride	mg/L	NV	3.36		NA		NA		NA		11.6		NA		16.1	
Nitrate	mg/L	NV	0.27		NA		NA		NA		< 0.1	U	NA		0.114	
Sulfate	mg/L	NV	22.7		NA		NA		NA		33.5		NA		61.9	
Total organic carbon	mg/L	NV	3.36		NA		NA		NA		2.14		NA		1.12	
Volatile Organic Compounds (8260C)																
1,1-Dichloroethene	µg/L	7	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	1.3	
cis-1,2-Dichloroethene	µg/L	70	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	0.5	J
Tetrachloroethene	µg/L	5	< 1	U	1.1		< 1	U	< 1	U	2.1		< 1	U	**24**	
Trichloroethene	µg/L	5	< 0.5	U	**23**		< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	**6.1**	
Vinyl chloride	µg/L	2	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 1	U

Notes:

Blue Highlighting Indicates concentrations above the MCL

J - Estimated: The analyte was positively identified, the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.

U - Undetected: The analyte was analyzed for, but not detected.

UJ - Undetected estimated: The analyte was analyzed for but, was not detected. Even though the analyte was not detected, certain discrepancies in meeting analyte specific quality control were not met.

MCL - Maximum Contaminant Limit, shown for contaminants of concern

Val Qual - validation qualifier

mg/L - milligrams per liter

ug/L - micrograms per liter

Std. Units - standard pH units

mV - millivolts

ID - identification

NV - MCL value not established and/or analyte is not a contaminant of concern

NA - not analyzed

NM - not measured

FD - field duplicate

LHAAP-35B(37) Remedial Action - Operation Monitoring
Year 5, Semiannual Event #1
November 2021

		Location Code	35BWW15				35BWW16		35BWW17		35BWW18		35BWW19		35BWW20	
		Sample ID	35BWW15-211122		35BWW15-211122-FD		35BWW16-211117		35BWW17-211122		35BWW18-211115		35BWW19-211115		35BWW20-211117	
		Sample Date	11/22/2021		11/22/2021		11/17/2021		11/22/2021		11/15/2021		11/15/2021		11/17/2021	
		Location Description:	Shallow zone, impacted, within site boundary				Shallow zone, impacted, outside site boundary		Shallow zone, impacted, within site boundary		Shallow zone, unimpacted, outside site boundary		Shallow zone, unimpacted, outside site boundary		Shallow sone, impacted, within site boundary	
Analyte	**Units**	**MCL**	**Result**	**Val Qual**	**Result**	**Val Qual**	**Result**	**Val Qual**	**Result**	**Val Qual**	**Result**	**Val Qual**	**Result**	**Val Qual**	**Result**	**Val Qual**
Field Measurements																
Dissolved oxygen	mg/L	NV	0.61		0.61		0.32		0.32		0.22		0.76		0.99	
Ferrous Iron	mg/L	NV	NM		NM		NM		NM		NM		NM		NM	
Oxidation-Reduction Potential	mV	NV	242		242		310		384		139		168		256	
pH	Std. Units	NV	5.47		5.47		4.67		3.93		6.29		6.34		5.27	
Dissolved Gases (RSK175)																
Carbon dioxide	µg/L	NV	NA		NA		NA		NA		NA		NA		NA	
Ethane	µg/L	NV	NA		NA		NA		NA		NA		NA		NA	
Ethylene	µg/L	NV	NA		NA		NA		NA		NA		NA		NA	
Methane	µg/L	NV	NA		NA		NA		NA		NA		NA		NA	
General Chemistry (9056A/SM5310C)																
Chloride	mg/L	NV	NA		NA		NA		NA		NA		NA		NA	
Nitrate	mg/L	NV	NA		NA		NA		NA		NA		NA		NA	
Sulfate	mg/L	NV	NA		NA		NA		NA		NA		NA		NA	
Total organic carbon	mg/L	NV	NA		NA		NA		NA		NA		NA		NA	
Volatile Organic Compounds (8260C)																
1,1-Dichloroethene	µg/L	7	< 1	U	< 1	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U
cis-1,2-Dichloroethene	µg/L	70	< 1	U	< 1	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U
Tetrachloroethene	µg/L	5	**13**		**13**		4.8		< 1	U	< 1	U	< 1	U	**5.4**	
Trichloroethene	µg/L	5	**5.1**		**5.2**		1.7		< 1	U	< 0.5	U	< 0.5	U	1.3	
Vinyl chloride	µg/L	2	< 1	U	< 1	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U

Notes:

Blue Highlighting Indicates concentrations above the MCL

J - Estimated: The analyte was positively identified, the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.

U - Undetected: The analyte was analyzed for, but not detected.

UJ - Undetected estimated: The analyte was analyzed for but, was not detected. Even though the analyte was not detected, certain discrepancies in meeting analyte specific quality control were not met.

MCL - Maximum Contaminant Limit, shown for contaminants of concern

Val Qual - validation qualifier

mg/L - milligrams per liter

ug/L - micrograms per liter

Std. Units - standard pH units

mV - millivolts

ID - identification

NV - MCL value not established and/or analyte is not a contaminant of concern

NA - not analyzed

NM - not measured

FD - field duplicate

LHAAP-35B(37) Remedial Action - Operation Monitoring
Year 5, Semiannual Event #1
November 2021

		Location Code	35BWW23		35BWW24		35BWW25		35BWW26				LHSMW58	
		Sample ID	35BWW23-211122		35BWW24-211122		35BWW25-211122		35BWW26-211117		35BWW26-211117-FD		LHSMW58-211115	
		Sample Date	11/22/2021		11/22/2021		11/22/2021		11/17/2021		11/17/2021		11/15/2021	
		Location Description:	Shallow zone, unimpacted, outside site boundary		Shallow zone, unimpacted, outside site boundary		Shallow zone, impacted, outside site boundary		Shallow zone, unimpacted, within site boundary				Shallow zone, impacted, within site boundary	
Analyte	**Units**	**MCL**	**Result**	**Val Qual**	**Result**	**Val Qual**	**Result**	**Val Qual**	**Result**	**Val Qual**	**Result**	**Val Qual**	**Result**	**Val Qual**
Field Measurements														
Dissolved oxygen	mg/L	NV	1.24		0.88		0.95		0.84		0.84		2.74	
Ferrous Iron	mg/L	NV	0.62		NM		NM		0		0		NM	
Oxidation-Reduction Potential	mV	NV	281		279		276		271		271		122	
pH	Std. Units	NV	5.16		5.5		5.41		5.21		5.21		6.27	
Dissolved Gases (RSK175)														
Carbon dioxide	µg/L	NV	1,120,000		NA		NA		552,000		557,000		NA	
Ethane	µg/L	NV	< 0.5	U	NA		NA		< 0.5	U	< 0.5	U	NA	
Ethylene	µg/L	NV	< 0.5	UJ	NA		NA		0.524	J	< 0.5	UJ	NA	
Methane	µg/L	NV	0.779		NA		NA		1.28	J	2.04	J	NA	
General Chemistry (9056A/SM5310C)														
Chloride	mg/L	NV	17.3		NA		NA		32.2		32.4		NA	
Nitrate	mg/L	NV	0.0865	J	NA		NA		0.13		0.144		NA	
Sulfate	mg/L	NV	77.5		NA		NA		26.4		24.7		NA	
Total organic carbon	mg/L	NV	2.57		NA		NA		2.12	J	3.33	J	NA	
Volatile Organic Compounds (8260C)														
1,1-Dichloroethene	µg/L	7	< 1	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U
cis-1,2-Dichloroethene	µg/L	70	< 1	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U
Tetrachloroethene	µg/L	5	< 1	U	< 1	U	0.53	J	< 1	U	< 1	U	**13**	
Trichloroethene	µg/L	5	< 1	U	2.9		**10**		< 0.5	U	< 0.5	U	1	
Vinyl chloride	µg/L	2	< 1	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U

Notes:

Blue Highlighting Indicates concentrations above the MCL

J - Estimated: The analyte was positively identified, the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.

U - Undetected: The analyte was analyzed for, but not detected.

UJ - Undetected estimated: The analyte was analyzed for but, was not detected. Even though the analyte was not detected, certain discrepancies in meeting analyte specific quality control were not met.

MCL - Maximum Contaminant Limit, shown for contaminants of concern

Val Qual - validation qualifier

mg/L - milligrams per liter

ug/L - micrograms per liter

Std. Units - standard pH units

mV - millivolts

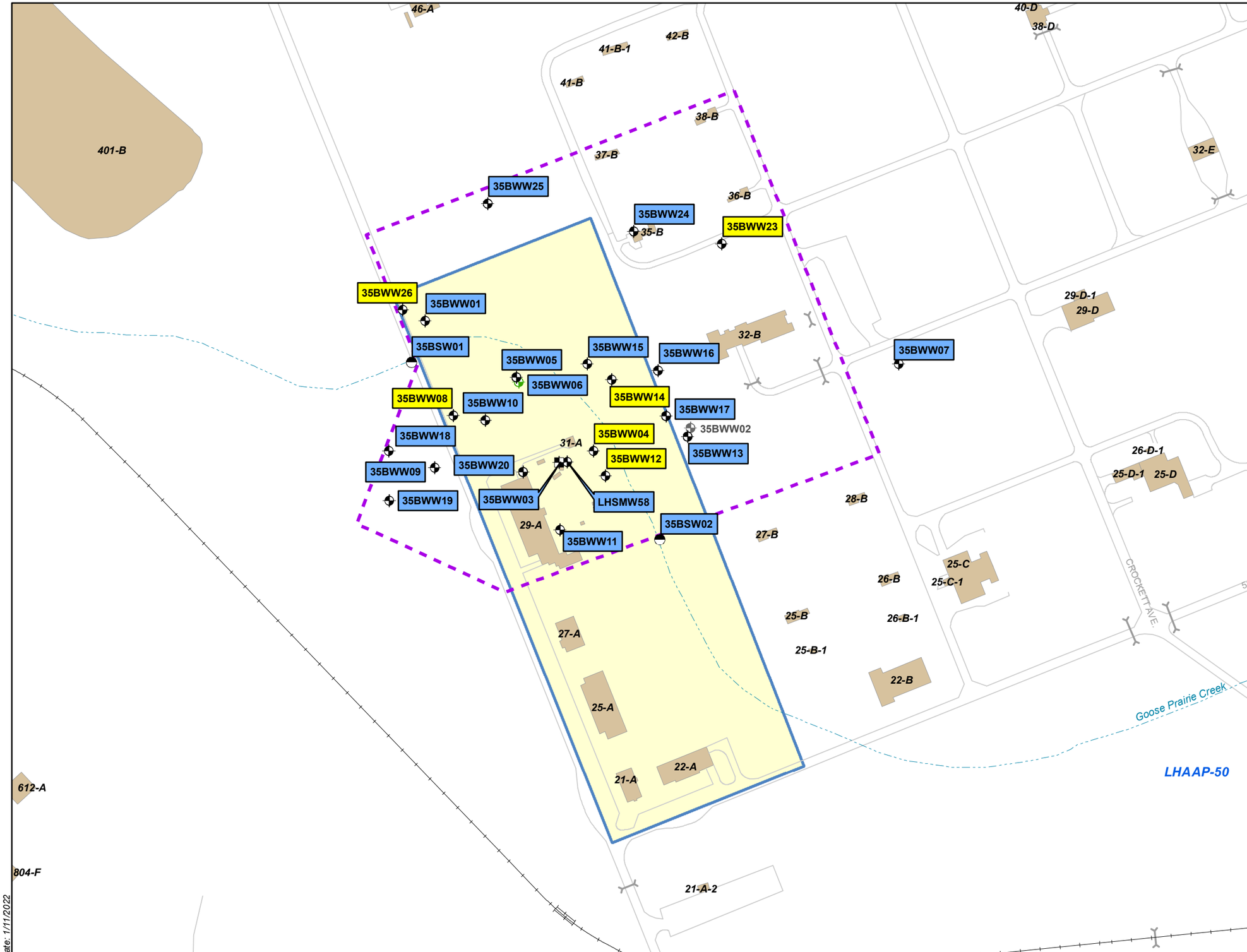
ID - identification

NV - MCL value not established and/or analyte is not a contaminant of concern

NA - not analyzed

NM - not measured

FD - field duplicate



Shallow Monitoring Well
Monitoring Well - Not Sampled
Lower Shallow Monitoring Well
Intermediate Monitoring Well
Surface Water Location
Former Railroad Location
Land Use Control Boundary
Goose Prairie Creek
Roads
Buildings
LHAAP-35B(37) Site Boundary

Note:
1. RA-O = Remedial Action Operations

35BWW15 Sampling Location

35BWW14 Sampling Location including MNA Parameters

2. 35BWW01 is screened above shallow zone
3. 35BWW02 is no longer sampled
4. 35BWW03 and 35BWW06 are sampled every 5 years

N

0 100 200 Feet

U.S. ARMY CORP OF ENGINEERS
TULSA DISTRICT
TULSA, OKLAHOMA

bhate APTIM

Figure 2-1

Groundwater Monitoring Well Locations
Fourth Annual RA-O Report
LHAAP-35B(37)

LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

Date: 1/11/2022

Document Path: F:\Projects\Longhorn\LHAAP\Documents\Mxd\LHAAP37\RAO\Year4\LHAAP37_GWMonitoringLocations.mxd

LHAAP-67 Year 8 Annual RA-O Sampling
November 2021

		Location Code	67WW01		67WW02		67WW05				67WW07		67WW08		67WW09	
		Sample ID	67WW01-211111		67WW02-211110		67WW05-211110		67WW05-211110-FD		67WW07-211110		67WW08-211111		67WW09-211111	
		Sample Date	11/11/2021		11/10/2021		11/10/2021		11/10/2021		11/10/2021		11/11/2021		11/11/2021	
		Location Description	Site 67 - Central, within site boundary		Site 67 - NW, within site boundary		Site 67 - WNW, outside site boundary				Site 67 - E, outside site boundary		Site 67 - S, within site boundary		Site 67 - S, outside site boundary	
Analyte	**Units**	**MCL**	**Result**	**Val Qual**	**Result**	**Val Qual**	**Result**	**Val Qual**	**Result**	**Val Qual**	**Result**	**Val Qual**	**Result**	**Val Qual**	**Result**	**Val Qual**
Field Measurements																
Dissolved oxygen	mg/L	NV	0.55		0.34		0.3		0.3		0.85		0.83		0.5	
Oxidation-Reduction Potential	mV	NV	39		108		48		48		154		174		234	
pH	Std. Units	NV	6.46		5.89		5.95		5.95		5.43		5.73		5.92	
Ferrous Iron	mg/L	NV	NM		NM		NM		NM		NM		0.28		NM	
Dissolved Gases (RSK175)																
Carbon dioxide	µg/L	NV	NA		NA		NA		NA		NA		466,000		NA	
Ethane	µg/L	NV	NA		NA		NA		NA		NA		0.151	J	NA	
Ethylene	µg/L	NV	NA		NA		NA		NA		NA		0.304	J	NA	
Methane	µg/L	NV	NA		NA		NA		NA		NA		1.79	J	NA	
General Chemistry (9056A/SM5310C)																
Chloride	mg/L	NV	NA		NA		NA		NA		NA		1660		NA	
Nitrate	mg/L	NV	NA		NA		NA		NA		NA		0.318	J	NA	
Sulfate	mg/L	NV	NA		NA		NA		NA		NA		471		NA	
Total organic carbon	mg/L	NV	NA		NA		NA		NA		NA		4.71		NA	
Volatile Organic Compounds (8260C)																
1,1,1-Trichloroethane	µg/L	200	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,1,2-Trichloroethane	µg/L	5	< 1	U	0.6	J	< 1	U	< 1	U	< 1	U	< 1	U	5.5	
1,1-Dichloroethene	µg/L	7	**23**		**100**		< 0.5	U	0.62	J	< 0.5	U	**18**		< 0.5	UJ
1,2-Dichloroethane	µg/L	5	3		3.2		< 0.5	U	< 0.5	U	< 0.5	U	0.67	J	**29**	
cis-1,2-Dichloroethene	µg/L	70	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	1.4	
Trichloroethene	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	1.4	
Vinyl chloride	µg/L	2	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U

Notes:

Blue highlighted/**bold** results indicate concentrations above the MCL/PCL.

