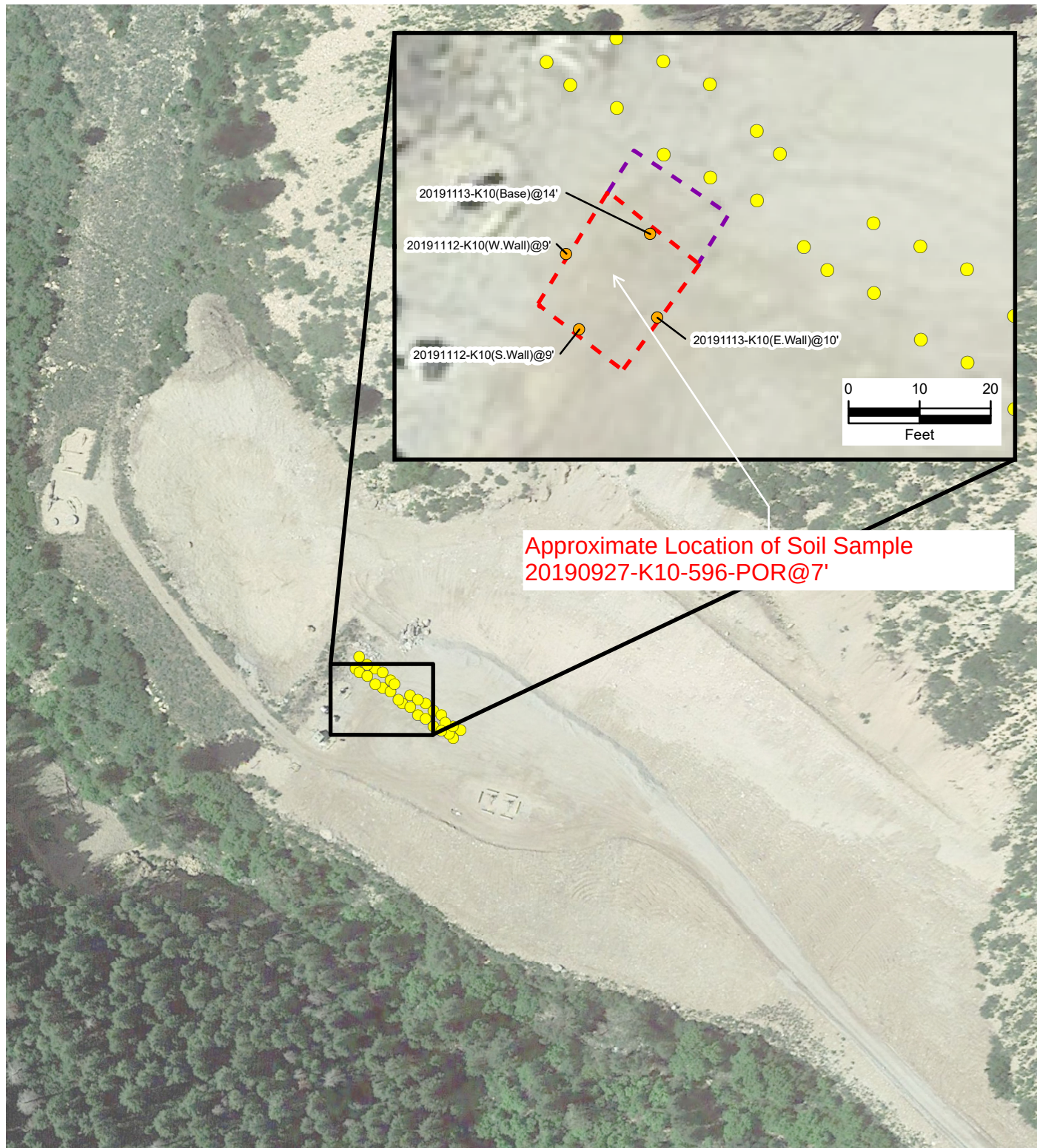




Approximate Location of Soil Sample
20190927-K10-596-POR@7'

LEGEND

- SOIL SAMPLE
- WELLHEAD
- - - EXCAVATION EXTENT (11/13/2019)
- - - PROPOSED ADDITIONAL EXCAVATION EXTENT

IMAGE COURTESY OF GOOGLE EARTH 2016

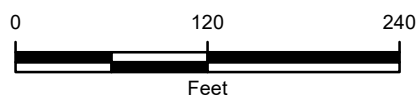
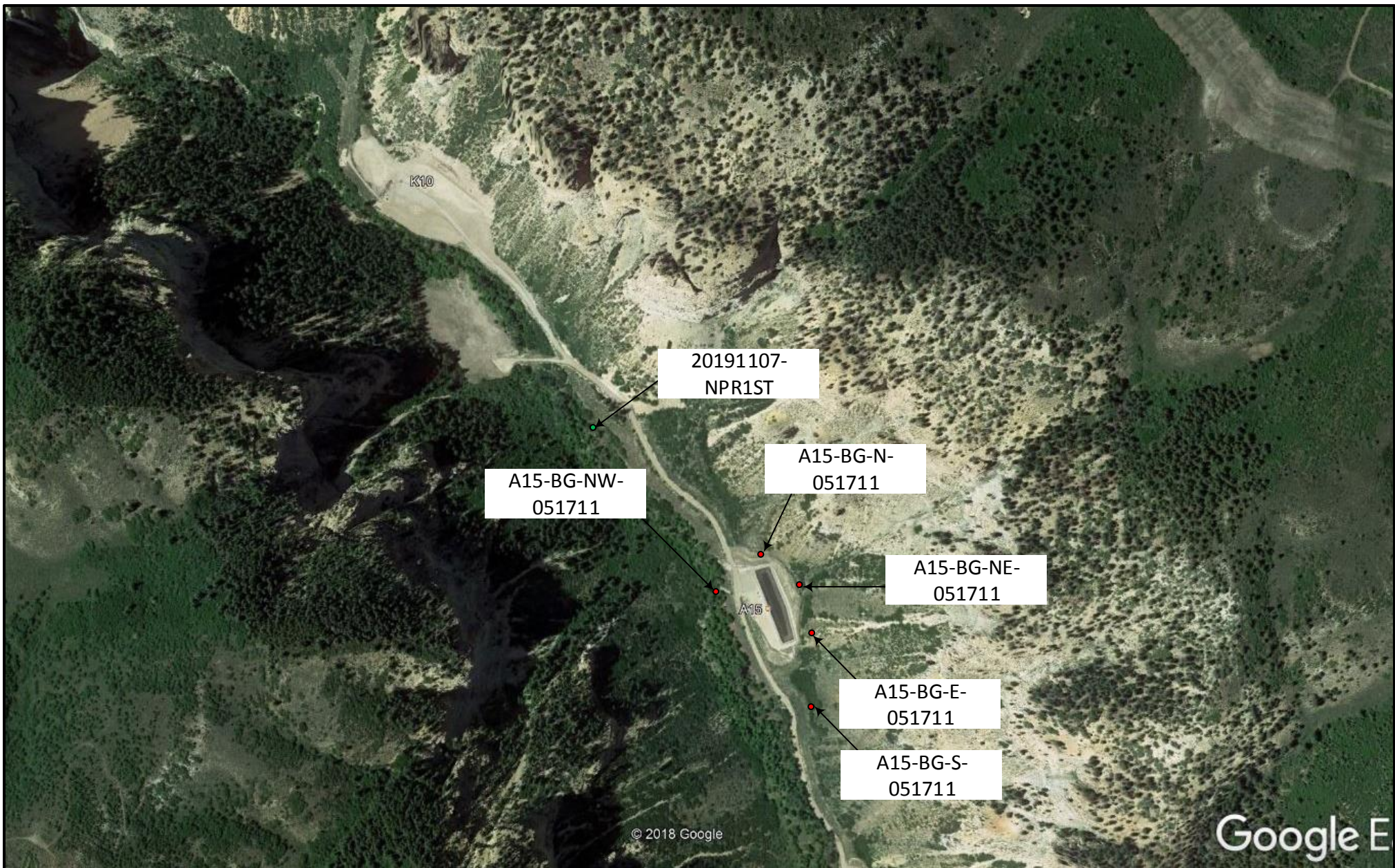


FIGURE 1
EXCAVATION SITE MAP
 K10-596
 NESW & NWSE SEC 10-T5S-R96W
 GARFIELD COUNTY, COLORADO
 CAERUS OIL AND GAS, LLC





143 Diamond Ave
Parachute, CO 81635
PHONE: 970-285-2600

Diagram Created By: Jake Janicek (EHS Specialist)
Date: 10/30/2019

LEGEND

- Background Soil Sample
- Quarterly Water Sample
- Excavation Extents
- Stockpile of Removed Soil

Figure 2
A15 BACKGROUND SAMPLE LOCATIONS



Not to Scale

Site Location:
Grass Mesa
Garfield County, Colorado
Caerus Oil and Gas LLC

TABLE 1 K10-596 GAS LIFT RELEASE SOIL ANALYTICAL RESULTS CAERUS OIL AND GAS LLC PICEANCE BASIN, COLORADO																	
PARAMETER	COGCC CONCENTRATION LEVELS	UNITS	20190927-K10-596- POR@7'	20191009-K10 (N WALL)@11'	20191009-K10 (EWALL)@10'	20191113-K10(E. WALL)@10'	20191009-K10 (SWALL)@9'	20191112-K10(S. WALL)@9'	20191009-K10 (BOTTOM)@13'	20191113- K10(BASE)@14'	20191009-K10 (WWALL)@9'	20191112-K10(W. WALL)@9'	A15-BG-S-051711	A15-BG-E-051711	A15-BG-NE-051711	A15-BG-N-051711	A15-BG-NW-051711
Sample Date			9/27/2019	10/9/2019	10/9/2019	11/13/2019	10/9/2019	11/12/2019	10/9/2019	11/13/2019	10/9/2019	11/12/2019	5/17/2011	5/17/2011	5/17/2011	5/17/2011	5/17/2011
Sample Matix			Confirmation	Confirmation	Confirmation	Confirmation	Confirmation	Confirmation	Confirmation	Confirmation	Confirmation	Confirmation	Background	Background	Background	Background	Background
Arsenic	0.39	mg/kg	35	12.8	12.8	13.9	9.33	11.6	7.91	18.6	7.15	12.3	18	15	11	19	16
Barium	15,000	mg/kg	420	245	223	310	1180	281	234	594	155	256	NA	NA	NA	NA	NA
Cadmium	70	mg/kg	0.34	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	NA	NA	NA	NA	NA
Chromium (III)	120,000	mg/kg	NA	17.7	19	23.8	22.4	27.1	19	18.7	14.8	19.0	NA	NA	NA	NA	NA
Chromium (VI)	23	mg/kg	NA	<2.00	6.69	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	NA	NA	NA	NA	NA
Copper	3,100	mg/kg	35	14.2	16.1	20.1	14.4	18.7	13.6	23.2	12.5	18.1	NA	NA	NA	NA	NA
Lead	400	mg/kg	25	9.46	10.7	12.3	10.8	11.5	9.05	10.4	8.08	11.8	NA	NA	NA	NA	NA
Mercury	23	mg/kg	1.3	<0.0300	<0.0300	<0.0300	<0.0300	<0.0300	0.0409	<0.0300	0.112	<0.0300	NA	NA	NA	NA	NA
Nickel	1,600	mg/kg	21	14.5	16.7	18.1	15.6	18.0	14.2	17.0	11.8	15.0	NA	NA	NA	NA	NA
Selenium	390	mg/kg	1.1	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	NA	NA	NA	NA	NA
Silver	390	mg/kg	0.076	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	NA	NA	NA	NA	NA
Zinc	23,000	mg/kg	70	35.9	41	43.3	44	53.6	39.6	44.4	33.2	45.1	NA	NA	NA	NA	NA
EC	4 or 2x background	mmhos/cm	1.7	0.288	0.383	0.500	0.321	0.662	0.2	0.969	0.364	0.842	NA	NA	NA	NA	NA
pH	6-9	SU	8.49	8.23	8.08	8.27	8.42	8.05	8.57	8.34	8.1	8.04	NA	NA	NA	NA	NA
SAR	12	unitless	1.1	0.735	0.696	0.436	0.744	0.681	0.728	1.60	1	0.687	NA	NA	NA	NA	NA
TPH-DRO			2300	694	74.9	86.4	108	129	397	214	115	153	NA	NA	NA	NA	NA
TPH-GRO			16000	6410	1820	7.02	1080	1.58	6340	3.16	1090	1.42	NA	NA	NA	NA	NA
TPH	500	mg/kg	18300	7104	1894.9	93.42	1188	130.58	6737	217.16	1205	154.42	NA	NA	NA	NA	NA
Benzene	0.17	mg/kg	22	6.06	2.49	<0.00100	1.53	<0.00100	10.7	<0.00100	1.2	0.00117	NA	NA	NA	NA	NA
Toluene	85	mg/kg	330	106	25.3	0.013	19.6	<0.00500	188	0.00543	15.5	0.00680	NA	NA	NA	NA	NA
Ethylbenzene	100	mg/kg	59	14.3	2.16	0.00430	1.92	<0.00250	19.1	<0.00250	1.01	<0.00250	NA	NA	NA	NA	NA
Total Xylenes	175	mg/kg	820	146	21.7	2.01	22.2	0.00808	194	0.218	28.3	0.0458	NA	NA	NA	NA	NA
Acenaphthene	1,000	mg/kg	<0.0052	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	NA	NA	NA	NA	NA
Anthracene	1,000	mg/kg	<0.0052	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	NA	NA	NA	NA	NA
Benz(a)anthracene	0.22	mg/kg	<0.0052	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	0.22	mg/kg	<0.0052	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	2.2	mg/kg	<0.0052	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	NA	NA	NA	NA	NA
Benzo(a)pyrene	0.022	mg/kg	<0.0052	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	NA	NA	NA	NA	NA
Chrysene	22	mg/kg	<0.0052	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	0.022	mg/kg	<0.0052	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	NA	NA	NA	NA	NA
Fluoranthene	1,000	mg/kg	<0.0052	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	NA	NA	NA	NA	NA
Fluorene	1,000	mg/kg	<0.0052	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	NA	NA	NA	NA	NA
Indeno(1,2,3,c,d)pyrene	0.22	mg/kg	<0.0052	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	NA	NA	NA	NA	NA
Naphthalene	23	mg/kg	1.8	0.0768	<0.0200	<0.0200	0.0301	<0.0200	0.122	<0.0200	<0.0200	<0.0200	NA	NA	NA	NA	NA
Pyrene	1,000	mg/kg	<0.0052	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	NA	NA	NA	NA	NA

Notes:
 < - less than the stated reporting limit
 Highlight - indicates result exceeds the COGCC concentration level
 COGCC - Colorado Oil and Gas Conservation Commission
 EC - electrical conductivity
 mg/kg - milligrams per kilogram
 mmhos/cm - millimhos per centimeter
 NA - not analyzed
 ND - non detect
 SAR - sodium adsorption ratio
 SU - standard unit
 TPH-GRO - total petroleum hydrocarbons-gasoline range organics
 TPH-DRO - total petroleum hydrocarbons-diesel range organics
 TPH - combination of TPH-GRO and TPH-DRO

November 21, 2019

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc

Caerus Oil and Gas

Sample Delivery Group: L1160511
Samples Received: 11/14/2019
Project Number: K10-596 GAS LIFT REL
Description: K10-596 Gas Lift Release
Site: K10-596
Report To: Jake Janicek
143 Diamond Avenue
Parachute, CO 81635

Entire Report Reviewed By:

Chris Ward

Chris Ward
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace Analytical National is performed per guidance provided in laboratory standard operating procedures ENV-SOP-MTJL-0067 and ENV-SOP-MTJL-0068. Where sampling conducted by the customer, results relate to the accuracy of the information provided, and as the samples are received.



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SAMPLE SUMMARY

ONE LAB. NATIONWIDE.



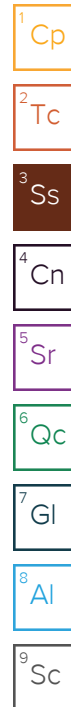
20191112-K10(W. WALL)@9' L1160511-01 Solid

Collected by
Steve S.

Collected date/time
11/12/19 12:30

Received date/time
11/14/19 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1380962	1	11/19/19 00:14	11/19/19 00:14	EL	Mt. Juliet, TN
Calculated Results	WG1380916	1	11/15/19 08:33	11/16/19 14:44	EL	Mt. Juliet, TN
Wet Chemistry by Method 3060A/7196A	WG1380458	1	11/14/19 14:00	11/14/19 21:48	ANP	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1381007	1	11/15/19 13:00	11/15/19 14:00	JIC	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1383074	1	11/19/19 13:00	11/19/19 16:00	SL	Mt. Juliet, TN
Mercury by Method 7471A	WG1380678	1	11/17/19 13:30	11/18/19 14:21	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1380916	1	11/15/19 08:33	11/16/19 14:44	EL	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG1381863	1	11/14/19 14:02	11/17/19 18:36	ACG	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1381535	1	11/14/19 14:02	11/16/19 02:40	JHH	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1381793	20	11/16/19 14:30	11/17/19 07:36	TJD	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG1381314	1	11/15/19 21:08	11/16/19 17:14	DMG	Mt. Juliet, TN



20191112-K10(S. WALL)@9' L1160511-02 Solid

Collected by
Steve S.

Collected date/time
11/12/19 12:40

Received date/time
11/14/19 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1380962	1	11/19/19 00:17	11/19/19 00:17	EL	Mt. Juliet, TN
Calculated Results	WG1380916	1	11/15/19 08:33	11/16/19 14:47	EL	Mt. Juliet, TN
Wet Chemistry by Method 3060A/7196A	WG1380458	1	11/14/19 14:00	11/14/19 21:50	ANP	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1381007	1	11/15/19 13:00	11/15/19 14:00	JIC	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1383074	1	11/19/19 13:00	11/19/19 16:00	SL	Mt. Juliet, TN
Mercury by Method 7471A	WG1380678	1	11/17/19 13:30	11/18/19 14:23	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1380916	1	11/15/19 08:33	11/16/19 14:47	EL	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG1381863	1	11/14/19 14:02	11/17/19 18:58	ACG	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1381535	1	11/14/19 14:02	11/16/19 02:59	JHH	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1382019	10	11/17/19 06:13	11/17/19 21:24	TJD	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG1381314	1	11/15/19 21:08	11/16/19 17:35	DMG	Mt. Juliet, TN

20191113-K10(BASE)@14' L1160511-03 Solid

Collected by
Steve S.

Collected date/time
11/13/19 10:30

Received date/time
11/14/19 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1380962	1	11/19/19 00:21	11/19/19 00:21	EL	Mt. Juliet, TN
Calculated Results	WG1380916	1	11/15/19 08:33	11/16/19 14:50	EL	Mt. Juliet, TN
Wet Chemistry by Method 3060A/7196A	WG1380458	1	11/14/19 14:00	11/14/19 21:52	ANP	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1381007	1	11/15/19 13:00	11/15/19 14:00	JIC	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1383074	1	11/19/19 13:00	11/19/19 16:00	SL	Mt. Juliet, TN
Mercury by Method 7471A	WG1380678	1	11/17/19 13:30	11/18/19 14:25	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1380916	1	11/15/19 08:33	11/16/19 14:50	EL	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG1381863	1	11/14/19 14:02	11/17/19 19:21	ACG	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1381535	1	11/14/19 14:02	11/16/19 03:18	JHH	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1382019	10	11/17/19 06:13	11/17/19 21:38	TJD	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG1381314	1	11/15/19 21:08	11/16/19 17:56	DMG	Mt. Juliet, TN

20191113-K10(E. WALL)@10' L1160511-04 Solid

Collected by
Steve S.

Collected date/time
11/13/19 11:30

Received date/time
11/14/19 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1380962	1	11/19/19 00:23	11/19/19 00:23	EL	Mt. Juliet, TN
Calculated Results	WG1380916	1	11/15/19 08:33	11/16/19 14:53	EL	Mt. Juliet, TN
Wet Chemistry by Method 3060A/7196A	WG1380458	1	11/14/19 14:00	11/14/19 21:53	ANP	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1381007	1	11/15/19 13:00	11/15/19 14:00	JIC	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1383074	1	11/19/19 13:00	11/19/19 16:00	SL	Mt. Juliet, TN

ACCOUNT:
Caerus Oil and Gas

PROJECT:
K10-596 GAS LIFT REL

SDG:
L1160511

DATE/TIME:
11/21/19 09:46

PAGE:
3 of 28

SAMPLE SUMMARY

ONE LAB. NATIONWIDE.



20191113-K10(E. WALL)@10' L1160511-04 Solid

Collected by
Steve S.

Collected date/time
11/13/19 11:30

Received date/time
11/14/19 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Mercury by Method 7471A	WG1380678	1	11/17/19 13:30	11/18/19 14:28	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1380916	1	11/15/19 08:33	11/16/19 14:53	EL	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG1381863	1	11/14/19 14:02	11/17/19 19:43	ACG	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1381535	1	11/14/19 14:02	11/16/19 03:37	JHH	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1382019	10	11/17/19 06:13	11/17/19 22:59	TJD	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG1381314	1	11/15/19 21:08	11/16/19 18:16	DMG	Mt. Juliet, TN

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc



All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Chris Ward
Project Manager

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc



Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	0.687		1	11/19/2019 00:14	WG1380962

Calculated Results

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Chromium, Trivalent	19.0		1.00	1	11/16/2019 14:44	WG1380916

Wet Chemistry by Method 3060A/7196A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Chromium, Hexavalent	ND		2.00	1	11/14/2019 21:48	WG1380458

Wet Chemistry by Method 9045D

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	8.04	T8	1	11/15/2019 14:00	WG1381007

Sample Narrative:

L1160511-01 WG1381007: 8.04 at 21.1C

Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	842		10.0	1	11/19/2019 16:00	WG1383074

Mercury by Method 7471A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Mercury	ND		0.0300	1	11/18/2019 14:21	WG1380678

Metals (ICP) by Method 6010B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	12.3		2.00	1	11/16/2019 14:44	WG1380916
Barium	256		0.500	1	11/16/2019 14:44	WG1380916
Cadmium	ND		0.500	1	11/16/2019 14:44	WG1380916
Chromium	19.0		1.00	1	11/16/2019 14:44	WG1380916
Copper	18.1		2.00	1	11/16/2019 14:44	WG1380916
Lead	11.8		0.500	1	11/16/2019 14:44	WG1380916
Nickel	15.0		2.00	1	11/16/2019 14:44	WG1380916
Selenium	ND		2.00	1	11/16/2019 14:44	WG1380916
Silver	ND		1.00	1	11/16/2019 14:44	WG1380916
Zinc	45.1		5.00	1	11/16/2019 14:44	WG1380916

Volatile Organic Compounds (GC) by Method 8015D/GRO

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	1.42		0.100	1	11/17/2019 18:36	WG1381863
(S) a,a,a-Trifluorotoluene(FID)	89.9		77.0-120		11/17/2019 18:36	WG1381863

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc



Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	0.00117		0.00100	1	11/16/2019 02:40	WG1381535
Toluene	0.00680		0.00500	1	11/16/2019 02:40	WG1381535
Ethylbenzene	ND		0.00250	1	11/16/2019 02:40	WG1381535
Total Xylenes	0.0458		0.00650	1	11/16/2019 02:40	WG1381535
(S) Toluene-d8	102		75.0-131		11/16/2019 02:40	WG1381535
(S) 4-Bromofluorobenzene	91.3		67.0-138		11/16/2019 02:40	WG1381535
(S) 1,2-Dichloroethane-d4	102		70.0-130		11/16/2019 02:40	WG1381535

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	153		80.0	20	11/17/2019 07:36	WG1381793
(S) o-Terphenyl	88.1	J7	18.0-148		11/17/2019 07:36	WG1381793

Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Anthracene	ND		0.00600	1	11/16/2019 17:14	WG1381314
Acenaphthene	ND		0.00600	1	11/16/2019 17:14	WG1381314
Acenaphthylene	ND		0.00600	1	11/16/2019 17:14	WG1381314
Benzo(a)anthracene	ND		0.00600	1	11/16/2019 17:14	WG1381314
Benzo(a)pyrene	ND		0.00600	1	11/16/2019 17:14	WG1381314
Benzo(b)fluoranthene	ND		0.00600	1	11/16/2019 17:14	WG1381314
Benzo(g,h,i)perylene	ND		0.00600	1	11/16/2019 17:14	WG1381314
Benzo(k)fluoranthene	ND		0.00600	1	11/16/2019 17:14	WG1381314
Chrysene	ND		0.00600	1	11/16/2019 17:14	WG1381314
Dibenz(a,h)anthracene	ND		0.00600	1	11/16/2019 17:14	WG1381314
Fluoranthene	ND		0.00600	1	11/16/2019 17:14	WG1381314
Fluorene	ND		0.00600	1	11/16/2019 17:14	WG1381314
Indeno(1,2,3-cd)pyrene	ND		0.00600	1	11/16/2019 17:14	WG1381314
Naphthalene	ND		0.0200	1	11/16/2019 17:14	WG1381314
Phenanthrene	ND		0.00600	1	11/16/2019 17:14	WG1381314
Pyrene	ND		0.00600	1	11/16/2019 17:14	WG1381314
1-Methylnaphthalene	ND		0.0200	1	11/16/2019 17:14	WG1381314
2-Methylnaphthalene	ND		0.0200	1	11/16/2019 17:14	WG1381314
2-Chloronaphthalene	ND		0.0200	1	11/16/2019 17:14	WG1381314
(S) p-Terphenyl-d14	106		23.0-120		11/16/2019 17:14	WG1381314
(S) Nitrobenzene-d5	95.4		14.0-149		11/16/2019 17:14	WG1381314
(S) 2-Fluorobiphenyl	91.6		34.0-125		11/16/2019 17:14	WG1381314



Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	0.681		1	11/19/2019 00:17	WG1380962

¹ Cp² Tc³ Ss⁴ Cn⁵ Sr⁶ Qc⁷ Gl⁸ Al⁹ Sc

Calculated Results

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Chromium, Trivalent	27.1		1.00	1	11/16/2019 14:47	WG1380916

Wet Chemistry by Method 3060A/7196A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Chromium, Hexavalent	ND		2.00	1	11/14/2019 21:50	WG1380458

Wet Chemistry by Method 9045D

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	8.05	T8	1	11/15/2019 14:00	WG1381007

Sample Narrative:

L1160511-02 WG1381007: 8.05 at 20.8C

Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	662		10.0	1	11/19/2019 16:00	WG1383074

Mercury by Method 7471A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Mercury	ND		0.0300	1	11/18/2019 14:23	WG1380678

Metals (ICP) by Method 6010B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	11.6		2.00	1	11/16/2019 14:47	WG1380916
Barium	281		0.500	1	11/16/2019 14:47	WG1380916
Cadmium	ND		0.500	1	11/16/2019 14:47	WG1380916
Chromium	27.1		1.00	1	11/16/2019 14:47	WG1380916
Copper	18.7		2.00	1	11/16/2019 14:47	WG1380916
Lead	11.5		0.500	1	11/16/2019 14:47	WG1380916
Nickel	18.0		2.00	1	11/16/2019 14:47	WG1380916
Selenium	ND		2.00	1	11/16/2019 14:47	WG1380916
Silver	ND		1.00	1	11/16/2019 14:47	WG1380916
Zinc	53.6		5.00	1	11/16/2019 14:47	WG1380916

Volatile Organic Compounds (GC) by Method 8015D/GRO

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	1.58		0.100	1	11/17/2019 18:58	WG1381863
(S) a,a,a-Trifluorotoluene(FID)	84.4		77.0-120		11/17/2019 18:58	WG1381863



Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00100	1	11/16/2019 02:59	WG1381535
Toluene	ND		0.00500	1	11/16/2019 02:59	WG1381535
Ethylbenzene	ND		0.00250	1	11/16/2019 02:59	WG1381535
Total Xylenes	0.00808		0.00650	1	11/16/2019 02:59	WG1381535
(S) Toluene-d8	101		75.0-131		11/16/2019 02:59	WG1381535
(S) 4-Bromofluorobenzene	88.8		67.0-138		11/16/2019 02:59	WG1381535
(S) 1,2-Dichloroethane-d4	96.6		70.0-130		11/16/2019 02:59	WG1381535

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	129		40.0	10	11/17/2019 21:24	WG1382019
(S) o-Terphenyl	130		18.0-148		11/17/2019 21:24	WG1382019

Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Anthracene	ND		0.00600	1	11/16/2019 17:35	WG1381314
Acenaphthene	ND		0.00600	1	11/16/2019 17:35	WG1381314
Acenaphthylene	ND		0.00600	1	11/16/2019 17:35	WG1381314
Benzo(a)anthracene	ND		0.00600	1	11/16/2019 17:35	WG1381314
Benzo(a)pyrene	ND		0.00600	1	11/16/2019 17:35	WG1381314
Benzo(b)fluoranthene	ND		0.00600	1	11/16/2019 17:35	WG1381314
Benzo(g,h,i)perylene	ND		0.00600	1	11/16/2019 17:35	WG1381314
Benzo(k)fluoranthene	ND		0.00600	1	11/16/2019 17:35	WG1381314
Chrysene	ND		0.00600	1	11/16/2019 17:35	WG1381314
Dibenz(a,h)anthracene	ND		0.00600	1	11/16/2019 17:35	WG1381314
Fluoranthene	ND		0.00600	1	11/16/2019 17:35	WG1381314
Fluorene	ND		0.00600	1	11/16/2019 17:35	WG1381314
Indeno(1,2,3-cd)pyrene	ND		0.00600	1	11/16/2019 17:35	WG1381314
Naphthalene	ND		0.0200	1	11/16/2019 17:35	WG1381314
Phenanthrene	ND		0.00600	1	11/16/2019 17:35	WG1381314
Pyrene	ND		0.00600	1	11/16/2019 17:35	WG1381314
1-Methylnaphthalene	ND		0.0200	1	11/16/2019 17:35	WG1381314
2-Methylnaphthalene	ND		0.0200	1	11/16/2019 17:35	WG1381314
2-Chloronaphthalene	ND		0.0200	1	11/16/2019 17:35	WG1381314
(S) p-Terphenyl-d14	90.5		23.0-120		11/16/2019 17:35	WG1381314
(S) Nitrobenzene-d5	88.8		14.0-149		11/16/2019 17:35	WG1381314
(S) 2-Fluorobiphenyl	80.2		34.0-125		11/16/2019 17:35	WG1381314



Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	1.60		1	11/19/2019 00:21	WG1380962

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Calculated Results

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Chromium, Trivalent	18.7		1.00	1	11/16/2019 14:50	WG1380916

Wet Chemistry by Method 3060A/7196A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Chromium, Hexavalent	ND		2.00	1	11/14/2019 21:52	WG1380458

Wet Chemistry by Method 9045D

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	8.34	T8	1	11/15/2019 14:00	WG1381007

Sample Narrative:

L1160511-03 WG1381007: 8.34 at 20.6C

Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	969		10.0	1	11/19/2019 16:00	WG1383074

Mercury by Method 7471A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Mercury	ND		0.0300	1	11/18/2019 14:25	WG1380678

Metals (ICP) by Method 6010B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	18.6		2.00	1	11/16/2019 14:50	WG1380916
Barium	594		0.500	1	11/16/2019 14:50	WG1380916
Cadmium	ND		0.500	1	11/16/2019 14:50	WG1380916
Chromium	18.7		1.00	1	11/16/2019 14:50	WG1380916
Copper	23.2		2.00	1	11/16/2019 14:50	WG1380916
Lead	10.4		0.500	1	11/16/2019 14:50	WG1380916
Nickel	17.0		2.00	1	11/16/2019 14:50	WG1380916
Selenium	ND		2.00	1	11/16/2019 14:50	WG1380916
Silver	ND		1.00	1	11/16/2019 14:50	WG1380916
Zinc	44.4		5.00	1	11/16/2019 14:50	WG1380916

Volatile Organic Compounds (GC) by Method 8015D/GRO

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	3.16		0.100	1	11/17/2019 19:21	WG1381863
(S) a,a,a-Trifluorotoluene(FID)	95.0		77.0-120		11/17/2019 19:21	WG1381863



Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00100	1	11/16/2019 03:18	WG1381535
Toluene	0.00543		0.00500	1	11/16/2019 03:18	WG1381535
Ethylbenzene	ND		0.00250	1	11/16/2019 03:18	WG1381535
Total Xylenes	0.218		0.00650	1	11/16/2019 03:18	WG1381535
(S) Toluene-d8	101		75.0-131		11/16/2019 03:18	WG1381535
(S) 4-Bromofluorobenzene	94.6		67.0-138		11/16/2019 03:18	WG1381535
(S) 1,2-Dichloroethane-d4	105		70.0-130		11/16/2019 03:18	WG1381535

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	214		40.0	10	11/17/2019 21:38	WG1382019
(S) o-Terphenyl	116		18.0-148		11/17/2019 21:38	WG1382019

Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Anthracene	ND		0.00600	1	11/16/2019 17:56	WG1381314
Acenaphthene	ND		0.00600	1	11/16/2019 17:56	WG1381314
Acenaphthylene	ND		0.00600	1	11/16/2019 17:56	WG1381314
Benzo(a)anthracene	ND		0.00600	1	11/16/2019 17:56	WG1381314
Benzo(a)pyrene	ND		0.00600	1	11/16/2019 17:56	WG1381314
Benzo(b)fluoranthene	ND		0.00600	1	11/16/2019 17:56	WG1381314
Benzo(g,h,i)perylene	ND		0.00600	1	11/16/2019 17:56	WG1381314
Benzo(k)fluoranthene	ND		0.00600	1	11/16/2019 17:56	WG1381314
Chrysene	ND		0.00600	1	11/16/2019 17:56	WG1381314
Dibenz(a,h)anthracene	ND		0.00600	1	11/16/2019 17:56	WG1381314
Fluoranthene	ND		0.00600	1	11/16/2019 17:56	WG1381314
Fluorene	ND		0.00600	1	11/16/2019 17:56	WG1381314
Indeno(1,2,3-cd)pyrene	ND		0.00600	1	11/16/2019 17:56	WG1381314
Naphthalene	ND		0.0200	1	11/16/2019 17:56	WG1381314
Phenanthrene	ND		0.00600	1	11/16/2019 17:56	WG1381314
Pyrene	ND		0.00600	1	11/16/2019 17:56	WG1381314
1-Methylnaphthalene	ND		0.0200	1	11/16/2019 17:56	WG1381314
2-Methylnaphthalene	ND		0.0200	1	11/16/2019 17:56	WG1381314
2-Chloronaphthalene	ND		0.0200	1	11/16/2019 17:56	WG1381314
(S) p-Terphenyl-d14	87.5		23.0-120		11/16/2019 17:56	WG1381314
(S) Nitrobenzene-d5	81.1		14.0-149		11/16/2019 17:56	WG1381314
(S) 2-Fluorobiphenyl	76.8		34.0-125		11/16/2019 17:56	WG1381314



Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	0.436		1	11/19/2019 00:23	WG1380962

Calculated Results

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Chromium, Trivalent	23.8		1.00	1	11/16/2019 14:53	WG1380916

Wet Chemistry by Method 3060A/7196A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Chromium, Hexavalent	ND		2.00	1	11/14/2019 21:53	WG1380458

Wet Chemistry by Method 9045D

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	8.27	T8	1	11/15/2019 14:00	WG1381007

Sample Narrative:

L1160511-04 WG1381007: 8.27 at 20.5C

Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	500		10.0	1	11/19/2019 16:00	WG1383074

Mercury by Method 7471A

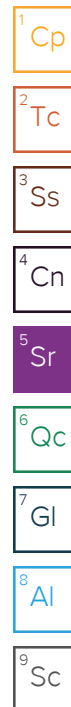
Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Mercury	ND		0.0300	1	11/18/2019 14:28	WG1380678

Metals (ICP) by Method 6010B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	13.9		2.00	1	11/16/2019 14:53	WG1380916
Barium	310		0.500	1	11/16/2019 14:53	WG1380916
Cadmium	ND		0.500	1	11/16/2019 14:53	WG1380916
Chromium	23.8		1.00	1	11/16/2019 14:53	WG1380916
Copper	20.1		2.00	1	11/16/2019 14:53	WG1380916
Lead	12.3		0.500	1	11/16/2019 14:53	WG1380916
Nickel	18.1		2.00	1	11/16/2019 14:53	WG1380916
Selenium	ND		2.00	1	11/16/2019 14:53	WG1380916
Silver	ND		1.00	1	11/16/2019 14:53	WG1380916
Zinc	43.3		5.00	1	11/16/2019 14:53	WG1380916

Volatile Organic Compounds (GC) by Method 8015D/GRO

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	7.02		0.100	1	11/17/2019 19:43	WG1381863
(S) a,a,a-Trifluorotoluene(FID)	88.8		77.0-120		11/17/2019 19:43	WG1381863





Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00100	1	11/16/2019 03:37	WG1381535
Toluene	0.0130		0.00500	1	11/16/2019 03:37	WG1381535
Ethylbenzene	0.00430		0.00250	1	11/16/2019 03:37	WG1381535
Total Xylenes	2.01		0.00650	1	11/16/2019 03:37	WG1381535
(S) Toluene-d8	101		75.0-131		11/16/2019 03:37	WG1381535
(S) 4-Bromofluorobenzene	90.4		67.0-138		11/16/2019 03:37	WG1381535
(S) 1,2-Dichloroethane-d4	99.4		70.0-130		11/16/2019 03:37	WG1381535

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	86.4		40.0	10	11/17/2019 22:59	WG1382019
(S) o-Terphenyl	137		18.0-148		11/17/2019 22:59	WG1382019

Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Anthracene	ND		0.00600	1	11/16/2019 18:16	WG1381314
Acenaphthene	ND		0.00600	1	11/16/2019 18:16	WG1381314
Acenaphthylene	ND		0.00600	1	11/16/2019 18:16	WG1381314
Benzo(a)anthracene	ND		0.00600	1	11/16/2019 18:16	WG1381314
Benzo(a)pyrene	ND		0.00600	1	11/16/2019 18:16	WG1381314
Benzo(b)fluoranthene	ND		0.00600	1	11/16/2019 18:16	WG1381314
Benzo(g,h,i)perylene	ND		0.00600	1	11/16/2019 18:16	WG1381314
Benzo(k)fluoranthene	ND		0.00600	1	11/16/2019 18:16	WG1381314
Chrysene	ND		0.00600	1	11/16/2019 18:16	WG1381314
Dibenz(a,h)anthracene	ND		0.00600	1	11/16/2019 18:16	WG1381314
Fluoranthene	ND		0.00600	1	11/16/2019 18:16	WG1381314
Fluorene	ND		0.00600	1	11/16/2019 18:16	WG1381314
Indeno(1,2,3-cd)pyrene	ND		0.00600	1	11/16/2019 18:16	WG1381314
Naphthalene	ND		0.0200	1	11/16/2019 18:16	WG1381314
Phenanthrene	ND		0.00600	1	11/16/2019 18:16	WG1381314
Pyrene	ND		0.00600	1	11/16/2019 18:16	WG1381314
1-Methylnaphthalene	ND		0.0200	1	11/16/2019 18:16	WG1381314
2-Methylnaphthalene	ND		0.0200	1	11/16/2019 18:16	WG1381314
2-Chloronaphthalene	ND		0.0200	1	11/16/2019 18:16	WG1381314
(S) p-Terphenyl-d14	86.9		23.0-120		11/16/2019 18:16	WG1381314
(S) Nitrobenzene-d5	87.6		14.0-149		11/16/2019 18:16	WG1381314
(S) 2-Fluorobiphenyl	76.0		34.0-125		11/16/2019 18:16	WG1381314

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Method Blank (MB)

(MB) R3472168-1 11/14/19 21:29

	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	mg/kg		mg/kg	mg/kg
Chromium,Hexavalent	U		0.640	2.00

L1160045-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1160045-01 11/14/19 21:30 • (DUP) R3472168-3 11/14/19 21:31

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	mg/kg	mg/kg		%		%
Chromium,Hexavalent	ND	0.000	1	0.000		20

L1160511-04 Original Sample (OS) • Duplicate (DUP)

(OS) L1160511-04 11/14/19 21:53 • (DUP) R3472168-8 11/14/19 21:57

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	mg/kg	mg/kg		%		%
Chromium,Hexavalent	ND	0.000	1	0.000		20

Laboratory Control Sample (LCS)

(LCS) R3472168-2 11/14/19 21:29

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	mg/kg	mg/kg	%	%	
Chromium,Hexavalent	24.0	22.0	91.8	80.0-120	

L1160045-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1160045-02 11/14/19 21:32 • (MS) R3472168-4 11/14/19 21:32 • (MSD) R3472168-5 11/14/19 21:33

	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Analyte	mg/kg	mg/kg	mg/kg	mg/kg	%	%		%			%	%
Chromium,Hexavalent	20.0	ND	13.7	15.0	68.7	75.0	1	75.0-125	J6		8.77	20

L1160045-02 Original Sample (OS) • Matrix Spike (MS)

(OS) L1160045-02 11/14/19 21:32 • (MS) R3472168-6 11/14/19 21:33

	Spike Amount	Original Result	MS Result	MS Rec.	Dilution	Rec. Limits	MS Qualifier
Analyte	mg/kg	mg/kg	mg/kg	%		%	
Chromium,Hexavalent	651	ND	489	75.1	50	75.0-125	

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc



L1160511-04 Original Sample (OS) • Duplicate (DUP)

(OS) L1160511-04 11/15/19 14:00 • (DUP) R3472514-2 11/15/19 14:00

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	su	su		%		%
pH	8.27	8.28	1	0.121		1

Sample Narrative:

OS: 8.27 at 20.5C

DUP: 8.28 at 20.5C

Laboratory Control Sample (LCS)

(LCS) R3472514-1 11/15/19 14:00

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	su	su	%	%	
pH	10.0	9.93	99.3	99.0-101	

Sample Narrative:

LCS: 9.93 at 17.2C

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc



Method Blank (MB)

(MB) R3473782-1 11/19/19 16:00

Analyte	MB Result umhos/cm	MB Qualifier	MB MDL umhos/cm	MB RDL umhos/cm
Specific Conductance	U		10.0	10.0

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc

L1160511-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1160511-02 11/19/19 16:00 • (DUP) R3473782-3 11/19/19 16:00

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	662	705	1	6.29		20

L1161380-09 Original Sample (OS) • Duplicate (DUP)

(OS) L1161380-09 11/19/19 16:00 • (DUP) R3473782-4 11/19/19 16:00

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	3910	4050	1	3.52		20

Laboratory Control Sample (LCS)

(LCS) R3473782-2 11/19/19 16:00

Analyte	Spike Amount umhos/cm	LCS Result umhos/cm	LCS Rec. %	Rec. Limits %	LCS Qualifier
Specific Conductance	475	475	100	85.0-115	



Method Blank (MB)

(MB) R3473239-1 11/18/19 13:30

	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	mg/kg		mg/kg	mg/kg
Mercury	U		0.00280	0.0300

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3473239-2 11/18/19 13:33 • (LCSD) R3473239-3 11/18/19 13:35

	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
Analyte	mg/kg	mg/kg	mg/kg	%	%	%			%	%
Mercury	0.500	0.573	0.537	115	107	80.0-120			6.61	20

L1160206-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1160206-02 11/18/19 13:37 • (MS) R3473239-4 11/18/19 13:39 • (MSD) R3473239-5 11/18/19 13:46

	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Analyte	mg/kg	mg/kg	mg/kg	mg/kg	%	%		%			%	%
Mercury	0.500	0.00617	0.502	0.502	99.1	99.1	1	75.0-125			0.000	20

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc



Method Blank (MB)

(MB) R3472862-1 11/16/19 13:57

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Arsenic	U		0.460	2.00
Barium	U		0.170	0.500
Cadmium	U		0.0700	0.500
Chromium	U		0.140	1.00
Copper	U		0.530	2.00
Lead	U		0.190	0.500
Nickel	U		0.490	2.00
Selenium	U		0.620	2.00
Silver	U		0.120	1.00
Zinc	U		0.590	5.00

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3472862-2 11/16/19 13:59 • (LCSD) R3472862-3 11/16/19 14:02

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Arsenic	100	94.4	96.2	94.4	96.2	80.0-120			1.86	20
Barium	100	102	103	102	103	80.0-120			1.93	20
Cadmium	100	95.9	97.9	95.9	97.9	80.0-120			1.99	20
Chromium	100	97.5	99.8	97.5	99.8	80.0-120			2.31	20
Copper	100	97.5	99.6	97.5	99.6	80.0-120			2.09	20
Lead	100	95.6	96.9	95.6	96.9	80.0-120			1.34	20
Nickel	100	96.8	98.6	96.8	98.6	80.0-120			1.85	20
Selenium	100	95.7	97.5	95.7	97.5	80.0-120			1.86	20
Silver	20.0	18.6	19.0	92.8	94.8	80.0-120			2.14	20
Zinc	100	95.5	97.2	95.5	97.2	80.0-120			1.81	20

L1160535-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1160535-03 11/16/19 14:04 • (MS) R3472862-6 11/16/19 14:12 • (MSD) R3472862-7 11/16/19 14:14

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Arsenic	100	2.18	88.4	88.0	86.2	85.8	1	75.0-125			0.458	20
Barium	100	80.7	175	174	94.4	93.1	1	75.0-125			0.723	20
Cadmium	100	ND	93.1	92.8	93.1	92.8	1	75.0-125			0.286	20
Chromium	100	16.5	112	109	95.2	92.8	1	75.0-125			2.12	20
Copper	100	13.1	111	109	97.7	96.3	1	75.0-125			1.31	20
Lead	100	11.2	110	110	98.5	99.1	1	75.0-125			0.504	20
Nickel	100	12.7	115	114	102	102	1	75.0-125			0.286	20



L1160535-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1160535-03 11/16/19 14:04 • (MS) R3472862-6 11/16/19 14:12 • (MSD) R3472862-7 11/16/19 14:14

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Selenium	100	ND	89.8	89.5	89.8	89.5	1	75.0-125			0.269	20
Silver	20.0	ND	18.5	18.1	92.5	90.6	1	75.0-125			2.06	20
Zinc	100	35.0	127	125	91.6	90.5	1	75.0-125			0.879	20

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc



Method Blank (MB)

(MB) R3474276-3 11/17/19 13:42

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
TPH (GC/FID) Low Fraction	0.0457	⬇	0.0217	0.100
(S) a,a,a-Trifluorotoluene(FID)	103			77.0-120

1
Cp

2
Tc

3
Ss

4
Cn

5
Sr

6
Qc

7
Gl

8
Al

9
Sc

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3474276-1 11/17/19 12:35 • (LCSD) R3474276-2 11/17/19 12:57

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
TPH (GC/FID) Low Fraction	5.50	6.21	6.32	113	115	72.0-127			1.76	20
(S) a,a,a-Trifluorotoluene(FID)				107	107	77.0-120				

L1161103-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1161103-01 11/17/19 14:04 • (MS) R3474276-4 11/17/19 22:45 • (MSD) R3474276-5 11/17/19 23:08

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
TPH (GC/FID) Low Fraction	7.18	0.120	5.08	4.79	69.1	65.1	1	10.0-151			5.82	28
(S) a,a,a-Trifluorotoluene(FID)					101	97.4		77.0-120				



Method Blank (MB)

(MB) R3473261-2 11/16/19 00:00

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Benzene	U		0.000400	0.00100
Ethylbenzene	U		0.000530	0.00250
Toluene	U		0.00125	0.00500
Xylenes, Total	U		0.00478	0.00650
(S) Toluene-d8	103			75.0-131
(S) 4-Bromofluorobenzene	89.2			67.0-138
(S) 1,2-Dichloroethane-d4	95.6			70.0-130

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc

Laboratory Control Sample (LCS)

(LCS) R3473261-1 11/15/19 23:04

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Benzene	0.125	0.139	111	70.0-123	
Ethylbenzene	0.125	0.109	87.2	74.0-126	
Toluene	0.125	0.117	93.6	75.0-121	
Xylenes, Total	0.375	0.330	88.0	72.0-127	
(S) Toluene-d8			97.7	75.0-131	
(S) 4-Bromofluorobenzene			93.0	67.0-138	
(S) 1,2-Dichloroethane-d4			105	70.0-130	

L1160142-28 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1160142-28 11/16/19 07:04 • (MS) R3473261-3 11/16/19 07:23 • (MSD) R3473261-4 11/16/19 07:41

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Benzene	10.0	2.22	15.7	15.4	135	132	80	10.0-149			1.93	37
Ethylbenzene	10.0	5.62	16.8	17.1	112	115	80	10.0-160			1.77	38
Toluene	10.0	17.3	32.0	31.6	147	143	80	10.0-156			1.26	38
Xylenes, Total	30.0	34.5	71.9	72.2	125	126	80	10.0-160			0.416	38
(S) Toluene-d8					98.3	98.3		75.0-131				
(S) 4-Bromofluorobenzene					92.6	91.3		67.0-138				
(S) 1,2-Dichloroethane-d4					102	105		70.0-130				



Method Blank (MB)

(MB) R3472912-1 11/16/19 20:16

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
TPH (GC/FID) High Fraction	U		0.769	4.00
(S) o-Terphenyl	71.5			18.0-148

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc

Laboratory Control Sample (LCS)

(LCS) R3472912-2 11/16/19 20:29

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
TPH (GC/FID) High Fraction	50.0	41.2	82.4	50.0-150	
(S) o-Terphenyl			94.1	18.0-148	

L1160434-06 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1160434-06 11/16/19 21:32 • (MS) R3472912-3 11/16/19 21:44 • (MSD) R3472912-4 11/16/19 21:57

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
TPH (GC/FID) High Fraction	49.2	ND	42.1	38.6	85.6	78.5	1	50.0-150			8.67	20
(S) o-Terphenyl					77.3	71.3		18.0-148				



Method Blank (MB)

(MB) R3472893-1 11/17/19 15:47

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
TPH (GC/FID) High Fraction	U		0.769	4.00
(S) o-Terphenyl	69.4			18.0-148

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Laboratory Control Sample (LCS)

(LCS) R3472893-2 11/17/19 16:00

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
TPH (GC/FID) High Fraction	50.0	41.0	82.0	50.0-150	
(S) o-Terphenyl			100	18.0-148	

L1160829-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1160829-01 11/18/19 15:22 • (MS) R3473102-1 11/18/19 16:15 • (MSD) R3473102-2 11/18/19 16:28

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
TPH (GC/FID) High Fraction	50.0	ND	41.0	37.2	82.0	74.4	1	50.0-150			9.72	20
(S) o-Terphenyl					99.1	89.6		18.0-148				



Method Blank (MB)

(MB) R3472886-2 11/16/19 11:01

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Anthracene	U		0.000600	0.00600
Acenaphthene	U		0.000600	0.00600
Acenaphthylene	U		0.000600	0.00600
Benzo(a)anthracene	U		0.000600	0.00600
Benzo(a)pyrene	U		0.000600	0.00600
Benzo(b)fluoranthene	U		0.000600	0.00600
Benzo(g,h,i)perylene	U		0.000600	0.00600
Benzo(k)fluoranthene	U		0.000600	0.00600
Chrysene	U		0.000600	0.00600
Dibenz(a,h)anthracene	U		0.000600	0.00600
Fluoranthene	U		0.000600	0.00600
Fluorene	U		0.000600	0.00600
Indeno(1,2,3-cd)pyrene	U		0.000600	0.00600
Naphthalene	U		0.00200	0.0200
Phenanthrene	U		0.000600	0.00600
Pyrene	U		0.000600	0.00600
1-Methylnaphthalene	U		0.00200	0.0200
2-Methylnaphthalene	U		0.00200	0.0200
2-Chloronaphthalene	U		0.00200	0.0200
(S) Nitrobenzene-d5	87.1			14.0-149
(S) 2-Fluorobiphenyl	83.5			34.0-125
(S) p-Terphenyl-d14	91.8			23.0-120

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Laboratory Control Sample (LCS)

(LCS) R3472886-1 11/16/19 10:41

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Anthracene	0.0800	0.0547	68.4	50.0-126	
Acenaphthene	0.0800	0.0569	71.1	50.0-120	
Acenaphthylene	0.0800	0.0595	74.4	50.0-120	
Benzo(a)anthracene	0.0800	0.0571	71.4	45.0-120	
Benzo(a)pyrene	0.0800	0.0498	62.3	42.0-120	
Benzo(b)fluoranthene	0.0800	0.0530	66.3	42.0-121	
Benzo(g,h,i)perylene	0.0800	0.0593	74.1	45.0-125	
Benzo(k)fluoranthene	0.0800	0.0579	72.4	49.0-125	
Chrysene	0.0800	0.0576	72.0	49.0-122	
Dibenz(a,h)anthracene	0.0800	0.0597	74.6	47.0-125	
Fluoranthene	0.0800	0.0622	77.8	49.0-129	

Laboratory Control Sample (LCS)

(LCS) R3472886-1 11/16/19 10:41

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Fluorene	0.0800	0.0578	72.3	49.0-120	
Indeno(1,2,3-cd)pyrene	0.0800	0.0610	76.3	46.0-125	
Naphthalene	0.0800	0.0555	69.4	50.0-120	
Phenanthrene	0.0800	0.0539	67.4	47.0-120	
Pyrene	0.0800	0.0474	59.3	43.0-123	
1-Methylnaphthalene	0.0800	0.0569	71.1	51.0-121	
2-Methylnaphthalene	0.0800	0.0539	67.4	50.0-120	
2-Chloronaphthalene	0.0800	0.0557	69.6	50.0-120	
(S) Nitrobenzene-d5			77.9	14.0-149	
(S) 2-Fluorobiphenyl			74.2	34.0-125	
(S) p-Terphenyl-d14			78.9	23.0-120	

L1160389-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1160389-01 11/16/19 11:22 • (MS) R3472886-3 11/16/19 11:43 • (MSD) R3472886-4 11/16/19 12:04

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Anthracene	0.0800	U	0.0603	0.0612	75.4	76.5	1	10.0-145			1.48	30
Acenaphthene	0.0800	0.0107	0.0661	0.0677	69.3	71.3	1	14.0-127			2.39	27
Acenaphthylene	0.0800	U	0.0635	0.0655	79.4	81.9	1	21.0-124			3.10	25
Benzo(a)anthracene	0.0800	0.00142	0.0583	0.0597	71.1	72.9	1	10.0-139			2.37	30
Benzo(a)pyrene	0.0800	U	0.0576	0.0589	72.0	73.6	1	10.0-141			2.23	31
Benzo(b)fluoranthene	0.0800	U	0.0540	0.0556	67.5	69.5	1	10.0-140			2.92	36
Benzo(g,h,i)perylene	0.0800	0.000865	0.0601	0.0611	74.0	75.3	1	10.0-140			1.65	33
Benzo(k)fluoranthene	0.0800	U	0.0557	0.0568	69.6	71.0	1	10.0-137			1.96	31
Chrysene	0.0800	0.000710	0.0553	0.0561	68.2	69.2	1	10.0-145			1.44	30
Dibenz(a,h)anthracene	0.0800	U	0.0597	0.0606	74.6	75.8	1	10.0-132			1.50	31
Fluoranthene	0.0800	0.00188	0.0638	0.0652	77.4	79.2	1	10.0-153			2.17	33
Fluorene	0.0800	U	0.0717	0.0732	89.6	91.5	1	11.0-130			2.07	29
Indeno(1,2,3-cd)pyrene	0.0800	U	0.0612	0.0624	76.5	78.0	1	10.0-137			1.94	32
Naphthalene	0.0800	2.45	2.88	2.94	538	613	1	10.0-135	V	V	2.06	27
Phenanthrene	0.0800	0.0187	0.0719	0.0731	66.5	68.0	1	10.0-144			1.66	31
Pyrene	0.0800	0.00367	0.0493	0.0510	57.0	59.2	1	10.0-148			3.39	35
1-Methylnaphthalene	0.0800	1.31	1.50	1.52	238	263	1	10.0-142	V	V	1.32	28
2-Methylnaphthalene	0.0800	2.34	2.66	2.69	400	438	1	10.0-137	V	V	1.12	28
2-Chloronaphthalene	0.0800	U	0.0548	0.0565	68.5	70.6	1	29.0-120			3.05	24
(S) Nitrobenzene-d5					54.8	58.0		14.0-149				
(S) 2-Fluorobiphenyl					79.6	80.1		34.0-125				
(S) p-Terphenyl-d14					87.5	88.8		23.0-120				

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc



Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

(dry)	Results are reported based on the dry weight of the sample. [this will only be present on a dry report basis for soils].
MDL	Method Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state "ND" (Not Detected) or "BDL" (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier Description

J	The identification of the analyte is acceptable; the reported value is an estimate.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.
J7	Surrogate recovery cannot be used for control limit evaluation due to dilution.
T8	Sample(s) received past/too close to holding time expiration.
V	The sample concentration is too high to evaluate accurate spike recoveries.

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico ¹	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina ¹	DW21704
Georgia	NELAP	North Carolina ³	41
Georgia ¹	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LA000356
Kentucky ^{1 6}	90010	South Carolina	84004
Kentucky ²	16	South Dakota	n/a
Louisiana	AI30792	Tennessee ^{1 4}	2006
Louisiana ¹	LA180010	Texas	T104704245-18-15
Maine	TN0002	Texas ⁵	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

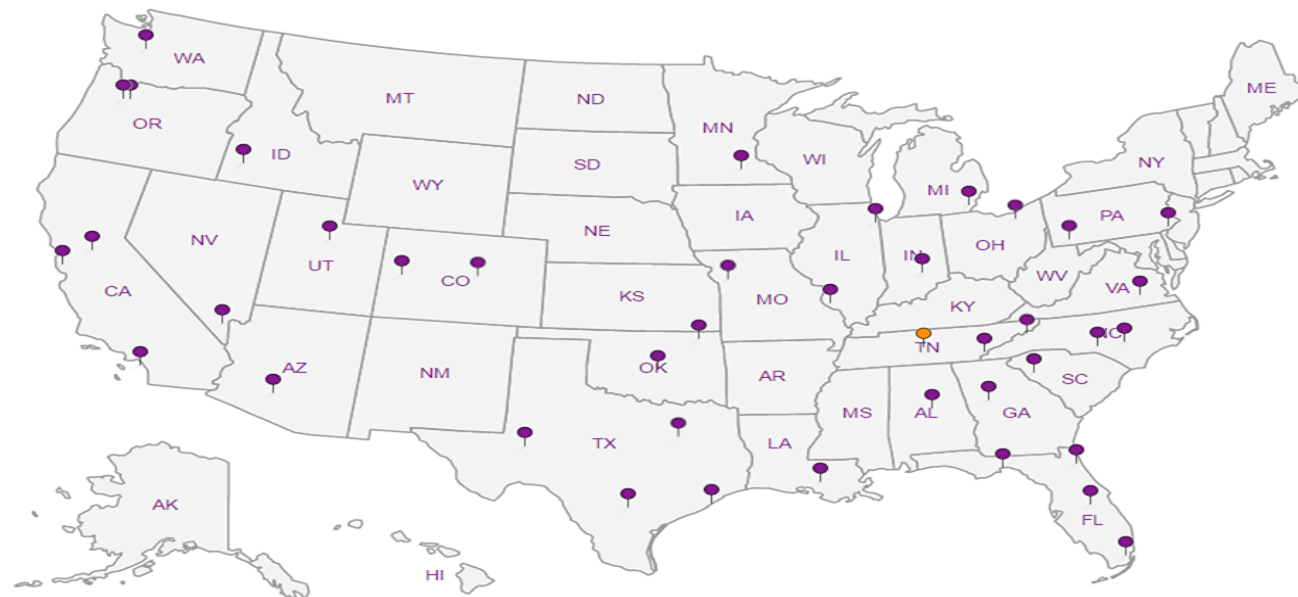
Third Party Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP, LLC EMLAP	100789
A2LA – ISO 17025 ⁵	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

¹ Drinking Water ² Underground Storage Tanks ³ Aquatic Toxicity ⁴ Chemical/Microbiological ⁵ Mold ⁶ Wastewater n/a Accreditation not applicable

Our Locations

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.



October 18, 2019

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc

Caerus Oil and Gas

Sample Delivery Group: L1149073
Samples Received: 10/11/2019
Project Number: 050819022
Description: K10-596 Gas Lift Release

Report To: Brett Middleton
143 Diamond Avenue
Parachute, CO 81635

Entire Report Reviewed By:

Chris Ward

Chris Ward
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace Analytical National is performed per guidance provided in laboratory standard operating procedures ENV-SOP-MTJL-0067 and ENV-SOP-MTJL-0068. Where sampling conducted by the customer, results relate to the accuracy of the information provided, and as the samples are received.



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SAMPLE SUMMARY

ONE LAB. NATIONWIDE.

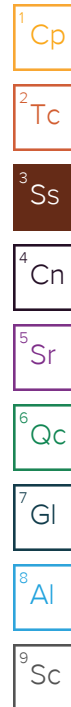


20191009-K10 (N WALL)@11' L1149073-01 Solid

Collected by
Collected date/time
Received date/time

10/09/19 16:30 10/11/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1362697	1	10/16/19 21:56	10/16/19 21:56	EL	Mt. Juliet, TN
Calculated Results	WG1362953	1	10/15/19 16:54	10/16/19 14:23	EL	Mt. Juliet, TN
Wet Chemistry by Method 3060A/7196A	WG1361793	1	10/12/19 10:13	10/12/19 23:00	JIC	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1361953	1	10/12/19 15:00	10/12/19 19:47	MSP	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1362887	1	10/15/19 18:43	10/15/19 21:11	AKA	Mt. Juliet, TN
Mercury by Method 7471A	WG1363108	1	10/15/19 10:50	10/15/19 21:58	TCT	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1362953	1	10/15/19 16:54	10/16/19 14:23	EL	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG1362552	5000	10/12/19 09:01	10/14/19 21:22	BMB	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1364858	400	10/12/19 09:01	10/18/19 02:36	BMB	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1363762	10	10/16/19 12:27	10/16/19 21:09	KME	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG1364022	1	10/16/19 21:31	10/18/19 03:26	AAT	Mt. Juliet, TN



20191009-K10 (SWALL)@9' L1149073-02 Solid

Collected by
Collected date/time
Received date/time

10/09/19 16:40 10/11/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1362697	1	10/16/19 21:59	10/16/19 21:59	EL	Mt. Juliet, TN
Calculated Results	WG1362953	1	10/15/19 16:54	10/16/19 14:25	EL	Mt. Juliet, TN
Wet Chemistry by Method 3060A/7196A	WG1361796	1	10/13/19 12:29	10/13/19 20:30	ANP	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1361953	1	10/12/19 15:00	10/12/19 19:47	MSP	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1362887	1	10/15/19 18:43	10/15/19 21:11	AKA	Mt. Juliet, TN
Mercury by Method 7471A	WG1363108	1	10/15/19 10:50	10/15/19 22:00	TCT	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1362953	1	10/15/19 16:54	10/16/19 14:25	EL	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG1362552	1000	10/12/19 09:01	10/14/19 20:58	BMB	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1364858	80	10/12/19 09:01	10/18/19 02:16	BMB	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1363762	10	10/16/19 12:27	10/16/19 22:02	KME	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG1364022	1	10/16/19 21:31	10/18/19 03:47	AAT	Mt. Juliet, TN

20191009-K10 (EWALL)@10' L1149073-03 Solid

Collected by
Collected date/time
Received date/time

10/09/19 16:20 10/11/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1362697	1	10/16/19 22:07	10/16/19 22:07	EL	Mt. Juliet, TN
Calculated Results	WG1362953	1	10/15/19 16:54	10/16/19 14:33	EL	Mt. Juliet, TN
Wet Chemistry by Method 3060A/7196A	WG1361796	1	10/13/19 12:29	10/13/19 20:31	ANP	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1361953	1	10/12/19 15:00	10/12/19 19:47	MSP	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1362887	1	10/15/19 18:43	10/15/19 21:11	AKA	Mt. Juliet, TN
Mercury by Method 7471A	WG1363108	1	10/15/19 10:50	10/15/19 22:02	TCT	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1362953	1	10/15/19 16:54	10/16/19 14:33	EL	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG1362552	250	10/12/19 09:01	10/14/19 20:11	BMB	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1364858	20	10/12/19 09:01	10/18/19 01:34	BMB	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1363762	10	10/16/19 12:27	10/16/19 22:15	KME	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG1364022	1	10/16/19 21:31	10/18/19 04:08	AAT	Mt. Juliet, TN

20191009-K10 (WWALL)@9' L1149073-04 Solid

Collected by
Collected date/time
Received date/time

10/09/19 16:25 10/11/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1362697	1	10/16/19 22:10	10/16/19 22:10	EL	Mt. Juliet, TN
Calculated Results	WG1362953	1	10/15/19 16:54	10/16/19 14:36	EL	Mt. Juliet, TN
Wet Chemistry by Method 3060A/7196A	WG1361796	1	10/13/19 12:29	10/13/19 20:33	ANP	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1361953	1	10/12/19 15:00	10/12/19 19:47	MSP	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1362887	1	10/15/19 18:43	10/15/19 21:11	AKA	Mt. Juliet, TN

ACCOUNT:
Caerus Oil and Gas

PROJECT:
050819022

SDG:
L1149073

DATE/TIME:
10/18/19 17:13

PAGE:
3 of 32



20191009-K10 (WWALL)@9' L1149073-04 Solid

Collected by

Collected date/time

Received date/time

10/09/19 16:25

10/11/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Mercury by Method 7471A	WG1363108	1	10/15/19 10:50	10/15/19 22:05	TCT	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1362953	1	10/15/19 16:54	10/16/19 14:36	EL	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG1362552	500	10/12/19 09:01	10/14/19 20:34	BMB	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1364858	40	10/12/19 09:01	10/18/19 01:55	BMB	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1363762	5	10/16/19 12:27	10/16/19 20:55	KME	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG1364022	1	10/16/19 21:31	10/18/19 04:29	AAT	Mt. Juliet, TN

¹ Cp² Tc³ Ss⁴ Cn⁵ Sr⁶ Qc⁷ Gl⁸ Al⁹ Sc

20191009-K10 (BOTTOM)@13' L1149073-05 Solid

Collected by

Collected date/time

Received date/time

10/09/19 15:30

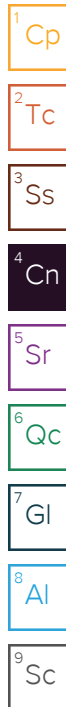
10/11/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1362697	1	10/16/19 22:13	10/16/19 22:13	EL	Mt. Juliet, TN
Calculated Results	WG1362953	1	10/15/19 16:54	10/16/19 14:39	EL	Mt. Juliet, TN
Wet Chemistry by Method 3060A/7196A	WG1361796	1	10/13/19 12:29	10/13/19 20:33	ANP	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1361953	1	10/12/19 15:00	10/12/19 19:47	MSP	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1362887	1	10/15/19 18:43	10/15/19 21:11	AKA	Mt. Juliet, TN
Mercury by Method 7471A	WG1363108	1	10/15/19 10:50	10/15/19 22:07	TCT	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1362953	1	10/15/19 16:54	10/16/19 14:39	EL	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG1362552	5000	10/12/19 09:01	10/14/19 21:45	BMB	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1364858	400	10/12/19 09:01	10/18/19 02:56	BMB	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1363762	10	10/16/19 12:27	10/16/19 21:48	KME	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG1364022	1	10/16/19 21:31	10/18/19 04:50	AAT	Mt. Juliet, TN



All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Chris Ward
Project Manager





Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	0.735		1	10/16/2019 21:56	WG1362697

Calculated Results

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Chromium, Trivalent	17.7		1.00	1	10/16/2019 14:23	WG1362953

Wet Chemistry by Method 3060A/7196A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Chromium, Hexavalent	ND		2.00	1	10/12/2019 23:00	WG1361793

Wet Chemistry by Method 9045D

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	8.23	T8	1	10/12/2019 19:47	WG1361953

Sample Narrative:

L1149073-01 WG1361953: 8.23 at 20.4C

Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	288		10.0	1	10/15/2019 21:11	WG1362887

Mercury by Method 7471A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Mercury	ND		0.0300	1	10/15/2019 21:58	WG1363108

Metals (ICP) by Method 6010B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	12.8		2.00	1	10/16/2019 14:23	WG1362953
Barium	245		0.500	1	10/16/2019 14:23	WG1362953
Cadmium	ND		0.500	1	10/16/2019 14:23	WG1362953
Chromium	17.7		1.00	1	10/16/2019 14:23	WG1362953
Copper	14.2		2.00	1	10/16/2019 14:23	WG1362953
Lead	9.46		0.500	1	10/16/2019 14:23	WG1362953
Nickel	14.5		2.00	1	10/16/2019 14:23	WG1362953
Selenium	ND		2.00	1	10/16/2019 14:23	WG1362953
Silver	ND		1.00	1	10/16/2019 14:23	WG1362953
Zinc	35.9		5.00	1	10/16/2019 14:23	WG1362953

Volatile Organic Compounds (GC) by Method 8015D/GRO

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	6410		500	5000	10/14/2019 21:22	WG1362552
(S) a,a,a-Trifluorotoluene(FID)	95.8		77.0-120		10/14/2019 21:22	WG1362552