J - Estimated. The analyte was positively identified, the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.

UJ - Undetected estimated: The analyte was analyzed for but, was not detected. Even though the analyte was not detected, certain discrepancies in meeting analyte specific quality control were not met.

U - Undetected. The analyte was analyzed for, but not detected.

µg/L - micrograms per liter

mg/L - milligrams per liter

FD - field duplicate

ID - identification

MCL - maximum contaminant limit

Val Qual - validation qualifier

VOCs - volatile organic compounds

NV - No value established or analyte is not a COC

Std. Units - standard pH units

mV - millivolts

NA - not analyzed

NM - not measured

LHAAP-67 Year 8 Annual RA-O Sampling
November 2021

		Location Code	67WW09A		67WW10		67WW11		67WW12		67WW13				67WW14	
		Sample ID	67WW09A-211110		67WW10-211110		67WW11-211111		67WW12-211110		67WW13-211111		67WW13-211111-FD		67WW14-211110	
		Sample Date	11/10/2021		11/10/2021		11/11/2021		11/10/2021		11/11/2021		11/11/2021		11/10/2021	
		Location Description	Site 67 - S, outside site boundary		Site 67 - SE, outside site boundary		Site 67 - SW, outside site boundary		Site 67 - NE, within site boundary		Site 67 - NE, within site boundary				Site 67 - SW, outside the site boundary beside Ignatius Ave.	
Analyte	**Units**	**MCL**	**Result**	**Val Qual**	**Result**	**Val Qual**	**Result**	**Val Qual**	**Result**	**Val Qual**	**Result**	**Val Qual**	**Result**	**Val Qual**	**Result**	**Val Qual**
Field Measurements																
Dissolved oxygen	mg/L	NV	0.26		0.27		0.76		1.35		0.67		0.67		0.58	
Oxidation-Reduction Potential	mV	NV	184		201		172		244		196		196		28	
pH	Std. Units	NV	5.99		4.89		6.19		5.23		6.07		6.07		6.09	
Ferrous Iron	mg/L	NV	NM		NM		NM		NM		0		0		NM	
Dissolved Gases (RSK175)																
Carbon dioxide	µg/L	NV	NA		NA		NA		NA		637,000		657,000		NA	
Ethane	µg/L	NV	NA		NA		NA		NA		0.794	J	0.293	J	NA	
Ethylene	µg/L	NV	NA		NA		NA		NA		1.02	J	< 0.5	UJ	NA	
Methane	µg/L	NV	NA		NA		NA		NA		2.29		1.72		NA	
General Chemistry (9056A/SM5310C)																
Chloride	mg/L	NV	NA		NA		NA		NA		1200		1210		NA	
Nitrate	mg/L	NV	NA		NA		NA		NA		0.32	J	0.31	J	NA	
Sulfate	mg/L	NV	NA		NA		NA		NA		268		261		NA	
Total organic carbon	mg/L	NV	NA		NA		NA		NA		4		4.61		NA	
Volatile Organic Compounds (8260C)																
1,1,1-Trichloroethane	µg/L	200	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,1,2-Trichloroethane	µg/L	5	< 1	U	< 1	U	< 1	U	< 1	U	< 1	UJ	5.9	J	< 1	U
1,1-Dichloroethene	µg/L	7	< 0.5	U	< 0.5	U	< 0.5	U	6.5		< 0.5	UJ	**410**	J	3	
1,2-Dichloroethane	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	UJ	**43**	J	0.58	J
cis-1,2-Dichloroethene	µg/L	70	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	UJ	1.6	J	< 0.5	U
Trichloroethene	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	UJ	2.4	J	< 0.5	U
Vinyl chloride	µg/L	2	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U

Notes:

Blue highlighted/**bold** results indicate concentrations above the MCL/PCL.

J - Estimated. The analyte was positively identified, the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.

UJ - Undetected estimated: The analyte was analyzed for but, was not detected. Even though the analyte was not detected, certain discrepancies in meeting analyte specific quality control were not met.

U - Undetected. The analyte was analyzed for, but not detected.

µg/L - micrograms per liter

mg/L - milligrams per liter

FD - field duplicate

ID - identification

MCL - maximum contaminant limit

Val Qual - validation qualifier

VOCs - volatile organic compounds

NV - No value established or analyte is not a COC

Std. Units - standard pH units

mV - millivolts

NA - not analyzed

NM - not measured

LHAAP-67 Year 8 Annual RA-O Sampling
November 2021

		Location Code	67WW15		67WW16I		67WW17		67WW18	
		Sample ID	67WW15-211111		67WW16I-211111		67WW17-211110		67WW18-211110	
		Sample Date	11/11/2021		11/11/2021		11/10/2021		11/10/2021	
		Location Description	Site 67 - W, outside site boundary		Site 67 - S, within site boundary		Site 67 - NW, within site boundary		Site 67 - N, outside site boundary	
Analyte	**Units**	**MCL**	**Result**	**Val Qual**	**Result**	**Val Qual**	**Result**	**Val Qual**	**Result**	**Val Qual**
Field Measurements										
Dissolved oxygen	mg/L	NV	0.69		0.77		0.25		0.63	
Oxidation-Reduction Potential	mV	NV	263		92		184		174	
pH	Std. Units	NV	5.43		5.61		5.94		5.73	
Ferrous Iron	mg/L	NV	NM		NM		NM		NM	
Dissolved Gases (RSK175)										
Carbon dioxide	µg/L	NV	NA		NA		NA		NA	
Ethane	µg/L	NV	NA		NA		NA		NA	
Ethylene	µg/L	NV	NA		NA		NA		NA	
Methane	µg/L	NV	NA		NA		NA		NA	
General Chemistry (9056A/SM5310C)										
Chloride	mg/L	NV	NA		NA		NA		NA	
Nitrate	mg/L	NV	NA		NA		NA		NA	
Sulfate	mg/L	NV	NA		NA		NA		NA	
Total organic carbon	mg/L	NV	NA		NA		NA		NA	
Volatile Organic Compounds (8260C)										
1,1,1-Trichloroethane	µg/L	200	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,1,2-Trichloroethane	µg/L	5	5.7		< 1	U	< 1	U	< 1	U
1,1-Dichloroethene	µg/L	7	**420**		< 0.5	U	< 0.5	U	< 0.5	U
1,2-Dichloroethane	µg/L	5	**43**		< 0.5	U	< 0.5	U	< 0.5	U
cis-1,2-Dichloroethene	µg/L	70	1.6		< 0.5	U	< 0.5	U	< 0.5	U
Trichloroethene	µg/L	5	2.2		< 0.5	U	< 0.5	U	< 0.5	U
Vinyl chloride	µg/L	2	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U

Notes:

Blue highlighted/**bold** results indicate concentrations above the MCL/PCL.

J - Estimated. The analyte was positively identified, the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.

UJ - Undetected estimated: The analyte was analyzed for but, was not detected. Even though the analyte was not detected, certain discrepancies in meeting analyte specific quality control were not met.

U - Undetected. The analyte was analyzed for, but not detected.

µg/L - micrograms per liter

mg/L - milligrams per liter

FD - field duplicate

ID - identification

MCL - maximum contaminant limit

Val Qual - validation qualifier

VOCs - volatile organic compounds

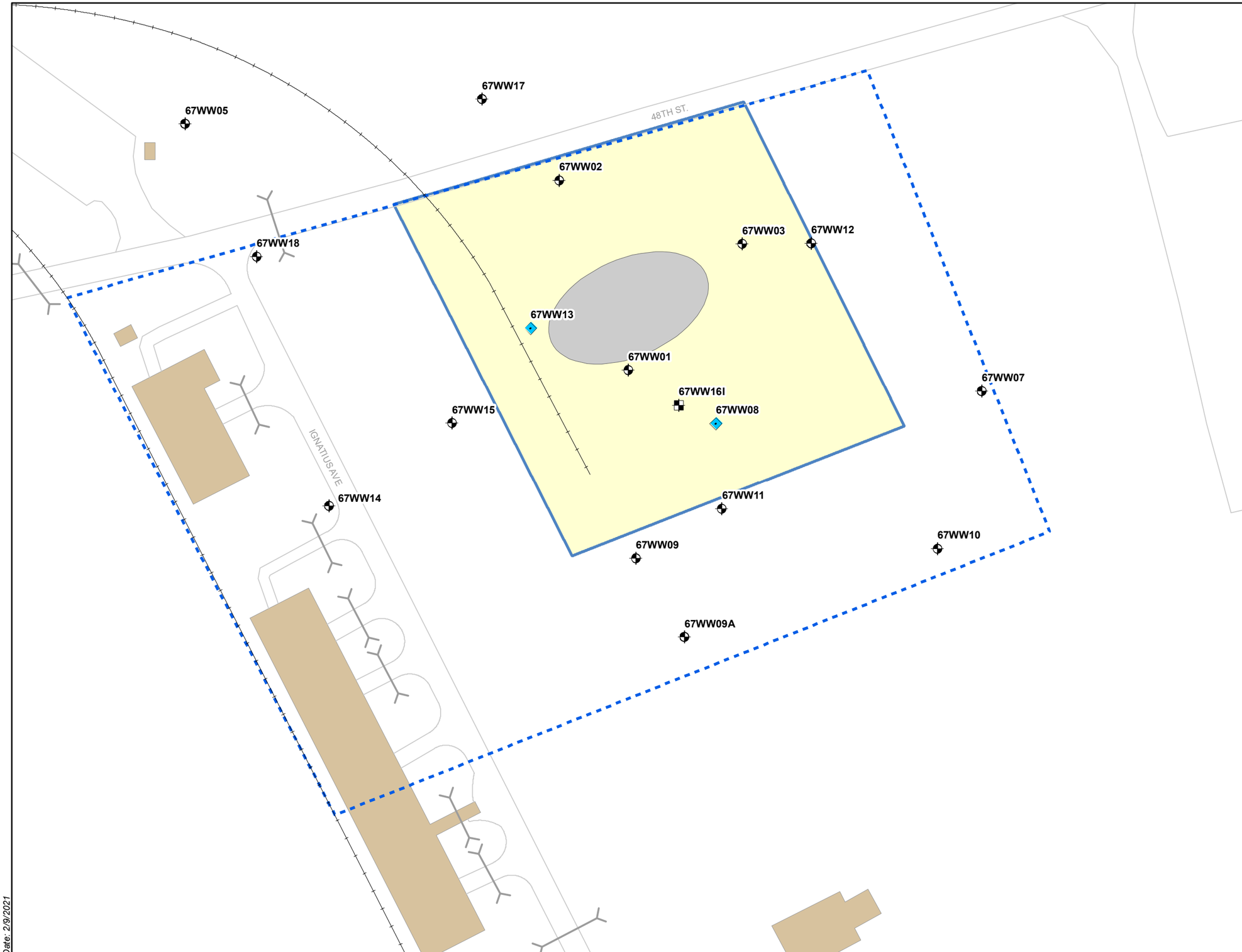
NV - No value established or analyte is not a COC

Std. Units - standard pH units

mV - millivolts

NA - not analyzed

NM - not measured



Shallow Monitoring Well
Intermediate Monitoring Well
Current MNA Parameter Analysis Well Location
Former Railroad Location
Culvert
Surveyed Land Use Control Boundary
Roads
Buildings
Approximate Tank Location
LHAAP-67 Site Boundary

Notes:
1. LHAAP = Longhorn Army Ammunition Plant
2. RA-O = Remedial Action Operations

N

0 37.5 75 Feet

U.S. ARMY CORP OF ENGINEERS
TULSA DISTRICT
TULSA, OKLAHOMA

bhate APTIM

Figure 2-1

Groundwater Monitoring Well Locations
Seventh Annual RA-O Report
LHAAP-67

LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

Date: 2/9/2021

Document Path: F:\Projects\Longhorn\LHAAP\Documents\Mxd\LHAAP67\RAO\Year7\LHAAP67_GWMonitoringLocations.mxd

LHAAP 18/24 December 2021

Location Identification				MW5_120621	18CPTMW08DW_120621	18CPTMW08SW_120621	18CPTMW12SW_120621	18CPTMW12DW_120621	MW7_120621	MW23_120621	120_120721	MW14_120721	1824DPTMW06_120721	1824DPTMW06_120721_a	18CPTMW22R_120721	18CPTMW22SW_120721
Date		MCL/MSC/ PCL		12/6/2021							12/7/2021					
Lab Package	CAS NUMBER		UNITS	HS21120428-01	HS21120428-02	HS21120428-03	HS21120428-04	HS21120428-05	HS21120428-06	HS21120428-07	HS21120475-01	HS21120475-02	HS21120475-03	HS21120475-04	HS21120475-05	HS21120475-06
Well ID				MW-5	18CPTMW08DW	18CPTMW08SW	18CPTMW12SW	18CPTMW12DW	MW-7	MW-23	120	MW-14	1824DPTMW06	1824DPTMW06	18CPTMW22R	18CPTMW22SW
Aquifer Zone				Shallow	Wilcox	Wilcox	Wilcox	Wilcox	Shallow	Shallow	Shallow	Wilcox	Wilcox	Wilcox	Shallow	Wilcox
Method: SW8260																
1,1,1,2-Tetrachloroethane	630-20-6	110	µg/L	< 1.0	NA	< 1.0	< 1.0	< 1.0	< 5.0	< 5.0	< 10	< 10	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1-Trichloroethane	71-55-6	200	µg/L	< 0.50	NA	< 0.50	< 0.50	< 0.50	< 2.5	< 2.5	< 5.0	< 5.0	< 0.50	< 0.50	< 0.50	< 0.50
1,1,2,2-Tetrachloroethane	79-34-5	14	µg/L	< 1.0	NA	< 1.0	< 1.0	< 1.0	< 5.0	< 5.0	< 10	< 10	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloroethane	79-00-5	5	µg/L	< 1.0	NA	< 1.0	< 1.0	< 1.0	< 5.0	< 5.0	< 10	< 10	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane	75-34-3	10,000	µg/L	**1.8**	NA	**4.4**	< 0.50	< 0.50	< 2.5	< 2.5	**11**	**20**	**1.2**	**1.3**	< 0.50	< 0.50
1,1-Dichloroethene	75-35-4	7	µg/L	< 0.50	NA	**0.74 J**	< 0.50	< 0.50	**6.6**	< 2.5	**38**	**69**	< 0.50	< 0.50	< 0.50	< 0.50
1,1-Dichloropropene	563-58-6	2.9	µg/L	< 1.0	NA	< 1.0	< 1.0	< 1.0	< 5.0	< 5.0	< 10	< 10	< 1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichlorobenzene	87-61-6	310	µg/L	< 1.0	NA	< 1.0	< 1.0	< 1.0	< 5.0	< 5.0	< 10	< 10	< 1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichloropropane	96-18-4	0.041	µg/L	< 1.0	NA	< 1.0	< 1.0	< 1.0	< 5.0	< 5.0	< 10	< 10	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trichlorobenzene	120-82-1	70	µg/L	< 1.0	NA	< 1.0	< 1.0	< 1.0	< 5.0	< 5.0	< 10	< 10	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trimethylbenzene	95-63-6	5,100	µg/L	< 1.0	NA	< 1.0	< 1.0	< 1.0	< 5.0	< 5.0	< 10	< 10	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromo-3-chloropropane	96-12-8	0.2	µg/L	< 1.0	NA	< 1.0	< 1.0	< 1.0	< 5.0	< 5.0	< 10	< 10	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromoethane	106-93-4	0.05	µg/L	< 0.50	NA	< 0.50	< 0.50	< 0.50	< 2.5	< 2.5	< 5.0	< 5.0	< 0.50	< 0.50	< 0.50	< 0.50
1,2-Dichlorobenzene	95-50-1	600	µg/L	< 1.0	NA	< 1.0	< 1.0	< 1.0	< 5.0	< 5.0	< 10	< 10	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane	107-06-2	5	µg/L	< 0.50	NA	< 0.50	< 0.50	< 0.50	**25**	**69**	**20**	**55**	**1.6**	**1.6**	< 0.50	< 0.50
1,2-Dichloropropane	78-87-5	5	µg/L	< 1.0	NA	< 1.0	< 1.0	< 1.0	< 5.0	< 5.0	< 10	< 10	< 1.0	< 1.0	< 1.0	< 1.0
1,3,5-Trimethylbenzene	108-67-8	5,100	µg/L	< 1.0	NA	< 1.0	< 1.0	< 1.0	< 5.0	< 5.0	< 10	< 10	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichlorobenzene	541-73-1	3,100	µg/L	< 1.0	NA	< 1.0	< 1.0	< 1.0	< 5.0	< 5.0	< 10	< 10	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichloropropane	142-28-9	29	µg/L	< 1.0	NA	< 1.0	< 1.0	< 1.0	< 5.0	< 5.0	< 10	< 10	< 1.0	< 1.0	< 1.0	< 1.0
1,4-Dichlorobenzene	106-46-7	75	µg/L	< 1.0	NA	< 1.0	< 1.0	< 1.0	< 5.0	< 5.0	< 10	< 10	< 1.0	< 1.0	< 1.0	< 1.0
2,2-Dichloropropane	594-20-7	42	µg/L	< 0.50 UJ	NA	< 0.50 UJ	< 0.50 UJ	< 0.50 UJ	< 2.5 UJ	< 2.5	< 5.0 UJ	< 5.0 UJ	< 0.50 UJ	< 0.50 UJ	< 0.50 UJ	< 0.50 UJ
2-Butanone	78-93-3	61,000	µg/L	< 1.0	NA	< 1.0	< 1.0	< 1.0	< 5.0	< 5.0	< 10	< 10	< 1.0	< 1.0	< 1.0	< 1.0
2-Chlorotoluene	95-49-8	2,000	µg/L	< 1.0	NA	< 1.0	< 1.0	< 1.0	< 5.0	< 5.0	< 10	< 10	< 1.0	< 1.0	< 1.0	< 1.0
2-Hexanone	591-78-6	6,100	µg/L	< 2.0	NA	< 2.0	< 2.0	< 2.0	< 10	< 10	< 20	< 20	< 2.0	< 2.0	< 2.0	< 2.0
4-Chlorotoluene	106-43-4	2,000	µg/L	< 1.0	NA	< 1.0	< 1.0	< 1.0	< 5.0	< 5.0	< 10	< 10	< 1.0	< 1.0	< 1.0	< 1.0
4-Isopropyltoluene	99-87-6	10,000	µg/L	< 1.0	NA	< 1.0	< 1.0	< 1.0	< 5.0	< 5.0	< 10	< 10	< 1.0	< 1.0	< 1.0	< 1.0
4-Methyl-2-pentanone	108-10-1	8,200	µg/L	< 2.0	NA	< 2.0	< 2.0	< 2.0	< 10	< 10	< 20	< 20	< 2.0	< 2.0	< 2.0	< 2.0
Acetone	67-64-1	92,000	µg/L	< 2.0 UJ	NA	< 2.0 UJ	< 2.0 UJ	< 2.0 UJ	< 10 UJ	< 10 UJ	< 20	< 20	< 2.0	< 2.0	< 2.0	< 2.0
Benzene	71-43-2	5	µg/L	< 0.50	NA	< 0.50	< 0.50	< 0.50	**5.4**	< 2.5	< 5.0	< 5.0	< 0.50	< 0.50	< 0.50	< 0.50
Bromobenzene	108-86-1	2,000	µg/L	< 1.0	NA	< 1.0	< 1.0	< 1.0	< 5.0	< 5.0	< 10	< 10	< 1.0	< 1.0	< 1.0	< 1.0
Bromochloromethane	74-97-5	4,100	µg/L	< 0.50	NA	< 0.50	< 0.50	< 0.50	< 2.5	< 2.5	< 5.0	< 5.0	< 0.50	< 0.50	< 0.50	< 0.50
Bromodichloromethane	75-27-4	4.6	µg/L	< 0.50	NA	< 0.50	< 0.50	< 0.50	< 2.5	< 2.5	< 5.0	< 5.0	< 0.50	< 0.50	< 0.50	< 0.50
Bromoform	75-25-2	36	µg/L	< 1.0	NA	< 1.0	< 1.0	< 1.0	< 5.0	< 5.0	< 10	< 10	< 1.0	< 1.0	< 1.0	< 1.0
Bromomethane	74-83-9	140	µg/L	< 1.0 UJ	NA	< 1.0 UJ	< 1.0 UJ	< 1.0 UJ	< 5.0 UJ	< 5.0 UJ	< 10 UJ	< 10 UJ	< 1.0 UJ	< 1.0 UJ	< 1.0 UJ	< 1.0 UJ
Carbon disulfide	75-15-0	10,000	µg/L	< 2.0	NA	< 2.0	< 2.0	< 2.0	< 10	< 10	< 20	< 20	< 2.0	< 2.0	< 2.0	< 2.0
Carbon tetrachloride	56-23-5	5	µg/L	< 1.0	NA	< 1.0	< 1.0	< 1.0	**9.0**	< 5.0	< 10	< 10	< 1.0	< 1.0	< 1.0	< 1.0
Chlorobenzene	108-90-7	100	µg/L	< 1.0	NA	< 1.0	< 1.0	< 1.0	< 5.0	< 5.0	< 10	< 10	< 1.0	< 1.0	< 1.0	< 1.0
Chloroethane	75-00-3	41,000	µg/L	< 1.0	NA	< 1.0	< 1.0	< 1.0	< 5.0	< 5.0	< 10	< 10	< 1.0	< 1.0	< 1.0	< 1.0
Chloroform	67-66-3	1,000	µg/L	< 0.50	NA	< 0.50	< 0.50	< 0.50	**13**	**10**	**12**	< 5.0	< 0.50	< 0.50	< 0.50	< 0.50
Chloromethane	74-87-3	220	µg/L	< 0.50 UJ	NA	< 0.50 UJ	< 0.50 UJ	< 0.50 UJ	< 2.5 UJ	< 2.5 UJ	< 5.0 UJ	< 5.0 UJ	< 0.50 UJ	< 0.50 UJ	< 0.50 UJ	< 0.50 UJ
cis-1,2-Dichloroethene	156-59-2	70	µg/L	**5.8**	NA	**11**	< 0.50	< 0.50	**19**	**21**	**800**	**1300**	**5.0**	**5.1**	< 0.50	< 0.50
cis-1,3-Dichloropropene	10061-01-5	5.3	µg/L	< 0.50	NA	< 0.50	< 0.50	< 0.50	< 2.5	< 2.5	< 5.0	< 5.0	< 0.50	< 0.50	< 0.50	< 0.50
Dibromochloromethane	124-48-1	34	µg/L	< 1.0	NA	< 1.0	< 1.0	< 1.0	< 5.0	< 5.0	< 10	< 10	< 1.0	< 1.0	< 1.0	< 1.0
Dibromomethane	74-95-3	380	µg/L	< 0.50	NA	< 0.50	< 0.50	< 0.50	< 2.5	< 2.5	< 5.0	< 5.0	< 0.50	< 0.50	< 0.50	< 0.50
Dichlorodifluoromethane	75-71-8	20,000	µg/L	< 1.0	NA	< 1.0	< 1.0	< 1.0	< 5.0	< 5.0	< 10	< 10	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	100-41-4	700	µg/L	< 1.0	NA	< 1.0	< 1.0	< 1.0	< 5.0	< 5.0	< 10	< 10	< 1.0	< 1.0	< 1.0	< 1.0
Hexachlorobutadiene	87-68-3	20	µg/L	< 1.0	NA	< 1.0	< 1.0	< 1.0	< 5.0	< 5.0	< 10 UJ	< 10 UJ	< 1.0 UJ	< 1.0 UJ	< 1.0 UJ	< 1.0 UJ
Isopropylbenzene	98-82-8	10,000	µg/L	< 1.0	NA	< 1.0	< 1.0	< 1.0	< 5.0	< 5.0	< 10	< 10	< 1.0	< 1.0	< 1.0	< 1.0
m,p-Xylene	179601-23-1	10,000**	µg/L	< 1.0	NA	< 1.0	< 1.0	< 1.0	< 5.0	< 5.0	< 10	< 10	< 1.0	< 1.0	< 1.0	< 1.0
Methylene chloride	75-09-2	5	µg/L	**1.9 J**	NA	< 1.0	< 1.0	< 2.0	**9.2 J**	**6.7 J**	< 10	< 10	< 2.0	< 2.0	< 2.0	< 2.0
n-Butylbenzene	104-51-8	4,100	µg/L	< 1.0	NA	< 1.0	< 1.0	< 1.0	< 5.0	< 5.0	< 10	< 10	< 1.0	< 1.0	< 1.0	< 1.0
n-Propylbenzene	103-65-1	4,100	µg/L	< 1.0	NA	< 1.0	< 1.0	< 1.0	< 5.0	< 5.0	< 10	< 10	< 1.0	< 1.0	< 1.0	< 1.0

Location Identification				MW5_120621	18CPTMW08DW_120621	18CPTMW08SW_120621	18CPTMW12SW_120621	18CPTMW12DW_120621	MW7_120621	MW23_120621	120_120721	MW14_120721	1824DPTMW06_120721	1824DPTMW06_120721_a	18CPTMW22R_120721	18CPTMW22SW_120721
Date		MCL/MSC/ PCL		12/6/2021							12/7/2021					
Lab Package	CAS NUMBER		UNITS	HS21120428-01	HS21120428-02	HS21120428-03	HS21120428-04	HS21120428-05	HS21120428-06	HS21120428-07	HS21120475-01	HS21120475-02	HS21120475-03	HS21120475-04	HS21120475-05	HS21120475-06
Well ID				MW-5	18CPTMW08DW	18CPTMW08SW	18CPTMW12SW	18CPTMW12DW	MW-7	MW-23	120	MW-14	1824DPTMW06	1824DPTMW06	18CPTMW22R	18CPTMW22SW
Aquifer Zone				Shallow	Wilcox	Wilcox	Wilcox	Wilcox	Shallow	Shallow	Shallow	Wilcox	Wilcox	Wilcox	Shallow	Wilcox
Method: SW8260																
Naphthalene	91-20-3	2,000	µg/L	< 1.0	NA	< 1.0	< 1.0	< 1.0	< 5.0	< 5.0	< 10	< 10	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	95-47-6	10,000**	µg/L	< 1.0	NA	< 1.0	< 1.0	< 1.0	< 5.0	< 5.0	< 10	< 10	< 1.0	< 1.0	< 1.0	< 1.0
sec-Butylbenzene	135-98-8	4,100	µg/L	< 1.0	NA	< 1.0	< 1.0	< 1.0	< 5.0	< 5.0	< 10	< 10	< 1.0	< 1.0	< 1.0	< 1.0
Styrene	100-42-5	100	µg/L	< 1.0	NA	< 1.0	< 1.0	< 1.0	< 5.0	< 5.0	< 10	< 10	< 1.0	< 1.0	< 1.0	< 1.0
tert-Butylbenzene	98-06-6	4,100	µg/L	< 1.0	NA	< 1.0	< 1.0	< 1.0	< 5.0	< 5.0	< 10	< 10	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloroethene	127-18-4	5	µg/L	< 1.0	NA	< 1.0	< 1.0	< 1.0	< 5.0	< 5.0	< 10	< 10	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	108-88-3	1,000	µg/L	< 0.50	NA	< 0.50	< 0.50	< 0.50	< 2.5	< 2.5	< 5.0	< 5.0	< 0.50	< 0.50	< 0.50	< 0.50
trans-1,2-Dichloroethene	156-60-5	100	µg/L	< 0.50	NA	< 0.50	< 0.50	< 0.50	< 2.5	**2.2 J**	**5.4 J**	**13**	< 0.50	< 0.50	< 0.50	< 0.50
trans-1,3-Dichloropropene	10061-02-6	29	µg/L	< 0.50	NA	< 0.50	< 0.50	< 0.50	< 2.5	< 2.5	< 5.0	< 5.0	< 0.50	< 0.50	< 0.50	< 0.50
Trichloroethene	79-01-6	5	µg/L	**18**	NA	**38**	**1.3**	< 0.50	**1700**	**3100**	**4900**	**6200**	**3.0**	**3.2**	< 0.50	**0.97 J**
Trichlorofluoromethane	75-69-4	31,000	µg/L	< 1.0	NA	< 1.0	< 1.0	< 1.0	< 5.0	< 5.0	< 10	< 10	< 1.0	< 1.0	< 1.0	< 1.0
Vinyl chloride	75-01-4	2	µg/L	**1.5**	NA	**1.9**	< 0.50	< 0.50	< 2.5	< 2.5	**13**	< 5.0	< 0.50	< 0.50	< 0.50	< 0.50
Method: SW8270SIM																
1,4-Dioxane	123-91-1	9.1*	ug/L	**0.96**	**0.86**	**2.2**	**1.8**	**1.7**	**4.0**	NA	**49**	**96**	**2.0**	**4.7**	**0.48**	**1.3**
Method: 6850																
Perchlorate	14797-73-0	17*	µg/L	**28900**	**4240**	**19700**	**0.134**	**0.0516 J**	**16300**	**81600**	**15200**	**164000**	**1.14 J**	**0.828 J**	**0.392**	**11700**
Method: SW6020A																
Aluminum	7429-90-5	100	mg/L	0.00396 UB	NA	NA	0.0123 UB	< 0.00500	NA	NA	NA	**0.0386**	NA	NA	**8.22**	**0.0534**
Antimony	7440-36-0	0.006	mg/L	< 0.00100	NA	NA	< 0.00100	< 0.00100	NA	NA	NA	**0.000416 J**	NA	NA	< 0.00100	< 0.00100
Arsenic	7440-38-2	0.01	mg/L	< 0.00100	NA	NA	**0.000813 J**	**0.00264 J**	NA	NA	NA	**0.00422 J**	NA	NA	**0.00351 J**	**0.00211 J**
Barium	7440-39-3	2	mg/L	**0.698**	NA	NA	**0.901**	**0.327**	NA	NA	NA	**0.341**	NA	NA	**0.171**	**0.110**
Beryllium	7440-41-7	0.004	mg/L	< 0.000500	NA	NA	< 0.000500	< 0.000500	NA	NA	NA	**0.000356 J**	NA	NA	**0.000971 J**	< 0.000500
Cadmium	7440-43-9	0.005	mg/L	**0.000671 J**	NA	NA	**0.000311 J**	< 0.000500	NA	NA	NA	**0.000880 J**	NA	NA	< 0.000500	< 0.000500
Calcium	7440-70-2	NV	mg/L	**15.5**	NA	NA	**56.6**	**27.4**	NA	NA	NA	**124**	NA	NA	**1.91**	**12.7**
Chromium	7440-47-3	0.1	mg/L	**0.0771**	NA	NA	**0.00295 J**	**0.00329 J**	NA	NA	NA	**0.211**	NA	NA	**0.00922**	**0.0188**
Cobalt	7440-48-4	6.1	mg/L	**0.00228 J**	NA	NA	**0.0126**	**0.000326 J**	NA	NA	NA	**0.0317**	NA	NA	**0.0146**	< 0.000500
Copper	7440-50-8	1.3	mg/L	**0.00121 J**	NA	NA	< 0.00250	< 0.00250	NA	NA	NA	**0.00229 J**	NA	NA	**0.00724**	< 0.00250
Iron	7439-89-6	NV	mg/L	**0.392**	NA	NA	**0.613**	**6.45**	NA	NA	NA	**66.4**	NA	NA	**10.8**	**0.0452 J**
Lead	7439-92-1	0.015	mg/L	< 0.00100	NA	NA	< 0.00100	< 0.00100	NA	NA	NA	< 0.00100	NA	NA	**0.00631**	< 0.00100
Magnesium	7439-95-4	NV	mg/L	**16.5**	NA	NA	**32.5**	**8.60**	NA	NA	NA	**50.4**	NA	NA	**2.26**	**1.05**
Manganese	7439-96-5	1.1*	mg/L	**0.0644**	NA	NA	**1.46**	**0.201**	NA	NA	NA	**3.11**	NA	NA	**0.112**	**0.00737**
Nickel	7440-02-0	0.49*	mg/L	**0.0599**	NA	NA	**0.0132**	**0.000774 J**	NA	NA	NA	**0.465**	NA	NA	**0.00890**	< 0.00100
Potassium	7440-09-7	NV	mg/L	**1.89**	NA	NA	**36.1**	**55.1**	NA	NA	NA	**15.7**	NA	NA	**0.867**	**244**
Selenium	7782-49-2	0.05	mg/L	< 0.00250	NA	NA	< 0.00250	< 0.00250	NA	NA	NA	**0.00143 J**	NA	NA	< 0.00250	**0.00331 J**
Silver	7440-22-4	0.51	mg/L	< 0.000500	NA	NA	< 0.000500	< 0.000500	NA	NA	NA	< 0.000500	NA	NA	< 0.000500	< 0.000500
Sodium	7440-23-5	NV	mg/L	**87.2**	NA	NA	**225**	**160**	NA	NA	NA	**292**	NA	NA	**33.1**	**272**
Thallium	7440-28-0	0.002	mg/L	< 0.000500	NA	NA	< 0.000500	< 0.000500	NA	NA	NA	< 0.000500	NA	NA	< 0.000500	< 0.000500
Vanadium	7440-62-2	0.72	mg/L	**0.00234 J**	NA	NA	**0.00161 J**	**0.000991 J**	NA	NA	NA	**0.000712 J**	NA	NA	**0.0146**	**0.00108 J**
Zinc	7440-66-6	31	mg/L	**0.0175**	NA	NA	**0.0169**	**0.00268 J**	NA	NA	NA	**0.915**	NA	NA	**0.0284**	**0.00264 J**
Method: SW7470A																
Mercury	7439-97-6	0.002	mg/L	**0.0000990 J**	NA	NA	**0.000130 J**	< 0.000100	NA	NA	NA	**0.000153 J**	NA	NA	**0.000153 J**	**0.0000410 J**