¹ Cp
² Tc
³ Ss
⁴ Cn
⁵ Sr
⁶ Qc
⁷ Gl
⁸ Al
⁹ Sc



Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	6.06		0.400	400	10/18/2019 02:36	WG1364858
Toluene	106		2.00	400	10/18/2019 02:36	WG1364858
Ethylbenzene	14.3		1.00	400	10/18/2019 02:36	WG1364858
Total Xylenes	146		2.60	400	10/18/2019 02:36	WG1364858
(S) Toluene-d8	101		75.0-131		10/18/2019 02:36	WG1364858
(S) 4-Bromofluorobenzene	102		67.0-138		10/18/2019 02:36	WG1364858
(S) 1,2-Dichloroethane-d4	108		70.0-130		10/18/2019 02:36	WG1364858

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	694	<u>V</u>	40.0	10	10/16/2019 21:09	WG1363762
(S) o-Terphenyl	139		18.0-148		10/16/2019 21:09	WG1363762

Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Anthracene	ND		0.00600	1	10/18/2019 03:26	WG1364022
Acenaphthene	ND		0.00600	1	10/18/2019 03:26	WG1364022
Acenaphthylene	ND		0.00600	1	10/18/2019 03:26	WG1364022
Benzo(a)anthracene	ND		0.00600	1	10/18/2019 03:26	WG1364022
Benzo(a)pyrene	ND		0.00600	1	10/18/2019 03:26	WG1364022
Benzo(b)fluoranthene	ND		0.00600	1	10/18/2019 03:26	WG1364022
Benzo(g,h,i)perylene	ND		0.00600	1	10/18/2019 03:26	WG1364022
Benzo(k)fluoranthene	ND		0.00600	1	10/18/2019 03:26	WG1364022
Chrysene	ND		0.00600	1	10/18/2019 03:26	WG1364022
Dibenz(a,h)anthracene	ND		0.00600	1	10/18/2019 03:26	WG1364022
Fluoranthene	ND		0.00600	1	10/18/2019 03:26	WG1364022
Fluorene	ND		0.00600	1	10/18/2019 03:26	WG1364022
Indeno(1,2,3-cd)pyrene	ND		0.00600	1	10/18/2019 03:26	WG1364022
Naphthalene	0.0768		0.0200	1	10/18/2019 03:26	WG1364022
Phenanthrene	ND		0.00600	1	10/18/2019 03:26	WG1364022
Pyrene	ND		0.00600	1	10/18/2019 03:26	WG1364022
1-Methylnaphthalene	ND		0.0200	1	10/18/2019 03:26	WG1364022
2-Methylnaphthalene	0.0345		0.0200	1	10/18/2019 03:26	WG1364022
2-Chloronaphthalene	ND		0.0200	1	10/18/2019 03:26	WG1364022
(S) p-Terphenyl-d14	55.7		23.0-120		10/18/2019 03:26	WG1364022
(S) Nitrobenzene-d5	348	<u>J1</u>	14.0-149		10/18/2019 03:26	WG1364022
(S) 2-Fluorobiphenyl	58.9		34.0-125		10/18/2019 03:26	WG1364022

Sample Narrative:

L1149073-01 WG1364022: Surrogate failure due to matrix interference



Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	0.744		1	10/16/2019 21:59	WG1362697

¹ Cp² Tc³ Ss⁴ Cn⁵ Sr⁶ Qc⁷ Gl⁸ Al⁹ Sc

Calculated Results

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Chromium, Trivalent	22.4		1.00	1	10/16/2019 14:25	WG1362953

Wet Chemistry by Method 3060A/7196A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Chromium, Hexavalent	ND		2.00	1	10/13/2019 20:30	WG1361796

Wet Chemistry by Method 9045D

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	8.42	T8	1	10/12/2019 19:47	WG1361953

Sample Narrative:

L1149073-02 WG1361953: 8.42 at 19.7C

Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	321		10.0	1	10/15/2019 21:11	WG1362887

Mercury by Method 7471A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Mercury	ND		0.0300	1	10/15/2019 22:00	WG1363108

Metals (ICP) by Method 6010B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	9.33		2.00	1	10/16/2019 14:25	WG1362953
Barium	1180		0.500	1	10/16/2019 14:25	WG1362953
Cadmium	ND		0.500	1	10/16/2019 14:25	WG1362953
Chromium	22.4		1.00	1	10/16/2019 14:25	WG1362953
Copper	14.4		2.00	1	10/16/2019 14:25	WG1362953
Lead	10.8		0.500	1	10/16/2019 14:25	WG1362953
Nickel	15.6		2.00	1	10/16/2019 14:25	WG1362953
Selenium	ND		2.00	1	10/16/2019 14:25	WG1362953
Silver	ND		1.00	1	10/16/2019 14:25	WG1362953
Zinc	44.0		5.00	1	10/16/2019 14:25	WG1362953

Volatile Organic Compounds (GC) by Method 8015D/GRO

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	1080		100	1000	10/14/2019 20:58	WG1362552
(S) a,a,a-Trifluorotoluene(FID)	95.3		77.0-120		10/14/2019 20:58	WG1362552



Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	1.53		0.0800	80	10/18/2019 02:16	WG1364858
Toluene	19.6		0.400	80	10/18/2019 02:16	WG1364858
Ethylbenzene	1.92		0.200	80	10/18/2019 02:16	WG1364858
Total Xylenes	22.2		0.520	80	10/18/2019 02:16	WG1364858
(S) Toluene-d8	99.1		75.0-131		10/18/2019 02:16	WG1364858
(S) 4-Bromofluorobenzene	99.4		67.0-138		10/18/2019 02:16	WG1364858
(S) 1,2-Dichloroethane-d4	110		70.0-130		10/18/2019 02:16	WG1364858

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	108		40.0	10	10/16/2019 22:02	WG1363762
(S) o-Terphenyl	120		18.0-148		10/16/2019 22:02	WG1363762

Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Anthracene	ND		0.00600	1	10/18/2019 03:47	WG1364022
Acenaphthene	ND		0.00600	1	10/18/2019 03:47	WG1364022
Acenaphthylene	ND		0.00600	1	10/18/2019 03:47	WG1364022
Benzo(a)anthracene	ND		0.00600	1	10/18/2019 03:47	WG1364022
Benzo(a)pyrene	ND		0.00600	1	10/18/2019 03:47	WG1364022
Benzo(b)fluoranthene	ND		0.00600	1	10/18/2019 03:47	WG1364022
Benzo(g,h,i)perylene	ND		0.00600	1	10/18/2019 03:47	WG1364022
Benzo(k)fluoranthene	ND		0.00600	1	10/18/2019 03:47	WG1364022
Chrysene	ND		0.00600	1	10/18/2019 03:47	WG1364022
Dibenz(a,h)anthracene	ND		0.00600	1	10/18/2019 03:47	WG1364022
Fluoranthene	ND		0.00600	1	10/18/2019 03:47	WG1364022
Fluorene	ND		0.00600	1	10/18/2019 03:47	WG1364022
Indeno(1,2,3-cd)pyrene	ND		0.00600	1	10/18/2019 03:47	WG1364022
Naphthalene	0.0301		0.0200	1	10/18/2019 03:47	WG1364022
Phenanthrene	ND		0.00600	1	10/18/2019 03:47	WG1364022
Pyrene	ND		0.00600	1	10/18/2019 03:47	WG1364022
1-Methylnaphthalene	ND		0.0200	1	10/18/2019 03:47	WG1364022
2-Methylnaphthalene	ND		0.0200	1	10/18/2019 03:47	WG1364022
2-Chloronaphthalene	ND		0.0200	1	10/18/2019 03:47	WG1364022
(S) p-Terphenyl-d14	70.5		23.0-120		10/18/2019 03:47	WG1364022
(S) Nitrobenzene-d5	66.7		14.0-149		10/18/2019 03:47	WG1364022
(S) 2-Fluorobiphenyl	79.2		34.0-125		10/18/2019 03:47	WG1364022



Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	0.696		1	10/16/2019 22:07	WG1362697

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Calculated Results

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Chromium, Trivalent	12.3		1.00	1	10/16/2019 14:33	WG1362953

Wet Chemistry by Method 3060A/7196A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Chromium, Hexavalent	6.69		2.00	1	10/13/2019 20:31	WG1361796

Wet Chemistry by Method 9045D

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	8.08	T8	1	10/12/2019 19:47	WG1361953

Sample Narrative:

L1149073-03 WG1361953: 8.08 at 20C

Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	383		10.0	1	10/15/2019 21:11	WG1362887

Mercury by Method 7471A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Mercury	ND		0.0300	1	10/15/2019 22:02	WG1363108

Metals (ICP) by Method 6010B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	12.8		2.00	1	10/16/2019 14:33	WG1362953
Barium	223		0.500	1	10/16/2019 14:33	WG1362953
Cadmium	ND		0.500	1	10/16/2019 14:33	WG1362953
Chromium	19.0		1.00	1	10/16/2019 14:33	WG1362953
Copper	16.1		2.00	1	10/16/2019 14:33	WG1362953
Lead	10.7		0.500	1	10/16/2019 14:33	WG1362953
Nickel	16.7		2.00	1	10/16/2019 14:33	WG1362953
Selenium	ND		2.00	1	10/16/2019 14:33	WG1362953
Silver	ND		1.00	1	10/16/2019 14:33	WG1362953
Zinc	41.0		5.00	1	10/16/2019 14:33	WG1362953

Volatile Organic Compounds (GC) by Method 8015D/GRO

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	1820		25.0	250	10/14/2019 20:11	WG1362552
(S) a,a,a-Trifluorotoluene(FID)	91.3		77.0-120		10/14/2019 20:11	WG1362552



Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	2.49		0.0200	20	10/18/2019 01:34	WG1364858
Toluene	25.3		0.100	20	10/18/2019 01:34	WG1364858
Ethylbenzene	2.16		0.0500	20	10/18/2019 01:34	WG1364858
Total Xylenes	21.7		0.130	20	10/18/2019 01:34	WG1364858
(S) Toluene-d8	101		75.0-131		10/18/2019 01:34	WG1364858
(S) 4-Bromofluorobenzene	102		67.0-138		10/18/2019 01:34	WG1364858
(S) 1,2-Dichloroethane-d4	109		70.0-130		10/18/2019 01:34	WG1364858

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	74.9		40.0	10	10/16/2019 22:15	WG1363762
(S) o-Terphenyl	114		18.0-148		10/16/2019 22:15	WG1363762

Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Anthracene	ND		0.00600	1	10/18/2019 04:08	WG1364022
Acenaphthene	ND		0.00600	1	10/18/2019 04:08	WG1364022
Acenaphthylene	ND		0.00600	1	10/18/2019 04:08	WG1364022
Benzo(a)anthracene	ND		0.00600	1	10/18/2019 04:08	WG1364022
Benzo(a)pyrene	ND		0.00600	1	10/18/2019 04:08	WG1364022
Benzo(b)fluoranthene	ND		0.00600	1	10/18/2019 04:08	WG1364022
Benzo(g,h,i)perylene	ND		0.00600	1	10/18/2019 04:08	WG1364022
Benzo(k)fluoranthene	ND		0.00600	1	10/18/2019 04:08	WG1364022
Chrysene	ND		0.00600	1	10/18/2019 04:08	WG1364022
Dibenz(a,h)anthracene	ND		0.00600	1	10/18/2019 04:08	WG1364022
Fluoranthene	ND		0.00600	1	10/18/2019 04:08	WG1364022
Fluorene	ND		0.00600	1	10/18/2019 04:08	WG1364022
Indeno(1,2,3-cd)pyrene	ND		0.00600	1	10/18/2019 04:08	WG1364022
Naphthalene	ND		0.0200	1	10/18/2019 04:08	WG1364022
Phenanthrene	ND		0.00600	1	10/18/2019 04:08	WG1364022
Pyrene	ND		0.00600	1	10/18/2019 04:08	WG1364022
1-Methylnaphthalene	ND		0.0200	1	10/18/2019 04:08	WG1364022
2-Methylnaphthalene	ND		0.0200	1	10/18/2019 04:08	WG1364022
2-Chloronaphthalene	ND		0.0200	1	10/18/2019 04:08	WG1364022
(S) p-Terphenyl-d14	71.4		23.0-120		10/18/2019 04:08	WG1364022
(S) Nitrobenzene-d5	209	J1	14.0-149		10/18/2019 04:08	WG1364022
(S) 2-Fluorobiphenyl	81.2		34.0-125		10/18/2019 04:08	WG1364022

Sample Narrative:

L1149073-03 WG1364022: Surrogate failure due to matrix interference



Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	1.00		1	10/16/2019 22:10	WG1362697

Calculated Results

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Chromium, Trivalent	14.8		1.00	1	10/16/2019 14:36	WG1362953

Wet Chemistry by Method 3060A/7196A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Chromium, Hexavalent	ND		2.00	1	10/13/2019 20:33	WG1361796

Wet Chemistry by Method 9045D

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	8.10	T8	1	10/12/2019 19:47	WG1361953

Sample Narrative:

L1149073-04 WG1361953: 8.1 at 20C

Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	364		10.0	1	10/15/2019 21:11	WG1362887

Mercury by Method 7471A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Mercury	0.112		0.0300	1	10/15/2019 22:05	WG1363108

Metals (ICP) by Method 6010B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	7.15		2.00	1	10/16/2019 14:36	WG1362953
Barium	155		0.500	1	10/16/2019 14:36	WG1362953
Cadmium	ND		0.500	1	10/16/2019 14:36	WG1362953
Chromium	14.8		1.00	1	10/16/2019 14:36	WG1362953
Copper	12.5		2.00	1	10/16/2019 14:36	WG1362953
Lead	8.08		0.500	1	10/16/2019 14:36	WG1362953
Nickel	11.8		2.00	1	10/16/2019 14:36	WG1362953
Selenium	ND		2.00	1	10/16/2019 14:36	WG1362953
Silver	ND		1.00	1	10/16/2019 14:36	WG1362953
Zinc	33.2		5.00	1	10/16/2019 14:36	WG1362953

Volatile Organic Compounds (GC) by Method 8015D/GRO

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	1090		50.0	500	10/14/2019 20:34	WG1362552
(S) a,a,a-Trifluorotoluene(FID)	95.6		77.0-120		10/14/2019 20:34	WG1362552

¹ Cp
² Tc
³ Ss
⁴ Cn
⁵ Sr
⁶ Qc
⁷ Gl
⁸ Al
⁹ Sc



Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	1.20		0.0400	40	10/18/2019 01:55	WG1364858
Toluene	15.5		0.200	40	10/18/2019 01:55	WG1364858
Ethylbenzene	1.01		0.100	40	10/18/2019 01:55	WG1364858
Total Xylenes	28.3		0.260	40	10/18/2019 01:55	WG1364858
(S) Toluene-d8	102		75.0-131		10/18/2019 01:55	WG1364858
(S) 4-Bromofluorobenzene	103		67.0-138		10/18/2019 01:55	WG1364858
(S) 1,2-Dichloroethane-d4	110		70.0-130		10/18/2019 01:55	WG1364858

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	115		20.0	5	10/16/2019 20:55	WG1363762
(S) o-Terphenyl	59.0		18.0-148		10/16/2019 20:55	WG1363762

Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Anthracene	ND		0.00600	1	10/18/2019 04:29	WG1364022
Acenaphthene	ND		0.00600	1	10/18/2019 04:29	WG1364022
Acenaphthylene	ND		0.00600	1	10/18/2019 04:29	WG1364022
Benzo(a)anthracene	ND		0.00600	1	10/18/2019 04:29	WG1364022
Benzo(a)pyrene	ND		0.00600	1	10/18/2019 04:29	WG1364022
Benzo(b)fluoranthene	ND		0.00600	1	10/18/2019 04:29	WG1364022
Benzo(g,h,i)perylene	ND		0.00600	1	10/18/2019 04:29	WG1364022
Benzo(k)fluoranthene	ND		0.00600	1	10/18/2019 04:29	WG1364022
Chrysene	ND		0.00600	1	10/18/2019 04:29	WG1364022
Dibenz(a,h)anthracene	ND		0.00600	1	10/18/2019 04:29	WG1364022
Fluoranthene	ND		0.00600	1	10/18/2019 04:29	WG1364022
Fluorene	ND		0.00600	1	10/18/2019 04:29	WG1364022
Indeno(1,2,3-cd)pyrene	ND		0.00600	1	10/18/2019 04:29	WG1364022
Naphthalene	ND		0.0200	1	10/18/2019 04:29	WG1364022
Phenanthrene	ND		0.00600	1	10/18/2019 04:29	WG1364022
Pyrene	ND		0.00600	1	10/18/2019 04:29	WG1364022
1-Methylnaphthalene	ND		0.0200	1	10/18/2019 04:29	WG1364022
2-Methylnaphthalene	ND		0.0200	1	10/18/2019 04:29	WG1364022
2-Chloronaphthalene	ND		0.0200	1	10/18/2019 04:29	WG1364022
(S) p-Terphenyl-d14	72.7		23.0-120		10/18/2019 04:29	WG1364022
(S) Nitrobenzene-d5	132		14.0-149		10/18/2019 04:29	WG1364022
(S) 2-Fluorobiphenyl	81.9		34.0-125		10/18/2019 04:29	WG1364022



Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	0.728		1	10/16/2019 22:13	WG1362697

Calculated Results

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Chromium, Trivalent	19.0		1.00	1	10/16/2019 14:39	WG1362953

Wet Chemistry by Method 3060A/7196A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Chromium, Hexavalent	ND		2.00	1	10/13/2019 20:33	WG1361796

Wet Chemistry by Method 9045D

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	8.57	T8	1	10/12/2019 19:47	WG1361953

Sample Narrative:

L1149073-05 WG1361953: 8.57 at 20.2C

Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	200		10.0	1	10/15/2019 21:11	WG1362887

Mercury by Method 7471A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Mercury	0.0409		0.0300	1	10/15/2019 22:07	WG1363108

Metals (ICP) by Method 6010B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	7.91		2.00	1	10/16/2019 14:39	WG1362953
Barium	234		0.500	1	10/16/2019 14:39	WG1362953
Cadmium	ND		0.500	1	10/16/2019 14:39	WG1362953
Chromium	19.0		1.00	1	10/16/2019 14:39	WG1362953
Copper	13.6		2.00	1	10/16/2019 14:39	WG1362953
Lead	9.05		0.500	1	10/16/2019 14:39	WG1362953
Nickel	14.2		2.00	1	10/16/2019 14:39	WG1362953
Selenium	ND		2.00	1	10/16/2019 14:39	WG1362953
Silver	ND		1.00	1	10/16/2019 14:39	WG1362953
Zinc	39.6		5.00	1	10/16/2019 14:39	WG1362953

Volatile Organic Compounds (GC) by Method 8015D/GRO

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	6340		500	5000	10/14/2019 21:45	WG1362552
(S) a,a,a-Trifluorotoluene(FID)	96.4		77.0-120		10/14/2019 21:45	WG1362552

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc



Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	10.7		0.400	400	10/18/2019 02:56	WG1364858
Toluene	188		2.00	400	10/18/2019 02:56	WG1364858
Ethylbenzene	19.1		1.00	400	10/18/2019 02:56	WG1364858
Total Xylenes	194		2.60	400	10/18/2019 02:56	WG1364858
(S) Toluene-d8	101		75.0-131		10/18/2019 02:56	WG1364858
(S) 4-Bromofluorobenzene	102		67.0-138		10/18/2019 02:56	WG1364858
(S) 1,2-Dichloroethane-d4	111		70.0-130		10/18/2019 02:56	WG1364858

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	397		40.0	10	10/16/2019 21:48	WG1363762
(S) o-Terphenyl	141		18.0-148		10/16/2019 21:48	WG1363762

Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Anthracene	ND		0.00600	1	10/18/2019 04:50	WG1364022
Acenaphthene	ND		0.00600	1	10/18/2019 04:50	WG1364022
Acenaphthylene	ND		0.00600	1	10/18/2019 04:50	WG1364022
Benzo(a)anthracene	ND		0.00600	1	10/18/2019 04:50	WG1364022
Benzo(a)pyrene	ND		0.00600	1	10/18/2019 04:50	WG1364022
Benzo(b)fluoranthene	ND		0.00600	1	10/18/2019 04:50	WG1364022
Benzo(g,h,i)perylene	ND		0.00600	1	10/18/2019 04:50	WG1364022
Benzo(k)fluoranthene	ND		0.00600	1	10/18/2019 04:50	WG1364022
Chrysene	ND		0.00600	1	10/18/2019 04:50	WG1364022
Dibenz(a,h)anthracene	ND		0.00600	1	10/18/2019 04:50	WG1364022
Fluoranthene	ND		0.00600	1	10/18/2019 04:50	WG1364022
Fluorene	ND		0.00600	1	10/18/2019 04:50	WG1364022
Indeno(1,2,3-cd)pyrene	ND		0.00600	1	10/18/2019 04:50	WG1364022
Naphthalene	0.122		0.0200	1	10/18/2019 04:50	WG1364022
Phenanthrene	ND		0.00600	1	10/18/2019 04:50	WG1364022
Pyrene	ND		0.00600	1	10/18/2019 04:50	WG1364022
1-Methylnaphthalene	ND		0.0200	1	10/18/2019 04:50	WG1364022
2-Methylnaphthalene	0.0552		0.0200	1	10/18/2019 04:50	WG1364022
2-Chloronaphthalene	ND		0.0200	1	10/18/2019 04:50	WG1364022
(S) p-Terphenyl-d14	73.7		23.0-120		10/18/2019 04:50	WG1364022
(S) Nitrobenzene-d5	337	J1	14.0-149		10/18/2019 04:50	WG1364022
(S) 2-Fluorobiphenyl	85.4		34.0-125		10/18/2019 04:50	WG1364022

Sample Narrative:

L1149073-05 WG1364022: Surrogate failure due to matrix interference



Method Blank (MB)

(MB) R3460448-1 10/12/19 22:47

	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	mg/kg		mg/kg	mg/kg
Chromium,Hexavalent	U		0.640	2.00

L1148616-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1148616-02 10/12/19 22:51 • (DUP) R3460448-3 10/12/19 22:51

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	mg/kg	mg/kg		%		%
Chromium,Hexavalent	ND	0.000	1	0.000		20

L1149042-05 Original Sample (OS) • Duplicate (DUP)

(OS) L1149042-05 10/12/19 22:53 • (DUP) R3460448-4 10/12/19 22:54

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	mg/kg	mg/kg		%		%
Chromium,Hexavalent	2.53	2.64	1	4.12		20

Laboratory Control Sample (LCS)

(LCS) R3460448-2 10/12/19 22:47

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	mg/kg	mg/kg	%	%	
Chromium,Hexavalent	24.0	25.0	104	80.0-120	

L1149042-07 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1149042-07 10/12/19 22:55 • (MS) R3460448-5 10/12/19 22:58 • (MSD) R3460448-6 10/12/19 22:58

	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Analyte	mg/kg	mg/kg	mg/kg	mg/kg	%	%		%			%	%
Chromium,Hexavalent	20.0	ND	9.65	9.37	42.9	41.5	1	75.0-125	J6	J6	2.92	20

Sample Narrative:

OS: Sample is a reducer

MS: Sample is a reducer

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc



L1149042-07 Original Sample (OS) • Matrix Spike (MS)

(OS) L1149042-07 10/12/19 22:55 • (MS) R3460448-7 10/12/19 22:59

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Chromium,Hexavalent	651	ND	463	71.1	50	75.0-125	J6

Sample Narrative:

OS: Sample is a reducer

MS: Sample is a reducer

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc



Method Blank (MB)

(MB) R3460575-1 10/13/19 20:27

	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	mg/kg		mg/kg	mg/kg
Chromium,Hexavalent	U		0.640	2.00

L1149159-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1149159-01 10/13/19 20:34 • (DUP) R3460575-3 10/13/19 20:38

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	mg/kg	mg/kg		%		%
Chromium,Hexavalent	ND	0.000	1	0.000		20

L1149263-07 Original Sample (OS) • Duplicate (DUP)

(OS) L1149263-07 10/13/19 21:01 • (DUP) R3460575-7 10/13/19 21:01

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	mg/kg	mg/kg		%		%
Chromium,Hexavalent	ND	0.000	1	0.000		20

Laboratory Control Sample (LCS)

(LCS) R3460575-2 10/13/19 20:30

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	mg/kg	mg/kg	%	%	
Chromium,Hexavalent	24.0	23.5	97.8	80.0-120	

L1149263-04 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1149263-04 10/13/19 20:56 • (MS) R3460575-8 10/13/19 21:11 • (MSD) R3460575-4 10/13/19 20:57

	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Analyte	mg/kg	mg/kg	mg/kg	mg/kg	%	%		%			%	%
Chromium,Hexavalent	20.0	ND	15.2	15.3	76.1	76.3	1	75.0-125			0.243	20

L1149263-04 Original Sample (OS) • Matrix Spike (MS)

(OS) L1149263-04 10/13/19 20:56 • (MS) R3460575-5 10/13/19 20:58

	Spike Amount	Original Result	MS Result	MS Rec.	Dilution	Rec. Limits	MS Qualifier
Analyte	mg/kg	mg/kg	mg/kg	%		%	
Chromium,Hexavalent	650	ND	815	125	50	75.0-125	

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc



L1149073-05 Original Sample (OS) • Duplicate (DUP)

(OS) L1149073-05 10/12/19 19:47 • (DUP) R3460442-3 10/12/19 19:47

	Original Result	DUP Result	Dilution	DUP RPD	<u>DUP Qualifier</u>	DUP RPD Limits
Analyte	su	su		%		%
pH	8.57	8.58	1	0.117		1

Sample Narrative:

OS: 8.57 at 20.2C

DUP: 8.58 at 19.8C

Laboratory Control Sample (LCS)

(LCS) R3460442-1 10/12/19 19:47

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	<u>LCS Qualifier</u>
Analyte	su	su	%	%	
pH	10.0	10.0	100	99.0-101	

Sample Narrative:

LCS: 10 at 19.2C

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc



Method Blank (MB)

(MB) R3461371-1 10/15/19 21:11

Analyte	MB Result umhos/cm	MB Qualifier	MB MDL umhos/cm	MB RDL umhos/cm
Specific Conductance	U		10.0	10.0

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc

L1148798-06 Original Sample (OS) • Duplicate (DUP)

(OS) L1148798-06 10/15/19 21:11 • (DUP) R3461371-3 10/15/19 21:11

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	888	885	1	0.338		20

L1149158-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1149158-02 10/15/19 21:11 • (DUP) R3461371-4 10/15/19 21:11

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	523	523	1	0.000		20

Laboratory Control Sample (LCS)

(LCS) R3461371-2 10/15/19 21:11

Analyte	Spike Amount umhos/cm	LCS Result umhos/cm	LCS Rec. %	Rec. Limits %	LCS Qualifier
Specific Conductance	393	394	100	85.0-115	



Method Blank (MB)

(MB) R3461393-1 10/15/19 21:35

	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	mg/kg		mg/kg	mg/kg
Mercury	U		0.00280	0.0300

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3461393-2 10/15/19 21:39 • (LCSD) R3461393-3 10/15/19 21:45

	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
Analyte	mg/kg	mg/kg	mg/kg	%	%	%			%	%
Mercury	0.500	0.485	0.512	97.0	102	80.0-120			5.35	20

L1149748-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1149748-03 10/15/19 21:51 • (MS) R3461393-4 10/15/19 21:54 • (MSD) R3461393-5 10/15/19 21:56

	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Analyte	mg/kg	mg/kg	mg/kg	mg/kg	%	%		%			%	%
Mercury	0.500	0.0468	0.776	0.789	146	148	1	75.0-125	J5	J5	1.66	20



Method Blank (MB)

(MB) R3461841-1 10/16/19 13:31

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Arsenic	U		0.460	2.00
Barium	U		0.170	0.500
Cadmium	U		0.0700	0.500
Chromium	U		0.140	1.00
Copper	U		0.530	2.00
Lead	U		0.190	0.500
Nickel	U		0.490	2.00
Selenium	U		0.620	2.00
Silver	U		0.120	1.00
Zinc	1.19	J	0.590	5.00

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3461841-2 10/16/19 13:34 • (LCSD) R3461841-3 10/16/19 13:36

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Arsenic	100	91.6	91.0	91.6	91.0	80.0-120			0.741	20
Barium	100	99.2	98.2	99.2	98.2	80.0-120			1.03	20
Cadmium	100	93.1	92.1	93.1	92.1	80.0-120			0.999	20
Chromium	100	95.5	94.2	95.5	94.2	80.0-120			1.32	20
Copper	100	95.6	94.4	95.6	94.4	80.0-120			1.33	20
Lead	100	93.3	92.9	93.3	92.9	80.0-120			0.489	20
Nickel	100	95.8	94.7	95.8	94.7	80.0-120			1.19	20
Selenium	100	93.0	92.2	93.0	92.2	80.0-120			0.813	20
Silver	20.0	17.6	17.4	88.1	86.8	80.0-120			1.46	20
Zinc	100	95.0	93.8	95.0	93.8	80.0-120			1.26	20

L1149058-09 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1149058-09 10/16/19 13:39 • (MS) R3461841-6 10/16/19 13:46 • (MSD) R3461841-7 10/16/19 13:49

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Arsenic	100	3.45	87.8	82.3	84.4	78.8	1	75.0-125			6.53	20
Barium	100	31.4	120	119	89.0	88.0	1	75.0-125			0.812	20
Cadmium	100	ND	86.1	80.5	86.0	80.3	1	75.0-125			6.79	20
Chromium	100	4.17	91.0	84.7	86.8	80.6	1	75.0-125			7.14	20
Copper	100	2.76	91.0	84.6	88.3	81.9	1	75.0-125			7.30	20
Lead	100	3.23	90.8	84.7	87.6	81.4	1	75.0-125			6.97	20
Nickel	100	11.3	98.4	92.9	87.1	81.7	1	75.0-125			5.70	20



L1149058-09 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1149058-09 10/16/19 13:39 • (MS) R3461841-6 10/16/19 13:46 • (MSD) R3461841-7 10/16/19 13:49

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Selenium	100	ND	86.2	80.1	86.2	80.1	1	75.0-125			7.32	20
Silver	20.0	ND	16.3	14.9	81.3	74.4	1	75.0-125		J6	8.87	20
Zinc	100	16.0	99.6	94.9	83.6	78.9	1	75.0-125			4.86	20

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc



Method Blank (MB)

(MB) R3460905-2 10/14/19 13:09

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
TPH (GC/FID) Low Fraction	U		0.0217	0.100
(S) a,a,a-Trifluorotoluene(FID)	96.2			77.0-120

Laboratory Control Sample (LCS)

(LCS) R3460905-1 10/14/19 12:02

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
TPH (GC/FID) Low Fraction	5.50	5.01	91.1	72.0-127	
(S) a,a,a-Trifluorotoluene(FID)			102	77.0-120	

L1149073-05 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1149073-05 10/14/19 21:45 • (MS) R3460905-3 10/14/19 22:09 • (MSD) R3460905-4 10/14/19 22:33

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
TPH (GC/FID) Low Fraction	27000	6340	31900	30500	94.7	89.5	5000	10.0-151			4.49	28
(S) a,a,a-Trifluorotoluene(FID)					99.7	99.9		77.0-120				

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc



Method Blank (MB)

(MB) R3462453-3 10/17/19 17:22

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Benzene	U		0.000400	0.00100
Ethylbenzene	U		0.000530	0.00250
Toluene	U		0.00125	0.00500
Xylenes, Total	U		0.00478	0.00650
(S) Toluene-d8	103			75.0-131
(S) 4-Bromofluorobenzene	97.8			67.0-138
(S) 1,2-Dichloroethane-d4	98.1			70.0-130

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3462453-1 10/17/19 16:00 • (LCSD) R3462453-2 10/17/19 16:20

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Benzene	0.125	0.133	0.134	106	107	70.0-123			0.749	20
Ethylbenzene	0.125	0.120	0.125	96.0	100	74.0-126			4.08	20
Toluene	0.125	0.113	0.118	90.4	94.4	75.0-121			4.33	20
Xylenes, Total	0.375	0.319	0.320	85.1	85.3	72.0-127			0.313	20
(S) Toluene-d8				98.8	100	75.0-131				
(S) 4-Bromofluorobenzene				99.0	98.5	67.0-138				
(S) 1,2-Dichloroethane-d4				108	106	70.0-130				

L1149071-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1149071-01 10/18/19 00:53 • (MS) R3462453-4 10/18/19 03:17 • (MSD) R3462453-5 10/18/19 03:37

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Benzene	1.00	0.0640	1.58	1.48	152	142	8	10.0-149	J5		6.54	37
Ethylbenzene	1.00	ND	1.42	1.34	134	126	8	10.0-160			5.80	38
Toluene	1.00	ND	1.69	1.57	156	144	8	10.0-156			7.36	38
Xylenes, Total	3.00	ND	5.12	4.89	171	163	8	10.0-160	J5	J5	4.60	38
(S) Toluene-d8					103	101		75.0-131				
(S) 4-Bromofluorobenzene					104	106		67.0-138				
(S) 1,2-Dichloroethane-d4					111	111		70.0-130				



Method Blank (MB)

(MB) R3461837-1 10/16/19 16:38

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
TPH (GC/FID) High Fraction	U		0.769	4.00
(S) o-Terphenyl	63.7			18.0-148

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc

Laboratory Control Sample (LCS)

(LCS) R3461837-2 10/16/19 16:51

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
TPH (GC/FID) High Fraction	50.0	35.4	70.8	50.0-150	
(S) o-Terphenyl			68.9	18.0-148	

L1149073-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1149073-01 10/16/19 21:09 • (MS) R3461837-3 10/16/19 21:22 • (MSD) R3461837-4 10/16/19 21:35

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
TPH (GC/FID) High Fraction	47.8	694	685	672	0.000	0.000	10	50.0-150	V	V	1.92	20
(S) o-Terphenyl					97.3	88.8		18.0-148				



Method Blank (MB)

(MB) R3462561-2 10/17/19 19:00

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Anthracene	U		0.000600	0.00600
Acenaphthene	U		0.000600	0.00600
Acenaphthylene	U		0.000600	0.00600
Benzo(a)anthracene	U		0.000600	0.00600
Benzo(a)pyrene	U		0.000600	0.00600
Benzo(b)fluoranthene	U		0.000600	0.00600
Benzo(g,h,i)perylene	U		0.000600	0.00600
Benzo(k)fluoranthene	U		0.000600	0.00600
Chrysene	U		0.000600	0.00600
Dibenz(a,h)anthracene	U		0.000600	0.00600
Fluoranthene	U		0.000600	0.00600
Fluorene	U		0.000600	0.00600
Indeno(1,2,3-cd)pyrene	U		0.000600	0.00600
Naphthalene	U		0.00200	0.0200
Phenanthrene	U		0.000600	0.00600
Pyrene	U		0.000600	0.00600
1-Methylnaphthalene	U		0.00200	0.0200
2-Methylnaphthalene	U		0.00200	0.0200
2-Chloronaphthalene	U		0.00200	0.0200
(S) Nitrobenzene-d5	120			14.0-149
(S) 2-Fluorobiphenyl	89.4			34.0-125
(S) p-Terphenyl-d14	75.3			23.0-120

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc

Laboratory Control Sample (LCS)

(LCS) R3462561-1 10/17/19 18:39

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Anthracene	0.0800	0.0655	81.9	50.0-126	
Acenaphthene	0.0800	0.0673	84.1	50.0-120	
Acenaphthylene	0.0800	0.0720	90.0	50.0-120	
Benzo(a)anthracene	0.0800	0.0654	81.8	45.0-120	
Benzo(a)pyrene	0.0800	0.0515	64.4	42.0-120	
Benzo(b)fluoranthene	0.0800	0.0552	69.0	42.0-121	
Benzo(g,h,i)perylene	0.0800	0.0576	72.0	45.0-125	
Benzo(k)fluoranthene	0.0800	0.0593	74.1	49.0-125	
Chrysene	0.0800	0.0649	81.1	49.0-122	
Dibenz(a,h)anthracene	0.0800	0.0610	76.3	47.0-125	
Fluoranthene	0.0800	0.0691	86.4	49.0-129	

Laboratory Control Sample (LCS)

(LCS) R3462561-1 10/17/19 18:39

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Fluorene	0.0800	0.0684	85.5	49.0-120	
Indeno(1,2,3-cd)pyrene	0.0800	0.0600	75.0	46.0-125	
Naphthalene	0.0800	0.0645	80.6	50.0-120	
Phenanthrene	0.0800	0.0647	80.9	47.0-120	
Pyrene	0.0800	0.0543	67.9	43.0-123	
1-Methylnaphthalene	0.0800	0.0780	97.5	51.0-121	
2-Methylnaphthalene	0.0800	0.0752	94.0	50.0-120	
2-Chloronaphthalene	0.0800	0.0638	79.8	50.0-120	
(S) Nitrobenzene-d5			131	14.0-149	
(S) 2-Fluorobiphenyl			86.5	34.0-125	
(S) p-Terphenyl-d14			67.5	23.0-120	

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

L1149058-33 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1149058-33 10/17/19 21:49 • (MS) R3462561-3 10/17/19 22:10 • (MSD) R3462561-4 10/17/19 22:31

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Anthracene	0.0764	ND	0.0649	0.0784	84.9	102	1	10.0-145			18.8	30
Acenaphthene	0.0764	ND	0.0699	0.0665	91.5	86.1	1	14.0-127			4.99	27
Acenaphthylene	0.0764	ND	0.0753	0.0687	98.6	89.0	1	21.0-124			9.17	25
Benzo(a)anthracene	0.0764	ND	0.0669	0.0642	87.6	83.2	1	10.0-139			4.12	30
Benzo(a)pyrene	0.0764	ND	0.0636	0.0622	83.2	80.6	1	10.0-141			2.23	31
Benzo(b)fluoranthene	0.0764	ND	0.0509	0.0579	66.6	75.0	1	10.0-140			12.9	36
Benzo(g,h,i)perylene	0.0764	ND	0.0573	0.0613	75.0	79.4	1	10.0-140			6.75	33
Benzo(k)fluoranthene	0.0764	ND	0.0586	0.0680	76.7	88.1	1	10.0-137			14.8	31
Chrysene	0.0764	ND	0.0673	0.0674	88.1	87.3	1	10.0-145			0.148	30
Dibenz(a,h)anthracene	0.0764	ND	0.0577	0.0627	75.5	81.2	1	10.0-132			8.31	31
Fluoranthene	0.0764	ND	0.0757	0.0828	99.1	107	1	10.0-153			8.96	33
Fluorene	0.0764	ND	0.0711	0.0747	93.1	96.8	1	11.0-130			4.94	29
Indeno(1,2,3-cd)pyrene	0.0764	ND	0.0573	0.0625	75.0	81.0	1	10.0-137			8.68	32
Naphthalene	0.0764	ND	0.0643	0.0665	84.2	86.1	1	10.0-135			3.36	27
Phenanthrene	0.0764	ND	0.0665	0.0681	87.0	88.2	1	10.0-144			2.38	31
Pyrene	0.0764	ND	0.0592	0.0610	77.5	79.0	1	10.0-148			3.00	35
1-Methylnaphthalene	0.0764	ND	0.0747	0.0732	97.8	94.8	1	10.0-142			2.03	28
2-Methylnaphthalene	0.0764	ND	0.0725	0.0708	94.9	91.7	1	10.0-137			2.37	28
2-Chloronaphthalene	0.0764	ND	0.0688	0.0646	90.1	83.7	1	29.0-120			6.30	24
(S) Nitrobenzene-d5					121	123		14.0-149				
(S) 2-Fluorobiphenyl					97.6	98.0		34.0-125				
(S) p-Terphenyl-d14					76.5	79.8		23.0-120				



Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

MDL	Method Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state "ND" (Not Detected) or "BDL" (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier Description

J	The identification of the analyte is acceptable; the reported value is an estimate.
J1	Surrogate recovery limits have been exceeded; values are outside upper control limits.
J5	The sample matrix interfered with the ability to make any accurate determination; spike value is high.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.
T8	Sample(s) received past/too close to holding time expiration.
V	The sample concentration is too high to evaluate accurate spike recoveries.

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico ¹	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina ¹	DW21704
Georgia	NELAP	North Carolina ³	41
Georgia ¹	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LA000356
Kentucky ^{1 6}	90010	South Carolina	84004
Kentucky ²	16	South Dakota	n/a
Louisiana	AI30792	Tennessee ^{1 4}	2006
Louisiana ¹	LA180010	Texas	T104704245-18-15
Maine	TN0002	Texas ⁵	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

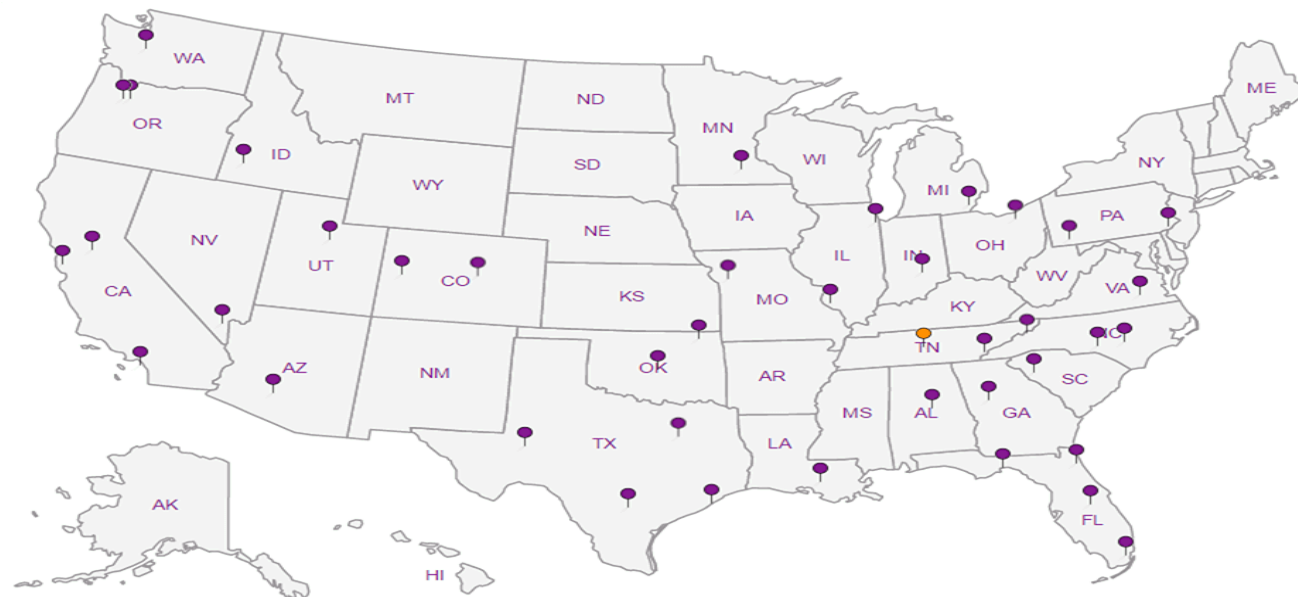
Third Party Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP, LLC EMLAP	100789
A2LA – ISO 17025 ⁵	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

¹ Drinking Water ² Underground Storage Tanks ³ Aquatic Toxicity ⁴ Chemical/Microbiological ⁵ Mold ⁶ Wastewater n/a Accreditation not applicable

Our Locations

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.



H134

Pace Analytical National Center for Testing & Innovation
Cooler Receipt Form

Client: ~~CAERUS COIT and GAS~~ CAERUSPCO		1149073	
Cooler Received/Opened On: 10/11/19		Temperature: 3.0	
Received By: <i>Tanner</i>			
Signature: <i>[Signature]</i>			
Receipt Check List	NP	Yes	No
COC Seal Present / Intact?	☒	☐	☐
COC Signed / Accurate?	☒	☐	☐
Bottles arrive intact?	☒	☐	☐
Correct bottles used?	☒	☐	☐
Sufficient volume sent?	☒	☐	☐
If Applicable			
VOA Zero headspace?			
Preservation Correct / Checked?			



03-Oct-2019

Jake Janicek
Caerus Oil and Gas LLC
143 Diamond Ave.
Parachute, CO 81635

Re: **K10-596 Gas Lift Release**

Work Order: **19091970**

Dear Jake,

ALS Environmental received 1 sample on 28-Sep-2019 10:00 AM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental - Holland and for only the analyses requested.

Sample results are compliant with industry accepted practices and Quality Control results achieved laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 24.

If you have any questions regarding this report, please feel free to contact me:

ADDRESS: 3352 128th Avenue, Holland, MI, USA
PHONE: +1 (616) 399-6070 FAX: +1 (616) 399-6185

Sincerely,

A handwritten signature in black ink, appearing to read "Chad Whelton".

Electronically approved by: Chad Whelton

Chad Whelton
Project Manager

Report of Laboratory Analysis

Certificate No: MN 026-999-449

ALS GROUP USA, CORP Part of the ALS Laboratory Group A Campbell Brothers Limited Company

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RIGHT SOLUTIONS RIGHT PARTNER

Client: Caerus Oil and Gas LLC
Project: K10-596 Gas Lift Release
Work Order: 19091970

Work Order Sample Summary

<u>Lab Samp ID</u>	<u>Client Sample ID</u>	<u>Matrix</u>	<u>Tag Number</u>	<u>Collection Date</u>	<u>Date Received</u>	<u>Hold</u>
19091970-01	20190927-K10-596-POR@7'	Soil		9/27/2019	9/28/2019 10:00	☐

Client: Caerus Oil and Gas LLC
Project: K10-596 Gas Lift Release
Work Order: 19091970

Case Narrative

Batch 143141, Method DRO_8015_S, Sample 19091970-01A MS/MSD: The MS/MSD recovery was outside of the control limit for DRO; however, the result in the parent sample is greater than 4x the spike amount. No qualification is required.

Batch 143203, Method VOC_8260_S, Sample 19091970-01A MS/MSD: The MS/MSD recoveries were above the upper control limits for multiple compounds per the QC report. The corresponding results in the parent sample may be biased high.

Batch 143204, Method GRO_8015_S, Sample 19091970-01A: GRO surrogate recovery high due to matrix interference.

Batch 143204, Method GRO_8015_S, Sample 19091970-01A MS/MSD: The MS/MSD recovery was outside of the control limit for GRO; however, the result in the parent sample is greater than 4x the spike amount. No qualification is required.

Batch 143319, Method PNLVI_8270_S, Sample 19091970-01A: One or more base/neutral surrogate recoveries were above the upper control limits. The base/neutral sample results may be biased high.

Batch 143367, Method CR6_7196_S, Sample 19091970-01A MS/MSD: The MS/MSD recovery was below the lower control limit for Hexavalent Chromium. The corresponding result in the parent sample may be biased low.

<u>Qualifier</u>	<u>Description</u>
*	Value exceeds Regulatory Limit
**	Estimated Value
a	Analyte is non-accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
Hr	BOD/CBOD - Sample was reset outside Hold Time, value should be considered estimated.
J	Analyte is present at an estimated concentration between the MDL and Report Limit
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
X	Analyte was detected in the Method Blank between the MDL and Reporting Limit, sample results may exhibit background or reagent contamination at the observed level.

<u>Acronym</u>	<u>Description</u>
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
LOD	Limit of Detection (see MDL)
LOQ	Limit of Quantitation (see PQL)
MBLK	Method Blank
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
TDL	Target Detection Limit
TNTC	Too Numerous To Count
A	APHA Standard Methods
D	ASTM
E	EPA
SW	SW-846 Update III

<u>Units Reported</u>	<u>Description</u>
% of sample	Percent of Sample
°C	Degrees Celcius
mg/Kg	Milligrams per Kilogram
mg/Kg-dry	Milligrams per Kilogram Dry Weight
mg/L	Milligrams per Liter
mmhos/cm @25°C	Millimhos-Centimeter at 25 Degrees Celcius
none	

s.u. Standard Units

ALS Group, USA

Date: 03-Oct-19

Client: Caerus Oil and Gas LLC
Project: K10-596 Gas Lift Release
Sample ID: 20190927-K10-596-POR@7'
Collection Date: 9/27/2019

Work Order: 19091970
Lab ID: 19091970-01
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID							
			Method: SW8015M		Prep: SW3550 / 9/29/19		Analyst: KB
DRO (C10-C28)	2,300		3.5	6.1	mg/Kg-dry	1	9/30/2019 10:16
Surr: 4-Terphenyl-d14	47.1			33-111	%REC	1	9/30/2019 10:16
GASOLINE RANGE ORGANICS BY GC-FID							
			Method: SW8015D		Prep: SW5035 / 9/30/19		Analyst: KB
GRO (C6-C10)	16,000		33	78	mg/Kg	10	10/1/2019 08:04
Surr: Toluene-d8	327	S		71-123	%REC	10	10/1/2019 08:04
MERCURY BY CVAA							
			Method: SW7471B		Prep: SW7471 / 10/1/19		Analyst: RSH
Mercury	1.3		0.020	0.20	mg/Kg-dry	10	10/2/2019 09:38
METALS BY ICP-MS							
			Method: SW6020A		Prep: SW3050B / 10/1/19		Analyst: STP
Arsenic	35		0.055	0.45	mg/Kg-dry	1	10/1/2019 22:05
Barium	420		4.2	4.5	mg/Kg-dry	10	10/2/2019 14:34
Cadmium	0.34		0.027	0.18	mg/Kg-dry	1	10/1/2019 22:05
Chromium	24		0.20	0.45	mg/Kg-dry	1	10/1/2019 22:05
Copper	35		4.5	4.5	mg/Kg-dry	10	10/2/2019 17:27
Lead	25		0.22	0.45	mg/Kg-dry	1	10/1/2019 22:05
Nickel	21		2.4	4.5	mg/Kg-dry	10	10/2/2019 14:34
Selenium	1.1		0.42	0.45	mg/Kg-dry	1	10/1/2019 22:05
Silver	0.076	J	0.060	0.45	mg/Kg-dry	1	10/1/2019 22:05
Zinc	70		8.9	9.1	mg/Kg-dry	10	10/2/2019 14:34
SOLUBLE CATIONS FOR SAR							
			Method: SW6020A		Prep: USDA Method 20B / 10/2/19		Analyst: STP
Calcium	83		2.5	5.0	mg/L	10	10/2/2019 17:13
Magnesium	87		0.50	2.0	mg/L	10	10/2/2019 17:13
Sodium	60		0.45	2.0	mg/L	10	10/2/2019 17:13
SODIUM ADSORPTION RATIO							
			Method: USDA H60 METHOD 2		Prep: USDA Method 20B / 10/2/19		Analyst: STP
Sodium Adsorption Ratio	1.1		0.010	0.010	none	1	10/2/2019
POLYNUCLEAR AROMATIC HYDROCARBONS (PAHS)							
			Method: SW846 8270D		Prep: SW3546 / 10/1/19		Analyst: EEW
Acenaphthene	U		0.0010	0.0052	mg/Kg-dry	1	10/2/2019 19:35
Anthracene	U		0.0018	0.0052	mg/Kg-dry	1	10/2/2019 19:35
Benzo(a)anthracene	U		0.0022	0.0052	mg/Kg-dry	1	10/2/2019 19:35
Benzo(a)pyrene	U		0.0014	0.0052	mg/Kg-dry	1	10/2/2019 19:35
Benzo(b)fluoranthene	U		0.0013	0.0052	mg/Kg-dry	1	10/2/2019 19:35
Benzo(k)fluoranthene	U		0.0015	0.0052	mg/Kg-dry	1	10/2/2019 19:35
Chrysene	U		0.0011	0.0052	mg/Kg-dry	1	10/2/2019 19:35
Dibenzo(a,h)anthracene	U		0.0012	0.0052	mg/Kg-dry	1	10/2/2019 19:35
Fluoranthene	U		0.00096	0.0052	mg/Kg-dry	1	10/2/2019 19:35

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: 03-Oct-19

Client: Caerus Oil and Gas LLC
Project: K10-596 Gas Lift Release
Sample ID: 20190927-K10-596-POR@7'
Collection Date: 9/27/2019

Work Order: 19091970
Lab ID: 19091970-01
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
Fluorene	U		0.0017	0.0052	mg/Kg-dry	1	10/2/2019 19:35
Indeno(1,2,3-cd)pyrene	U		0.0019	0.0052	mg/Kg-dry	1	10/2/2019 19:35
Naphthalene	1.8		0.0023	0.0052	mg/Kg-dry	1	10/2/2019 19:35
Pyrene	U		0.00086	0.0052	mg/Kg-dry	1	10/2/2019 19:35
Surr: 2-Fluorobiphenyl	98.3			20-140	%REC	1	10/2/2019 19:35
Surr: 4-Terphenyl-d14	97.5			22-172	%REC	1	10/2/2019 19:35
Surr: Nitrobenzene-d5	292	S		28-140	%REC	1	10/2/2019 19:35
VOLATILE ORGANIC COMPOUNDS			Method: SW8260C		Prep: SW5035 / 9/30/19		Analyst: BCM
Benzene	22		0.52	3.1	mg/Kg-dry	100	9/30/2019 14:46
Ethylbenzene	59		0.65	3.1	mg/Kg-dry	100	9/30/2019 14:46
m,p-Xylene	730		4.1	6.1	mg/Kg-dry	100	9/30/2019 14:46
o-Xylene	93		1.2	3.1	mg/Kg-dry	100	9/30/2019 14:46
Toluene	330		0.84	3.1	mg/Kg-dry	100	9/30/2019 14:46
Xylenes, Total	820		4.1	9.2	mg/Kg-dry	100	9/30/2019 14:46
Surr: 1,2-Dichloroethane-d4	96.2			70-130	%REC	100	9/30/2019 14:46
Surr: 4-Bromofluorobenzene	106			70-130	%REC	100	9/30/2019 14:46
Surr: Dibromofluoromethane	95.2			70-130	%REC	100	9/30/2019 14:46
Surr: Toluene-d8	103			70-130	%REC	100	9/30/2019 14:46
ELECTRICAL CONDUCTIVITY (SAR)			Method: USDA H60 METHOD 2		Prep: USDA Method 20B / 10/2/19		Analyst: QTN
Electrical Conductivity @ Saturation	1.7		0.011	0.10	mmhos/cm @25°	20	10/3/2019 11:28
CHROMIUM, TRIVALENT			Method: CALCULATION				Analyst: MB
Chromium, Trivalent	23		0.39	1.3	mg/Kg-dry	1	10/2/2019 16:15
CHROMIUM, HEXAVALENT			Method: SW7196A		Prep: SW3060A / 10/2/19		Analyst: RZM
Chromium, Hexavalent	1.2	J	1.1	1.3	mg/Kg-dry	1	10/2/2019 15:00
MOISTURE			Method: SW3550C				Analyst: KTP
Moisture	21		0.10	0.10	% of sample	1	9/30/2019 13:22
PH			Method: SW9045D		Prep: EXTRACT / 9/30/19		Analyst: DNW
pH	8.49		0.10	0.100	s.u.	1	9/30/2019 12:00
Temperature	22.5		0.10	0.100	°C	1	9/30/2019 12:00

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: Caerus Oil and Gas LLC
Work Order: 19091970
Project: K10-596 Gas Lift Release

QC BATCH REPORT

Batch ID: **143141** Instrument ID **GC8** Method: **SW8015M**

MBLK		Sample ID: DBLKS1-143141-143141				Units: mg/Kg		Analysis Date: 9/30/2019 09:17 AM		
Client ID:		Run ID: GC8_190930A				SeqNo: 5954998		Prep Date: 9/29/2019		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

DRO (C10-C28)	U	5.0								
Surr: 4-Terphenyl-d14	1.537	0	3.33	0	46.1	33-111	0			

LCS		Sample ID: DLCSS1-143141-143141				Units: mg/Kg		Analysis Date: 9/30/2019 09:46 AM		
Client ID:		Run ID: GC8_190930A				SeqNo: 5954999		Prep Date: 9/29/2019		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

DRO (C10-C28)	339.1	5.0	333	0	102	58-111	0			
Surr: 4-Terphenyl-d14	1.939	0	3.33	0	58.2	33-111	0			

MS		Sample ID: 19091970-01A MS				Units: mg/Kg		Analysis Date: 9/30/2019 10:45 AM		
Client ID: 20190927-K10-596-POR@7'		Run ID: GC8_190930A				SeqNo: 5955001		Prep Date: 9/29/2019		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

DRO (C10-C28)	1164	4.9	324.4	1840	-208	58-111	0			SO
Surr: 4-Terphenyl-d14	1.662	0	3.244	0	51.2	33-111	0			

MSD		Sample ID: 19091970-01A MSD				Units: mg/Kg		Analysis Date: 9/30/2019 11:14 AM		
Client ID: 20190927-K10-596-POR@7'		Run ID: GC8_190930A				SeqNo: 5955003		Prep Date: 9/29/2019		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

DRO (C10-C28)	1167	4.9	326.6	1840	-206	58-111	1164	0.313	30	SO
Surr: 4-Terphenyl-d14	1.46	0	3.266	0	44.7	33-111	1.662	13	30	

The following samples were analyzed in this batch:

19091970-01A

Client: Caerus Oil and Gas LLC
Work Order: 19091970
Project: K10-596 Gas Lift Release

QC BATCH REPORT

Batch ID: **143204** Instrument ID **GC9** Method: **SW8015D**

MBLK		Sample ID: MBLK-143204-143204				Units: µg/Kg-dry		Analysis Date: 9/30/2019 01:42 PM		
Client ID:		Run ID: GC9_190930A				SeqNo: 5955427		Prep Date: 9/30/2019		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
GRO (C6-C10)	U	5,000								
<i>Surr: Toluene-d8</i>	4408	0	5000	0	88.2	71-123	0			

LCS		Sample ID: LCS-143204-143204				Units: µg/Kg-dry		Analysis Date: 9/30/2019 01:12 PM		
Client ID:		Run ID: GC9_190930A				SeqNo: 5955426		Prep Date: 9/30/2019		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
GRO (C6-C10)	535900	5,000	500000	0	107	71-123	0			
<i>Surr: Toluene-d8</i>	5640	0	5000	0	113	71-123	0			

MS		Sample ID: 19091970-01A MS				Units: µg/Kg-dry		Analysis Date: 10/1/2019 08:33 AM		
Client ID: 20190927-K10-596-POR@7'		Run ID: GC9_190930A				SeqNo: 5958291		Prep Date: 9/30/2019		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
GRO (C6-C10)	5278000	7,800	784100	4801000	60.8	71-123	0			SEO
<i>Surr: Toluene-d8</i>	113800	0	7841	0	1450	71-123	0			S

MSD		Sample ID: 19091970-01A MSD				Units: µg/Kg-dry		Analysis Date: 10/1/2019 09:03 AM		
Client ID: 20190927-K10-596-POR@7'		Run ID: GC9_190930A				SeqNo: 5958292		Prep Date: 9/30/2019		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
GRO (C6-C10)	6827000	7,800	784100	4801000	258	71-123	5278000	25.6	30	SEO
<i>Surr: Toluene-d8</i>	171300	0	7841	0	2180	71-123	113800	40.3	30	SR

The following samples were analyzed in this batch:

19091970-01A

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

Client: Caerus Oil and Gas LLC
Work Order: 19091970
Project: K10-596 Gas Lift Release

QC BATCH REPORT

Batch ID: **143300** Instrument ID **HG4** Method: **SW7471B**

MBLK		Sample ID: MBLK-143300-143300				Units: mg/Kg		Analysis Date: 10/2/2019 08:48 AM		
Client ID:		Run ID: HG4_191002A				SeqNo: 5960282		Prep Date: 10/1/2019		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Mercury U 0.020

LCS		Sample ID: LCS-143300-143300				Units: mg/Kg		Analysis Date: 10/2/2019 08:50 AM		
Client ID:		Run ID: HG4_191002A				SeqNo: 5960284		Prep Date: 10/1/2019		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Mercury 0.175 0.020 0.1665 0 105 80-120 0

MS		Sample ID: 19091723-02AMS				Units: mg/Kg		Analysis Date: 10/2/2019 09:06 AM		
Client ID:		Run ID: HG4_191002A				SeqNo: 5960293		Prep Date: 10/1/2019		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Mercury 0.1652 0.018 0.1482 0.02007 97.9 75-125 0

MSD		Sample ID: 19091723-02AMSD				Units: mg/Kg		Analysis Date: 10/2/2019 09:08 AM		
Client ID:		Run ID: HG4_191002A				SeqNo: 5960294		Prep Date: 10/1/2019		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Mercury 0.1683 0.018 0.1487 0.02007 99.7 75-125 0.1652 1.86 35

The following samples were analyzed in this batch:

19091970-01A

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

Client: Caerus Oil and Gas LLC
Work Order: 19091970
Project: K10-596 Gas Lift Release

QC BATCH REPORT

Batch ID: **143293** Instrument ID **ICPMS3** Method: **SW6020A**

MBLK		Sample ID: MBLK-143293-143293				Units: mg/Kg		Analysis Date: 10/1/2019 09:33 PM		
Client ID:		Run ID: ICPMS3_191001B				SeqNo: 5959681		Prep Date: 10/1/2019		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	U	0.25								
Barium	U	0.25								
Cadmium	U	0.10								
Chromium	U	0.25								
Lead	U	0.25								
Nickel	U	0.25								
Selenium	U	0.25								
Silver	U	0.25								
Zinc	U	0.50								

MBLK		Sample ID: MBLK-143293-143293				Units: mg/Kg		Analysis Date: 10/2/2019 05:18 PM		
Client ID:		Run ID: ICPMS4_191002B				SeqNo: 5962503		Prep Date: 10/1/2019		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Copper	U	0.25								

LCS		Sample ID: LCS-143293-143293				Units: mg/Kg		Analysis Date: 10/1/2019 09:35 PM		
Client ID:		Run ID: ICPMS3_191001B				SeqNo: 5959682		Prep Date: 10/1/2019		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	5.059	0.25	5	0	101	80-120	0			
Barium	5.007	0.25	5	0	100	80-120	0			
Cadmium	4.886	0.10	5	0	97.7	80-120	0			
Chromium	5.324	0.25	5	0	106	80-120	0			
Copper	4.814	0.25	5	0	96.3	80-120	0			
Lead	5.169	0.25	5	0	103	80-120	0			
Nickel	5.208	0.25	5	0	104	80-120	0			
Selenium	4.847	0.25	5	0	96.9	80-120	0			
Silver	5.032	0.25	5	0	101	80-120	0			
Zinc	5.109	0.50	5	0	102	80-120	0			

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

Client: Caerus Oil and Gas LLC
Work Order: 19091970
Project: K10-596 Gas Lift Release

QC BATCH REPORT

Batch ID: **143293** Instrument ID **ICPMS3** Method: **SW6020A**

MS					Sample ID: 19092031-06AMS		Units: mg/Kg		Analysis Date: 10/1/2019 10:19 PM	
Client ID:			Run ID: ICPMS3_191001B			SeqNo: 5959706		Prep Date: 10/1/2019		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	19.65	0.36	7.174	8.787	151	75-125	0			S
Cadmium	5.759	0.14	7.174	0.1385	78.3	75-125	0			
Chromium	64.69	0.36	7.174	61.31	47	75-125	0			SO
Lead	19.4	0.36	7.174	11.05	116	75-125	0			
Selenium	6.11	0.36	7.174	0.2183	82.1	75-125	0			
Silver	5.672	0.36	7.174	0.04333	78.5	75-125	0			

MS				Sample ID: 19092031-06AMS				Units: mg/Kg		Analysis Date: 10/2/2019 02:46 PM	
Client ID:			Run ID: ICPMS3_191002B			SeqNo: 5961933		Prep Date: 10/1/2019		DF: 10	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Barium	175	3.6	7.174	182.5	-104	75-125	0			SO	
Nickel	62.4	3.6	7.174	58.69	51.7	75-125	0			SO	
Zinc	62.4	7.2	7.174	56.77	78.5	75-125	0			O	

MS				Sample ID: 19092031-06AMS				Units: mg/Kg		Analysis Date: 10/2/2019 05:32 PM	
Client ID:			Run ID: ICPMS4_191002B			SeqNo: 5962512		Prep Date: 10/1/2019		DF: 10	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Copper	27.82	3.6	7.174	20.9	96.5	75-125	0				

MSD				Sample ID: 19092031-06AMSD				Units: mg/Kg		Analysis Date: 10/1/2019 10:21 PM	
Client ID:			Run ID: ICPMS3_191001B			SeqNo: 5959707		Prep Date: 10/1/2019		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Arsenic	13.67	0.36	7.215	8.787	67.6	75-125	19.65	35.9	20	SR	
Cadmium	5.735	0.14	7.215	0.1385	77.6	75-125	5.759	0.42	20		
Chromium	60.97	0.36	7.215	61.31	-4.75	75-125	64.69	5.91	20	SO	
Lead	18.37	0.36	7.215	11.05	101	75-125	19.4	5.46	20		
Selenium	6.009	0.36	7.215	0.2183	80.3	75-125	6.11	1.66	20		
Silver	5.647	0.36	7.215	0.04333	77.7	75-125	5.672	0.44	20		

MSD				Sample ID: 19092031-06AMSD				Units: mg/Kg		Analysis Date: 10/2/2019 02:51 PM	
Client ID:			Run ID: ICPMS3_191002B			SeqNo: 5961936		Prep Date: 10/1/2019		DF: 10	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Barium	186.8	3.6	7.215	182.5	59.7	75-125	175	6.52	20	SO	
Nickel	60.35	3.6	7.215	58.69	23	75-125	62.4	3.34	20	SO	
Zinc	60.77	7.2	7.215	56.77	55.5	75-125	62.4	2.64	20	SO	

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

Client: Caerus Oil and Gas LLC
Work Order: 19091970
Project: K10-596 Gas Lift Release

QC BATCH REPORT

Batch ID: **143293** Instrument ID **ICPMS3** Method: **SW6020A**

MSD		Sample ID: 19092031-06AMSD				Units: mg/Kg		Analysis Date: 10/2/2019 05:34 PM		
Client ID:		Run ID: ICPMS4_191002B				SeqNo: 5962513		Prep Date: 10/1/2019		DF: 10
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Copper	28.16	3.6	7.215	20.9	101	75-125	27.82	1.23	20	

The following samples were analyzed in this batch:

19091970-01A

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

Client: Caerus Oil and Gas LLC
Work Order: 19091970
Project: K10-596 Gas Lift Release

QC BATCH REPORT

Batch ID: **143389** Instrument ID **ICPMS4** Method: **SW6020A**

DUP		Sample ID: 19091970-01ADUP				Units: mg/L		Analysis Date: 10/2/2019 05:14 PM		
Client ID: 20190927-K10-596-POR@7'		Run ID: ICPMS4_191002A				SeqNo: 5962471		Prep Date: 10/2/2019		DF: 10
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	86.75	5.0	0	0	0	0-0	83.25	4.12		
Magnesium	88.39	2.0	0	0	0	0-0	87.05	1.53		
Sodium	60.08	2.0	0	0	0	0-0	59.77	0.517		

The following samples were analyzed in this batch:

19091970-01A

Batch ID: **143389** Instrument ID **SAR** Method: **USDA H60 Metho**

DUP		Sample ID: 19091970-01ADUP				Units: none		Analysis Date: 10/2/2019		
Client ID: 20190927-K10-596-POR@7'		Run ID: SAR_191002A				SeqNo: 5962216		Prep Date: 10/2/2019		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sodium Adsorption Ratio	1.085	0.010	0	0	0		1.093	0.726	50	

The following samples were analyzed in this batch:

19091970-01A

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

Client: Caerus Oil and Gas LLC
Work Order: 19091970
Project: K10-596 Gas Lift Release

QC BATCH REPORT

Batch ID: **143319** Instrument ID **SVMS6** Method: **SW846 8270D**

MBLK		Sample ID: SBLKS1-143319-143319				Units: µg/Kg		Analysis Date: 10/2/2019 12:05 PM		
Client ID:		Run ID: SVMS6_191002A				SeqNo: 5963280		Prep Date: 10/1/2019		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acenaphthene	U	4.2								
Anthracene	U	4.2								
Benzo(a)anthracene	U	4.2								
Benzo(a)pyrene	U	4.2								
Benzo(b)fluoranthene	U	4.2								
Benzo(k)fluoranthene	U	4.2								
Chrysene	U	4.2								
Dibenzo(a,h)anthracene	U	4.2								
Fluoranthene	U	4.2								
Fluorene	U	4.2								
Indeno(1,2,3-cd)pyrene	U	4.2								
Naphthalene	U	4.2								
Pyrene	U	4.2								
Surr: 2-Fluorobiphenyl	3190	0	3333	0	95.7	20-140	0			
Surr: 4-Terphenyl-d14	3662	0	3333	0	110	22-172	0			
Surr: Nitrobenzene-d5	3124	0	3333	0	93.7	28-140	0			

LCS		Sample ID: SLCSS1-143319-143319				Units: µg/Kg		Analysis Date: 10/2/2019 12:21 PM		
Client ID:		Run ID: SVMS6_191002A				SeqNo: 5963281		Prep Date: 10/1/2019		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acenaphthene	1184	4.2	1333	0	88.8	40-140	0			
Anthracene	1262	4.2	1333	0	94.7	40-140	0			
Benzo(a)anthracene	1314	4.2	1333	0	98.5	40-140	0			
Benzo(a)pyrene	1404	4.2	1333	0	105	40-140	0			
Benzo(b)fluoranthene	1297	4.2	1333	0	97.3	40-140	0			
Benzo(k)fluoranthene	1354	4.2	1333	0	102	40-140	0			
Chrysene	1215	4.2	1333	0	91.1	40-140	0			
Dibenzo(a,h)anthracene	1340	4.2	1333	0	101	40-140	0			
Fluoranthene	1182	4.2	1333	0	88.7	40-140	0			
Fluorene	1258	4.2	1333	0	94.4	40-140	0			
Indeno(1,2,3-cd)pyrene	1422	4.2	1333	0	107	40-140	0			
Naphthalene	1233	4.2	1333	0	92.5	40-140	0			
Pyrene	1341	4.2	1333	0	101	40-140	0			
Surr: 2-Fluorobiphenyl	3211	0	3333	0	96.3	20-140	0			
Surr: 4-Terphenyl-d14	3309	0	3333	0	99.3	22-172	0			
Surr: Nitrobenzene-d5	2912	0	3333	0	87.4	28-140	0			