Notes:

Blue highlighting indicates concentrations above the MCL/MSC/PCL

MCL/MSC - Maximum Contaminant Limit/Medium-Specific Concentrations/Protective Concentration Level

NA - Not Analyzed

µg/L - micrograms per liter

mg/L - milligrams per liter

J - Estimated: The analyte was positively identified, the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality

UJ - The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria.

U - Undetected: The analyte was analyzed for, but not detected.

UB - considered a non-detect due to blank contamination

NV - No Value

*Perchlorate, manganese, 1,4-dioxane and nickel compared to the PCL

** Value is for total xylenes

PCL – Texas Risk Reduction Program (TRRP) Tier 1 Groundwater Residential Protective Concentration Level

a - duplicate sample

< - non-detect

Location Identification				MW19_120721	MW18_120721	MW18_120721_a	18CPTMW04SW-120821	18CPTMW04-120821	MW22_120821	MW22_120821_a	18CPTMW06_120821	18ww06_120821	18ww02-120821	18CPTMW15-120821	MW-2_120921	MW-2_120921_a	18CPTMW01SW_120921
Date		MCL/MSC/ PCL					12/8/2021										
Lab Package	CAS NUMBER		UNITS	HS21120475-07	HS21120475-08	HS21120475-09	HS21120589-01	HS21120589-02	HS21120589-03	HS21120589-04	HS21120589-05	HS21120589-06	HS21120589-07	HS21120589-08	HS21120658-01	HS21120658-02	HS21120658-03
Well ID				MW-19	MW-18	MW-18	18CPTMW04SW	18CPTMW04	MW-22	MW-22	18CPTMW06	18WW06	18WW02	18CPTMW15	MW-2	MW-2	18CPTMW01SW
Aquifer Zone				Shallow	Shallow	Shallow	Wilcox	Wilcox	Shallow	Shallow	Wilcox	Wilcox	Wilcox	Shallow	Shallow	Shallow	Wilcox
Method: SW8260																	
1,1,1,2-Tetrachloroethane	630-20-6	110	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 10 UJ	< 10	< 10 UJ
1,1,1-Trichloroethane	71-55-6	200	µg/L	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 5.0 UJ	< 5.0	< 5.0 UJ
1,1,2,2-Tetrachloroethane	79-34-5	14	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 10 UJ	< 10	< 10 UJ
1,1,2-Trichloroethane	79-00-5	5	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 10 UJ	**5.7 J**	< 10 UJ
1,1-Dichloroethane	75-34-3	10,000	µg/L	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	**18 J**	**22**	< 5.0 UJ
1,1-Dichloroethene	75-35-4	7	µg/L	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	**160**	**190**	< 5.0
1,1-Dichloropropene	563-58-6	2.9	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 10	< 10	< 10
1,2,3-Trichlorobenzene	87-61-6	310	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 10	< 10	< 10
1,2,3-Trichloropropane	96-18-4	0.041	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 10 UJ	< 10	< 10 UJ
1,2,4-Trichlorobenzene	120-82-1	70	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 10	< 10	< 10
1,2,4-Trimethylbenzene	95-63-6	5,100	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 10	< 10	< 10
1,2-Dibromo-3-chloropropane	96-12-8	0.2	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 10 UJ	< 10	< 10 UJ
1,2-Dibromoethane	106-93-4	0.05	µg/L	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 5.0 UJ	< 5.0	< 5.0 UJ
1,2-Dichlorobenzene	95-50-1	600	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 10	< 10	< 10
1,2-Dichloroethane	107-06-2	5	µg/L	< 0.50	< 0.50	< 0.50	< 0.50	**0.63 J**	**5.1**	**5.1**	< 0.50	< 0.50	< 0.50	< 0.50	< 5.0 UJ	< 5.0	< 5.0 UJ
1,2-Dichloropropane	78-87-5	5	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 10 UJ	< 10	< 10 UJ
1,3,5-Trimethylbenzene	108-67-8	5,100	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 10	< 10	< 10
1,3-Dichlorobenzene	541-73-1	3,100	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 10	< 10	< 10
1,3-Dichloropropane	142-28-9	29	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 10 UJ	< 10	< 10 UJ
1,4-Dichlorobenzene	106-46-7	75	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 10	< 10	< 10
2,2-Dichloropropane	594-20-7	42	µg/L	< 0.50 UJ	< 0.50 UJ	< 0.50 UJ	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 5.0 UJ	< 5.0	< 5.0 UJ
2-Butanone	78-93-3	61,000	µg/L	< 1.0	< 1.0	< 1.0	< 1.0 UJ	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 10	< 10	< 10
2-Chlorotoluene	95-49-8	2,000	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 10	< 10	< 10
2-Hexanone	591-78-6	6,100	µg/L	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 20	< 20	< 20
4-Chlorotoluene	106-43-4	2,000	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 10	< 10	< 10
4-Isopropyltoluene	99-87-6	10,000	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 10	< 10	< 10
4-Methyl-2-pentanone	108-10-1	8,200	µg/L	< 2.0	< 2.0	< 2.0	< 2.0 UJ	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 20	< 20	< 20
Acetone	67-64-1	92,000	µg/L	< 2.0	< 2.0	< 2.0	< 2.0 UJ	< 2.0 UJ	< 2.0 UJ	< 2.0 UJ	< 2.0 UJ	< 2.0 UJ	< 2.0 UJ	< 2.0 UJ	< 20	< 20	< 20
Benzene	71-43-2	5	µg/L	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	**0.88 J**	**0.89 J**	< 0.50	< 0.50	< 0.50	< 0.50	< 5.0	< 5.0	< 5.0
Bromobenzene	108-86-1	2,000	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 10	< 10	< 10
Bromochloromethane	74-97-5	4,100	µg/L	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 5.0 UJ	< 5.0	**20 J**
Bromodichloromethane	75-27-4	4.6	µg/L	< 0.50	< 0.50	< 0.50	< 0.50 UJ	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 5.0 UJ	< 5.0	< 5.0 UJ
Bromoform	75-25-2	36	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 10	< 10	< 10
Bromomethane	74-83-9	140	µg/L	< 1.0 UJ	< 1.0 UJ	< 1.0 UJ	< 1.0 UJ	< 1.0 UJ	< 1.0 UJ	< 1.0 UJ	< 1.0 UJ	< 1.0 UJ	< 1.0 UJ	< 1.0 UJ	< 10 UJ	< 10 UJ	< 10 UJ
Carbon disulfide	75-15-0	10,000	µg/L	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 20 UJ	< 20 UJ	< 20 UJ
Carbon tetrachloride	56-23-5	5	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 10	< 10	< 10
Chlorobenzene	108-90-7	100	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 10	< 10	< 10
Chloroethane	75-00-3	41,000	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 10 UJ	< 10	< 10 UJ
Chloroform	67-66-3	1,000	µg/L	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	**2.3**	**2.3**	< 0.50	< 0.50	< 0.50	< 0.50	**22**	**26**	< 5.0
Chloromethane	74-87-3	220	µg/L	< 0.50 UJ	< 0.50 UJ	< 0.50 UJ	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 5.0 UJ	< 5.0	< 5.0 UJ
cis-1,2-Dichloroethene	156-59-2	70	µg/L	**5.1**	**0.89 J**	**0.94 J**	< 0.50	**9.0**	**3.6**	**3.6**	< 0.50	< 0.50	< 0.50	< 0.50	**18000**	**17000**	**1600**
cis-1,3-Dichloropropene	10061-01-5	5.3	µg/L	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 5.0	< 5.0	< 5.0
Dibromochloromethane	124-48-1	34	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 10 UJ	< 10	< 10 UJ
Dibromomethane	74-95-3	380	µg/L	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 5.0 UJ	< 5.0	< 5.0 UJ
Dichlorodifluoromethane	75-71-8	20,000	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 10 UJ	< 10	< 10 UJ
Ethylbenzene	100-41-4	700	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 10	< 10	< 10
Hexachlorobutadiene	87-68-3	20	µg/L	< 1.0 UJ	< 1.0 UJ	< 1.0 UJ	< 1.0 UJ	< 1.0 UJ	< 1.0 UJ	< 1.0 UJ	< 1.0 UJ	< 1.0 UJ	< 1.0 UJ	< 1.0 UJ	< 10 UJ	< 10 UJ	< 10 UJ
Isopropylbenzene	98-82-8	10,000	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 10	< 10	< 10
m,p-Xylene	179601-23-1	10,000**	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 10	< 10	< 10
Methylene chloride	75-09-2	5	µg/L	< 2.0	< 2.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	**1600**	**1900**	**21000**
n-Butylbenzene	104-51-8	4,100	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 10	< 10	< 10
n-Propylbenzene	103-65-1	4,100	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 10	< 10	< 10