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

Client: Caerus Oil and Gas LLC
 Work Order: 19091970
 Project: K10-596 Gas Lift Release

QC BATCH REPORT

Batch ID: **143319** Instrument ID **SVMS6** Method: **SW846 8270D**

MS				Sample ID: 19092044-01B MS			Units: µg/Kg		Analysis Date: 10/2/2019 06:17 PM		
Client ID:		Run ID: SVMS6_191002A			SeqNo: 5963304		Prep Date: 10/1/2019		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Acenaphthene	1255	4.1	1311	110.1	87.4	40-140		0			
Anthracene	1303	4.1	1311	149.9	88	40-140		0			
Benzo(a)anthracene	1348	4.1	1311	35.62	100	40-140		0			
Benzo(a)pyrene	1350	4.1	1311	20.43	101	40-140		0			
Benzo(b)fluoranthene	1274	4.1	1311	61.5	92.5	40-140		0			
Benzo(k)fluoranthene	1198	4.1	1311	21.64	89.8	40-140		0			
Chrysene	1155	4.1	1311	44.01	84.8	40-140		0			
Dibenzo(a,h)anthracene	1424	4.1	1311	7.113	108	40-140		0			
Fluoranthene	1171	4.1	1311	105.3	81.3	40-140		0			
Fluorene	1460	4.1	1311	166.7	98.7	40-140		0			
Indeno(1,2,3-cd)pyrene	1564	4.1	1311	41.27	116	40-140		0			
Naphthalene	1424	4.1	1311	59.56	104	40-140		0			
Pyrene	1298	4.1	1311	278.8	77.8	40-140		0			
Surr: 2-Fluorobiphenyl	3069	0	3277	0	93.7	20-140		0			
Surr: 4-Terphenyl-d14	2773	0	3277	0	84.6	22-172		0			
Surr: Nitrobenzene-d5	2466	0	3277	0	75.2	28-140		0			

MSD				Sample ID: 19092044-01B MSD			Units: µg/Kg		Analysis Date: 10/2/2019 06:33 PM	
Client ID:		Run ID: SVMS6_191002A			SeqNo: 5963305		Prep Date: 10/1/2019		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acenaphthene	1461	4.1	1322	110.1	102	40-140	1255	15.2	30	
Anthracene	1511	4.1	1322	149.9	103	40-140	1303	14.8	30	
Benzo(a)anthracene	1534	4.1	1322	35.62	113	40-140	1348	12.9	30	
Benzo(a)pyrene	1521	4.1	1322	20.43	114	40-140	1350	12	30	
Benzo(b)fluoranthene	1513	4.1	1322	61.5	110	40-140	1274	17.2	30	
Benzo(k)fluoranthene	1353	4.1	1322	21.64	101	40-140	1198	12.2	30	
Chrysene	1319	4.1	1322	44.01	96.5	40-140	1155	13.2	30	
Dibenzo(a,h)anthracene	1568	4.1	1322	7.113	118	40-140	1424	9.68	30	
Fluoranthene	1451	4.1	1322	105.3	102	40-140	1171	21.4	30	
Fluorene	1555	4.1	1322	166.7	105	40-140	1460	6.29	30	
Indeno(1,2,3-cd)pyrene	1694	4.1	1322	41.27	125	40-140	1564	7.99	30	
Naphthalene	1616	4.1	1322	59.56	118	40-140	1424	12.6	30	
Pyrene	1561	4.1	1322	278.8	97	40-140	1298	18.3	30	
Surr: 2-Fluorobiphenyl	3399	0	3305	0	103	20-140	3069	10.2	0	
Surr: 4-Terphenyl-d14	3271	0	3305	0	99	22-172	2773	16.5	0	
Surr: Nitrobenzene-d5	2827	0	3305	0	85.6	28-140	2466	13.7	0	

The following samples were analyzed in this batch:

19091970-01A

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

Client: Caerus Oil and Gas LLC
Work Order: 19091970
Project: K10-596 Gas Lift Release

QC BATCH REPORT

Batch ID: **143203** Instrument ID **VMS10** Method: **SW8260C**

Sample ID: MBLK-143203-143203				Units: µg/Kg-dry			Analysis Date: 9/30/2019 12:26 PM			
Client ID:		Run ID: VMS10_190930A			SeqNo: 5955635		Prep Date: 9/30/2019		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	U	30								
Ethylbenzene	9.5	30								J
m,p-Xylene	U	60								
o-Xylene	13	30								J
Toluene	U	30								
Xylenes, Total	U	90								
<i>Surr: 1,2-Dichloroethane-d4</i>	975.5	0	1000	0	97.6	70-130	0			
<i>Surr: 4-Bromofluorobenzene</i>	1015	0	1000	0	102	70-130	0			
<i>Surr: Dibromofluoromethane</i>	904.5	0	1000	0	90.4	70-130	0			
<i>Surr: Toluene-d8</i>	907	0	1000	0	90.7	70-130	0			

LCS				Sample ID: LCS-143203-143203				Units: µg/Kg-dry			Analysis Date: 9/30/2019 11:36 AM			
Client ID:				Run ID: VMS10_190930A				SeqNo: 5955634			Prep Date: 9/30/2019		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual				
Benzene	1010	30	1000	0	101	75-125	0							
Ethylbenzene	936	30	1000	0	93.6	75-125	0							
m,p-Xylene	1931	60	2000	0	96.6	80-125	0							
o-Xylene	945.5	30	1000	0	94.6	75-125	0							
Toluene	902	30	1000	0	90.2	70-125	0							
Xylenes, Total	2876	90	3000	0	95.9	75-125	0							
Surr: 1,2-Dichloroethane-d4	947	0	1000	0	94.7	70-130	0							
Surr: 4-Bromofluorobenzene	1001	0	1000	0	100	70-130	0							
Surr: Dibromofluoromethane	1025	0	1000	0	102	70-130	0							
Surr: Toluene-d8	912.5	0	1000	0	91.2	70-130	0							

MS					Sample ID: 19091970-01A MS		Units: µg/Kg-dry		Analysis Date: 10/1/2019 02:20 PM	
Client ID: 20190927-K10-596-POR@7'			Run ID: VMS10_191001A		SeqNo: 5958873		Prep Date: 9/30/2019		DF: 100	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	228000	4,700	156800	22450	131	75-125		0		S
Ethylbenzene	276500	4,700	156800	59030	139	75-125		0		S
m,p-Xylene	1698000	9,400	313600	725700	310	80-125		0		SE
o-Xylene	343900	4,700	156800	93270	160	75-125		0		S
Toluene	791700	4,700	156800	333300	292	70-125		0		SE
Xylenes, Total	2041000	14,000	470400	818900	260	75-125		0		S
Surr: 1,2-Dichloroethane-d4	149400	0	156800	0	95.2	70-130		0		
Surr: 4-Bromofluorobenzene	171700	0	156800	0	110	70-130		0		
Surr: Dibromofluoromethane	167200	0	156800	0	107	70-130		0		
Surr: Toluene-d8	152400	0	156800	0	97.2	70-130		0		

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

Client: Caerus Oil and Gas LLC
Work Order: 19091970
Project: K10-596 Gas Lift Release

QC BATCH REPORT

Batch ID: **143203** Instrument ID **VMS10** Method: **SW8260C**

MSD				Sample ID: 19091970-01A MSD			Units: µg/Kg-dry		Analysis Date: 10/1/2019 02:37 PM		
Client ID: 20190927-K10-596-POR@7'			Run ID: VMS10_191001A			SeqNo: 5958874		Prep Date: 9/30/2019		DF: 100	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Benzene	207900	4,700	156800	22450	118	75-125	228000	9.25	30		
Ethylbenzene	243700	4,700	156800	59030	118	75-125	276500	12.6	30		
m,p-Xylene	1458000	9,400	313600	725700	234	80-125	1698000	15.2	30	S	
o-Xylene	300400	4,700	156800	93270	132	75-125	343900	13.5	30	S	
Toluene	674100	4,700	156800	333300	217	70-125	791700	16	30	S	
Xylenes, Total	1759000	14,000	470400	818900	200	75-125	2041000	14.9	30	S	
Surr: 1,2-Dichloroethane-d4	150100	0	156800	0	95.8	70-130	149400	0.524	30		
Surr: 4-Bromofluorobenzene	165300	0	156800	0	105	70-130	171700	3.82	30		
Surr: Dibromofluoromethane	170000	0	156800	0	108	70-130	167200	1.67	30		
Surr: Toluene-d8	146500	0	156800	0	93.4	70-130	152400	3.93	30		

The following samples were analyzed in this batch:

19091970-01A

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

Client: Caerus Oil and Gas LLC
Work Order: 19091970
Project: K10-596 Gas Lift Release

QC BATCH REPORT

Batch ID: **143239** Instrument ID **WETCHEM** Method: **SW9045D**

LCS				Sample ID: LCS-143239-143239				Units: s.u.			Analysis Date: 9/30/2019 12:00 PM			
Client ID:				Run ID: WETCHEM_190930J				SeqNo: 5955386			Prep Date: 9/30/2019		DF: 1	
Analyte				Result		PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

pH	3.97	0.10	4	0	99.2	90-110	0			
----	------	------	---	---	------	--------	---	--	--	--

DUP				Sample ID: 19091931-04A DUP				Units: s.u.			Analysis Date: 9/30/2019 12:00 PM			
Client ID:				Run ID: WETCHEM_190930J				SeqNo: 5955394			Prep Date: 9/30/2019		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual				

pH	7.51	0.10	0	0	0	0-0	7.51	0	20	
----	------	------	---	---	---	-----	------	---	----	--

Temperature	22.7	0.10	0	0	0		22.6	0.442		
-------------	------	------	---	---	---	--	------	-------	--	--

DUP				Sample ID: 19091954-01A DUP				Units: s.u.		Analysis Date: 9/30/2019 12:00 PM			
Client ID:				Run ID: WETCHEM_190930J				SeqNo: 5955398		Prep Date: 9/30/2019		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual			

pH	8.5	0.10	0	0	0	0-0	8.28	2.62	20	
----	-----	------	---	---	---	-----	------	------	----	--

Temperature	22.2	0.10	0	0	0		22	0.905		
-------------	------	------	---	---	---	--	----	-------	--	--

The following samples were analyzed in this batch:

19091970-01A

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

Client: Caerus Oil and Gas LLC
Work Order: 19091970
Project: K10-596 Gas Lift Release

QC BATCH REPORT

Batch ID: **143367** Instrument ID **WETCHEM** Method: **SW7196A**

MBLK		Sample ID: MBLK-143367-143367				Units: mg/Kg		Analysis Date: 10/2/2019 03:00 PM		
Client ID:		Run ID: WETCHEM_191002T		SeqNo: 5961818		Prep Date: 10/2/2019		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Chromium, Hexavalent U 1.0

LCS		Sample ID: LCS-143367-143367				Units: mg/Kg		Analysis Date: 10/2/2019 03:00 PM		
Client ID:		Run ID: WETCHEM_191002T		SeqNo: 5961819		Prep Date: 10/2/2019		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Chromium, Hexavalent 4.54 1.0 5 0 90.8 80-120 0

MS		Sample ID: 19091970-01A MS				Units: mg/Kg		Analysis Date: 10/2/2019 03:00 PM		
Client ID: 20190927-K10-596-POR@7'		Run ID: WETCHEM_191002T		SeqNo: 5961823		Prep Date: 10/2/2019		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Chromium, Hexavalent 1.07 1.0 5 0.94 2.6 75-125 0 S

MS		Sample ID: 19091970-01A MSI				Units: mg/Kg		Analysis Date: 10/2/2019 03:00 PM		
Client ID: 20190927-K10-596-POR@7'		Run ID: WETCHEM_191002T		SeqNo: 5961825		Prep Date: 10/2/2019		DF: 100		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Chromium, Hexavalent 1715 100 1931 0.94 88.8 75-125 0

MSD		Sample ID: 19091970-01A MSD				Units: mg/Kg		Analysis Date: 10/2/2019 03:00 PM		
Client ID: 20190927-K10-596-POR@7'		Run ID: WETCHEM_191002T		SeqNo: 5961824		Prep Date: 10/2/2019		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Chromium, Hexavalent 1.2 1.0 5 0.94 5.2 75-125 1.07 11.5 20 S

The following samples were analyzed in this batch:

19091970-01A

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

Client: Caerus Oil and Gas LLC
Work Order: 19091970
Project: K10-596 Gas Lift Release

QC BATCH REPORT

Batch ID: **143389** Instrument ID **WETCHEM** Method: **USDA H60 Metho**

DUP		Sample ID: 19091970-01A DUP				Units: mmhos/cm @25°		Analysis Date: 10/3/2019 11:28 AM		
Client ID: 20190927-K10-596-POR@7'		Run ID: WETCHEM_191003F		SeqNo: 5963349		Prep Date: 10/2/2019		DF: 20		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Electrical Conductivity @ Saturation	1.578	0.10	0	0	0		1.67	5.67	50	

The following samples were analyzed in this batch:

19091970-01A

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

Client: Caerus Oil and Gas LLC
Work Order: 19091970
Project: K10-596 Gas Lift Release

QC BATCH REPORT

Batch ID: **R271830** Instrument ID **MOIST** Method: **SW3550C**

MBLK				Sample ID: WBLKS-R271830				Units: % of sample			Analysis Date: 9/30/2019 01:22 PM			
Client ID:				Run ID: MOIST_190930A				SeqNo: 5957265			Prep Date:		DF: 1	
Analyte				Result		PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Moisture U 0.10

LCS		Sample ID: LCS-R271830					Units: % of sample		Analysis Date: 9/30/2019 01:22 PM		
Client ID:			Run ID: MOIST_190930A			SeqNo: 5957264		Prep Date:		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	

Moisture 100 0.10 100 0 100 98-102 0

DUP				Sample ID: 19091958-01A DUP				Units: % of sample			Analysis Date: 9/30/2019 01:22 PM			
Client ID:				Run ID: MOIST_190930A				SeqNo: 5957249			Prep Date:		DF: 1	
Analyte		Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual			

Moisture 2.91 0.10 0 0 0 0-0 2.8 3.85 10

DUP				Sample ID: 19091992-01B DUP				Units: % of sample			Analysis Date: 9/30/2019 01:22 PM			
Client ID:				Run ID: MOIST_190930A				SeqNo: 5957261			Prep Date:		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual				

Moisture 11.09 0.10 0 0 0 0-0 10.66 3.95 10

The following samples were analyzed in this batch:

19091970-01A

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



☐ ALS Environmental
10450 Stancliff Rd. #210
Houston, Texas 77099
(Tel) 281.530.5656
(Fax) 281.530.5887

Chain of Custody Form

Page 1 of 1

☒ ALS Environmental
3352 128th Avenue
Holland, Michigan 49424
(Tel) 616.399.6070
(Fax) 616.399.6185

Customer Information				Project Information			Parameter/Method Request for Analysis										
Purchase Order		Project Name	K10-596 Gas Lift Release	A	TPH GRO/DRO												
Work Order		Project Number		B	BTEX												
Company Name	Caerus Oil and Gas LLC	Bill To Company	Caerus Oil and Gas LLC	C	Table 910 PAHs												
Send Report To	Jake Janicek	Invoice Attn	Jake Janicek	D	Table 910 Metals												
Address	143 Diamond Ave	Address	143 Diamond Ave	E	EC												
City/State/Zip	Parachute, CO 81635	City/State/Zip	Parachute, CO 81635	F	SAR												
Phone	970-778-2314	Phone	970-778-2314	G	pH												
Fax		Fax		H	Benzene												
e-Mail Address	jjanicek@caerusoilandgas.com		jjanicek@caerusoilandgas.com		I	Arsenic											
				J													
No.	Sample Description	Date	Time	Matrix	Pres. Key Numbers	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	20190927-K10-596-POR@7'	9/27/2019		SOIL	NONE	2	X	X	X	X	X	X	X				
2																	
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	
Sampler(s): Please Print & Sign <i>Jake Janicek</i>				Shipment Method: Lab Hub		Turnaround Time in Business Days (BD): ☐ 10 BD ☐ 5 BD ☒ 3 BD ☐ 2 BD ☐ 1 BD					Results Due Date:						
Relinquished by: <i>[Signature]</i>		Date: 9-27-19	Time: 12:00	Received by: <i>[Signature]</i>		Date: 9-27-19	Time: 1:30	Notes: PLEASE REPORT BTEX AND TPH ON A SAME DAY TURNAROUND TIME									
Relinquished by: <i>[Signature]</i>		Date: 9-27-19	Time: 1:30	Received by (Laboratory): <i>[Signature]</i>		Date: 9/28/19	Time: 1:00	ALS Cooler ID	Cooler Temp	QC Package: (Check Box Below)							
Logged by (Laboratory): PHD		Date: 9/28/19	Time: 1045	Checked by (Laboratory): <i>[Signature]</i>						☒ Level II: Standard QC ☐ Level III: Raw Data							
										☐ TRRP LRC ☐ TRRP Level IV							
										☐ Level IV: SW846 Methods/CLP like							
										☐ Other: _____							
Preservative Key: 1-HCl 2-HNO ₃ 3-H ₂ SO ₄ 4-NaOH 5-Na ₂ S ₂ O ₃ 6-NaHSO ₄ 7-Other 8-None/4°C																	

Sample Receipt Checklist

Client Name: **CAERUS**

Date/Time Received: **28-Sep-19 10:00**

Work Order: **19091970**

Received by: **PD**

Checklist completed by <u>Paul De Weese</u>	28-Sep-19	Reviewed by: <u>Chad Whelton</u>	30-Sep-19
eSignature	Date	eSignature	Date

Matrices: **Soil**

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 ☒	
Chain of custody present?	Yes ☒	No ☐		
Chain of custody signed when relinquished and received?	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 ☐		
Sample(s) received on ice?	Yes ☒	No ☐		
Temperature(s)/Thermometer(s):	<u>5C</u>			
Cooler(s)/Kit(s):				
Date/Time sample(s) sent to storage:	<u>9/28/2019 10:51:36 AM</u>			
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:

CorrectiveAction:

Caerus Oil and Gas

Sample Delivery Group: L1158611
Samples Received: 11/08/2019
Project Number: NPR QRT
Description: NPR 4thq
Site: NPR
Report To: Jake Janicek
143 Diamond Avenue
Parachute, CO 81635

Entire Report Reviewed By:

Chris Ward

Chris Ward
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace Analytical National is performed per guidance provided in laboratory standard operating procedures ENV-SOP-MTJL-0067 and ENV-SOP-MTJL-0068. Where sampling conducted by the customer, results relate to the accuracy of the information provided, and as the samples are received.



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SAMPLE SUMMARY

ONE LAB. NATIONWIDE.



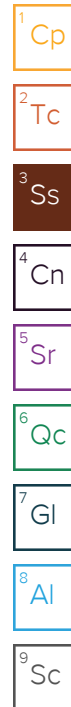
20191107-NPR1ST L1158611-01 GW

Collected by
Chance Holder

Collected date/time
11/07/19 09:30

Received date/time
11/08/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1378163	1	11/11/19 11:41	11/11/19 12:56	TH	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG1380577	1	11/15/19 13:25	11/15/19 13:25	GB	Mt. Juliet, TN
Wet Chemistry by Method 350.1	WG1381475	1	11/19/19 13:39	11/19/19 13:39	JER	Mt. Juliet, TN
Wet Chemistry by Method 4500S2 D-2011	WG1379332	1	11/13/19 15:34	11/13/19 15:34	MJA	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG1378259	1	11/10/19 22:05	11/10/19 22:05	ANP	Mt. Juliet, TN
Wet Chemistry by Method 9050A	WG1379189	1	11/13/19 15:02	11/13/19 15:02	BAM	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1377367	1	11/09/19 09:28	11/09/19 09:28	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1377367	5	11/09/19 09:42	11/09/19 09:42	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1378889	1	11/13/19 13:39	11/14/19 02:44	TRB	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method RSK175	WG1379553	1	11/13/19 16:18	11/13/19 16:18	DAH	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1378080	1	11/10/19 05:27	11/10/19 05:27	CMJ	Mt. Juliet, TN



20191107-NPR2ST L1158611-02 GW

Collected by
Chance Holder

Collected date/time
11/07/19 10:00

Received date/time
11/08/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1378163	1	11/11/19 11:41	11/11/19 12:56	TH	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG1380577	1	11/15/19 13:41	11/15/19 13:41	GB	Mt. Juliet, TN
Wet Chemistry by Method 350.1	WG1381475	1	11/19/19 14:20	11/19/19 14:20	JER	Mt. Juliet, TN
Wet Chemistry by Method 4500S2 D-2011	WG1379332	1	11/13/19 15:34	11/13/19 15:34	MJA	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG1378259	1	11/10/19 22:05	11/10/19 22:05	ANP	Mt. Juliet, TN
Wet Chemistry by Method 9050A	WG1379189	1	11/13/19 15:02	11/13/19 15:02	BAM	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1377422	1	11/08/19 13:27	11/08/19 13:27	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1378889	1	11/13/19 13:39	11/14/19 02:47	TRB	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method RSK175	WG1379553	1	11/13/19 16:25	11/13/19 16:25	DAH	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1378080	1	11/10/19 05:47	11/10/19 05:47	CMJ	Mt. Juliet, TN

20191107-NPR2SP L1158611-03 GW

Collected by
Chance Holder

Collected date/time
11/07/19 10:15

Received date/time
11/08/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1378163	1	11/11/19 11:41	11/11/19 12:56	TH	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG1380577	5	11/15/19 16:16	11/15/19 16:16	GB	Mt. Juliet, TN
Wet Chemistry by Method 350.1	WG1381475	1	11/19/19 14:21	11/19/19 14:21	JER	Mt. Juliet, TN
Wet Chemistry by Method 4500S2 D-2011	WG1379332	1	11/13/19 15:34	11/13/19 15:34	MJA	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG1378259	1	11/10/19 22:05	11/10/19 22:05	ANP	Mt. Juliet, TN
Wet Chemistry by Method 9050A	WG1379189	1	11/13/19 15:02	11/13/19 15:02	BAM	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1377422	1	11/08/19 13:44	11/08/19 13:44	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1377422	50	11/08/19 16:41	11/08/19 16:41	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1378889	1	11/13/19 13:39	11/14/19 02:49	TRB	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1378889	5	11/13/19 13:39	11/14/19 14:10	TRB	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method RSK175	WG1379553	1	11/13/19 16:29	11/13/19 16:29	DAH	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1378080	1	11/10/19 06:07	11/10/19 06:07	CMJ	Mt. Juliet, TN

20191107-NPR6ST L1158611-04 GW

Collected by
Chance Holder

Collected date/time
11/07/19 10:30

Received date/time
11/08/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1378163	1	11/11/19 11:41	11/11/19 12:56	TH	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG1380577	1	11/15/19 14:10	11/15/19 14:10	GB	Mt. Juliet, TN
Wet Chemistry by Method 350.1	WG1381475	1	11/19/19 13:51	11/19/19 13:51	JER	Mt. Juliet, TN
Wet Chemistry by Method 4500S2 D-2011	WG1379332	1	11/13/19 15:35	11/13/19 15:35	MJA	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG1378259	1	11/10/19 22:05	11/10/19 22:05	ANP	Mt. Juliet, TN

ACCOUNT:
Caerus Oil and Gas

PROJECT:
NPR QRT

SDG:
L1158611

DATE/TIME:
11/20/19 09:09

PAGE:
3 of 56

SAMPLE SUMMARY

ONE LAB. NATIONWIDE.



20191107-NPR6ST L1158611-04 GW

Collected by
Chance Holder

Collected date/time
11/07/19 10:30

Received date/time
11/08/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 9050A	WG1379189	1	11/13/19 15:02	11/13/19 15:02	BAM	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1377422	1	11/08/19 14:02	11/08/19 14:02	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1378889	1	11/13/19 13:39	11/14/19 02:52	TRB	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method RSK175	WG1379553	1	11/13/19 16:31	11/13/19 16:31	DAH	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1378080	1	11/10/19 06:28	11/10/19 06:28	CMJ	Mt. Juliet, TN

¹ Cp

² Tc

³ Ss

⁴ Cn

20191107-NPR3MW L1158611-05 GW

Collected by
Chance Holder

Collected date/time
11/07/19 11:05

Received date/time
11/08/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1378163	1	11/11/19 11:41	11/11/19 12:56	TH	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG1380577	1	11/15/19 14:18	11/15/19 14:18	GB	Mt. Juliet, TN
Wet Chemistry by Method 350.1	WG1381475	1	11/19/19 13:53	11/19/19 13:53	JER	Mt. Juliet, TN
Wet Chemistry by Method 4500S2 D-2011	WG1379332	1	11/13/19 15:35	11/13/19 15:35	MJA	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG1378260	1	11/10/19 19:13	11/10/19 19:13	ANP	Mt. Juliet, TN
Wet Chemistry by Method 9050A	WG1379711	1	11/13/19 12:16	11/13/19 12:16	MJA	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1377422	1	11/08/19 14:20	11/08/19 14:20	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1377422	2	11/08/19 23:44	11/08/19 23:44	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1378889	1	11/13/19 13:39	11/14/19 02:55	TRB	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method RSK175	WG1379553	1	11/13/19 16:34	11/13/19 16:34	DAH	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1378080	1	11/10/19 06:48	11/10/19 06:48	CMJ	Mt. Juliet, TN

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc

20191107-NPR3ST L1158611-06 GW

Collected by
Chance Holder

Collected date/time
11/07/19 11:45

Received date/time
11/08/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1378163	1	11/11/19 11:41	11/11/19 12:56	TH	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG1380577	1	11/15/19 14:26	11/15/19 14:26	GB	Mt. Juliet, TN
Wet Chemistry by Method 350.1	WG1381475	1	11/19/19 13:54	11/19/19 13:54	JER	Mt. Juliet, TN
Wet Chemistry by Method 4500S2 D-2011	WG1380284	1	11/14/19 20:34	11/14/19 20:34	MJA	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG1378260	1	11/10/19 19:13	11/10/19 19:13	ANP	Mt. Juliet, TN
Wet Chemistry by Method 9050A	WG1379711	1	11/13/19 12:16	11/13/19 12:16	MJA	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1377422	1	11/08/19 14:37	11/08/19 14:37	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1377422	2	11/09/19 00:02	11/09/19 00:02	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1378889	1	11/13/19 13:39	11/14/19 03:03	TRB	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method RSK175	WG1379553	1	11/13/19 16:36	11/13/19 16:36	DAH	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1378080	1	11/10/19 07:08	11/10/19 07:08	CMJ	Mt. Juliet, TN

20191107-NPR4MW L1158611-07 GW

Collected by
Chance Holder

Collected date/time
11/07/19 12:00

Received date/time
11/08/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1378163	1	11/11/19 11:41	11/11/19 12:56	TH	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG1380577	1	11/15/19 14:34	11/15/19 14:34	GB	Mt. Juliet, TN
Wet Chemistry by Method 350.1	WG1381475	1	11/19/19 13:56	11/19/19 13:56	JER	Mt. Juliet, TN
Wet Chemistry by Method 4500S2 D-2011	WG1380284	1	11/14/19 20:35	11/14/19 20:35	MJA	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG1378260	1	11/10/19 19:13	11/10/19 19:13	ANP	Mt. Juliet, TN
Wet Chemistry by Method 9050A	WG1379711	1	11/13/19 12:16	11/13/19 12:16	MJA	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1377422	1	11/08/19 14:55	11/08/19 14:55	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1377422	2	11/09/19 00:20	11/09/19 00:20	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1378889	1	11/13/19 13:39	11/14/19 03:05	TRB	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method RSK175	WG1379553	1	11/13/19 16:38	11/13/19 16:38	DAH	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1378080	1	11/10/19 07:29	11/10/19 07:29	CMJ	Mt. Juliet, TN

SAMPLE SUMMARY

ONE LAB. NATIONWIDE.



20191107-NPR13MW L1158611-08 GW

Collected by
Chance HolderCollected date/time
11/07/19 12:30Received date/time
11/08/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1378163	1	11/11/19 11:41	11/11/19 12:56	TH	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG1380577	1	11/15/19 14:42	11/15/19 14:42	GB	Mt. Juliet, TN
Wet Chemistry by Method 350.1	WG1381475	1	11/19/19 13:58	11/19/19 13:58	JER	Mt. Juliet, TN
Wet Chemistry by Method 4500S2 D-2011	WG1380284	1	11/14/19 20:35	11/14/19 20:35	MJA	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG1378260	1	11/10/19 19:13	11/10/19 19:13	ANP	Mt. Juliet, TN
Wet Chemistry by Method 9050A	WG1379711	1	11/13/19 12:16	11/13/19 12:16	MJA	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1377422	1	11/08/19 15:14	11/08/19 15:14	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1377422	2	11/09/19 00:37	11/09/19 00:37	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1378889	1	11/13/19 13:39	11/14/19 03:08	TRB	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method RSK175	WG1379553	1	11/13/19 16:41	11/13/19 16:41	DAH	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1378085	1	11/09/19 20:38	11/09/19 20:38	CMJ	Mt. Juliet, TN

¹Cp²Tc³Ss⁴Cn⁵Sr⁶Qc⁷Gl⁸Al⁹Sc

20191107-NPR11ST L1158611-09 GW

Collected by
Chance HolderCollected date/time
11/07/19 13:45Received date/time
11/08/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1378163	1	11/11/19 11:41	11/11/19 12:56	TH	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG1380577	1	11/15/19 14:49	11/15/19 14:49	GB	Mt. Juliet, TN
Wet Chemistry by Method 350.1	WG1381475	1	11/19/19 13:59	11/19/19 13:59	JER	Mt. Juliet, TN
Wet Chemistry by Method 4500S2 D-2011	WG1380284	1	11/14/19 20:37	11/14/19 20:37	MJA	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG1378260	1	11/10/19 19:13	11/10/19 19:13	ANP	Mt. Juliet, TN
Wet Chemistry by Method 9050A	WG1379711	1	11/13/19 12:16	11/13/19 12:16	MJA	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1377422	1	11/08/19 15:31	11/08/19 15:31	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1378889	1	11/13/19 13:39	11/14/19 03:11	TRB	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method RSK175	WG1379553	1	11/13/19 16:43	11/13/19 16:43	DAH	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1378085	1	11/09/19 20:57	11/09/19 20:57	CMJ	Mt. Juliet, TN



All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Chris Ward
Project Manager

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc



Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Dissolved Solids	435		10.0	1	11/11/2019 12:56	WG1378163

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Wet Chemistry by Method 2320 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Alkalinity	305		20.0	1	11/15/2019 13:25	WG1380577
Alkalinity,Bicarbonate	302		20.0	1	11/15/2019 13:25	WG1380577
Alkalinity,Carbonate	ND		20.0	1	11/15/2019 13:25	WG1380577

Sample Narrative:

L1158611-01 WG1380577: Endpoint pH 4.5 headspace

Wet Chemistry by Method 350.1

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Ammonia Nitrogen	ND		0.100	1	11/19/2019 13:39	WG1381475

Wet Chemistry by Method 4500S2 D-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Sulfide	ND		0.0500	1	11/13/2019 15:34	WG1379332

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	8.44	T8	1	11/10/2019 22:05	WG1378259

Sample Narrative:

L1158611-01 WG1378259: 8.44 at 16.6C

Wet Chemistry by Method 9050A

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Specific Conductance	755		10.0	1	11/13/2019 15:02	WG1379189

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Bromide	ND		1.00	1	11/09/2019 09:28	WG1377367
Chloride	8.70		1.00	1	11/09/2019 09:28	WG1377367
Fluoride	0.171		0.100	1	11/09/2019 09:28	WG1377367
Nitrate as (N)	ND		0.100	1	11/09/2019 09:28	WG1377367
Nitrite as (N)	ND		0.100	1	11/09/2019 09:28	WG1377367
Sulfate	103		25.0	5	11/09/2019 09:42	WG1377367

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Arsenic,Dissolved	ND		0.0100	1	11/14/2019 02:44	WG1378889
Barium,Dissolved	0.0813		0.00500	1	11/14/2019 02:44	WG1378889
Cadmium,Dissolved	ND		0.00200	1	11/14/2019 02:44	WG1378889
Calcium,Dissolved	55.8		1.00	1	11/14/2019 02:44	WG1378889



Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chromium,Dissolved	ND		0.0100	1	11/14/2019 02:44	WG1378889
Copper,Dissolved	ND		0.0100	1	11/14/2019 02:44	WG1378889
Iron,Dissolved	ND		0.100	1	11/14/2019 02:44	WG1378889
Lead,Dissolved	ND		0.00500	1	11/14/2019 02:44	WG1378889
Magnesium,Dissolved	38.2		1.00	1	11/14/2019 02:44	WG1378889
Manganese,Dissolved	ND		0.0100	1	11/14/2019 02:44	WG1378889
Potassium,Dissolved	1.24		1.00	1	11/14/2019 02:44	WG1378889
Selenium,Dissolved	ND		0.0100	1	11/14/2019 02:44	WG1378889
Silver,Dissolved	ND		0.00500	1	11/14/2019 02:44	WG1378889
Sodium,Dissolved	63.9		1.00	1	11/14/2019 02:44	WG1378889

¹ Cp² Tc³ Ss⁴ Cn⁵ Sr⁶ Qc⁷ Gl⁸ Al⁹ Sc

Volatile Organic Compounds (GC) by Method RSK175

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Methane	ND		0.0100	1	11/13/2019 16:18	WG1379553
Ethane	ND		0.0130	1	11/13/2019 16:18	WG1379553
Ethene	ND		0.0130	1	11/13/2019 16:18	WG1379553
Propane	ND		0.0190	1	11/13/2019 16:18	WG1379553

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Benzene	ND		0.00100	1	11/10/2019 05:27	WG1378080
Toluene	ND		0.00100	1	11/10/2019 05:27	WG1378080
Ethylbenzene	ND		0.00100	1	11/10/2019 05:27	WG1378080
Total Xylenes	ND		0.00300	1	11/10/2019 05:27	WG1378080
Methyl tert-butyl ether	ND		0.00100	1	11/10/2019 05:27	WG1378080
(S) Toluene-d8	107		80.0-120		11/10/2019 05:27	WG1378080
(S) 4-Bromofluorobenzene	92.3		77.0-126		11/10/2019 05:27	WG1378080
(S) 1,2-Dichloroethane-d4	101		70.0-130		11/10/2019 05:27	WG1378080



Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Dissolved Solids	454		10.0	1	11/11/2019 12:56	WG1378163

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Wet Chemistry by Method 2320 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Alkalinity	327		20.0	1	11/15/2019 13:41	WG1380577
Alkalinity,Bicarbonate	327		20.0	1	11/15/2019 13:41	WG1380577
Alkalinity,Carbonate	ND		20.0	1	11/15/2019 13:41	WG1380577

Sample Narrative:

L1158611-02 WG1380577: Endpoint pH 4.5 headspace

Wet Chemistry by Method 350.1

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Ammonia Nitrogen	ND		0.100	1	11/19/2019 14:20	WG1381475

Wet Chemistry by Method 4500S2 D-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Sulfide	ND		0.0500	1	11/13/2019 15:34	WG1379332

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	8.44	T8	1	11/10/2019 22:05	WG1378259

Sample Narrative:

L1158611-02 WG1378259: 8.44 at 16.2C

Wet Chemistry by Method 9050A

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Specific Conductance	746		10.0	1	11/13/2019 15:02	WG1379189

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Bromide	ND		1.00	1	11/08/2019 13:27	WG1377422
Chloride	7.96		1.00	1	11/08/2019 13:27	WG1377422
Fluoride	0.177		0.100	1	11/08/2019 13:27	WG1377422
Nitrate as (N)	ND		0.100	1	11/08/2019 13:27	WG1377422
Nitrite as (N)	ND		0.100	1	11/08/2019 13:27	WG1377422
Sulfate	97.4		5.00	1	11/08/2019 13:27	WG1377422

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Arsenic,Dissolved	ND		0.0100	1	11/14/2019 02:47	WG1378889
Barium,Dissolved	0.0806		0.00500	1	11/14/2019 02:47	WG1378889
Cadmium,Dissolved	ND		0.00200	1	11/14/2019 02:47	WG1378889
Calcium,Dissolved	59.8		1.00	1	11/14/2019 02:47	WG1378889



Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chromium,Dissolved	ND		0.0100	1	11/14/2019 02:47	WG1378889
Copper,Dissolved	ND		0.0100	1	11/14/2019 02:47	WG1378889
Iron,Dissolved	ND		0.100	1	11/14/2019 02:47	WG1378889
Lead,Dissolved	ND		0.00500	1	11/14/2019 02:47	WG1378889
Magnesium,Dissolved	37.3		1.00	1	11/14/2019 02:47	WG1378889
Manganese,Dissolved	ND		0.0100	1	11/14/2019 02:47	WG1378889
Potassium,Dissolved	1.37		1.00	1	11/14/2019 02:47	WG1378889
Selenium,Dissolved	ND		0.0100	1	11/14/2019 02:47	WG1378889
Silver,Dissolved	ND		0.00500	1	11/14/2019 02:47	WG1378889
Sodium,Dissolved	62.2		1.00	1	11/14/2019 02:47	WG1378889

¹ Cp² Tc³ Ss⁴ Cn⁵ Sr⁶ Qc⁷ Gl⁸ Al⁹ Sc

Volatile Organic Compounds (GC) by Method RSK175

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Methane	ND		0.0100	1	11/13/2019 16:25	WG1379553
Ethane	ND		0.0130	1	11/13/2019 16:25	WG1379553
Ethene	ND		0.0130	1	11/13/2019 16:25	WG1379553
Propane	ND		0.0190	1	11/13/2019 16:25	WG1379553

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Benzene	ND		0.00100	1	11/10/2019 05:47	WG1378080
Toluene	ND		0.00100	1	11/10/2019 05:47	WG1378080
Ethylbenzene	ND		0.00100	1	11/10/2019 05:47	WG1378080
Total Xylenes	ND		0.00300	1	11/10/2019 05:47	WG1378080
Methyl tert-butyl ether	ND		0.00100	1	11/10/2019 05:47	WG1378080
(S) Toluene-d8	108		80.0-120		11/10/2019 05:47	WG1378080
(S) 4-Bromofluorobenzene	91.0		77.0-126		11/10/2019 05:47	WG1378080
(S) 1,2-Dichloroethane-d4	99.0		70.0-130		11/10/2019 05:47	WG1378080



Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Dissolved Solids	5890		100	1	11/11/2019 12:56	WG1378163

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Wet Chemistry by Method 2320 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Alkalinity	2560		100	5	11/15/2019 16:16	WG1380577
Alkalinity,Bicarbonate	2260		100	5	11/15/2019 16:16	WG1380577
Alkalinity,Carbonate	300		100	5	11/15/2019 16:16	WG1380577

Sample Narrative:

L1158611-03 WG1380577: Endpoint pH 4.5 headspace

Wet Chemistry by Method 350.1

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Ammonia Nitrogen	ND		0.100	1	11/19/2019 14:21	WG1381475

Wet Chemistry by Method 4500S2 D-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Sulfide	ND		0.0500	1	11/13/2019 15:34	WG1379332

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	8.43	T8	1	11/10/2019 22:05	WG1378259

Sample Narrative:

L1158611-03 WG1378259: 8.43 at 16.5C

Wet Chemistry by Method 9050A

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Specific Conductance	10000		10.0	1	11/13/2019 15:02	WG1379189

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Bromide	2.97		1.00	1	11/08/2019 13:44	WG1377422
Chloride	2220		50.0	50	11/08/2019 16:41	WG1377422
Fluoride	10.5		5.00	50	11/08/2019 16:41	WG1377422
Nitrate as (N)	1.16		0.100	1	11/08/2019 13:44	WG1377422
Nitrite as (N)	ND		0.100	1	11/08/2019 13:44	WG1377422
Sulfate	15.4		5.00	1	11/08/2019 13:44	WG1377422

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Arsenic,Dissolved	0.0155		0.0100	1	11/14/2019 02:49	WG1378889
Barium,Dissolved	0.789		0.00500	1	11/14/2019 02:49	WG1378889
Cadmium,Dissolved	ND		0.00200	1	11/14/2019 02:49	WG1378889
Calcium,Dissolved	6.22		1.00	1	11/14/2019 02:49	WG1378889



Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chromium,Dissolved	ND		0.0100	1	11/14/2019 02:49	WG1378889
Copper,Dissolved	ND		0.0100	1	11/14/2019 02:49	WG1378889
Iron,Dissolved	ND		0.100	1	11/14/2019 02:49	WG1378889
Lead,Dissolved	ND		0.00500	1	11/14/2019 02:49	WG1378889
Magnesium,Dissolved	18.1		1.00	1	11/14/2019 02:49	WG1378889
Manganese,Dissolved	ND		0.0100	1	11/14/2019 02:49	WG1378889
Potassium,Dissolved	4.14		1.00	1	11/14/2019 02:49	WG1378889
Selenium,Dissolved	ND		0.0100	1	11/14/2019 02:49	WG1378889
Silver,Dissolved	ND		0.00500	1	11/14/2019 02:49	WG1378889
Sodium,Dissolved	2190		5.00	5	11/14/2019 14:10	WG1378889

¹ Cp² Tc³ Ss⁴ Cn⁵ Sr⁶ Qc⁷ Gl⁸ Al⁹ Sc

Volatile Organic Compounds (GC) by Method RSK175

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Methane	ND		0.0100	1	11/13/2019 16:29	WG1379553
Ethane	ND		0.0130	1	11/13/2019 16:29	WG1379553
Ethene	ND		0.0130	1	11/13/2019 16:29	WG1379553
Propane	ND		0.0190	1	11/13/2019 16:29	WG1379553

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Benzene	ND		0.00100	1	11/10/2019 06:07	WG1378080
Toluene	ND		0.00100	1	11/10/2019 06:07	WG1378080
Ethylbenzene	ND		0.00100	1	11/10/2019 06:07	WG1378080
Total Xylenes	ND		0.00300	1	11/10/2019 06:07	WG1378080
Methyl tert-butyl ether	ND		0.00100	1	11/10/2019 06:07	WG1378080
(S) Toluene-d8	108		80.0-120		11/10/2019 06:07	WG1378080
(S) 4-Bromofluorobenzene	89.6		77.0-126		11/10/2019 06:07	WG1378080
(S) 1,2-Dichloroethane-d4	101		70.0-130		11/10/2019 06:07	WG1378080



Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Dissolved Solids	435		10.0	1	11/11/2019 12:56	WG1378163

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Wet Chemistry by Method 2320 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Alkalinity	336		20.0	1	11/15/2019 14:10	WG1380577
Alkalinity,Bicarbonate	336		20.0	1	11/15/2019 14:10	WG1380577
Alkalinity,Carbonate	ND		20.0	1	11/15/2019 14:10	WG1380577

Sample Narrative:

L1158611-04 WG1380577: Endpoint pH 4.5 headspace

Wet Chemistry by Method 350.1

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Ammonia Nitrogen	ND		0.100	1	11/19/2019 13:51	WG1381475

Wet Chemistry by Method 4500S2 D-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Sulfide	ND		0.0500	1	11/13/2019 15:35	WG1379332

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	8.36	T8	1	11/10/2019 22:05	WG1378259

Sample Narrative:

L1158611-04 WG1378259: 8.36 at 16.8C

Wet Chemistry by Method 9050A

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Specific Conductance	752		10.0	1	11/13/2019 15:02	WG1379189

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Bromide	ND		1.00	1	11/08/2019 14:02	WG1377422
Chloride	17.7		1.00	1	11/08/2019 14:02	WG1377422
Fluoride	0.223		0.100	1	11/08/2019 14:02	WG1377422
Nitrate as (N)	ND		0.100	1	11/08/2019 14:02	WG1377422
Nitrite as (N)	ND		0.100	1	11/08/2019 14:02	WG1377422
Sulfate	97.5		5.00	1	11/08/2019 14:02	WG1377422

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Arsenic,Dissolved	ND		0.0100	1	11/14/2019 02:52	WG1378889
Barium,Dissolved	0.0766		0.00500	1	11/14/2019 02:52	WG1378889
Cadmium,Dissolved	ND		0.00200	1	11/14/2019 02:52	WG1378889
Calcium,Dissolved	59.3		1.00	1	11/14/2019 02:52	WG1378889



Collected date/time: 11/07/19 10:30

L1158611

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chromium,Dissolved	ND		0.0100	1	11/14/2019 02:52	WG1378889
Copper,Dissolved	ND		0.0100	1	11/14/2019 02:52	WG1378889
Iron,Dissolved	ND		0.100	1	11/14/2019 02:52	WG1378889
Lead,Dissolved	ND		0.00500	1	11/14/2019 02:52	WG1378889
Magnesium,Dissolved	36.8		1.00	1	11/14/2019 02:52	WG1378889
Manganese,Dissolved	ND		0.0100	1	11/14/2019 02:52	WG1378889
Potassium,Dissolved	1.45		1.00	1	11/14/2019 02:52	WG1378889
Selenium,Dissolved	ND		0.0100	1	11/14/2019 02:52	WG1378889
Silver,Dissolved	ND		0.00500	1	11/14/2019 02:52	WG1378889
Sodium,Dissolved	61.3		1.00	1	11/14/2019 02:52	WG1378889

¹ Cp² Tc³ Ss⁴ Cn⁵ Sr⁶ Qc⁷ Gl⁸ Al⁹ Sc

Volatile Organic Compounds (GC) by Method RSK175

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Methane	ND		0.0100	1	11/13/2019 16:31	WG1379553
Ethane	ND		0.0130	1	11/13/2019 16:31	WG1379553
Ethene	ND		0.0130	1	11/13/2019 16:31	WG1379553
Propane	ND		0.0190	1	11/13/2019 16:31	WG1379553

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Benzene	ND		0.00100	1	11/10/2019 06:28	WG1378080
Toluene	ND		0.00100	1	11/10/2019 06:28	WG1378080
Ethylbenzene	ND		0.00100	1	11/10/2019 06:28	WG1378080
Total Xylenes	ND		0.00300	1	11/10/2019 06:28	WG1378080
Methyl tert-butyl ether	ND		0.00100	1	11/10/2019 06:28	WG1378080
(S) Toluene-d8	108		80.0-120		11/10/2019 06:28	WG1378080
(S) 4-Bromofluorobenzene	88.5		77.0-126		11/10/2019 06:28	WG1378080
(S) 1,2-Dichloroethane-d4	99.1		70.0-130		11/10/2019 06:28	WG1378080



Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Dissolved Solids	549		10.0	1	11/11/2019 12:56	WG1378163

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Wet Chemistry by Method 2320 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Alkalinity	387		20.0	1	11/15/2019 14:18	WG1380577
Alkalinity,Bicarbonate	387		20.0	1	11/15/2019 14:18	WG1380577
Alkalinity,Carbonate	ND		20.0	1	11/15/2019 14:18	WG1380577

Sample Narrative:

L1158611-05 WG1380577: Endpoint pH 4.5 headspace

Wet Chemistry by Method 350.1

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Ammonia Nitrogen	ND		0.100	1	11/19/2019 13:53	WG1381475

Wet Chemistry by Method 4500S2 D-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Sulfide	ND		0.0500	1	11/13/2019 15:35	WG1379332

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	7.57	T8	1	11/10/2019 19:13	WG1378260

Sample Narrative:

L1158611-05 WG1378260: 7.57 at 15.8C

Wet Chemistry by Method 9050A

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Specific Conductance	931		10.0	1	11/13/2019 12:16	WG1379711

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Bromide	ND		1.00	1	11/08/2019 14:20	WG1377422
Chloride	27.3		1.00	1	11/08/2019 14:20	WG1377422
Fluoride	0.614		0.100	1	11/08/2019 14:20	WG1377422
Nitrate as (N)	0.521		0.100	1	11/08/2019 14:20	WG1377422
Nitrite as (N)	ND		0.100	1	11/08/2019 14:20	WG1377422
Sulfate	109		10.0	2	11/08/2019 23:44	WG1377422

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Arsenic,Dissolved	ND		0.0100	1	11/14/2019 02:55	WG1378889
Barium,Dissolved	0.0732		0.00500	1	11/14/2019 02:55	WG1378889
Cadmium,Dissolved	ND		0.00200	1	11/14/2019 02:55	WG1378889
Calcium,Dissolved	65.6		1.00	1	11/14/2019 02:55	WG1378889



Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chromium,Dissolved	ND		0.0100	1	11/14/2019 02:55	WG1378889
Copper,Dissolved	ND		0.0100	1	11/14/2019 02:55	WG1378889
Iron,Dissolved	ND		0.100	1	11/14/2019 02:55	WG1378889
Lead,Dissolved	ND		0.00500	1	11/14/2019 02:55	WG1378889
Magnesium,Dissolved	44.8		1.00	1	11/14/2019 02:55	WG1378889
Manganese,Dissolved	ND		0.0100	1	11/14/2019 02:55	WG1378889
Potassium,Dissolved	2.59		1.00	1	11/14/2019 02:55	WG1378889
Selenium,Dissolved	ND		0.0100	1	11/14/2019 02:55	WG1378889
Silver,Dissolved	ND		0.00500	1	11/14/2019 02:55	WG1378889
Sodium,Dissolved	85.7		1.00	1	11/14/2019 02:55	WG1378889

¹ Cp² Tc³ Ss⁴ Cn⁵ Sr⁶ Qc⁷ Gl⁸ Al⁹ Sc

Volatile Organic Compounds (GC) by Method RSK175

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Methane	ND		0.0100	1	11/13/2019 16:34	WG1379553
Ethane	ND		0.0130	1	11/13/2019 16:34	WG1379553
Ethene	ND		0.0130	1	11/13/2019 16:34	WG1379553
Propane	ND		0.0190	1	11/13/2019 16:34	WG1379553

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Benzene	ND		0.00100	1	11/10/2019 06:48	WG1378080
Toluene	ND		0.00100	1	11/10/2019 06:48	WG1378080
Ethylbenzene	ND		0.00100	1	11/10/2019 06:48	WG1378080
Total Xylenes	ND		0.00300	1	11/10/2019 06:48	WG1378080
Methyl tert-butyl ether	ND		0.00100	1	11/10/2019 06:48	WG1378080
(S) Toluene-d8	109		80.0-120		11/10/2019 06:48	WG1378080
(S) 4-Bromofluorobenzene	90.0		77.0-126		11/10/2019 06:48	WG1378080
(S) 1,2-Dichloroethane-d4	98.0		70.0-130		11/10/2019 06:48	WG1378080



Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Dissolved Solids	523		10.0	1	11/11/2019 12:56	WG1378163

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Wet Chemistry by Method 2320 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Alkalinity	379		20.0	1	11/15/2019 14:26	WG1380577
Alkalinity,Bicarbonate	379		20.0	1	11/15/2019 14:26	WG1380577
Alkalinity,Carbonate	ND		20.0	1	11/15/2019 14:26	WG1380577

Sample Narrative:

L1158611-06 WG1380577: Endpoint pH 4.5 headspace

Wet Chemistry by Method 350.1

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Ammonia Nitrogen	ND		0.100	1	11/19/2019 13:54	WG1381475

Wet Chemistry by Method 4500S2 D-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Sulfide	ND		0.0500	1	11/14/2019 20:34	WG1380284

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	8.18	T8	1	11/10/2019 19:13	WG1378260

Sample Narrative:

L1158611-06 WG1378260: 8.18 at 14.5C

Wet Chemistry by Method 9050A

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Specific Conductance	941		10.0	1	11/13/2019 12:16	WG1379711

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Bromide	ND		1.00	1	11/08/2019 14:37	WG1377422
Chloride	27.0		1.00	1	11/08/2019 14:37	WG1377422
Fluoride	0.680		0.100	1	11/08/2019 14:37	WG1377422
Nitrate as (N)	0.454		0.100	1	11/08/2019 14:37	WG1377422
Nitrite as (N)	ND		0.100	1	11/08/2019 14:37	WG1377422
Sulfate	112		10.0	2	11/09/2019 00:02	WG1377422

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Arsenic,Dissolved	ND		0.0100	1	11/14/2019 03:03	WG1378889
Barium,Dissolved	0.0611		0.00500	1	11/14/2019 03:03	WG1378889
Cadmium,Dissolved	ND		0.00200	1	11/14/2019 03:03	WG1378889
Calcium,Dissolved	63.7		1.00	1	11/14/2019 03:03	WG1378889



Collected date/time: 11/07/19 11:45

L1158611

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chromium,Dissolved	ND		0.0100	1	11/14/2019 03:03	WG1378889
Copper,Dissolved	ND		0.0100	1	11/14/2019 03:03	WG1378889
Iron,Dissolved	ND		0.100	1	11/14/2019 03:03	WG1378889
Lead,Dissolved	ND		0.00500	1	11/14/2019 03:03	WG1378889
Magnesium,Dissolved	45.7		1.00	1	11/14/2019 03:03	WG1378889
Manganese,Dissolved	ND		0.0100	1	11/14/2019 03:03	WG1378889
Potassium,Dissolved	2.99		1.00	1	11/14/2019 03:03	WG1378889
Selenium,Dissolved	ND		0.0100	1	11/14/2019 03:03	WG1378889
Silver,Dissolved	ND		0.00500	1	11/14/2019 03:03	WG1378889
Sodium,Dissolved	86.4		1.00	1	11/14/2019 03:03	WG1378889

¹ Cp² Tc³ Ss⁴ Cn⁵ Sr⁶ Qc⁷ Gl⁸ Al⁹ Sc

Volatile Organic Compounds (GC) by Method RSK175

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Methane	ND		0.0100	1	11/13/2019 16:36	WG1379553
Ethane	ND		0.0130	1	11/13/2019 16:36	WG1379553
Ethene	ND		0.0130	1	11/13/2019 16:36	WG1379553
Propane	ND		0.0190	1	11/13/2019 16:36	WG1379553

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Benzene	ND		0.00100	1	11/10/2019 07:08	WG1378080
Toluene	ND		0.00100	1	11/10/2019 07:08	WG1378080
Ethylbenzene	ND		0.00100	1	11/10/2019 07:08	WG1378080
Total Xylenes	ND		0.00300	1	11/10/2019 07:08	WG1378080
Methyl tert-butyl ether	ND		0.00100	1	11/10/2019 07:08	WG1378080
(S) Toluene-d8	109		80.0-120		11/10/2019 07:08	WG1378080
(S) 4-Bromofluorobenzene	87.6		77.0-126		11/10/2019 07:08	WG1378080
(S) 1,2-Dichloroethane-d4	99.4		70.0-130		11/10/2019 07:08	WG1378080



Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Dissolved Solids	568		10.0	1	11/11/2019 12:56	WG1378163

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Wet Chemistry by Method 2320 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Alkalinity	402		20.0	1	11/15/2019 14:34	WG1380577
Alkalinity,Bicarbonate	402		20.0	1	11/15/2019 14:34	WG1380577
Alkalinity,Carbonate	ND		20.0	1	11/15/2019 14:34	WG1380577

Sample Narrative:

L1158611-07 WG1380577: Endpoint pH 4.5 headspace

Wet Chemistry by Method 350.1

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Ammonia Nitrogen	ND		0.100	1	11/19/2019 13:56	WG1381475

Wet Chemistry by Method 4500S2 D-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Sulfide	ND		0.0500	1	11/14/2019 20:35	WG1380284

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	7.64	T8	1	11/10/2019 19:13	WG1378260

Sample Narrative:

L1158611-07 WG1378260: 7.64 at 14.9C

Wet Chemistry by Method 9050A

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Specific Conductance	1020		10.0	1	11/13/2019 12:16	WG1379711

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Bromide	ND		1.00	1	11/08/2019 14:55	WG1377422
Chloride	30.8		1.00	1	11/08/2019 14:55	WG1377422
Fluoride	0.639		0.100	1	11/08/2019 14:55	WG1377422
Nitrate as (N)	0.751		0.100	1	11/08/2019 14:55	WG1377422
Nitrite as (N)	ND		0.100	1	11/08/2019 14:55	WG1377422
Sulfate	124		10.0	2	11/09/2019 00:20	WG1377422

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Arsenic,Dissolved	ND		0.0100	1	11/14/2019 03:05	WG1378889
Barium,Dissolved	0.0644		0.00500	1	11/14/2019 03:05	WG1378889
Cadmium,Dissolved	ND		0.00200	1	11/14/2019 03:05	WG1378889
Calcium,Dissolved	69.9		1.00	1	11/14/2019 03:05	WG1378889



Collected date/time: 11/07/19 12:00

L1158611

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chromium,Dissolved	ND		0.0100	1	11/14/2019 03:05	WG1378889
Copper,Dissolved	ND		0.0100	1	11/14/2019 03:05	WG1378889
Iron,Dissolved	ND		0.100	1	11/14/2019 03:05	WG1378889
Lead,Dissolved	ND		0.00500	1	11/14/2019 03:05	WG1378889
Magnesium,Dissolved	48.8		1.00	1	11/14/2019 03:05	WG1378889
Manganese,Dissolved	ND		0.0100	1	11/14/2019 03:05	WG1378889
Potassium,Dissolved	3.23		1.00	1	11/14/2019 03:05	WG1378889
Selenium,Dissolved	ND		0.0100	1	11/14/2019 03:05	WG1378889
Silver,Dissolved	ND		0.00500	1	11/14/2019 03:05	WG1378889
Sodium,Dissolved	90.7		1.00	1	11/14/2019 03:05	WG1378889

¹ Cp² Tc³ Ss⁴ Cn⁵ Sr⁶ Qc⁷ Gl⁸ Al⁹ Sc

Volatile Organic Compounds (GC) by Method RSK175

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Methane	ND		0.0100	1	11/13/2019 16:38	WG1379553
Ethane	ND		0.0130	1	11/13/2019 16:38	WG1379553
Ethene	ND		0.0130	1	11/13/2019 16:38	WG1379553
Propane	ND		0.0190	1	11/13/2019 16:38	WG1379553

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Benzene	ND		0.00100	1	11/10/2019 07:29	WG1378080
Toluene	ND		0.00100	1	11/10/2019 07:29	WG1378080
Ethylbenzene	ND		0.00100	1	11/10/2019 07:29	WG1378080
Total Xylenes	ND		0.00300	1	11/10/2019 07:29	WG1378080
Methyl tert-butyl ether	ND		0.00100	1	11/10/2019 07:29	WG1378080
(S) Toluene-d8	109		80.0-120		11/10/2019 07:29	WG1378080
(S) 4-Bromofluorobenzene	91.0		77.0-126		11/10/2019 07:29	WG1378080
(S) 1,2-Dichloroethane-d4	101		70.0-130		11/10/2019 07:29	WG1378080



Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Dissolved Solids	645		10.0	1	11/11/2019 12:56	WG1378163

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Wet Chemistry by Method 2320 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Alkalinity	398		20.0	1	11/15/2019 14:42	WG1380577
Alkalinity,Bicarbonate	398		20.0	1	11/15/2019 14:42	WG1380577
Alkalinity,Carbonate	ND		20.0	1	11/15/2019 14:42	WG1380577

Sample Narrative:

L1158611-08 WG1380577: Endpoint pH 4.5 headspace

Wet Chemistry by Method 350.1

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Ammonia Nitrogen	ND		0.100	1	11/19/2019 13:58	WG1381475

Wet Chemistry by Method 4500S2 D-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Sulfide	ND		0.0500	1	11/14/2019 20:35	WG1380284

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	7.54	T8	1	11/10/2019 19:13	WG1378260

Sample Narrative:

L1158611-08 WG1378260: 7.54 at 14.6C

Wet Chemistry by Method 9050A

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Specific Conductance	1040		10.0	1	11/13/2019 12:16	WG1379711

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Bromide	ND		1.00	1	11/08/2019 15:14	WG1377422
Chloride	31.0		1.00	1	11/08/2019 15:14	WG1377422
Fluoride	0.723		0.100	1	11/08/2019 15:14	WG1377422
Nitrate as (N)	1.02		0.100	1	11/08/2019 15:14	WG1377422
Nitrite as (N)	ND		0.100	1	11/08/2019 15:14	WG1377422
Sulfate	137		10.0	2	11/09/2019 00:37	WG1377422

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Arsenic,Dissolved	ND		0.0100	1	11/14/2019 03:08	WG1378889
Barium,Dissolved	0.0761		0.00500	1	11/14/2019 03:08	WG1378889
Cadmium,Dissolved	ND		0.00200	1	11/14/2019 03:08	WG1378889
Calcium,Dissolved	67.8		1.00	1	11/14/2019 03:08	WG1378889



Collected date/time: 11/07/19 12:30

L1158611

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chromium,Dissolved	ND		0.0100	1	11/14/2019 03:08	WG1378889
Copper,Dissolved	ND		0.0100	1	11/14/2019 03:08	WG1378889
Iron,Dissolved	ND		0.100	1	11/14/2019 03:08	WG1378889
Lead,Dissolved	ND		0.00500	1	11/14/2019 03:08	WG1378889
Magnesium,Dissolved	49.3		1.00	1	11/14/2019 03:08	WG1378889
Manganese,Dissolved	ND		0.0100	1	11/14/2019 03:08	WG1378889
Potassium,Dissolved	3.08		1.00	1	11/14/2019 03:08	WG1378889
Selenium,Dissolved	ND		0.0100	1	11/14/2019 03:08	WG1378889
Silver,Dissolved	ND		0.00500	1	11/14/2019 03:08	WG1378889
Sodium,Dissolved	97.9		1.00	1	11/14/2019 03:08	WG1378889

¹ Cp² Tc³ Ss⁴ Cn⁵ Sr⁶ Qc⁷ Gl⁸ Al⁹ Sc

Volatile Organic Compounds (GC) by Method RSK175

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Methane	ND		0.0100	1	11/13/2019 16:41	WG1379553
Ethane	ND		0.0130	1	11/13/2019 16:41	WG1379553
Ethene	ND		0.0130	1	11/13/2019 16:41	WG1379553
Propane	ND		0.0190	1	11/13/2019 16:41	WG1379553

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Benzene	ND		0.00100	1	11/09/2019 20:38	WG1378085
Toluene	ND		0.00100	1	11/09/2019 20:38	WG1378085
Ethylbenzene	ND		0.00100	1	11/09/2019 20:38	WG1378085
Total Xylenes	ND		0.00300	1	11/09/2019 20:38	WG1378085
Methyl tert-butyl ether	ND		0.00100	1	11/09/2019 20:38	WG1378085
(S) Toluene-d8	104		80.0-120		11/09/2019 20:38	WG1378085
(S) 4-Bromofluorobenzene	94.3		77.0-126		11/09/2019 20:38	WG1378085
(S) 1,2-Dichloroethane-d4	114		70.0-130		11/09/2019 20:38	WG1378085



Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Dissolved Solids	419		10.0	1	11/11/2019 12:56	WG1378163

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Wet Chemistry by Method 2320 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Alkalinity	303		20.0	1	11/15/2019 14:49	WG1380577
Alkalinity,Bicarbonate	303		20.0	1	11/15/2019 14:49	WG1380577
Alkalinity,Carbonate	ND		20.0	1	11/15/2019 14:49	WG1380577

Sample Narrative:

L1158611-09 WG1380577: Endpoint pH 4.5 headspace

Wet Chemistry by Method 350.1

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Ammonia Nitrogen	ND		0.100	1	11/19/2019 13:59	WG1381475

Wet Chemistry by Method 4500S2 D-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Sulfide	ND		0.0500	1	11/14/2019 20:37	WG1380284

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	8.49	T8	1	11/10/2019 19:13	WG1378260

Sample Narrative:

L1158611-09 WG1378260: 8.49 at 15.3C

Wet Chemistry by Method 9050A

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Specific Conductance	730		10.0	1	11/13/2019 12:16	WG1379711

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Bromide	ND		1.00	1	11/08/2019 15:31	WG1377422
Chloride	9.15		1.00	1	11/08/2019 15:31	WG1377422
Fluoride	0.604		0.100	1	11/08/2019 15:31	WG1377422
Nitrate as (N)	1.46		0.100	1	11/08/2019 15:31	WG1377422
Nitrite as (N)	ND		0.100	1	11/08/2019 15:31	WG1377422
Sulfate	90.3		5.00	1	11/08/2019 15:31	WG1377422

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Arsenic,Dissolved	ND		0.0100	1	11/14/2019 03:11	WG1378889
Barium,Dissolved	0.0693		0.00500	1	11/14/2019 03:11	WG1378889
Cadmium,Dissolved	ND		0.00200	1	11/14/2019 03:11	WG1378889
Calcium,Dissolved	59.7		1.00	1	11/14/2019 03:11	WG1378889



Collected date/time: 11/07/19 13:45

L1158611

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chromium,Dissolved	ND		0.0100	1	11/14/2019 03:11	WG1378889
Copper,Dissolved	ND		0.0100	1	11/14/2019 03:11	WG1378889
Iron,Dissolved	ND		0.100	1	11/14/2019 03:11	WG1378889
Lead,Dissolved	ND		0.00500	1	11/14/2019 03:11	WG1378889
Magnesium,Dissolved	37.3		1.00	1	11/14/2019 03:11	WG1378889
Manganese,Dissolved	ND		0.0100	1	11/14/2019 03:11	WG1378889
Potassium,Dissolved	2.35		1.00	1	11/14/2019 03:11	WG1378889
Selenium,Dissolved	ND		0.0100	1	11/14/2019 03:11	WG1378889
Silver,Dissolved	ND		0.00500	1	11/14/2019 03:11	WG1378889
Sodium,Dissolved	49.4		1.00	1	11/14/2019 03:11	WG1378889

¹ Cp² Tc³ Ss⁴ Cn⁵ Sr⁶ Qc⁷ Gl⁸ Al⁹ Sc

Volatile Organic Compounds (GC) by Method RSK175

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Methane	ND		0.0100	1	11/13/2019 16:43	WG1379553
Ethane	ND		0.0130	1	11/13/2019 16:43	WG1379553
Ethene	ND		0.0130	1	11/13/2019 16:43	WG1379553
Propane	ND		0.0190	1	11/13/2019 16:43	WG1379553

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Benzene	ND		0.00100	1	11/09/2019 20:57	WG1378085
Toluene	ND		0.00100	1	11/09/2019 20:57	WG1378085
Ethylbenzene	ND		0.00100	1	11/09/2019 20:57	WG1378085
Total Xylenes	ND		0.00300	1	11/09/2019 20:57	WG1378085
Methyl tert-butyl ether	ND		0.00100	1	11/09/2019 20:57	WG1378085
(S) Toluene-d8	104		80.0-120		11/09/2019 20:57	WG1378085
(S) 4-Bromofluorobenzene	93.9		77.0-126		11/09/2019 20:57	WG1378085
(S) 1,2-Dichloroethane-d4	118		70.0-130		11/09/2019 20:57	WG1378085

Method Blank (MB)

(MB) R3470958-1 11/11/19 12:56

	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	mg/l		mg/l	mg/l
Dissolved Solids	U		2.82	10.0

L1158593-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1158593-01 11/11/19 12:56 • (DUP) R3470958-3 11/11/19 12:56

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	mg/l	mg/l		%		%
Dissolved Solids	7160	7780	1	8.30	J3	5

L1158593-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1158593-03 11/11/19 12:56 • (DUP) R3470958-4 11/11/19 12:56

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	mg/l	mg/l		%		%
Dissolved Solids	7260	7180	1	1.11		5

Laboratory Control Sample (LCS)

(LCS) R3470958-2 11/11/19 12:56

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	mg/l	mg/l	%	%	
Dissolved Solids	8800	8100	92.0	85.0-115	

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc



Method Blank (MB)

(MB) R3472503-1 11/15/19 12:22

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Alkalinity	3.43	U	2.71	20.0
Alkalinity,Bicarbonate	3.43	U	2.71	20.0
Alkalinity,Carbonate	U		2.71	20.0

Sample Narrative:

BLANK: Endpoint pH 4.5

L1158611-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1158611-01 11/15/19 13:25 • (DUP) R3472503-2 11/15/19 13:34

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Alkalinity	305	321	1	5.00		20
Alkalinity,Bicarbonate	302	321	1	6.14		20
Alkalinity,Carbonate	ND	0.000	1	0.000		20

Sample Narrative:

OS: Endpoint pH 4.5 headspace

DUP: Endpoint pH 4.5

L1158611-09 Original Sample (OS) • Duplicate (DUP)

(OS) L1158611-09 11/15/19 14:49 • (DUP) R3472503-4 11/15/19 14:57

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Alkalinity	303	305	1	0.843		20
Alkalinity,Bicarbonate	303	305	1	0.843		20
Alkalinity,Carbonate	ND	0.000	1	0.000		20

Sample Narrative:

OS: Endpoint pH 4.5 headspace

DUP: Endpoint pH 4.5

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc



Laboratory Control Sample (LCS)

(LCS) R3472503-3 11/15/19 13:51

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	<u>LCS Qualifier</u>
Alkalinity	100	99.4	99.4	85.0-115	

Sample Narrative:

LCS: Endpoint pH 4.5

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc



Method Blank (MB)

(MB) R3473751-1 11/19/19 13:29

	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	mg/l		mg/l	mg/l
Ammonia Nitrogen	U		0.0317	0.100

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc

L1158598-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1158598-01 11/19/19 13:34 • (DUP) R3473751-3 11/19/19 13:35

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	mg/l	mg/l		%		%
Ammonia Nitrogen	1.31	1.30	1	0.461		10

L1158643-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1158643-02 11/19/19 14:10 • (DUP) R3473751-6 11/19/19 14:12

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	mg/l	mg/l		%		%
Ammonia Nitrogen	U	0.000	1	0.000		10

Laboratory Control Sample (LCS)

(LCS) R3473751-2 11/19/19 13:31

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	mg/l	mg/l	%	%	
Ammonia Nitrogen	7.50	7.22	96.2	90.0-110	

L1158611-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1158611-01 11/19/19 13:39 • (MS) R3473751-4 11/19/19 13:40 • (MSD) R3473751-5 11/19/19 13:42

	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Analyte	mg/l	mg/l	mg/l	mg/l	%	%		%			%	%
Ammonia Nitrogen	5.00	ND	4.82	4.82	96.5	96.3	1	90.0-110			0.166	10

L1158697-01 Original Sample (OS) • Matrix Spike (MS)

(OS) L1158697-01 11/19/19 14:14 • (MS) R3473751-7 11/19/19 14:15

	Spike Amount	Original Result	MS Result	MS Rec.	Dilution	Rec. Limits	MS Qualifier
Analyte	mg/l	mg/l	mg/l	%		%	
Ammonia Nitrogen	5.00	10.7	15.0	85.0	1	90.0-110	E J6



Method Blank (MB)

(MB) R3471612-1 11/13/19 15:28

	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	mg/l		mg/l	mg/l
Sulfide	U		0.00650	0.0500

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc

L1158071-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1158071-01 11/13/19 15:28 • (DUP) R3471612-3 11/13/19 15:28

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	mg/l	mg/l		%		%
Sulfide	U	0.000	1	0.000		20

L1158587-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1158587-01 11/13/19 15:32 • (DUP) R3471612-6 11/13/19 15:33

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	mg/l	mg/l		%		%
Sulfide	ND	0.000	1	0.000		20

Laboratory Control Sample (LCS)

(LCS) R3471612-2 11/13/19 15:28

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	mg/l	mg/l	%	%	
Sulfide	0.500	0.518	104	85.0-115	

L1158207-07 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1158207-07 11/13/19 15:29 • (MS) R3471612-4 11/13/19 15:29 • (MSD) R3471612-5 11/13/19 15:29

	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Analyte	mg/l	mg/l	mg/l	mg/l	%	%		%			%	%
Sulfide	1.00	ND	0.912	0.860	91.2	86.0	1	80.0-120			5.87	20



Method Blank (MB)

(MB) R3472162-1 11/14/19 20:33

	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	mg/l		mg/l	mg/l
Sulfide	U		0.00650	0.0500

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc

L1158611-06 Original Sample (OS) • Duplicate (DUP)

(OS) L1158611-06 11/14/19 20:34 • (DUP) R3472162-3 11/14/19 20:35

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	mg/l	mg/l		%		%
Sulfide	ND	0.000	1	0.000		20

L1159960-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1159960-02 11/14/19 20:40 • (DUP) R3472162-6 11/14/19 20:40

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	mg/l	mg/l		%		%
Sulfide	ND	0.000	1	0.000		20

Laboratory Control Sample (LCS)

(LCS) R3472162-2 11/14/19 20:33

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	mg/l	mg/l	%	%	
Sulfide	0.500	0.481	96.2	85.0-115	

L1158611-08 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1158611-08 11/14/19 20:35 • (MS) R3472162-4 11/14/19 20:36 • (MSD) R3472162-5 11/14/19 20:36

	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Analyte	mg/l	mg/l	mg/l	mg/l	%	%		%			%	%
Sulfide	1.00	ND	0.948	0.947	94.8	94.7	1	80.0-120			0.106	20



L1158208-06 Original Sample (OS) • Duplicate (DUP)

(OS) L1158208-06 11/10/19 22:05 • (DUP) R3470429-2 11/10/19 22:05

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	su	su		%		%
pH	7.42	7.43	1	0.135		1

Sample Narrative:

OS: 7.42 at 17.7C

DUP: 7.43 at 17.8C



L1158208-07 Original Sample (OS) • Duplicate (DUP)

(OS) L1158208-07 11/10/19 22:05 • (DUP) R3470429-3 11/10/19 22:05

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	su	su		%		%
pH	8.02	8.07	1	0.622		1

Sample Narrative:

OS: 8.02 at 16.9C

DUP: 8.07 at 16.6C

L1158208-08 Original Sample (OS) • Duplicate (DUP)

(OS) L1158208-08 11/10/19 22:05 • (DUP) R3470429-4 11/10/19 22:05

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	su	su		%		%
pH	8.03	8.03	1	0.000		1

Sample Narrative:

OS: 8.03 at 17.1C

DUP: 8.03 at 17.1C

L1158551-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1158551-01 11/10/19 22:05 • (DUP) R3470429-5 11/10/19 22:05

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	su	su		%		%
pH	6.42	6.41	1	0.156		1

Sample Narrative:



L1158551-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1158551-01 11/10/19 22:05 • (DUP) R3470429-5 11/10/19 22:05

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	su	su		%		%
OS: 6.42 at 16.7C						
DUP: 6.41 at 16.6C						

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc

L1158551-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1158551-02 11/10/19 22:05 • (DUP) R3470429-6 11/10/19 22:05

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	su	su		%		%
pH	7.40	7.39	1	0.135		1

Sample Narrative:

OS: 7.4 at 16.5C
DUP: 7.39 at 16.2C

L1158551-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1158551-03 11/10/19 22:05 • (DUP) R3470429-7 11/10/19 22:05

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	su	su		%		%
pH	6.86	6.83	1	0.438		1

Sample Narrative:

OS: 6.86 at 16.4C
DUP: 6.83 at 16.4C

L1158595-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1158595-01 11/10/19 22:05 • (DUP) R3470429-8 11/10/19 22:05

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	su	su		%		%
pH	6.31	6.31	1	0.000		1

Sample Narrative:

OS: 6.31 at 16.5C
DUP: 6.31 at 16.4C

L1158605-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1158605-01 11/10/19 22:05 • (DUP) R3470429-9 11/10/19 22:05

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	su	su		%		%
pH	6.57	6.58	1	0.152		1

Sample Narrative:
OS: 6.57 at 16.7C
DUP: 6.58 at 16.6C

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc

L1158606-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1158606-01 11/10/19 22:05 • (DUP) R3470429-10 11/10/19 22:05

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	su	su		%		%
pH	6.22	6.20	1	0.322		1

Sample Narrative:
OS: 6.22 at 17.1C
DUP: 6.2 at 16.9C

L1158611-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1158611-01 11/10/19 22:05 • (DUP) R3470429-11 11/10/19 22:05

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	su	su		%		%
pH	8.44	8.43	1	0.119		1

Sample Narrative:
OS: 8.44 at 16.6C
DUP: 8.43 at 16.7C

L1158611-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1158611-02 11/10/19 22:05 • (DUP) R3470429-12 11/10/19 22:05

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	su	su		%		%
pH	8.44	8.43	1	0.119		1

Sample Narrative:

L1158611-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1158611-02 11/10/19 22:05 • (DUP) R3470429-12 11/10/19 22:05

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	su	su		%		%
OS: 8.44 at 16.2C						
DUP: 8.43 at 16.1C						

L1158611-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1158611-03 11/10/19 22:05 • (DUP) R3470429-13 11/10/19 22:05

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	su	su		%		%
pH	8.43	8.44	1	0.119		1

Sample Narrative:

OS: 8.43 at 16.5C
DUP: 8.44 at 16.4C

L1158611-04 Original Sample (OS) • Duplicate (DUP)

(OS) L1158611-04 11/10/19 22:05 • (DUP) R3470429-14 11/10/19 22:05

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	su	su		%		%
pH	8.36	8.40	1	0.477		1

Sample Narrative:

OS: 8.36 at 16.8C
DUP: 8.4 at 16.8C

L1159079-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1159079-01 11/10/19 22:05 • (DUP) R3470429-15 11/10/19 22:05

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	su	su		%		%
pH	7.95	7.93	1	0.252		1

Sample Narrative:

OS: 7.95 at 17.3C
DUP: 7.93 at 17.3C

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc



L1159392-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1159392-02 11/10/19 22:05 • (DUP) R3470429-16 11/10/19 22:05

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	su	su		%		%
pH	7.29	7.29	1	0.000		1

Sample Narrative:

OS: 7.29 at 16.8C

DUP: 7.29 at 16.9C

Laboratory Control Sample (LCS)

(LCS) R3470429-1 11/10/19 22:05

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	su	su	%	%	
pH	10.0	9.92	99.2	99.0-101	

Sample Narrative:

LCS: 9.92 at 18.3C

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc



L1158611-05 Original Sample (OS) • Duplicate (DUP)

(OS) L1158611-05 11/10/19 19:13 • (DUP) R3470413-2 11/10/19 19:13

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	su	su		%		%
pH	7.57	7.55	1	0.265		1

Sample Narrative:

OS: 7.57 at 15.8C

DUP: 7.55 at 15.5C



L1158611-06 Original Sample (OS) • Duplicate (DUP)

(OS) L1158611-06 11/10/19 19:13 • (DUP) R3470413-3 11/10/19 19:13

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	su	su		%		%
pH	8.18	8.21	1	0.366		1

Sample Narrative:

OS: 8.18 at 14.5C

DUP: 8.21 at 14.5C

L1158611-07 Original Sample (OS) • Duplicate (DUP)

(OS) L1158611-07 11/10/19 19:13 • (DUP) R3470413-4 11/10/19 19:13

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	su	su		%		%
pH	7.64	7.65	1	0.131		1

Sample Narrative:

OS: 7.64 at 14.9C

DUP: 7.65 at 14.6C

L1158611-08 Original Sample (OS) • Duplicate (DUP)

(OS) L1158611-08 11/10/19 19:13 • (DUP) R3470413-5 11/10/19 19:13

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	su	su		%		%
pH	7.54	7.53	1	0.133		1

Sample Narrative:

L1158611-08 Original Sample (OS) • Duplicate (DUP)

(OS) L1158611-08 11/10/19 19:13 • (DUP) R3470413-5 11/10/19 19:13

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	su	su		%		%
OS: 7.54 at 14.6C						
DUP: 7.53 at 14.5C						

1

Cp

2

Tc

3

Ss

4

Cn

5

Sr

6

Qc

7

Gl

8

Al

9

Sc

L1158611-09 Original Sample (OS) • Duplicate (DUP)

(OS) L1158611-09 11/10/19 19:13 • (DUP) R3470413-6 11/10/19 19:13

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	su	su		%		%
pH	8.49	8.49	1	0.000		1
Sample Narrative:						
OS: 8.49 at 15.3C						
DUP: 8.49 at 14.9C						

L1158844-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1158844-01 11/10/19 19:13 • (DUP) R3470413-7 11/10/19 19:13

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	su	su		%		%
pH	6.79	6.76	1	0.443		1
Sample Narrative:						
OS: 6.79 at 16.3C						
DUP: 6.76 at 15.9C						

L1158875-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1158875-01 11/10/19 19:13 • (DUP) R3470413-8 11/10/19 19:13

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	su	su		%		%
pH	7.58	7.55	1	0.397		1
Sample Narrative:						
OS: 7.58 at 17.2C						
DUP: 7.55 at 17.5C						



L1158895-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1158895-01 11/10/19 19:13 • (DUP) R3470413-9 11/10/19 19:13

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	su	su		%		%
pH	7.86	7.87	1	0.127		1

Sample Narrative:

OS: 7.86 at 15.7C

DUP: 7.87 at 15.7C

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc

L1158895-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1158895-02 11/10/19 19:13 • (DUP) R3470413-10 11/10/19 19:13

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	su	su		%		%
pH	7.86	7.88	1	0.254		1

Sample Narrative:

OS: 7.86 at 15.1C

DUP: 7.88 at 14.6C

L1158895-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1158895-03 11/10/19 19:13 • (DUP) R3470413-11 11/10/19 19:13

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	su	su		%		%
pH	7.81	7.80	1	0.128		1

Sample Narrative:

OS: 7.81 at 14.5C

DUP: 7.8 at 13.9C

L1158895-04 Original Sample (OS) • Duplicate (DUP)

(OS) L1158895-04 11/10/19 19:13 • (DUP) R3470413-12 11/10/19 19:13

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	su	su		%		%
pH	7.78	7.78	1	0.000		1

Sample Narrative:



L1158895-04 Original Sample (OS) • Duplicate (DUP)

(OS) L1158895-04 11/10/19 19:13 • (DUP) R3470413-12 11/10/19 19:13

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	su	su		%		%
OS: 7.78 at 14.6C						
DUP: 7.78 at 14C						

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc

L1158895-05 Original Sample (OS) • Duplicate (DUP)

(OS) L1158895-05 11/10/19 19:13 • (DUP) R3470413-13 11/10/19 19:13

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	su	su		%		%
pH	7.80	7.79	1	0.128		1

Sample Narrative:

OS: 7.8 at 15.6C

DUP: 7.79 at 15.2C

L1158895-06 Original Sample (OS) • Duplicate (DUP)

(OS) L1158895-06 11/10/19 19:13 • (DUP) R3470413-14 11/10/19 19:13

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	su	su		%		%
pH	7.80	7.80	1	0.000		1

Sample Narrative:

OS: 7.8 at 15.7C

DUP: 7.8 at 15.6C

L1158895-07 Original Sample (OS) • Duplicate (DUP)

(OS) L1158895-07 11/10/19 19:13 • (DUP) R3470413-15 11/10/19 19:13

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	su	su		%		%
pH	7.73	7.78	1	0.645		1

Sample Narrative:

OS: 7.73 at 16.3C

DUP: 7.78 at 16C



L1158898-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1158898-01 11/10/19 19:13 • (DUP) R3470413-16 11/10/19 19:13

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	su	su		%		%
pH	7.90	7.91	1	0.127		1

Sample Narrative:

OS: 7.9 at 15.8C

DUP: 7.91 at 15.1C



L1159074-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1159074-01 11/10/19 19:13 • (DUP) R3470413-17 11/10/19 19:13

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	su	su		%		%
pH	8.16	8.18	1	0.245		1

Sample Narrative:

OS: 8.16 at 15C

DUP: 8.18 at 14.7C

L1159078-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1159078-01 11/10/19 19:13 • (DUP) R3470413-18 11/10/19 19:13

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	su	su		%		%
pH	6.47	6.47	1	0.000		1

Sample Narrative:

OS: 6.47 at 14.7C

DUP: 6.47 at 14.6C

L1159087-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1159087-01 11/10/19 19:13 • (DUP) R3470413-19 11/10/19 19:13

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	su	su		%		%
pH	6.09	6.08	1	0.164		1

Sample Narrative:



L1159087-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1159087-01 11/10/19 19:13 • (DUP) R3470413-19 11/10/19 19:13

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	su	su		%		%
OS: 6.09 at 15.8C						
DUP: 6.08 at 15.5C						

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc

L1159089-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1159089-01 11/10/19 19:13 • (DUP) R3470413-20 11/10/19 19:13

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	su	su		%		%
pH	7.05	7.05	1	0.000		1

Sample Narrative:

OS: 7.05 at 17.4C

DUP: 7.05 at 17.6C

L1159090-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1159090-01 11/10/19 19:13 • (DUP) R3470413-21 11/10/19 19:13

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	su	su		%		%
pH	6.13	6.10	1	0.491		1

Sample Narrative:

OS: 6.13 at 16.8C

DUP: 6.1 at 16.8C

Laboratory Control Sample (LCS)

(LCS) R3470413-1 11/10/19 19:13

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	su	su	%	%	
pH	10.0	9.92	99.2	99.0-101	

Sample Narrative:

LCS: 9.92 at 18.4C

Method Blank (MB)

(MB) R3471568-1 11/13/19 15:02

Analyte	MB Result umhos/cm	MB Qualifier	MB MDL umhos/cm	MB RDL umhos/cm
Specific Conductance	U		10.0	10.0

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc

L1157897-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1157897-01 11/13/19 15:02 • (DUP) R3471568-3 11/13/19 15:02

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	219	216	1	1.43		20

L1159029-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1159029-01 11/13/19 15:02 • (DUP) R3471568-4 11/13/19 15:02

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	400	400	1	0.000		20

Laboratory Control Sample (LCS)

(LCS) R3471568-2 11/13/19 15:02

Analyte	Spike Amount umhos/cm	LCS Result umhos/cm	LCS Rec. %	Rec. Limits %	LCS Qualifier
Specific Conductance	475	475	100	85.0-115	



Method Blank (MB)

(MB) R3471453-1 11/13/19 12:16

Analyte	MB Result umhos/cm	MB Qualifier	MB MDL umhos/cm	MB RDL umhos/cm
Specific Conductance	U		10.0	10.0

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc

L1158611-05 Original Sample (OS) • Duplicate (DUP)

(OS) L1158611-05 11/13/19 12:16 • (DUP) R3471453-3 11/13/19 12:16

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	931	948	1	1.81		20

L1159074-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1159074-01 11/13/19 12:16 • (DUP) R3471453-4 11/13/19 12:16

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	336	337	1	0.297		20

Laboratory Control Sample (LCS)

(LCS) R3471453-2 11/13/19 12:16

Analyte	Spike Amount umhos/cm	LCS Result umhos/cm	LCS Rec. %	Rec. Limits %	LCS Qualifier
Specific Conductance	475	475	100	85.0-115	



Method Blank (MB)

(MB) R3470232-1 11/08/19 11:47

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Bromide	U		0.0790	1.00
Chloride	0.0781	U	0.0519	1.00
Fluoride	U		0.00990	0.100
Nitrate	U		0.0227	0.100
Nitrite	U		0.0277	0.100
Sulfate	0.792	U	0.0774	5.00

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc

L1158580-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1158580-01 11/08/19 17:38 • (DUP) R3470232-4 11/08/19 18:22

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Bromide	ND	0.000	1	0.000		15
Chloride	15.9	16.2	1	1.78		15
Fluoride	0.560	0.561	1	0.214		15
Nitrate	0.662	0.661	1	0.0454		15
Nitrite	ND	0.000	1	0.000		15
Sulfate	22.9	22.8	1	0.175		15

L1158644-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1158644-02 11/09/19 10:26 • (DUP) R3470232-10 11/09/19 12:46

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	1.85	2.22	1	18.6	P1	15
Fluoride	ND	0.0211	1	0.000		15
Nitrate	ND	0.0229	1	0.000		15
Nitrite	ND	0.000	1	0.000		15
Sulfate	ND	0.504	1	0.000		15

Laboratory Control Sample (LCS)

(LCS) R3470232-3 11/08/19 13:10

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Bromide	40.0	39.2	97.9	80.0-120	
Chloride	40.0	38.4	96.1	80.0-120	



Laboratory Control Sample (LCS)

(LCS) R3470232-3 11/08/19 13:10

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	<u>LCS Qualifier</u>
Fluoride	8.00	7.91	98.9	80.0-120	
Nitrate	8.00	8.14	102	80.0-120	
Nitrite	8.00	7.96	99.5	80.0-120	
Sulfate	40.0	40.2	101	80.0-120	

L1158593-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1158593-02 11/08/19 19:48 • (MS) R3470232-5 11/08/19 20:31 • (MSD) R3470232-6 11/08/19 20:46

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	<u>MS Qualifier</u>	<u>MSD Qualifier</u>	RPD %	RPD Limits %
Bromide	50.0	3.66	49.6	49.6	91.9	91.9	1	80.0-120			0.0373	15
Chloride	50.0	5730	5500	5500	0.000	0.000	1	80.0-120	<u>E V</u>	<u>E V</u>	0.119	15
Fluoride	5.00	0.905	5.41	5.39	90.1	89.7	1	80.0-120			0.300	15
Nitrate	5.00	ND	4.58	4.58	91.5	91.5	1	80.0-120			0.0459	15
Nitrite	5.00	ND	4.28	4.32	85.6	86.3	1	80.0-120			0.852	15
Sulfate	50.0	332	358	358	52.3	52.2	1	80.0-120	<u>E V</u>	<u>E V</u>	0.0195	15

L1158644-04 Original Sample (OS) • Matrix Spike (MS)

(OS) L1158644-04 11/09/19 01:34 • (MS) R3470232-8 11/09/19 01:48

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MS Rec. %	Dilution	Rec. Limits %	<u>MS Qualifier</u>
Bromide	50.0	ND	46.5	92.9	1	80.0-120	
Chloride	50.0	6.58	54.0	94.8	1	80.0-120	
Fluoride	5.00	ND	5.01	99.1	1	80.0-120	
Nitrate	5.00	0.670	5.51	96.9	1	80.0-120	
Nitrite	5.00	ND	4.96	99.1	1	80.0-120	
Sulfate	50.0	5.73	55.0	98.6	1	80.0-120	

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc



Method Blank (MB)

(MB) R3470184-1 11/08/19 08:45

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Bromide	U		0.0790	1.00
Chloride	U		0.0519	1.00
Fluoride	U		0.00990	0.100
Nitrate	U		0.0227	0.100
Nitrite	U		0.0277	0.100
Sulfate	U		0.0774	5.00

L1158611-09 Original Sample (OS) • Duplicate (DUP)

(OS) L1158611-09 11/08/19 15:31 • (DUP) R3470184-3 11/08/19 16:23

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Bromide	ND	0.000	1	0.000		15
Chloride	9.15	9.16	1	0.0284		15
Fluoride	0.604	0.603	1	0.149		15
Nitrate	1.46	1.43	1	1.72		15
Nitrite	ND	0.000	1	0.000		15
Sulfate	90.3	90.2	1	0.123		15

L1158641-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1158641-01 11/08/19 17:52 • (DUP) R3470184-4 11/08/19 18:09

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Bromide	0.249	0.246	1	1.21	J	15
Chloride	663	662	1	0.0793	E	15
Fluoride	0.0842	0.0599	1	33.7	J P1	15
Nitrate	1.19	1.18	1	1.26		15
Nitrite	U	0.000	1	0.000		15
Sulfate	12.1	12.2	1	0.730		15

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc



Laboratory Control Sample (LCS)

(LCS) R3470184-2 11/08/19 09:02

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	<u>LCS Qualifier</u>
Bromide	40.0	38.5	96.3	80.0-120	
Chloride	40.0	39.2	97.9	80.0-120	
Fluoride	8.00	7.85	98.1	80.0-120	
Nitrate	8.00	8.08	101	80.0-120	
Nitrite	8.00	7.84	98.0	80.0-120	
Sulfate	40.0	38.0	95.0	80.0-120	

L1158641-04 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1158641-04 11/08/19 19:02 • (MS) R3470184-5 11/08/19 20:30 • (MSD) R3470184-7 11/08/19 20:48

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	<u>MS Qualifier</u>	<u>MSD Qualifier</u>	RPD %	RPD Limits %
Bromide	50.0	U	46.7	47.1	93.5	94.1	1	80.0-120			0.657	15
Fluoride	5.00	0.0551	5.03	5.02	99.5	99.2	1	80.0-120			0.277	15
Nitrate	5.00	2.24	7.31	7.34	102	102	1	80.0-120			0.441	15
Nitrite	5.00	U	5.18	5.16	104	103	1	80.0-120			0.421	15
Sulfate	50.0	16.6	64.8	65.0	96.4	96.9	1	80.0-120			0.351	15

L1158618-02 Original Sample (OS) • Matrix Spike (MS)

(OS) L1158618-02 11/08/19 21:23 • (MS) R3470184-6 11/08/19 21:41

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MS Rec. %	Dilution	Rec. Limits %	<u>MS Qualifier</u>
Bromide	50.0	U	41.5	82.9	1	80.0-120	
Chloride	50.0	1.34	49.0	95.3	1	80.0-120	
Fluoride	5.00	0.555	5.26	94.2	1	80.0-120	
Nitrate	5.00	1.35	5.97	92.5	1	80.0-120	
Nitrite	5.00	U	4.90	98.1	1	80.0-120	
Sulfate	50.0	45.2	89.4	88.5	1	80.0-120	

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc



Method Blank (MB)

(MB) R3471788-1 11/14/19 01:55

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Arsenic,Dissolved	U		0.00650	0.0100
Barium,Dissolved	U		0.00170	0.00500
Cadmium,Dissolved	U		0.000700	0.00200
Calcium,Dissolved	U		0.0463	1.00
Chromium,Dissolved	U		0.00140	0.0100
Copper,Dissolved	U		0.00530	0.0100
Iron,Dissolved	U		0.0141	0.100
Lead,Dissolved	U		0.00190	0.00500
Magnesium,Dissolved	U		0.0111	1.00
Manganese,Dissolved	U		0.00120	0.0100
Potassium,Dissolved	U		0.102	1.00
Selenium,Dissolved	U		0.00740	0.0100
Silver,Dissolved	U		0.00280	0.00500
Sodium,Dissolved	U		0.0985	1.00

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3471788-2 11/14/19 01:58 • (LCSD) R3471788-3 11/14/19 02:00

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Arsenic,Dissolved	1.00	0.957	0.944	95.7	94.4	80.0-120			1.41	20
Barium,Dissolved	1.00	1.01	1.00	101	100	80.0-120			0.788	20
Cadmium,Dissolved	1.00	0.962	0.957	96.2	95.7	80.0-120			0.464	20
Calcium,Dissolved	10.0	9.69	9.56	96.9	95.6	80.0-120			1.28	20
Chromium,Dissolved	1.00	0.968	0.960	96.8	96.0	80.0-120			0.791	20
Copper,Dissolved	1.00	0.971	0.957	97.1	95.7	80.0-120			1.47	20
Iron,Dissolved	10.0	9.62	9.45	96.2	94.5	80.0-120			1.86	20
Lead,Dissolved	1.00	0.969	0.959	96.9	95.9	80.0-120			1.03	20
Magnesium,Dissolved	10.0	9.98	9.80	99.8	98.0	80.0-120			1.83	20
Manganese,Dissolved	1.00	0.963	0.949	96.3	94.9	80.0-120			1.41	20
Potassium,Dissolved	10.0	9.82	9.60	98.2	96.0	80.0-120			2.27	20
Selenium,Dissolved	1.00	0.970	0.963	97.0	96.3	80.0-120			0.726	20
Silver,Dissolved	0.200	0.186	0.182	93.0	91.1	80.0-120			2.08	20
Sodium,Dissolved	10.0	9.84	9.72	98.4	97.2	80.0-120			1.21	20



L1158590-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1158590-01 11/14/19 02:03 • (MS) R3471788-5 11/14/19 02:08 • (MSD) R3471788-6 11/14/19 02:11

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Arsenic,Dissolved	1.00	ND	1.00	0.998	100	99.8	1	75.0-125			0.619	20
Barium,Dissolved	1.00	0.0595	1.06	1.05	100	99.4	1	75.0-125			0.650	20
Cadmium,Dissolved	1.00	ND	0.990	0.983	99.0	98.3	1	75.0-125			0.685	20
Calcium,Dissolved	10.0	47.0	56.2	56.3	92.3	93.7	1	75.0-125			0.251	20
Chromium,Dissolved	1.00	ND	0.945	0.948	94.5	94.8	1	75.0-125			0.354	20
Copper,Dissolved	1.00	ND	0.984	0.961	98.4	96.1	1	75.0-125			2.35	20
Iron,Dissolved	10.0	ND	9.65	9.59	96.5	95.9	1	75.0-125			0.640	20
Lead,Dissolved	1.00	ND	0.980	0.978	98.0	97.8	1	75.0-125			0.243	20
Magnesium,Dissolved	10.0	54.5	63.7	64.6	92.2	101	1	75.0-125			1.41	20
Manganese,Dissolved	1.00	ND	0.947	0.943	94.7	94.3	1	75.0-125			0.443	20
Potassium,Dissolved	10.0	5.45	15.1	15.1	96.1	96.6	1	75.0-125			0.303	20
Selenium,Dissolved	1.00	0.0114	1.02	1.02	101	101	1	75.0-125			0.0243	20
Silver,Dissolved	0.200	ND	0.193	0.189	96.4	94.3	1	75.0-125			2.22	20
Sodium,Dissolved	10.0	271	281	284	104	126	1	75.0-125		V	0.782	20

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc

Method Blank (MB)

(MB) R3471798-1 11/13/19 15:47

	MB Result	<u>MB Qualifier</u>	MB MDL	MB RDL
Analyte	mg/l		mg/l	mg/l
Methane	U		0.00291	0.0100
Ethane	U		0.00407	0.0130
Ethene	U		0.00426	0.0130
Propane	U		0.00548	0.0190

L1158590-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1158590-01 11/13/19 16:04 • (DUP) R3471798-2 11/13/19 16:27

	Original Result	DUP Result	Dilution	DUP RPD	<u>DUP Qualifier</u>	DUP RPD Limits
Analyte	mg/l	mg/l		%		%
Methane	ND	0.000	1	0.000		20
Ethane	ND	0.000	1	0.000		20
Ethene	ND	0.000	1	0.000		20
Propane	ND	0.000	1	0.000		20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3471798-3 11/13/19 16:56 • (LCSD) R3471798-4 11/13/19 16:59

	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	<u>LCS Qualifier</u>	<u>LCSD Qualifier</u>	RPD	RPD Limits
Analyte	mg/l	mg/l	mg/l	%	%	%			%	%
Methane	0.0678	0.0653	0.0687	96.3	101	85.0-115			5.07	20
Ethane	0.129	0.125	0.128	96.9	99.2	85.0-115			2.37	20
Ethene	0.127	0.120	0.123	94.5	96.9	85.0-115			2.47	20
Propane	0.186	0.180	0.186	96.8	100	85.0-115			3.28	20

1

Cp

2

Tc

3

Ss

4

Cn

5

Sr

6

Qc

7

Gl

8

Al

9

Sc



Method Blank (MB)

(MB) R3470540-2 11/09/19 23:46

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Benzene	U		0.000331	0.00100
Ethylbenzene	U		0.000384	0.00100
Methyl tert-butyl ether	U		0.000367	0.00100
Toluene	U		0.000412	0.00100
Xylenes, Total	U		0.00106	0.00300
(S) Toluene-d8	106			80.0-120
(S) 4-Bromofluorobenzene	90.3			77.0-126
(S) 1,2-Dichloroethane-d4	102			70.0-130

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc

Laboratory Control Sample (LCS)

(LCS) R3470540-1 11/09/19 22:45

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Benzene	0.00500	0.00582	116	70.0-123	
Ethylbenzene	0.00500	0.00466	93.2	79.0-123	
Methyl tert-butyl ether	0.00500	0.00509	102	68.0-125	
Toluene	0.00500	0.00526	105	79.0-120	
Xylenes, Total	0.0150	0.0143	95.3	79.0-123	
(S) Toluene-d8			106	80.0-120	
(S) 4-Bromofluorobenzene			93.2	77.0-126	
(S) 1,2-Dichloroethane-d4			101	70.0-130	



Method Blank (MB)

(MB) R3470608-2 11/09/19 15:55

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Benzene	U		0.000331	0.00100
Ethylbenzene	U		0.000384	0.00100
Methyl tert-butyl ether	U		0.000367	0.00100
Toluene	U		0.000412	0.00100
Xylenes, Total	U		0.00106	0.00300
(S) Toluene-d8	105			80.0-120
(S) 4-Bromofluorobenzene	94.6			77.0-126
(S) 1,2-Dichloroethane-d4	116			70.0-130

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3470608-1 11/09/19 14:58 • (LCSD) R3470608-3 11/09/19 16:48

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Benzene	0.00500	0.00528	0.00565	106	113	70.0-123			6.77	20
Ethylbenzene	0.00500	0.00477	0.00524	95.4	105	79.0-123			9.39	20
Methyl tert-butyl ether	0.00500	0.00533	0.00593	107	119	68.0-125			10.7	20
Toluene	0.00500	0.00502	0.00539	100	108	79.0-120			7.11	20
Xylenes, Total	0.0150	0.0144	0.0158	96.0	105	79.0-123			9.27	20
(S) Toluene-d8				102	101	80.0-120				
(S) 4-Bromofluorobenzene				97.8	96.9	77.0-126				
(S) 1,2-Dichloroethane-d4				117	123	70.0-130				

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc



Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

MDL	Method Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state "ND" (Not Detected) or "BDL" (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL).
J	The identification of the analyte is acceptable; the reported value is an estimate.
J3	The associated batch QC was outside the established quality control range for precision.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.
P1	RPD value not applicable for sample concentrations less than 5 times the reporting limit.
T8	Sample(s) received past/too close to holding time expiration.
V	The sample concentration is too high to evaluate accurate spike recoveries.

1	Cp
2	Tc
3	Ss
4	Cn
5	Sr
6	Qc
7	Gl
8	Al
9	Sc



Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico ¹	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina ¹	DW21704
Georgia	NELAP	North Carolina ³	41
Georgia ¹	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LA000356
Kentucky ^{1 6}	90010	South Carolina	84004
Kentucky ²	16	South Dakota	n/a
Louisiana	AI30792	Tennessee ^{1 4}	2006
Louisiana ¹	LA180010	Texas	T104704245-18-15
Maine	TN0002	Texas ⁵	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

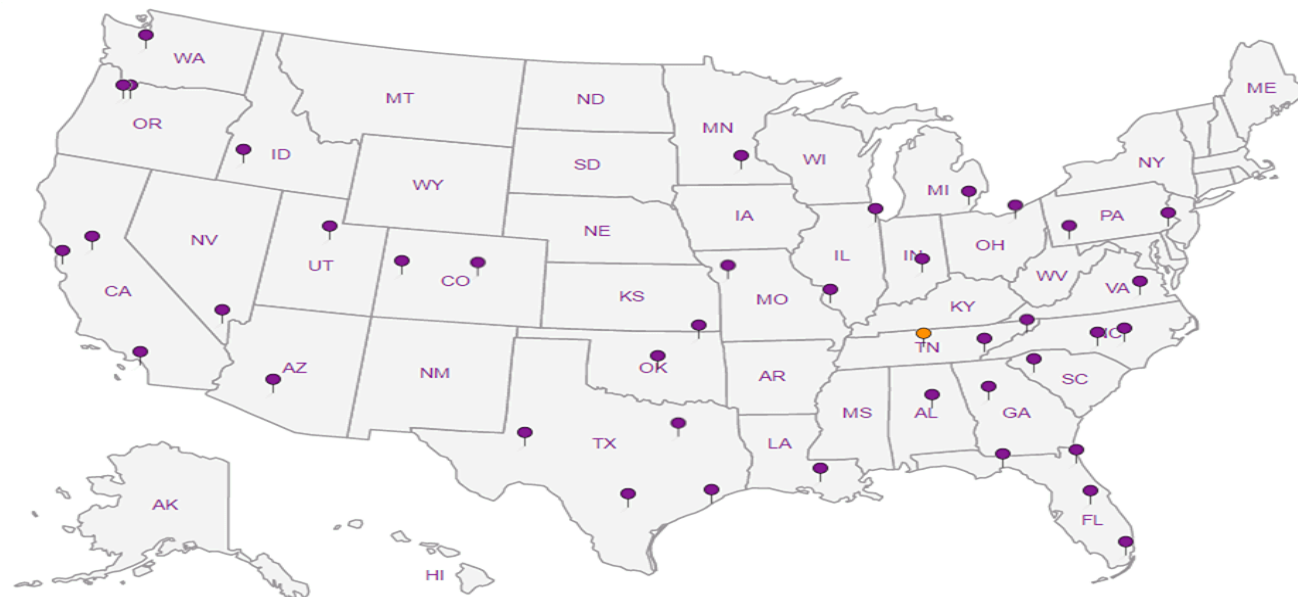
Third Party Federal Accreditations

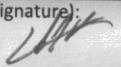
A2LA – ISO 17025	1461.01	AIHA-LAP, LLC EMLAP	100789
A2LA – ISO 17025 ⁵	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

¹ Drinking Water ² Underground Storage Tanks ³ Aquatic Toxicity ⁴ Chemical/Microbiological ⁵ Mold ⁶ Wastewater n/a Accreditation not applicable

Our Locations

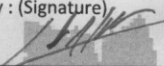
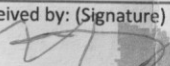
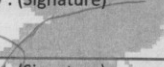
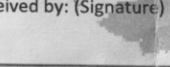
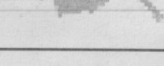
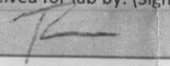
Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.