Location Identification				MW19_120721	MW18_120721	MW18_120721_a	18CPTMW04SW-120821	18CPTMW04-120821	MW22_120821	MW22_120821_a	18CPTMW06_120821	18ww06_120821	18ww02-120821	18CPTMW15-120821	MW-2_120921	MW-2_120921_a	18CPTMW01SW_120921
Date		MCL/MSC/ PCL					12/8/2021										
Lab Package	CAS NUMBER		UNITS	HS21120475-07	HS21120475-08	HS21120475-09	HS21120589-01	HS21120589-02	HS21120589-03	HS21120589-04	HS21120589-05	HS21120589-06	HS21120589-07	HS21120589-08	HS21120658-01	HS21120658-02	HS21120658-03
Well ID				MW-19	MW-18	MW-18	18CPTMW04SW	18CPTMW04	MW-22	MW-22	18CPTMW06	18WW06	18WW02	18CPTMW15	MW-2	MW-2	18CPTMW01SW
Aquifer Zone				Shallow	Shallow	Shallow	Wilcox	Wilcox	Shallow	Shallow	Wilcox	Wilcox	Wilcox	Shallow	Shallow	Shallow	Wilcox
Method: SW8260																	
Naphthalene	91-20-3	2,000	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 10	< 10	< 10
o-Xylene	95-47-6	10,000**	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 10	< 10	< 10
sec-Butylbenzene	135-98-8	4,100	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 10	< 10	< 10
Styrene	100-42-5	100	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 10	< 10	< 10
tert-Butylbenzene	98-06-6	4,100	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 10	< 10	< 10
Tetrachloroethene	127-18-4	5	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	**31**	**37**	< 10
Toluene	108-88-3	1,000	µg/L	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	**7.7 J**	**9.4 J**	< 5.0
trans-1,2-Dichloroethene	156-60-5	100	µg/L	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	**37**	**44**	**5.7 J**
trans-1,3-Dichloropropene	10061-02-6	29	µg/L	< 0.50	< 0.50	< 0.50	< 0.50 UJ	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 5.0	< 5.0	< 5.0
Trichloroethene	79-01-6	5	µg/L	**6.8**	**11**	**11**	< 0.50	**200**	**380**	**370**	**2.0**	< 0.50	< 0.50	**1.5**	**3600**	**3300**	**230**
Trichlorofluoromethane	75-69-4	31,000	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 10 UJ	< 10	< 10 UJ
Vinyl chloride	75-01-4	2	µg/L	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	**0.55 J**	**0.51 J**	< 0.50	< 0.50	< 0.50	< 0.50	**8.4 J**	**10**	< 5.0
Method: SW8270SIM																	
1,4-Dioxane	123-91-1	9.1*	ug/L	NA	NA	NA	**1.4**	**1.1**	NA	NA	**0.79**	**0.81**	**0.92**	**1.7**	**1.8**	**1.2**	**0.052**
Method: 6850																	
Perchlorate	14797-73-0	17*	µg/L	**0.117**	**0.0818 J**	**0.700 J**	**0.0581 J**	**129**	**1060**	**1180**	**0.0396 J**	< 0.0500	**0.0331 J**	**0.364**	**0.263**	**0.281**	< 0.0500
Method: SW6020A																	
Aluminum	7429-90-5	100	mg/L	**0.673**	NA	NA	**0.142**	NA	**0.0378 J**	**0.0220 J**	NA	NA	**0.408**	NA	**0.0230**	**0.0232**	**0.0257**
Antimony	7440-36-0	0.006	mg/L	< 0.00100	NA	NA	**0.000647 J**	NA	**0.000604 J**	**0.000509 J**	NA	NA	< 0.00100	NA	< 0.00100	< 0.00100	< 0.00100
Arsenic	7440-38-2	0.01	mg/L	**0.00328 J**	NA	NA	**0.00684**	NA	**0.00153 J**	**0.00143 J**	NA	NA	**0.000528 J**	NA	**0.0259**	**0.0265**	**0.0108**
Barium	7440-39-3	2	mg/L	**0.323**	NA	NA	**0.925**	NA	**1.02**	**0.972**	NA	NA	**0.0445**	NA	**2.68**	**3.06**	**1.13**
Beryllium	7440-41-7	0.004	mg/L	< 0.000500	NA	NA	< 0.00500	NA	< 0.00500	< 0.00500	NA	NA	< 0.00500	NA	**0.000349 J**	**0.000350 J**	< 0.000500
Cadmium	7440-43-9	0.005	mg/L	**0.00134 J**	NA	NA	< 0.00500	NA	**0.000493 J**	**0.000436 J**	NA	NA	< 0.00500	NA	< 0.000500	< 0.000500	< 0.000500
Calcium	7440-70-2	NV	mg/L	**114**	NA	NA	**30.1**	NA	**97.1**	**91.3**	NA	NA	**7.00**	NA	**71.5**	**73.8**	**37.1**
Chromium	7440-47-3	0.1	mg/L	**0.0517**	NA	NA	**0.0111**	NA	**1.25**	**1.00**	NA	NA	**0.0151**	NA	**0.218**	**0.252**	**0.00254 J**
Cobalt	7440-48-4	6.1	mg/L	**0.0142**	NA	NA	**0.00805**	NA	**0.0102**	**0.00965**	NA	NA	**0.000189 J**	NA	**0.136**	**0.145**	**0.000996 J**
Copper	7440-50-8	1.3	mg/L	**0.00490 J**	NA	NA	<0.00100	NA	**0.0231**	**0.0207**	NA	NA	**0.00254 J**	NA	**0.00670**	**0.00651**	< 0.00250
Iron	7439-89-6	NV	mg/L	**47.1**	NA	NA	**29.3**	NA	**13.8**	**12.3**	NA	NA	**0.896**	NA	**31.8**	**33.1**	**54.2**
Lead	7439-92-1	0.015	mg/L	**0.000644 J**	NA	NA	< 0.00100	NA	< 0.00100	< 0.00100	NA	NA	< 0.00100	NA	< 0.00100	< 0.00100	< 0.00100
Magnesium	7439-95-4	NV	mg/L	**64.7**	NA	NA	**17.7**	NA	**27.9**	**25.9**	NA	NA	**1.32**	NA	**53.5**	**55.8**	**23.4**
Manganese	7439-96-5	1.1*	mg/L	**2.71**	NA	NA	**0.561**	NA	**0.288**	**0.267**	NA	NA	**0.0803**	NA	**7.69**	**8.83**	**0.576**
Nickel	7440-02-0	0.49*	mg/L	**0.0433**	NA	NA	**0.00606**	NA	**0.930**	**0.865**	NA	NA	**0.00942**	NA	**0.396**	**0.408**	**0.00192 J**
Potassium	7440-09-7	NV	mg/L	**4.46**	NA	NA	**103**	NA	**2.06**	**1.95**	NA	NA	**1.93**	NA	**2.91**	**3.07**	**8.39**
Selenium	7782-49-2	0.05	mg/L	**0.00637**	NA	NA	< 0.00250	NA	< 0.00250	< 0.00250	NA	NA	< 0.00250	NA	< 0.00250	< 0.00250	< 0.00250
Silver	7440-22-4	0.51	mg/L	< 0.000500	NA	NA	< 0.00500	NA	< 0.00500	< 0.00500	NA	NA	< 0.00500	NA	< 0.000500	< 0.000500	< 0.000500
Sodium	7440-23-5	NV	mg/L	**854**	NA	NA	**132**	NA	**368**	**351**	NA	NA	**29.0**	NA	**201**	**234**	**109**
Thallium	7440-28-0	0.002	mg/L	< 0.000500	NA	NA	< 0.00500	NA	< 0.00500	< 0.00500	NA	NA	< 0.00500	NA	< 0.000500	< 0.000500	< 0.000500
Vanadium	7440-62-2	0.72	mg/L	**0.00157 J**	NA	NA	< 0.00100	NA	**0.00613**	**0.00521**	NA	NA	**0.00225 J**	NA	**0.00119 J**	**0.00127 J**	< 0.00100
Zinc	7440-66-6	31	mg/L	**0.0101**	NA	NA	**0.0239**	NA	**0.00370 J**	**0.00243 J**	NA	NA	**0.00230 J**	NA	**0.0630**	**0.0680**	**0.00769**
Method: SW7470A																	
Mercury	7439-97-6	0.002	mg/L	< 0.000100	NA	NA	**0.0000430 J**	NA	**0.0000740 J**	**0.0000910 J**	NA	NA	**0.0000370 J**	NA	< 0.000100	< 0.000100	< 0.000100

Notes:

Blue highlighting indicates concentrations above the MCL/MSC/PCL

MCL/MSC - Maximum Contaminant Limit/Medium-Specific Concentrations/Protective Concentration Level

NA - Not Analyzed

µg/L - micrograms per liter

mg/L - milligrams per liter

J - Estimated: The analyte was positively identified, the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality

UJ - The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria.

U - Undetected: The analyte was analyzed for, but not detected.

UB - considered a non-detect due to blank contamination

NV - No Value

*Perchlorate, manganese, 1,4-dioxane and nickel compared to the PCL

** Value is for total xylenes

PCL – Texas Risk Reduction Program (TRRP) Tier 1 Groundwater Residential Protective Concentration Level

a - duplicate sample

< - non-detect

Location Identification				MW3_120921	18WW10_120921	MW17_120921	18CPTMW14_120921	AWD1_120921	18CPTMW03SW_121321	18DPTMW05_121321	MW21_121321	18CPTMW10DW_121321	18CPTMW10DW_121321_a	18CPTMW10SW_121321	18ww08_121321	18CPTMW19_121321
Date		MCL/MSC/ PCL		12/9/2021					12/13/2021							
Lab Package	CAS NUMBER		UNITS	HS21120658-04	HS21120658-05	HS21120658-06	HS21120658-07	HS21120658-08	HS21120917-01	HS21120917-02	HS21120917-03	HS21120917-04	HS21120917-05	HS21120917-06	HS21120917-07	HS21120917-08
Well ID				MW-3	18WW10	MW-17	18CPTMW14	AWD-1	18CPTMW03SW	18DPTMW05	MW-21	18CPTMW10DW	18CPTMW10DW	18CPTMW10SW	18WW08	18CPTMW19
Aquifer Zone				Shallow	Shallow	Shallow	Shallow	Shallow	Wilcox	Shallow	Shallow	Wilcox	Wilcox	Wilcox	Shallow	Shallow
Method: SW8260																
1,1,1,2-Tetrachloroethane	630-20-6	110	µg/L	< 1.0 UJ	< 1.0	NA	< 5.0	NA	< 1.0	< 5.0 UJ	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1-Trichloroethane	71-55-6	200	µg/L	< 0.50 UJ	< 0.50	NA	< 2.5	NA	< 0.50	< 2.5	< 2.5	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,1,2,2-Tetrachloroethane	79-34-5	14	µg/L	< 1.0 UJ	< 1.0	NA	< 5.0	NA	< 1.0	< 5.0 UJ	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloroethane	79-00-5	5	µg/L	< 1.0 UJ	< 1.0	NA	< 5.0	NA	< 1.0	< 5.0 UJ	**8.6**	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane	75-34-3	10,000	µg/L	**4.0 J**	< 0.50	NA	< 2.5	NA	< 0.50	< 2.5 UJ	**3.2 J**	< 0.50	< 0.50	< 0.50	**0.65 J**	< 0.50
1,1-Dichloroethene	75-35-4	7	µg/L	< 0.50	< 0.50	NA	< 2.5	NA	< 0.50	< 2.5	< 2.5	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,1-Dichloropropene	563-58-6	2.9	µg/L	< 1.0 UJ	< 1.0	NA	< 5.0	NA	< 1.0	< 5.0 UJ	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichlorobenzene	87-61-6	310	µg/L	< 1.0	< 1.0	NA	< 5.0	NA	< 1.0	< 5.0 UJ	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichloropropane	96-18-4	0.041	µg/L	< 1.0 UJ	< 1.0	NA	< 5.0	NA	< 1.0	< 5.0 UJ	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trichlorobenzene	120-82-1	70	µg/L	< 1.0 UJ	< 1.0	NA	< 5.0	NA	< 1.0	< 5.0 UJ	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trimethylbenzene	95-63-6	5,100	µg/L	< 1.0	< 1.0	NA	< 5.0	NA	< 1.0	< 5.0 UJ	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromo-3-chloropropane	96-12-8	0.2	µg/L	< 1.0 UJ	< 1.0	NA	< 5.0	NA	< 1.0	< 5.0 UJ	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromoethane	106-93-4	0.05	µg/L	< 0.50 UJ	< 0.50	NA	< 2.5	NA	< 0.50	< 2.5 UJ	< 2.5	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,2-Dichlorobenzene	95-50-1	600	µg/L	< 1.0 UJ	< 1.0	NA	< 5.0	NA	< 1.0	< 5.0 UJ	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane	107-06-2	5	µg/L	< 0.50 UJ	< 0.50	NA	< 2.5	NA	**0.60 J**	**71 J**	**16**	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,2-Dichloropropane	78-87-5	5	µg/L	< 1.0 UJ	< 1.0	NA	< 5.0	NA	< 1.0	< 5.0 UJ	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3,5-Trimethylbenzene	108-67-8	5,100	µg/L	< 1.0 UJ	< 1.0	NA	< 5.0	NA	< 1.0	< 5.0 UJ	**3.0 J**	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichlorobenzene	541-73-1	3,100	µg/L	< 1.0 UJ	< 1.0	NA	< 5.0	NA	< 1.0	< 5.0 UJ	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichloropropane	142-28-9	29	µg/L	< 1.0 UJ	< 1.0	NA	< 5.0	NA	< 1.0	< 5.0 UJ	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,4-Dichlorobenzene	106-46-7	75	µg/L	< 1.0 UJ	< 1.0	NA	< 5.0	NA	< 1.0	< 5.0 UJ	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2,2-Dichloropropane	594-20-7	42	µg/L	< 0.50 UJ	< 0.50	NA	< 2.5	NA	< 0.50	< 2.5 UJ	< 2.5	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Butanone	78-93-3	61,000	µg/L	< 1.0 UJ	< 1.0	NA	< 5.0	NA	< 1.0	< 5.0	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Chlorotoluene	95-49-8	2,000	µg/L	< 1.0 UJ	< 1.0	NA	< 5.0	NA	< 1.0	< 5.0 UJ	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Hexanone	591-78-6	6,100	µg/L	< 2.0 UJ	< 2.0	NA	< 10	NA	< 2.0	< 10	< 10	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
4-Chlorotoluene	106-43-4	2,000	µg/L	< 1.0 UJ	< 1.0	NA	< 5.0	NA	< 1.0	< 5.0 UJ	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Isopropyltoluene	99-87-6	10,000	µg/L	< 1.0 UJ	< 1.0	NA	< 5.0	NA	< 1.0	< 5.0 UJ	**3.9 J**	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Methyl-2-pentanone	108-10-1	8,200	µg/L	< 2.0 UJ	< 2.0	NA	< 10	NA	< 2.0	< 10	< 10	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Acetone	67-64-1	92,000	µg/L	< 2.0	< 2.0	NA	< 10	NA	< 2.0	< 10	< 10	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Benzene	71-43-2	5	µg/L	< 0.50 UJ	< 0.50	NA	< 2.5	NA	**1.6**	**9.4 J**	< 2.5	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bromobenzene	108-86-1	2,000	µg/L	< 1.0	< 1.0	NA	< 5.0	NA	< 1.0	< 5.0 UJ	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromochloromethane	74-97-5	4,100	µg/L	< 0.50 UJ	< 0.50	NA	< 2.5	NA	< 0.50	< 2.5 UJ	< 2.5	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bromodichloromethane	75-27-4	4.6	µg/L	< 0.50 UJ	< 0.50	NA	< 2.5	NA	< 0.50	< 2.5 UJ	< 2.5	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bromoform	75-25-2	36	µg/L	< 1.0 UJ	< 1.0	NA	< 5.0	NA	< 1.0	< 5.0 UJ	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromomethane	74-83-9	140	µg/L	< 1.0 UJ	< 1.0	NA	< 5.0 UJ	NA	< 1.0	< 5.0	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Carbon disulfide	75-15-0	10,000	µg/L	< 2.0 UJ	< 2.0	NA	< 10 UJ	NA	< 2.0	< 10	< 10	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Carbon tetrachloride	56-23-5	5	µg/L	< 1.0	< 1.0	NA	< 5.0	NA	< 1.0	**14 J**	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chlorobenzene	108-90-7	100	µg/L	< 1.0 UJ	< 1.0	NA	< 5.0	NA	< 1.0	< 5.0 UJ	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloroethane	75-00-3	41,000	µg/L	< 1.0	< 1.0	NA	< 5.0	NA	< 1.0	< 5.0	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloroform	67-66-3	1,000	µg/L	**1.00 J**	< 0.50	NA	**9.0**	NA	< 0.50	**30 J**	**9.2**	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Chloromethane	74-87-3	220	µg/L	< 0.50	< 0.50	NA	< 2.5	NA	< 0.50	< 2.5	< 2.5	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
cis-1,2-Dichloroethene	156-59-2	70	µg/L	**55 J**	< 0.50	NA	**11**	NA	**32**	**69 J**	**880**	< 0.50	< 0.50	< 0.50	**2.9**	< 0.50
cis-1,3-Dichloropropene	10061-01-5	5.3	µg/L	< 0.50 UJ	< 0.50	NA	< 2.5	NA	< 0.50	< 2.5 UJ	< 2.5	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Dibromochloromethane	124-48-1	34	µg/L	< 1.0 UJ	< 1.0	NA	< 5.0	NA	< 1.0	< 5.0 UJ	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromomethane	74-95-3	380	µg/L	< 0.50 UJ	< 0.50	NA	< 2.5	NA	< 0.50	< 2.5 UJ	< 2.5	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Dichlorodifluoromethane	75-71-8	20,000	µg/L	< 1.0	< 1.0	NA	< 5.0	NA	< 1.0	< 5.0	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	100-41-4	700	µg/L	< 1.0	< 1.0	NA	< 5.0	NA	< 1.0	< 5.0 UJ	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Hexachlorobutadiene	87-68-3	20	µg/L	< 1.0 UJ	< 1.0	NA	< 5.0 UJ	NA	< 1.0	< 5.0 UJ	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Isopropylbenzene	98-82-8	10,000	µg/L	< 1.0	< 1.0	NA	< 5.0	NA	< 1.0	< 5.0 UJ	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
m,p-Xylene	179601-23-1	10,000**	µg/L	< 1.0	< 1.0	NA	< 5.0	NA	< 1.0	< 5.0 UJ	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Methylene chloride	75-09-2	5	µg/L	< 2.0	< 2.0	NA	**23**	NA	< 2.0	< 5.0 UJ	< 5.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
n-Butylbenzene	104-51-8	4,100	µg/L	< 1.0 UJ	< 1.0	NA	< 5.0	NA	< 1.0	< 5.0 UJ	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
n-Propylbenzene	103-65-1	4,100	µg/L	< 1.0 UJ	< 1.0	NA	< 5.0	NA	< 1.0	< 5.0 UJ	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Location Identification				MW3_120921	18WW10_120921	MW17_120921	18CPTMW14_120921	AWD1_120921	18CPTMW03SW_121321	18DPTMW05_121321	MW21_121321	18CPTMW10DW_121321	18CPTMW10DW_121321_a	18CPTMW10SW_121321	18ww08_121321	18CPTMW19_121321
Date		MCL/MSC/ PCL		12/9/2021					12/13/2021							
Lab Package	CAS NUMBER		UNITS	HS21120658-04	HS21120658-05	HS21120658-06	HS21120658-07	HS21120658-08	HS21120917-01	HS21120917-02	HS21120917-03	HS21120917-04	HS21120917-05	HS21120917-06	HS21120917-07	HS21120917-08
Well ID				MW-3	18WW10	MW-17	18CPTMW14	AWD-1	18CPTMW03SW	18DPTMW05	MW-21	18CPTMW10DW	18CPTMW10DW	18CPTMW10SW	18WW08	18CPTMW19
Aquifer Zone				Shallow	Shallow	Shallow	Shallow	Shallow	Wilcox	Shallow	Shallow	Wilcox	Wilcox	Wilcox	Shallow	Shallow
Method: SW8260																
Naphthalene	91-20-3	2,000	µg/L	< 1.0 UJ	< 1.0	NA	< 5.0	NA	< 1.0	< 5.0	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	95-47-6	10,000**	µg/L	< 1.0 UJ	< 1.0	NA	< 5.0	NA	< 1.0	< 5.0 UJ	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
sec-Butylbenzene	135-98-8	4,100	µg/L	< 1.0 UJ	< 1.0	NA	< 5.0	NA	< 1.0	< 5.0 UJ	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Styrene	100-42-5	100	µg/L	< 1.0	< 1.0	NA	< 5.0	NA	< 1.0	< 5.0 UJ	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
tert-Butylbenzene	98-06-6	4,100	µg/L	< 1.0 UJ	< 1.0	NA	< 5.0	NA	< 1.0	< 5.0 UJ	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloroethene	127-18-4	5	µg/L	**1.3**	< 1.0	NA	< 5.0	NA	< 1.0	< 5.0 UJ	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	108-88-3	1,000	µg/L	< 0.50 UJ	< 0.50	NA	< 2.5	NA	< 0.50	< 2.5 UJ	< 2.5	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
trans-1,2-Dichloroethene	156-60-5	100	µg/L	**2.6 J**	< 0.50	NA	< 2.5	NA	**1.2**	< 2.5 UJ	**6.7**	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
trans-1,3-Dichloropropene	10061-02-6	29	µg/L	< 0.50 UJ	< 0.50	NA	< 2.5	NA	< 0.50	< 2.5 UJ	< 2.5	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Trichloroethene	79-01-6	5	µg/L	**270 J**	3.3 UB	NA	**890**	NA	7.4 UB	**4600 J**	**4500 J**	2.6 UB	2.3 UB	1.9 UB	**10**	< 0.50
Trichlorofluoromethane	75-69-4	31,000	µg/L	< 1.0	< 1.0	NA	< 5.0	NA	< 1.0	< 5.0	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vinyl chloride	75-01-4	2	µg/L	**23 J**	< 0.50	NA	< 2.5	NA	< 0.50	< 2.5	**20**	< 0.50	< 0.50	< 0.50	**1.2**	< 0.50
Method: SW8270SIM																
1,4-Dioxane	123-91-1	9.1*	ug/L	NA	**0.078**	**0.11**	**0.17**	**3.5**	**1.3**	**46**	**3.6**	NA	NA	**0.28**	**0.10**	**0.21**
Method: 6850																
Perchlorate	14797-73-0	17*	µg/L	**8220**	**0.147**	**0.0282 J**	**4300**	**0.345**	**0.0753**	**402000**	**9660**	**0.245**	**0.262**	**0.0861**	**23600**	**2.37**
Method: SW6020A																
Aluminum	7429-90-5	100	mg/L	0.0118 UB	NA	NA	**0.532**	**1.61**	**0.0351**	NA	**0.0233**	**0.175**	**0.168**	NA	NA	NA
Antimony	7440-36-0	0.006	mg/L	< 0.00100	NA	NA	< 0.00100	**0.000856 J**	< 0.00100	NA	< 0.00100	< 0.00100	< 0.00100	NA	NA	NA
Arsenic	7440-38-2	0.01	mg/L	**0.000461 J**	NA	NA	**0.00205 J**	**0.0127**	**0.00479 J**	NA	**0.000799 J**	**0.00276 J**	**0.00255 J**	NA	NA	NA
Barium	7440-39-3	2	mg/L	**0.551**	NA	NA	**3.95**	**0.298**	**0.607**	NA	**4.09**	**0.208**	**0.202**	NA	NA	NA
Beryllium	7440-41-7	0.004	mg/L	< 0.000500	NA	NA	< 0.000500	**0.000305 J**	< 0.000500	NA	< 0.000500	< 0.000500	< 0.000500	NA	NA	NA
Cadmium	7440-43-9	0.005	mg/L	**0.000341 J**	NA	NA	**0.000270 J**	< 0.000500	< 0.000500	NA	**0.000508 J**	< 0.000500	< 0.000500	NA	NA	NA
Calcium	7440-70-2	NV	mg/L	**31.7**	NA	NA	**440**	**2.58**	**122**	NA	**132**	**17.1**	**17.4**	NA	NA	NA
Chromium	7440-47-3	0.1	mg/L	**0.00305 J**	NA	NA	**0.0213**	**0.0181**	**0.00571**	NA	**0.623**	**0.00517**	**0.00525**	NA	NA	NA
Cobalt	7440-48-4	6.1	mg/L	**0.00452 J**	NA	NA	**0.00530**	**0.00786**	**0.00155 J**	NA	**0.0370**	**0.000251 J**	**0.000249 J**	NA	NA	NA
Copper	7440-50-8	1.3	mg/L	**0.00138 J**	NA	NA	< 0.00250	**0.00226 J**	< 0.00250	NA	**0.0219**	**0.00129 J**	**0.00117 J**	NA	NA	NA
Iron	7439-89-6	NV	mg/L	**0.808**	NA	NA	**0.797**	**6.11**	**11.5**	NA	**5.13**	**7.90**	**8.05**	NA	NA	NA
Lead	7439-92-1	0.015	mg/L	< 0.00100	NA	NA	< 0.00100	**0.00179 J**	< 0.00100	NA	< 0.00100	< 0.00100	< 0.00100	NA	NA	NA
Magnesium	7439-95-4	NV	mg/L	**17.9**	NA	NA	**124**	**2.93**	**19.4**	NA	**99.9**	**8.58**	**8.49**	NA	NA	NA
Manganese	7439-96-5	1.1*	mg/L	**2.39**	NA	NA	**0.285**	**0.242**	**0.674**	NA	**1.14**	**0.185**	**0.186**	NA	NA	NA
Nickel	7440-02-0	0.49*	mg/L	**0.00722**	NA	NA	**0.00476 J**	**0.0320**	**0.00314 J**	NA	**0.478**	**0.00201 J**	**0.00161 J**	NA	NA	NA
Potassium	7440-09-7	NV	mg/L	**1.72**	NA	NA	**10.5**	**2.98**	**118**	NA	**1.92**	**72.8**	**72.5**	NA	NA	NA
Selenium	7782-49-2	0.05	mg/L	< 0.00250	NA	NA	< 0.00250	**0.00325 J**	< 0.00250	NA	< 0.00250	< 0.00250	< 0.00250	NA	NA	NA
Silver	7440-22-4	0.51	mg/L	< 0.000500	NA	NA	< 0.000500	< 0.000500	< 0.000500	NA	< 0.000500	< 0.000500	< 0.000500	NA	NA	NA
Sodium	7440-23-5	NV	mg/L	**277**	NA	NA	**637**	**105**	**217**	NA	**399**	**178**	**175**	NA	NA	NA
Thallium	7440-28-0	0.002	mg/L	< 0.000500	NA	NA	< 0.000500	< 0.000500	< 0.000500	NA	< 0.000500	< 0.000500	< 0.000500	NA	NA	NA
Vanadium	7440-62-2	0.72	mg/L	**0.000602 J**	NA	NA	**0.00242 J**	**0.00600**	< 0.00100	NA	**0.00387 J**	**0.00112 J**	**0.000822 J**	NA	NA	NA
Zinc	7440-66-6	31	mg/L	**0.00696**	NA	NA	**0.00528**	**0.0113**	**0.00667**	NA	**0.0147**	**0.00590**	**0.00461 J**	NA	NA	NA
Method: SW7470A																
Mercury	7439-97-6	0.002	mg/L	**0.0000540 J**	NA	NA	**0.0000640 J**	**0.000145 J**	< 0.000100	NA	**0.000189 J**	**0.0000530 J**	< 0.000100	NA	NA	NA

Notes:

Blue highlighting indicates concentrations above the MCL/MSC/PCL

MCL/MSC - Maximum Contaminant Limit/Medium-Specific Concentrations/Protective Concentration Level

NA - Not Analyzed

µg/L - micrograms per liter

mg/L - milligrams per liter

J - Estimated: The analyte was positively identified, the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality

UJ - The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria.

U - Undetected: The analyte was analyzed for, but not detected.

UB - considered a non-detect due to blank contamination

NV - No Value

*Perchlorate, manganese, 1,4-dioxane and nickel compared to the PCL

** Value is for total xylenes

PCL – Texas Risk Reduction Program (TRRP) Tier 1 Groundwater Residential Protective Concentration Level

a - duplicate sample

< - non-detect

Location Identification				126_121421	109_121421	18CPTMW07_121421	18CPTMW24_121421	CO8_121421	18DPTMW04_121421	125_121421	MW9_121521	MW16_121521	18CPTMW23_121521	18WW24_121521	18WW22_121521	18WW17_121521	18CPTMW16_121521
Date		MCL/MSC/ PCL		12/14/2021							12/15/2021						
Lab Package	CAS NUMBER		UNITS	HS21120921-01	HS21120921-02	HS21120921-03	HS21120921-04	HS21120921-05	HS21120921-06	HS21120921-07	HS21121014-01	HS21121014-02	HS21121014-03	HS21121014-04	HS21121014-05	HS21121014-06	HS21121014-07
Well ID				126	109	18CPTMW07	18CPTMW24	C-08	18DPTMW04	125	MW-9	MW-16	18CPTMW23	18WW24	18WW22	18WW17	18CPTMW16
Aquifer Zone				Shallow	Shallow	Wilcox	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Wilcox	Shallow
Method: SW8260																	
1,1,1,2-Tetrachloroethane	630-20-6	110	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 25	< 5.0	< 10	< 1.0	< 1.0	< 1.0	NA
1,1,1-Trichloroethane	71-55-6	200	µg/L	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 12	< 2.5	< 5.0	< 0.50	< 0.50	< 0.50	NA
1,1,2,2-Tetrachloroethane	79-34-5	14	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 25	< 5.0	< 10	< 1.0	< 1.0	< 1.0	NA
1,1,2-Trichloroethane	79-00-5	5	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 25	< 5.0	< 10	< 1.0	< 1.0	< 1.0	NA
1,1-Dichloroethane	75-34-3	10,000	µg/L	< 0.50	**0.40 J**	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 12	< 2.5	< 5.0	< 0.50 UJ	< 0.50	< 0.50	NA
1,1-Dichloroethene	75-35-4	7	µg/L	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 12	**4.8 J**	< 5.0	< 0.50	< 0.50	< 0.50	NA
1,1-Dichloropropene	563-58-6	2.9	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 25	< 5.0	< 10	< 1.0	< 1.0	< 1.0	NA
1,2,3-Trichlorobenzene	87-61-6	310	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 25	< 5.0	< 10	< 1.0	< 1.0	< 1.0	NA
1,2,3-Trichloropropane	96-18-4	0.041	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 25	< 5.0	< 10	< 1.0	< 1.0	< 1.0	NA
1,2,4-Trichlorobenzene	120-82-1	70	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 25	< 5.0	< 10	< 1.0	< 1.0	< 1.0	NA
1,2,4-Trimethylbenzene	95-63-6	5,100	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 25	< 5.0	< 10	< 1.0	< 1.0	< 1.0	NA
1,2-Dibromo-3-chloropropane	96-12-8	0.2	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 25	< 5.0	< 10	< 1.0	< 1.0	< 1.0	NA
1,2-Dibromoethane	106-93-4	0.05	µg/L	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 12	< 2.5	< 5.0	< 0.50	< 0.50	< 0.50	NA
1,2-Dichlorobenzene	95-50-1	600	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 25	< 5.0	< 10	< 1.0	< 1.0	< 1.0	NA
1,2-Dichloroethane	107-06-2	5	µg/L	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 12	**30**	**110**	< 0.50	< 0.50	< 0.50	NA
1,2-Dichloropropane	78-87-5	5	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 25	< 5.0	< 10	< 1.0	< 1.0	< 1.0	NA
1,3,5-Trimethylbenzene	108-67-8	5,100	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 25	< 5.0	< 10	< 1.0	< 1.0	< 1.0	NA
1,3-Dichlorobenzene	541-73-1	3,100	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 25	< 5.0	< 10	< 1.0	< 1.0	< 1.0	NA
1,3-Dichloropropane	142-28-9	29	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 25	< 5.0	< 10	< 1.0	< 1.0	< 1.0	NA
1,4-Dichlorobenzene	106-46-7	75	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 25	< 5.0	< 10	< 1.0	< 1.0	< 1.0	NA
2,2-Dichloropropane	594-20-7	42	µg/L	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 12	< 2.5	< 5.0	< 0.50	< 0.50	< 0.50	NA
2-Butanone	78-93-3	61,000	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 25	< 5.0	< 10	< 1.0	< 1.0	< 1.0	NA
2-Chlorotoluene	95-49-8	2,000	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 25	< 5.0	< 10	< 1.0	< 1.0	< 1.0	NA
2-Hexanone	591-78-6	6,100	µg/L	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 50	< 10	< 20	< 2.0	< 2.0	< 2.0	NA
4-Chlorotoluene	106-43-4	2,000	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 25	< 5.0	< 10	< 1.0	< 1.0	< 1.0	NA
4-Isopropyltoluene	99-87-6	10,000	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 25	< 5.0	< 10	< 1.0	< 1.0	< 1.0	NA
4-Methyl-2-pentanone	108-10-1	8,200	µg/L	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 50	< 10	< 20	< 2.0	< 2.0	< 2.0	NA
Acetone	67-64-1	92,000	µg/L	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 50	< 10	< 20	< 2.0	< 2.0	< 2.0	NA
Benzene	71-43-2	5	µg/L	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 12	< 2.5	< 5.0	< 0.50	< 0.50	< 0.50	NA
Bromobenzene	108-86-1	2,000	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 25	< 5.0	< 10	< 1.0	< 1.0	< 1.0	NA
Bromochloromethane	74-97-5	4,100	µg/L	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 12	< 2.5	< 5.0	< 0.50	< 0.50	< 0.50	NA
Bromodichloromethane	75-27-4	4.6	µg/L	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 12	< 2.5	< 5.0	< 0.50	< 0.50	< 0.50	NA
Bromoform	75-25-2	36	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 25	< 5.0	< 10	< 1.0	< 1.0	< 1.0	NA
Bromomethane	74-83-9	140	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 25	< 5.0	< 10	< 1.0	< 1.0	< 1.0	NA
Carbon disulfide	75-15-0	10,000	µg/L	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 50	< 10	< 20	< 2.0	< 2.0	< 2.0	NA
Carbon tetrachloride	56-23-5	5	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 25	< 5.0	< 10	< 1.0	< 1.0	< 1.0	NA
Chlorobenzene	108-90-7	100	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 25	< 5.0	< 10	< 1.0	< 1.0	< 1.0	NA
Chloroethane	75-00-3	41,000	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 25	< 5.0	< 10	< 1.0	< 1.0	< 1.0	NA
Chloroform	67-66-3	1,000	µg/L	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 12	< 2.5	< 5.0	< 0.50	< 0.50	< 0.50	NA
Chloromethane	74-87-3	220	µg/L	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 12	< 2.5	< 5.0	< 0.50	< 0.50	< 0.50	NA
cis-1,2-Dichloroethene	156-59-2	70	µg/L	< 0.50	**65**	< 0.50	**14**	< 0.50	< 0.50	< 0.50	**28**	**18**	**230**	< 0.50	**1.3**	< 0.50	NA
cis-1,3-Dichloropropene	10061-01-5	5.3	µg/L	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 12	< 2.5	< 5.0	< 0.50	< 0.50	< 0.50	NA
Dibromochloromethane	124-48-1	34	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 25	< 5.0	< 10	< 1.0	< 1.0	< 1.0	NA
Dibromomethane	74-95-3	380	µg/L	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 12	< 2.5	< 5.0	< 0.50	< 0.50	< 0.50	NA
Dichlorodifluoromethane	75-71-8	20,000	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 25	< 5.0	< 10	< 1.0	< 1.0	< 1.0	NA
Ethylbenzene	100-41-4	700	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 25	< 5.0	< 10	< 1.0	< 1.0	< 1.0	NA
Hexachlorobutadiene	87-68-3	20	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 25	< 5.0	< 10	< 1.0	< 1.0	< 1.0	NA
Isopropylbenzene	98-82-8	10,000	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 25	< 5.0	< 10	< 1.0	< 1.0	< 1.0	NA
m,p-Xylene	179601-23-1	10,000**	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 25	< 5.0	< 10	< 1.0	< 1.0	< 1.0	NA
Methylene chloride	75-09-2	5	µg/L	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 50	< 5.0	< 10	< 1.0 UJ	< 1.0	< 1.0	NA
n-Butylbenzene	104-51-8	4,100	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 25	< 5.0	< 10	< 1.0	< 1.0	< 1.0	NA
n-Propylbenzene	103-65-1	4,100	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 25	< 5.0	< 10	< 1.0	< 1.0	< 1.0	NA

Location Identification				126_121421	109_121421	18CPTMW07_121421	18CPTMW24_121421	CO8_121421	18DPTMW04_121421	125_121421	MW9_121521	MW16_121521	18CPTMW23_121521	18WW24_121521	18WW22_121521	18WW17_121521	18CPTMW16_121521
Date		MCL/MSC/ PCL		12/14/2021							12/15/2021						
Lab Package	CAS NUMBER		UNITS	HS21120921-01	HS21120921-02	HS21120921-03	HS21120921-04	HS21120921-05	HS21120921-06	HS21120921-07	HS21121014-01	HS21121014-02	HS21121014-03	HS21121014-04	HS21121014-05	HS21121014-06	HS21121014-07
Well ID				126	109	18CPTMW07	18CPTMW24	C-08	18DPTMW04	125	MW-9	MW-16	18CPTMW23	18WW24	18WW22	18WW17	18CPTMW16
Aquifer Zone				Shallow	Shallow	Wilcox	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Wilcox	Shallow
Method: SW8260																	
Naphthalene	91-20-3	2,000	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 25	< 5.0	< 10	< 1.0	< 1.0	< 1.0	NA
o-Xylene	95-47-6	10,000**	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 25	< 5.0	< 10	< 1.0	< 1.0	< 1.0	NA
sec-Butylbenzene	135-98-8	4,100	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 25	< 5.0	< 10	< 1.0	< 1.0	< 1.0	NA
Styrene	100-42-5	100	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 25	< 5.0	< 10	< 1.0	< 1.0	< 1.0	NA
tert-Butylbenzene	98-06-6	4,100	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 25	< 5.0	< 10	< 1.0	< 1.0	< 1.0	NA
Tetrachloroethene	127-18-4	5	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 25	< 5.0	< 10	< 1.0	< 1.0	< 1.0	NA
Toluene	108-88-3	1,000	µg/L	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 12	< 2.5	< 5.0	< 0.50	< 0.50	< 0.50	NA
trans-1,2-Dichloroethene	156-60-5	100	µg/L	< 0.50	**0.43 J**	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 12	< 2.5	< 5.0	< 0.50 UJ	< 0.50	< 0.50	NA
trans-1,3-Dichloropropene	10061-02-6	29	µg/L	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 12	< 2.5	< 5.0	< 0.50	< 0.50	< 0.50	NA
Trichloroethene	79-01-6	5	µg/L	< 0.50	**120**	< 0.50	**7.5**	**1.3**	**1.3**	**1.1**	**1200**	**380**	**1600**	< 0.50	**56**	< 0.50	NA
Trichlorofluoromethane	75-69-4	31,000	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 25	< 5.0	< 10	< 1.0	< 1.0	< 1.0	NA
Vinyl chloride	75-01-4	2	µg/L	< 0.50	< 0.50	< 0.50	**15**	< 0.50	< 0.50	< 0.50	< 12	< 2.5	< 5.0	< 0.50	< 0.50	< 0.50	NA
Method: SW8270SIM																	
1,4-Dioxane	123-91-1	9.1*	ug/L	< 0.010	**0.054**	**0.059**	**0.053**	< 0.010	< 0.010	NA	**2.4**	**4.8**	**5.5**	NA	< 0.010	NA	< 0.010
Method: 6850																	
Perchlorate	14797-73-0	17*	µg/L	**0.658**	**21500**	**0.0850**	**27.6**	**0.273**	**10.9**	**2670**	**81.8**	**0.0269 J**	**4.63**	**0.0729 J**	**0.457**	**136000**	< 0.0500
Method: SW6020A																	
Aluminum	7429-90-5	100	mg/L	**0.228**	NA	NA	**0.0334**	**0.275**	NA	**3.50**	**0.0293**	NA	NA	**0.434**	**0.247**	0.0105 UB	NA
Antimony	7440-36-0	0.006	mg/L	<0.000400	NA	NA	<0.000400	<0.000400	NA	<0.000400	< 0.00100	NA	NA	< 0.00100	< 0.00100	< 0.00100	NA
Arsenic	7440-38-2	0.01	mg/L	**0.0233**	NA	NA	**0.00718**	**0.00112 J**	NA	**0.0129**	< 0.00100	NA	NA	**0.000899 J**	**0.00206 J**	**0.000746 J**	NA
Barium	7440-39-3	2	mg/L	**10.5**	NA	NA	**10.6**	**5.42**	NA	**0.139**	**0.105**	NA	NA	**0.0464**	**0.0919**	**3.45**	NA
Beryllium	7440-41-7	0.004	mg/L	**0.000259 J**	NA	NA	<0.000200	<0.000200	NA	**0.000384 J**	< 0.000500	NA	NA	**0.000886 J**	< 0.000500	< 0.000500	NA
Cadmium	7440-43-9	0.005	mg/L	**0.000726 J**	NA	NA	<0.000200	**0.000477 J**	NA	**0.000269 J**	< 0.000500	NA	NA	**0.000369 J**	< 0.000500	**0.000404 J**	NA
Calcium	7440-70-2	NV	mg/L	**310**	NA	NA	**393**	**302**	NA	**1.90**	**9.38**	NA	NA	**53.2**	**15.4**	**316**	NA
Chromium	7440-47-3	0.1	mg/L	**0.00180 J**	NA	NA	**0.00229 J**	**0.00143 J**	NA	**0.0110**	**0.147**	NA	NA	**0.00165 J**	**0.0251**	**0.0272**	NA
Cobalt	7440-48-4	6.1	mg/L	**0.0311**	NA	NA	**0.00259 J**	**0.00603**	NA	**0.00305 J**	**0.00666**	NA	NA	**0.0211**	**0.000265 J**	**0.00102 J**	NA
Copper	7440-50-8	1.3	mg/L	**0.00126 J**	NA	NA	<0.00100	**0.00101 J**	NA	**0.00402 J**	**0.00225 J**	NA	NA	**0.00278 J**	<0.00100	**0.0141**	NA
Iron	7439-89-6	NV	mg/L	**20.7**	NA	NA	**6.84**	**2.28**	NA	**8.10**	**1.22**	NA	NA	**0.364**	**0.0609 J**	**0.253**	NA
Lead	7439-92-1	0.015	mg/L	**0.000872 J**	NA	NA	<0.000600	<0.000600	NA	**0.00482 J**	< 0.00100	NA	NA	< 0.00100	< 0.00100	< 0.00100	NA
Magnesium	7439-95-4	NV	mg/L	**245**	NA	NA	**258**	**179**	NA	**1.94**	**3.66**	NA	NA	**45.5**	**2.06**	**209**	NA
Manganese	7439-96-5	1.1*	mg/L	**0.398**	NA	NA	**0.483**	**1.18**	NA	**0.0581**	**0.147**	NA	NA	**7.16**	**0.00243 J**	**0.0300**	NA
Nickel	7440-02-0	0.49*	mg/L	**0.0204**	NA	NA	**0.00758**	**0.00775**	NA	**0.00696**	**0.0476**	NA	NA	**0.178 J**	<0.000600	**0.0531**	NA
Potassium	7440-09-7	NV	mg/L	**4.25**	NA	NA	**2.50**	**2.70**	NA	**1.47**	**0.304**	NA	NA	**0.738**	**3.47**	**1.68**	NA
Selenium	7782-49-2	0.05	mg/L	<0.00110	NA	NA	<0.00110	<0.00110	NA	<0.00110	< 0.00250	NA	NA	< 0.00250	< 0.00250	**0.00214 J**	NA
Silver	7440-22-4	0.51	mg/L	<0.000200	NA	NA	<0.000200	<0.000200	NA	<0.000200	<0.000200	NA	NA	<0.000200	<0.000200	<0.000200	NA
Sodium	7440-23-5	NV	mg/L	**836**	NA	NA	**983**	**866**	NA	**35.7**	**18.3**	NA	NA	**732**	**45.8**	**1090**	NA
Thallium	7440-28-0	0.002	mg/L	<0.000200	NA	NA	<0.000200	<0.000200	NA	<0.000200	< 0.000500	NA	NA	< 0.000500	< 0.000500	< 0.000500	NA
Vanadium	7440-62-2	0.72	mg/L	**0.00361 J**	NA	NA	**0.00188 J**	**0.00212 J**	NA	**0.0126**	**0.00125 J**	NA	NA	**0.00152 J**	**0.0189**	**0.00226 J**	NA
Zinc	7440-66-6	31	mg/L	**0.0266**	NA	NA	**0.00652**	**0.0107**	NA	**0.0209**	**0.0366**	NA	NA	**0.0622**	< 0.00250	**0.0280**	NA
Method: SW7470A																	
Mercury	7439-97-6	0.002	mg/L	**0.0000840 J**	NA	NA	< 0.000100	**0.000121 J**	NA	**0.0000580 J**	**0.000116 J**	NA	NA	**0.0000570 J**	**0.0000540 J**	**0.0000770 J**	NA

Notes:

Blue highlighting indicates concentrations above the MCL/MSC/PCL

MCL/MSC - Maximum Contaminant Limit/Medium-Specific Concentrations/Protective Concentration Level

NA - Not Analyzed

µg/L - micrograms per liter

mg/L - milligrams per liter

J - Estimated: The analyte was positively identified, the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality

UJ - The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria.

U - Undetected: The analyte was analyzed for, but not detected.

UB - considered a non-detect due to blank contamination

NV - No Value

*Perchlorate, manganese, 1,4-dioxane and nickel compared to the PCL

** Value is for total xylenes

PCL – Texas Risk Reduction Program (TRRP) Tier 1 Groundwater Residential Protective Concentration Level

a - duplicate sample

< - non-detect

Location Identification				MW8_122021	1824DPTMW01_122021	1824DPTMW03_122021	1824DPTMW03_122021_a	CO3_122021	1824DPTMW02_122021
Date		MCL/MSC/ PCL		12/20/2021					
Lab Package	CAS NUMBER		UNITS	HS21121254-01	HS21121254-02	HS21121254-03	HS21121254-04	HS21121254-05	HS21121254-06
Well ID				MW-8	1824DPTMW01	1824DPTMW03	1824DPTMW03	C-03	1824DPTMW02
Aquifer Zone				Shallow	Shallow	Shallow	Shallow	Wilcox	Shallow
Method: SW8260									
1,1,1,2-Tetrachloroethane	630-20-6	110	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1-Trichloroethane	71-55-6	200	µg/L	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,1,2,2-Tetrachloroethane	79-34-5	14	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloroethane	79-00-5	5	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane	75-34-3	10,000	µg/L	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	**0.62 J**
1,1-Dichloroethene	75-35-4	7	µg/L	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,1-Dichloropropene	563-58-6	2.9	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichlorobenzene	87-61-6	310	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichloropropane	96-18-4	0.041	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trichlorobenzene	120-82-1	70	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trimethylbenzene	95-63-6	5,100	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromo-3-chloropropane	96-12-8	0.2	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromoethane	106-93-4	0.05	µg/L	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,2-Dichlorobenzene	95-50-1	600	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane	107-06-2	5	µg/L	**2.9**	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,2-Dichloropropane	78-87-5	5	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3,5-Trimethylbenzene	108-67-8	5,100	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichlorobenzene	541-73-1	3,100	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichloropropane	142-28-9	29	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,4-Dichlorobenzene	106-46-7	75	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2,2-Dichloropropane	594-20-7	42	µg/L	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Butanone	78-93-3	61,000	µg/L	< 1.0	< 1.0	< 1.0	**1.3 J**	< 1.0	< 1.0
2-Chlorotoluene	95-49-8	2,000	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Hexanone	591-78-6	6,100	µg/L	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
4-Chlorotoluene	106-43-4	2,000	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Isopropyltoluene	99-87-6	10,000	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Methyl-2-pentanone	108-10-1	8,200	µg/L	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Acetone	67-64-1	92,000	µg/L	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Benzene	71-43-2	5	µg/L	**0.84 J**	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bromobenzene	108-86-1	2,000	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromochloromethane	74-97-5	4,100	µg/L	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bromodichloromethane	75-27-4	4.6	µg/L	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bromoform	75-25-2	36	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromomethane	74-83-9	140	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Carbon disulfide	75-15-0	10,000	µg/L	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Carbon tetrachloride	56-23-5	5	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chlorobenzene	108-90-7	100	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloroethane	75-00-3	41,000	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloroform	67-66-3	1,000	µg/L	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	**1.7**
Chloromethane	74-87-3	220	µg/L	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
cis-1,2-Dichloroethene	156-59-2	70	µg/L	**23**	< 0.50	< 0.50	< 0.50	< 0.50	**11**
cis-1,3-Dichloropropene	10061-01-5	5.3	µg/L	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Dibromochloromethane	124-48-1	34	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromomethane	74-95-3	380	µg/L	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Dichlorodifluoromethane	75-71-8	20,000	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	100-41-4	700	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Hexachlorobutadiene	87-68-3	20	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Isopropylbenzene	98-82-8	10,000	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
m,p-Xylene	179601-23-1	10,000**	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Methylene chloride	75-09-2	5	µg/L	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
n-Butylbenzene	104-51-8	4,100	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
n-Propylbenzene	103-65-1	4,100	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Location Identification				MW8_122021	1824DPTMW01_122021	1824DPTMW03_122021	1824DPTMW03_122021_a	CO3_122021	1824DPTMW02_122021
Date		MCL/MSC/ PCL		12/20/2021					
Lab Package	CAS NUMBER		UNITS	HS21121254-01	HS21121254-02	HS21121254-03	HS21121254-04	HS21121254-05	HS21121254-06
Well ID				MW-8	1824DPTMW01	1824DPTMW03	1824DPTMW03	C-03	1824DPTMW02
Aquifer Zone				Shallow	Shallow	Shallow	Shallow	Wilcox	Shallow
Method: SW8260									
Naphthalene	91-20-3	2,000	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	95-47-6	10,000**	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
sec-Butylbenzene	135-98-8	4,100	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Styrene	100-42-5	100	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
tert-Butylbenzene	98-06-6	4,100	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloroethene	127-18-4	5	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	108-88-3	1,000	µg/L	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
trans-1,2-Dichloroethene	156-60-5	100	µg/L	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	**0.42 J**
trans-1,3-Dichloropropene	10061-02-6	29	µg/L	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Trichloroethene	79-01-6	5	µg/L	**200**	< 0.50	< 0.50	< 0.50	< 0.50	**190**
Trichlorofluoromethane	75-69-4	31,000	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vinyl chloride	75-01-4	2	µg/L	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	**0.86 J**
Method: SW8270SIM									
1,4-Dioxane	123-91-1	9.1*	ug/L	**1.7**	**0.052**	< 0.010	< 0.010	**0.12**	**0.50**
Method: 6850									
Perchlorate	14797-73-0	17*	µg/L	**3880**	**19.8**	**0.0978 J**	**0.113**	**220**	**107000**
Method: SW6020A									
Aluminum	7429-90-5	100	mg/L	NA	NA	NA	NA	NA	NA
Antimony	7440-36-0	0.006	mg/L	NA	NA	NA	NA	NA	NA
Arsenic	7440-38-2	0.01	mg/L	NA	NA	NA	NA	NA	NA
Barium	7440-39-3	2	mg/L	NA	NA	NA	NA	NA	NA
Beryllium	7440-41-7	0.004	mg/L	NA	NA	NA	NA	NA	NA
Cadmium	7440-43-9	0.005	mg/L	NA	NA	NA	NA	NA	NA
Calcium	7440-70-2	NV	mg/L	NA	NA	NA	NA	NA	NA
Chromium	7440-47-3	0.1	mg/L	NA	NA	NA	NA	NA	NA
Cobalt	7440-48-4	6.1	mg/L	NA	NA	NA	NA	NA	NA
Copper	7440-50-8	1.3	mg/L	NA	NA	NA	NA	NA	NA
Iron	7439-89-6	NV	mg/L	NA	NA	NA	NA	NA	NA
Lead	7439-92-1	0.015	mg/L	NA	NA	NA	NA	NA	NA
Magnesium	7439-95-4	NV	mg/L	NA	NA	NA	NA	NA	NA
Manganese	7439-96-5	1.1*	mg/L	NA	NA	NA	NA	NA	NA
Nickel	7440-02-0	0.49*	mg/L	NA	NA	NA	NA	NA	NA
Potassium	7440-09-7	NV	mg/L	NA	NA	NA	NA	NA	NA
Selenium	7782-49-2	0.05	mg/L	NA	NA	NA	NA	NA	NA
Silver	7440-22-4	0.51	mg/L	NA	NA	NA	NA	NA	NA
Sodium	7440-23-5	NV	mg/L	NA	NA	NA	NA	NA	NA
Thallium	7440-28-0	0.002	mg/L	NA	NA	NA	NA	NA	NA
Vanadium	7440-62-2	0.72	mg/L	NA	NA	NA	NA	NA	NA
Zinc	7440-66-6	31	mg/L	NA	NA	NA	NA	NA	NA
Method: SW7470A									
Mercury	7439-97-6	0.002	mg/L	NA	NA	NA	NA	NA	NA

Notes:

Blue highlighting indicates concentrations above the MCL/MSC/PCL

MCL/MSC - Maximum Contaminant Limit/Medium-Specific Concentrations/Protective Concentration Level

NA - Not Analyzed

µg/L - micrograms per liter

mg/L - milligrams per liter

J - Estimated: The analyte was positively identified, the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality

UJ - The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria.

U - Undetected: The analyte was analyzed for, but not detected.

UB - considered a non-detect due to blank contamination

NV - No Value

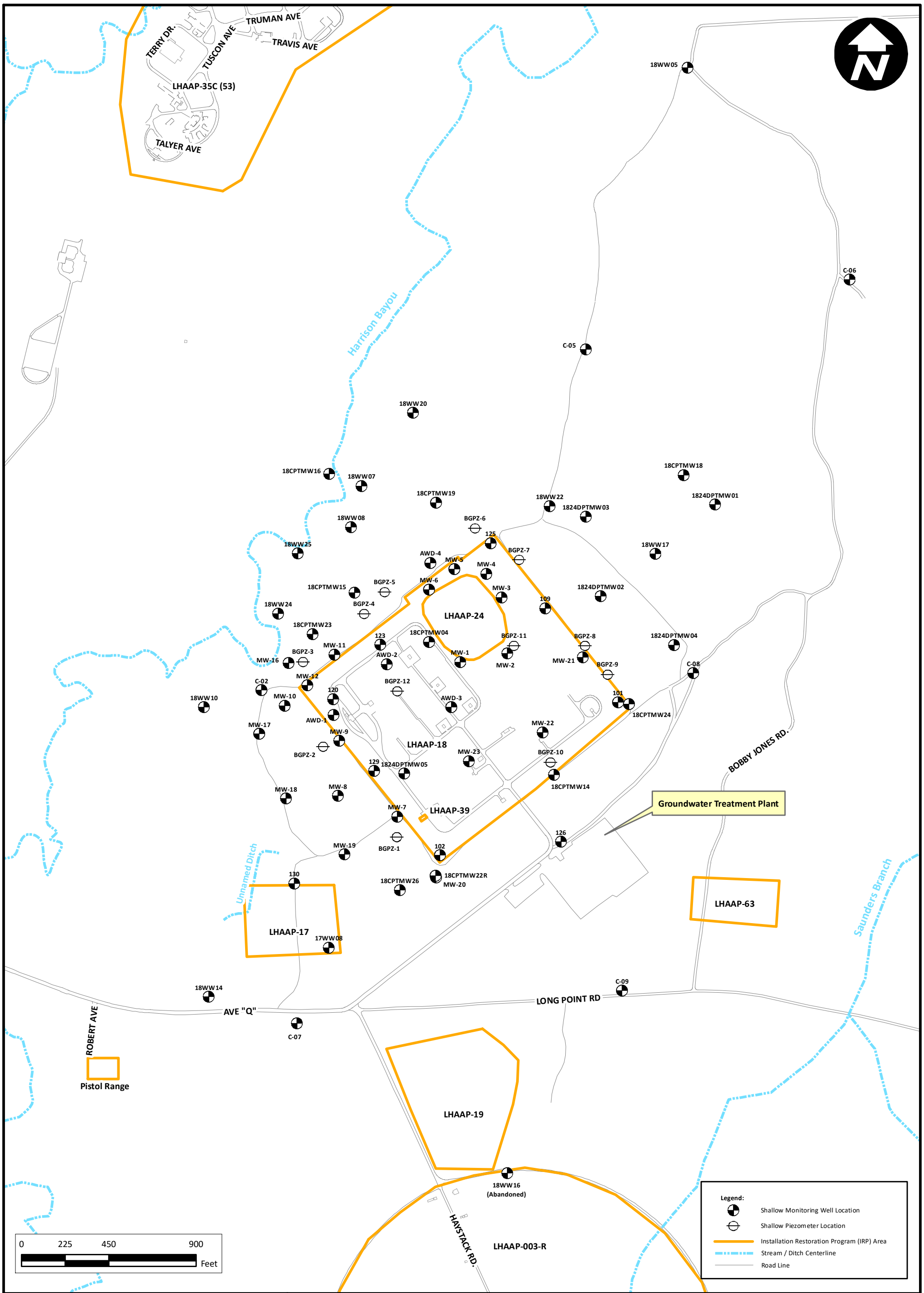
*Perchlorate, manganese, 1,4-dioxane and nickel compared to the PCL

** Value is for total xylenes

PCL – Texas Risk Reduction Program (TRRP) Tier 1 Groundwater Residential Protective Concentration Level

a - duplicate sample

< - non-detect



bhate

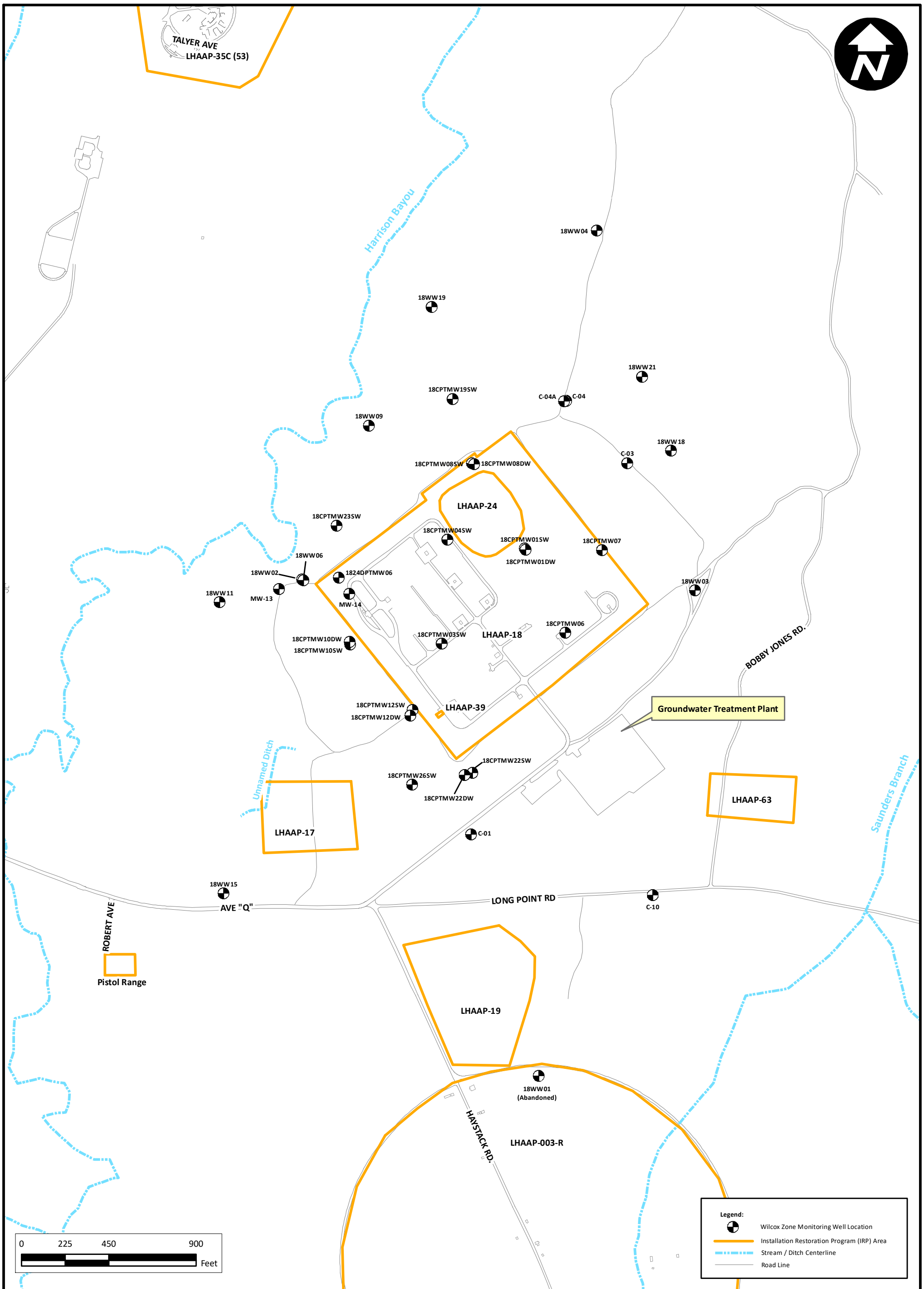
www.bhate.com

Groundwater Treatment Plant
Longhorn Army Ammunition Plant, Karnack, Texas

PROJECT NO:	SCALE:	DATE:	DRAWN BY:
NWO1312.0150	As Shown	2/14/2022	MRM

Shallow Zone Site Map

Figure B-1



bhate

www.bhate.com

Groundwater Treatment Plant
Longhorn Army Ammunition Plant, Karnack, Texas

PROJECT NO:	SCALE:	DATE:	DRAWN BY:
NWO1312.0150	As Shown	2/14/2022	MRM

Wilcox Zone Site Map

Figure B-4