Company Name/Address: Caerus 143 Diamond Avenue Parachute, CO 81635				Billing Information: Caerus				Analysis / Container / Preservative										Chain of Custody Page ____ of ____  L.A.B S.C.I.E.N.C.E.S YOUR LAB OF CHOICE 12065 Lebanon Rd Mount Juliet, TN 37122 Phone: 615-758-5858 Phone: 800-767-5859 Fax: 615-758-5859 			
Report to: Blair Rollins				Email To: brollins@caerusoilandgas.com																	
Project NPR 4thq Description:				City/State Collected:																	
Phone: Fax:		Client Project # NPR QRT		Lab Project #																	
Collected by (print): MK <i>CHANCE HOLDER</i>		Site/Facility ID # NPR		P.O. #																	
Collected by (signature): 		Rush? (Lab MUST Be Notified) ___ Same Day 200% ___ Next Day 100% ___ Two Day 50% ___ Three Day 25%		Date Results Needed		Email? ___ No ☒ Yes FAX? ___ No ___ Yes		No. of Cntrs													
Immediately Packed on Ice N ___ Y ☒																					
Sample ID		Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	ALK/ALKBI/ALKCA	Br,Cl,F,SO4,NO2,NO3	Dissolved Metals (See Remarks)	Ammonia (H2SO4)	RSK175 (HCL)	Sulfide (NaOH+ZnAc)	BTEXM (8260)(HCL)	pH/SPCOND/TDS	Rem./Contaminant	Sample # (lab only)				
20191107 - NPR 1st		Grab	GW	-	11/7/19	930	12	X	X	X	X	X	X	X	X			-01			
20191107 - NPR 2st						1000	12	X	X	X	X	X	X	X	X			02			
20191107 - NPR 3sp						1015	13	X	X	X	X	X	X	X	X			03			
20191107 - NPR 6st						1030	13	X	X	X	X	X	X	X	X			04			
~~20191107 - NPR 2MW~~						~~1100~~	~~12~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~						
20191107 - NPR 3MW						1115	12	X	X	X	X	X	X	X	X			05			
20191107 - NPR 3st						1145	12	X	X	X	X	X	X	X	X			06			
20191107 - NPR 4MW						1200	12	X	X	X	X	X	X	X	X			07			
20191107 - NPR 13MW						1230	12	X	X	X	X	X	X	X	X			08			
20191107 - NPR 11st						1345	12	X	X	X	X	X	X	X	X			09			

* Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other Surface Water

Remarks: **Metals-As,Ba,Cd,Cr,Cu,Pb,Ag,Ca,Fe,K,Mg,Mn,Na,Se**

Relinquished by: (Signature) 		Date: 11/7/19	Time: 1800	Received by: (Signature) 		Samples returned via: ☐ UPS ☒ FedEx ☐ Courier ☐ _____		Condition: (lab use only) RAD SCREEN 0.5 MP/hr	
Relinquished by: (Signature) 		Date: 11/6/19	Time: 1700	Received by: (Signature) 		Temp: _____ °C Bottles Received: _____ 03-1-023 122		COC Seal Intact: ___ Y ___ N ☒ NA	
Relinquished by: (Signature) 		Date:	Time:	Received for lab by: (Signature) 		Date: 11-8-14		Time: 0845	

Pace Analytical National Center for Testing & Innovation
Cooler Receipt Form

Client: <i>Caerus</i>	<i>L1158611</i>
Cooler Received/Opened On: 11 /12 /19	Temperature: <i>2</i>
Received By: Tanner Windham	
Signature: <i>[Signature]</i>	

Receipt Check List	NP	Yes	No
COC Seal Present / Intact?	<i>✓</i>	<i>✓</i>	
COC Signed / Accurate?		<i>✓</i>	
Bottles arrive intact?		<i>✓</i>	
Correct bottles used?		<i>✓</i>	
Sufficient volume sent?		<i>✓</i>	
If Applicable			
VOA Zero headspace?		<i>✓</i>	
Preservation Correct / Checked?		<i>✓</i>	

Chris Hines
EnCana Oil & Gas Inc. - CO
2717 County Road 215, Suite 100
Parachute, CO 81635

Report Summary

Friday May 20, 2011

Report Number: L516540

Samples Received: 05/18/11

Client Project:

Description: A15 Pit

The analytical results in this report are based upon information supplied by you, the client, and are for your exclusive use. If you have any questions regarding this data package, please do not hesitate to call.

Entire Report Reviewed By:


Jarred Willis , ESC Representative

Laboratory Certification Numbers

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - I-2327, CT - PH-0197, FL - E87487
GA - 923, IN - C-TN-01, KY - 90010, KYUST - 0016, NC - ENV375/DW21704, ND - R-140
NJ - TN002, NJ NELAP - TN002, SC - 84004, TN - 2006, VA - 00109, WV - 233
AZ - 0612, MN - 047-999-395, NY - 11742, WI - 998093910, NV - TN000032008A,
TX - T104704245, OK-9915

Accreditation is only applicable to the test methods specified on each scope of accreditation held by ESC Lab Sciences.

Note: The use of the preparatory EPA Method 3511 is not approved or endorsed by the CA ELAP.

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12065 Lebanon Rd.
Mt. Juliet, TN 37122
(615) 758-5858
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Fax (615) 758-5859

Tax I.D. 62-0814289

Est. 1970

REPORT OF ANALYSIS

Chris Hines
EnCana Oil & Gas Inc. - CO
2717 County Road 215, Suite 100
Parachute, CO 81635

May 20, 2011

Date Received : May 18, 2011
Description : A15 Pit
Sample ID : A15-BG-S-051711
Collected By : Bob Stockton
Collection Date : 05/17/11 11:51

ESC Sample # : L516540-01

Site ID : A15

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Arsenic	18.	5.0	mg/kg	6010B	05/18/11	5

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

The reported analytical results relate only to the sample submitted.

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Reported: 05/20/11 16:20 Printed: 05/20/11 16:21



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REPORT OF ANALYSIS

Chris Hines
EnCana Oil & Gas Inc. - CO
2717 County Road 215, Suite 100
Parachute, CO 81635

May 20, 2011

Date Received : May 18, 2011
Description : A15 Pit
Sample ID : A15-BG-E-051711
Collected By : Bob Stockton
Collection Date : 05/17/11 12:02

ESC Sample # : L516540-02

Site ID : A15

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Arsenic	15.	5.0	mg/kg	6010B	05/18/11	5

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

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REPORT OF ANALYSIS

Chris Hines
EnCana Oil & Gas Inc. - CO
2717 County Road 215, Suite 100
Parachute, CO 81635

May 20, 2011

Date Received : May 18, 2011
Description : A15 Pit
Sample ID : A15-BG-NE-051711
Collected By : Bob Stockton
Collection Date : 05/17/11 12:10

ESC Sample # : L516540-03

Site ID : A15

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Arsenic	11.	1.0	mg/kg	6010B	05/18/11	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

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Reported: 05/20/11 16:20 Printed: 05/20/11 16:21



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REPORT OF ANALYSIS

Chris Hines
EnCana Oil & Gas Inc. - CO
2717 County Road 215, Suite 100
Parachute, CO 81635

May 20, 2011

Date Received : May 18, 2011
Description : A15 Pit
Sample ID : A15-BG-N-051711
Collected By : Bob Stockton
Collection Date : 05/17/11 12:21

ESC Sample # : L516540-04

Site ID : A15

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Arsenic	19.	5.0	mg/kg	6010B	05/18/11	5

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

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Reported: 05/20/11 16:20 Printed: 05/20/11 16:21



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REPORT OF ANALYSIS

Chris Hines
EnCana Oil & Gas Inc. - CO
2717 County Road 215, Suite 100
Parachute, CO 81635

May 20, 2011

Date Received : May 18, 2011
Description : A15 Pit

Sample ID : A15-BG-NW-051711

Collected By : Bob Stockton
Collection Date : 05/17/11 11:33

ESC Sample # : L516540-05

Site ID : A15

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Arsenic	16.	5.0	mg/kg	6010B	05/18/11	5

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

The reported analytical results relate only to the sample submitted.

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Reported: 05/20/11 16:20 Printed: 05/20/11 16:21

REPORT OF ANALYSIS

Chris Hines
EnCana Oil & Gas Inc. - CO
2717 County Road 215, Suite 100
Parachute, CO 81635

May 20, 2011

Date Received : May 18, 2011
Description : A15 Pit

Sample ID : A15-SPOIL-051711

Collected By : Bob Stockton
Collection Date : 05/17/11 13:04

ESC Sample # : L516540-06

Site ID : A15

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Chromium, Hexavalent	BDL	2.0	mg/kg	3060A/7196A	05/20/11	1
Chromium, Trivalent	19.	2.0	mg/kg	Calc.	05/19/11	1
ORP	120		mV	2580	05/19/11	1
pH	8.0		su	9045D	05/20/11	1
Sodium Adsorption Ratio	5.1			Calc.	05/19/11	1
Specific Conductance	1200		umhos/cm	9050AMod	05/20/11	1
Mercury	0.074	0.020	mg/kg	7471	05/19/11	1
Arsenic	15.	1.0	mg/kg	6010B	05/19/11	1
Barium	5900	1.2	mg/kg	6010B	05/19/11	5
Cadmium	0.28	0.25	mg/kg	6010B	05/19/11	1
Chromium	19.	0.50	mg/kg	6010B	05/19/11	1
Copper	19.	1.0	mg/kg	6010B	05/19/11	1
Lead	14.	0.25	mg/kg	6010B	05/19/11	1
Nickel	12.	5.0	mg/kg	6010B	05/19/11	5
Selenium	BDL	1.0	mg/kg	6010B	05/19/11	1
Silver	BDL	0.50	mg/kg	6010B	05/19/11	1
Zinc	68.	7.5	mg/kg	6010B	05/19/11	5
Benzene	BDL	0.0025	mg/kg	8021/8015	05/18/11	5
Toluene	BDL	0.025	mg/kg	8021/8015	05/18/11	5
Ethylbenzene	BDL	0.0025	mg/kg	8021/8015	05/18/11	5
Total Xylene	BDL	0.0075	mg/kg	8021/8015	05/18/11	5
TPH (GC/FID) Low Fraction	BDL	0.50	mg/kg	GR0	05/18/11	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	101.		% Rec.	8021/8015	05/18/11	5
a,a,a-Trifluorotoluene(PID)	105.		% Rec.	8021/8015	05/18/11	5
TPH (GC/FID) High Fraction	57.	4.0	mg/kg	3546/DR0	05/19/11	1
Surrogate recovery(%)						
o-Terphenyl	80.1		% Rec.	3546/DR0	05/19/11	1
Polynuclear Aromatic Hydrocarbons						
Anthracene	BDL	0.0060	mg/kg	8270C-SIM	05/19/11	1
Acenaphthene	BDL	0.0060	mg/kg	8270C-SIM	05/19/11	1
Acenaphthylene	BDL	0.0060	mg/kg	8270C-SIM	05/19/11	1
Benzo(a)anthracene	BDL	0.0060	mg/kg	8270C-SIM	05/19/11	1
Benzo(a)pyrene	BDL	0.0060	mg/kg	8270C-SIM	05/19/11	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
L516540-06 (PH) - 8.0@21.5c

REPORT OF ANALYSIS

Chris Hines
EnCana Oil & Gas Inc. - CO
2717 County Road 215, Suite 100
Parachute, CO 81635

May 20, 2011

Date Received : May 18, 2011
Description : A15 Pit

Sample ID : A15-SPOIL-051711

Collected By : Bob Stockton
Collection Date : 05/17/11 13:04

ESC Sample # : L516540-06

Site ID : A15

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzo(b)fluoranthene	BDL	0.0060	mg/kg	8270C-SIM	05/19/11	1
Benzo(g,h,i)perylene	BDL	0.0060	mg/kg	8270C-SIM	05/19/11	1
Benzo(k)fluoranthene	BDL	0.0060	mg/kg	8270C-SIM	05/19/11	1
Chrysene	BDL	0.0060	mg/kg	8270C-SIM	05/19/11	1
Dibenz(a,h)anthracene	BDL	0.0060	mg/kg	8270C-SIM	05/19/11	1
Fluoranthene	BDL	0.0060	mg/kg	8270C-SIM	05/19/11	1
Fluorene	0.0065	0.0060	mg/kg	8270C-SIM	05/19/11	1
Indeno(1,2,3-cd)pyrene	BDL	0.0060	mg/kg	8270C-SIM	05/19/11	1
Naphthalene	3.7	0.30	mg/kg	8270C-SIM	05/19/11	50
Phenanthrene	BDL	0.0060	mg/kg	8270C-SIM	05/19/11	1
Pyrene	BDL	0.0060	mg/kg	8270C-SIM	05/19/11	1
1-Methylnaphthalene	0.67	0.30	mg/kg	8270C-SIM	05/19/11	50
2-Methylnaphthalene	1.3	0.30	mg/kg	8270C-SIM	05/19/11	50
2-Chloronaphthalene	BDL	0.30	mg/kg	8270C-SIM	05/19/11	50
Surrogate Recovery						
Nitrobenzene-d5	0.00		% Rec.	8270C-SIM	05/19/11	50
2-Fluorobiphenyl	70.1		% Rec.	8270C-SIM	05/19/11	1
p-Terphenyl-d14	81.0		% Rec.	8270C-SIM	05/19/11	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

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Reported: 05/20/11 16:20 Printed: 05/20/11 16:21
L516540-06 (PH) - 8.0@21.5c

Attachment A
List of Analytes with QC Qualifiers

Sample Number	Work Group	Sample Type	Analyte	Run ID	Qualifier
L516540-06	WG536335	SAMP	Barium	R1694295	V
	WG536335	SAMP	Cadmium	R1694295	J3J6
	WG536335	SAMP	Chromium	R1694295	J6
	WG536335	SAMP	Copper	R1694295	J3
	WG536335	SAMP	Lead	R1694295	J3
	WG536064	SAMP	Nitrobenzene-d5	R1694509	J7

Attachment B
Explanation of QC Qualifier Codes

Qualifier	Meaning
J3	The associated batch QC was outside the established quality control range for precision.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low
J7	Surrogate recovery limits cannot be evaluated; surrogates were diluted out
V	(ESC) - Additional QC Info: The sample concentration is too high to evaluate accurate spike recoveries.

Qualifier Report Information

ESC utilizes sample and result qualifiers as set forth by the EPA Contract Laboratory Program and as required by most certifying bodies including NELAC. In addition to the EPA qualifiers adopted by ESC, we have implemented ESC qualifiers to provide more information pertaining to our analytical results. Each qualifier is designated in the qualifier explanation as either EPA or ESC. Data qualifiers are intended to provide the ESC client with more detailed information concerning the potential bias of reported data. Because of the wide range of constituents and variety of matrices incorporated by most EPA methods, it is common for some compounds to fall outside of established ranges. These exceptions are evaluated and all reported data is valid and useable "unless qualified as 'R' (Rejected)."

Definitions

- Accuracy - The relationship of the observed value of a known sample to the true value of a known sample. Represented by percent recovery and relevant to samples such as: control samples, matrix spike recoveries, surrogate recoveries, etc.
- Precision - The agreement between a set of samples or between duplicate samples. Relates to how close together the results are and is represented by Relative Percent Difference.
- Surrogate - Organic compounds that are similar in chemical composition, extraction, and chromatography to analytes of interest. The surrogates are used to determine the probable response of the group of analytes that are chemically related to the surrogate compound. Surrogates are added to the sample and carried through all stages of preparation and analyses.
- TIC - Tentatively Identified Compound: Compounds detected in samples that are not target compounds, internal standards, system monitoring compounds, or surrogates.

Summary of Remarks For Samples Printed
05/20/11 at 16:21:06

TSR Signing Reports: 358
R3 - Rush: Two Day

Sample: L516540-01 Account: ENCANACO Received: 05/18/11 09:00 Due Date: 05/20/11 00:00 RPT Date: 05/20/11 16:20
Sample: L516540-02 Account: ENCANACO Received: 05/18/11 09:00 Due Date: 05/20/11 00:00 RPT Date: 05/20/11 16:20
Sample: L516540-03 Account: ENCANACO Received: 05/18/11 09:00 Due Date: 05/20/11 00:00 RPT Date: 05/20/11 16:20
Sample: L516540-04 Account: ENCANACO Received: 05/18/11 09:00 Due Date: 05/20/11 00:00 RPT Date: 05/20/11 16:20
Sample: L516540-05 Account: ENCANACO Received: 05/18/11 09:00 Due Date: 05/20/11 00:00 RPT Date: 05/20/11 16:20
Sample: L516540-06 Account: ENCANACO Received: 05/18/11 09:00 Due Date: 05/20/11 00:00 RPT Date: 05/20/11 16:20



YOUR LAB OF CHOICE

EnCana Oil & Gas Inc. - CO
Chris Hines
2717 County Road 215, Suite 100
Parachute, CO 81635

Quality Assurance Report
Level II

L516540

12065 Lebanon Rd.
Mt. Juliet, TN 37122
(615) 758-5858
1-800-767-5859
Fax (615) 758-5859

Tax I.D. 62-0814289

Est. 1970

May 20, 2011

Analyte	Result	Laboratory Blank		Limit	Batch	Date Analyzed
		Units	% Rec			
TPH (GC/FID) High Fraction	< 4	ppm			WG535938	05/19/11 01:05
o-Terphenyl		% Rec.	78.05	50-150	WG535938	05/19/11 01:05
Benzene	< .0005	mg/kg			WG536255	05/18/11 13:49
Ethylbenzene	< .0005	mg/kg			WG536255	05/18/11 13:49
Toluene	< .005	mg/kg			WG536255	05/18/11 13:49
TPH (GC/FID) Low Fraction	< .1	mg/kg			WG536255	05/18/11 13:49
Total Xylene	< .0015	mg/kg			WG536255	05/18/11 13:49
a,a,a-Trifluorotoluene(FID)		% Rec.	101.4	59-128	WG536255	05/18/11 13:49
a,a,a-Trifluorotoluene(PID)		% Rec.	105.9	54-144	WG536255	05/18/11 13:49
Arsenic	< 1	mg/kg			WG536186	05/18/11 20:37
Mercury	< .02	mg/kg			WG536285	05/19/11 10:05
Arsenic	< 1	mg/kg			WG536335	05/19/11 12:12
Barium	< .25	mg/kg			WG536335	05/19/11 12:12
Cadmium	< .25	mg/kg			WG536335	05/19/11 12:12
Chromium	< .5	mg/kg			WG536335	05/19/11 12:12
Copper	< 1	mg/kg			WG536335	05/19/11 12:12
Lead	< .25	mg/kg			WG536335	05/19/11 12:12
Nickel	< 1	mg/kg			WG536335	05/19/11 12:12
Selenium	< 1	mg/kg			WG536335	05/19/11 12:12
Silver	< .5	mg/kg			WG536335	05/19/11 12:12
Zinc	< 1.5	mg/kg			WG536335	05/19/11 12:12
1-Methylnaphthalene	< .006	mg/kg			WG536064	05/19/11 14:59
2-Chloronaphthalene	< .006	mg/kg			WG536064	05/19/11 14:59
2-Methylnaphthalene	< .006	mg/kg			WG536064	05/19/11 14:59
Acenaphthene	< .006	mg/kg			WG536064	05/19/11 14:59
Acenaphthylene	< .006	mg/kg			WG536064	05/19/11 14:59
Anthracene	< .006	mg/kg			WG536064	05/19/11 14:59
Benzo(a)anthracene	< .006	mg/kg			WG536064	05/19/11 14:59
Benzo(a)pyrene	< .006	mg/kg			WG536064	05/19/11 14:59
Benzo(b)fluoranthene	< .006	mg/kg			WG536064	05/19/11 14:59
Benzo(g,h,i)perylene	< .006	mg/kg			WG536064	05/19/11 14:59
Benzo(k)fluoranthene	< .006	mg/kg			WG536064	05/19/11 14:59
Chrysene	< .006	mg/kg			WG536064	05/19/11 14:59
Dibenz(a,h)anthracene	< .006	mg/kg			WG536064	05/19/11 14:59
Fluoranthene	< .006	mg/kg			WG536064	05/19/11 14:59
Fluorene	< .006	mg/kg			WG536064	05/19/11 14:59
Indeno(1,2,3-cd)pyrene	< .006	mg/kg			WG536064	05/19/11 14:59
Naphthalene	< .006	mg/kg			WG536064	05/19/11 14:59
Phenanthrene	< .006	mg/kg			WG536064	05/19/11 14:59
Pyrene	< .006	mg/kg			WG536064	05/19/11 14:59
2-Fluorobiphenyl		% Rec.	70.05	21-120	WG536064	05/19/11 14:59
Nitrobenzene-d5		% Rec.	70.29	33-114	WG536064	05/19/11 14:59
p-Terphenyl-d14		% Rec.	86.63	18-142	WG536064	05/19/11 14:59
Specific Conductance	1.40	umhos/cm			WG536551	05/20/11 13:42
Chromium, Hexavalent	< 2	mg/kg			WG536313	05/20/11 13:15

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2717 County Road 215, Suite 100
Parachute, CO 81635

Quality Assurance Report
Level II

L516540

12065 Lebanon Rd.
Mt. Juliet, TN 37122
(615) 758-5858
1-800-767-5859
Fax (615) 758-5859

Tax I.D. 62-0814289

Est. 1970

May 20, 2011

Analyte	Result	Laboratory Blank		Limit	Batch	Date Analyzed
		Units	% Rec			
pH	4.50	su			WG536562	05/20/11 14:20

Analyte	Units	Result	Duplicate	RPD	Limit	Ref Samp	Batch
Arsenic	mg/kg	7.50	7.24	3.93	20	L516518-01	WG536186
Mercury	mg/kg	0.00850	0.00750	12.5	20	L516495-13	WG536285
ORP	mV	62.0	65.0	4.72	20	L515976-09	WG536408
ORP	mV	120.	110.	7.86	20	L515976-23	WG536408
Arsenic	mg/kg	14.0	15.0	5.48	20	L516540-06	WG536335
Cadmium	mg/kg	0.380	0.280	29.0*	20	L516540-06	WG536335
Chromium	mg/kg	22.0	19.0	12.3	20	L516540-06	WG536335
Copper	mg/kg	24.0	19.0	22.8*	20	L516540-06	WG536335
Lead	mg/kg	20.0	14.0	33.8*	20	L516540-06	WG536335
Selenium	mg/kg	0	0	0	20	L516540-06	WG536335
Silver	mg/kg	0	0	0	20	L516540-06	WG536335
Barium	mg/kg	5400	5900	9.78	20	L516540-06	WG536335
Nickel	mg/kg	14.0	12.0	18.2	20	L516540-06	WG536335
Zinc	mg/kg	72.0	68.0	5.44	20	L516540-06	WG536335
Specific Conductance	umhos/cm	260.	240.	7.11	20	L516495-39	WG536551
Specific Conductance	umhos/cm	3000	2800	5.89	20	L516547-04	WG536551
Chromium, Hexavalent	mg/kg	0	0	0	20	L516414-01	WG536313
pH	su	7.70	7.80	1.29*	1	L516495-59	WG536562
pH	su	7.60	7.70	1.31*	1	L516547-04	WG536562

Analyte	Units	Laboratory Control Sample		% Rec	Limit	Batch
		Known Val	Result			
TPH (GC/FID) High Fraction	ppm	60	47.6	79.3	50-150	WG535938
o-Terphenyl				76.87	50-150	WG535938
Benzene	mg/kg	.05	0.0493	98.6	76-113	WG536255
Ethylbenzene	mg/kg	.05	0.0513	103.	78-115	WG536255
Toluene	mg/kg	.05	0.0501	100.	76-114	WG536255
Total Xylene	mg/kg	.15	0.153	102.	81-118	WG536255
a,a,a-Trifluorotoluene(PID)				106.5	54-144	WG536255
TPH (GC/FID) Low Fraction	mg/kg	5.5	6.33	115.	67-135	WG536255
a,a,a-Trifluorotoluene(FID)				109.5	59-128	WG536255
Arsenic	mg/kg	192	165.	85.9	78.6-120.8	WG536186
Mercury	mg/kg	8.77	7.84	89.4	71.6-127.7	WG536285

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Analyte	Units	Laboratory Control Known Val	Sample Result	% Rec	Limit	Batch
ORP	mV	229	220.	96.1	95.6-104.37	WG536408
Arsenic	mg/kg	192	166.	86.5	78.6-120.8	WG536335
Barium	mg/kg	420	366.	87.1	78.8-121.4	WG536335
Cadmium	mg/kg	70.1	61.0	87.0	78.5-121.5	WG536335
Chromium	mg/kg	168	151.	89.9	80.4-120.2	WG536335
Copper	mg/kg	122	112.	91.8	81.6-119.7	WG536335
Lead	mg/kg	113	99.6	88.1	77.3-122.1	WG536335
Nickel	mg/kg	74.1	66.4	89.6	78.8-121.2	WG536335
Selenium	mg/kg	176	156.	88.6	75.6-125.0	WG536335
Silver	mg/kg	115	104.	90.4	66-133.9	WG536335
Zinc	mg/kg	437	384.	87.9	78.5-121.7	WG536335
1-Methylnaphthalene	mg/kg	.033	0.0293	88.9	41-110	WG536064
2-Chloronaphthalene	mg/kg	.033	0.0277	83.9	43-109	WG536064
2-Methylnaphthalene	mg/kg	.033	0.0262	79.3	38-104	WG536064
Acenaphthene	mg/kg	.033	0.0278	84.3	48-103	WG536064
Acenaphthylene	mg/kg	.033	0.0282	85.3	43-106	WG536064
Anthracene	mg/kg	.033	0.0271	82.1	51-110	WG536064
Benzo(a)anthracene	mg/kg	.033	0.0309	93.8	38-126	WG536064
Benzo(a)pyrene	mg/kg	.033	0.0269	81.4	47-118	WG536064
Benzo(b)fluoranthene	mg/kg	.033	0.0258	78.1	47-118	WG536064
Benzo(g,h,i)perylene	mg/kg	.033	0.0291	88.2	40-125	WG536064
Benzo(k)fluoranthene	mg/kg	.033	0.0327	99.1	45-121	WG536064
Chrysene	mg/kg	.033	0.0295	89.5	35-135	WG536064
Dibenz(a,h)anthracene	mg/kg	.033	0.0285	86.3	41-124	WG536064
Fluoranthene	mg/kg	.033	0.0250	75.7	50-114	WG536064
Fluorene	mg/kg	.033	0.0277	83.8	49-109	WG536064
Indeno(1,2,3-cd)pyrene	mg/kg	.033	0.0288	87.1	40-126	WG536064
Naphthalene	mg/kg	.033	0.0251	76.0	36-100	WG536064
Phenanthrene	mg/kg	.033	0.0288	87.2	46-108	WG536064
Pyrene	mg/kg	.033	0.0325	98.5	30-136	WG536064
2-Fluorobiphenyl				74.90	33-114	WG536064
Nitrobenzene-d5				79.99	21-120	WG536064
p-Terphenyl-d14				89.55	18-142	WG536064
Specific Conductance	umhos/cm	556	550.	98.9	85-115	WG536551
Chromium, Hexavalent	mg/kg	132	97.0	73.5	50-150	WG536313
pH	su	6.3	6.30	100.	97.98-102.02	WG536562

Analyte	Units	Laboratory Control Result	Sample Ref	Duplicate %Rec	Limit	RPD	Limit	Batch
TPH (GC/FID) High Fraction	ppm	46.0	47.6	77.0	50-150	3.35	25	WG535938
o-Terphenyl				73.45	50-150			WG535938
Benzene	mg/kg	0.0487	0.0493	97.0	76-113	1.15	20	WG536255
Ethylbenzene	mg/kg	0.0507	0.0513	101.	78-115	1.13	20	WG536255
Toluene	mg/kg	0.0493	0.0501	98.0	76-114	1.80	20	WG536255
Total Xylene	mg/kg	0.152	0.153	101.	81-118	0.990	20	WG536255
a,a,a-Trifluorotoluene(PID)				105.0	54-144			WG536255

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Analyte	Units	Laboratory Control Sample Duplicate			Limit	RPD	Limit	Batch
		Result	Ref	%Rec				
TPH (GC/FID) Low Fraction	mg/kg	6.16	6.33	112.	67-135	2.78	20	WG536255
a,a,a-Trifluorotoluene(FID)				108.6	59-128			WG536255
ORP	mV	220.	220.	96.0	95.6-104.37	0	20	WG536408
1-Methylnaphthalene	mg/kg	0.0315	0.0293	95.0	41-110	7.06	24	WG536064
2-Chloronaphthalene	mg/kg	0.0309	0.0277	94.0	43-109	11.0	21	WG536064
2-Methylnaphthalene	mg/kg	0.0319	0.0262	97.0	38-104	19.8	24	WG536064
Acenaphthene	mg/kg	0.0284	0.0278	86.0	48-103	2.14	20	WG536064
Acenaphthylene	mg/kg	0.0282	0.0282	85.0	43-106	0.0676	20	WG536064
Anthracene	mg/kg	0.0307	0.0271	93.0	51-110	12.5	22	WG536064
Benzo(a)anthracene	mg/kg	0.0297	0.0309	90.0	38-126	4.21	20	WG536064
Benzo(a)pyrene	mg/kg	0.0280	0.0269	85.0	47-118	3.99	20	WG536064
Benzo(b)fluoranthene	mg/kg	0.0341	0.0258	103.	47-118	27.7	29	WG536064
Benzo(g,h,i)perylene	mg/kg	0.0313	0.0291	95.0	40-125	7.21	20	WG536064
Benzo(k)fluoranthene	mg/kg	0.0375	0.0327	114.	45-121	13.7	31	WG536064
Chrysene	mg/kg	0.0328	0.0295	99.0	35-135	10.5	20	WG536064
Dibenz(a,h)anthracene	mg/kg	0.0309	0.0285	94.0	41-124	8.11	20	WG536064
Fluoranthene	mg/kg	0.0281	0.0250	85.0	50-114	11.7	20	WG536064
Fluorene	mg/kg	0.0292	0.0277	89.0	49-109	5.57	19	WG536064
Indeno(1,2,3-cd)pyrene	mg/kg	0.0309	0.0288	94.0	40-126	7.13	20	WG536064
Naphthalene	mg/kg	0.0257	0.0251	78.0	36-100	2.30	24	WG536064
Phenanthrene	mg/kg	0.0288	0.0288	87.0	46-108	0.179	21	WG536064
Pyrene	mg/kg	0.0301	0.0325	91.0	30-136	7.57	20	WG536064
2-Fluorobiphenyl				79.03	33-114			WG536064
Nitrobenzene-d5				77.47	21-120			WG536064
p-Terphenyl-d14				82.71	18-142			WG536064
Specific Conductance	umhos/	550.	550.	99.0	85-115	0	20	WG536551
Chromium, Hexavalent	mg/kg	110.	97.0	83.0	50-150	12.6	20	WG536313
pH	su	6.30	6.30	100.	97.98-102.02	0	20	WG536562

Analyte	Units	Matrix Spike			% Rec	Limit	Ref Samp	Batch
		MS Res	Ref Res	TV				
TPH (GC/FID) High Fraction	ppm	40.1	0	60	66.8	50-150	L515977-42	WG535938
o-Terphenyl					65.54	50-150		WG535938
Benzene	mg/kg	0.193	0.0140	.05	71.4	32-137	L516414-01	WG536255
Ethylbenzene	mg/kg	0.182	0	.05	72.8	10-150	L516414-01	WG536255
Toluene	mg/kg	0.192	0	.05	76.6	20-142	L516414-01	WG536255
Total Xylene	mg/kg	0.557	0	.15	74.2	16-141	L516414-01	WG536255
a,a,a-Trifluorotoluene(PID)	mg/kg				103.9	54-144		WG536255
TPH (GC/FID) Low Fraction	mg/kg	16.2	0	5.5	58.8	55-109	L516414-01	WG536255
a,a,a-Trifluorotoluene(FID)					104.0	59-128		WG536255
Arsenic	mg/kg	51.4	7.24	50	88.3	75-125	L516518-01	WG536186
Mercury	mg/kg	0.256	0.00750	.25	99.4	70-130	L516495-13	WG536285

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Mt. Juliet, TN 37122
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Analyte	Units	MS Res	Matrix Spike		% Rec	Limit	Ref Samp	Batch
			Ref Res	TV				
Arsenic	mg/kg	59.2	15.0	50	88.4	75-125	L516540-06	WG536335
Cadmium	mg/kg	36.9	0.280	50	73.2*	75-125	L516540-06	WG536335
Chromium	mg/kg	56.7	19.0	50	75.4	75-125	L516540-06	WG536335
Copper	mg/kg	64.3	19.0	50	90.6	75-125	L516540-06	WG536335
Lead	mg/kg	57.7	14.0	50	87.4	75-125	L516540-06	WG536335
Selenium	mg/kg	39.4	0	50	78.8	75-125	L516540-06	WG536335
Silver	mg/kg	42.6	0	50	85.2	75-125	L516540-06	WG536335
Barium	mg/kg	5110	5900	10	0*	75-125	L516540-06	WG536335
Nickel	mg/kg	59.3	12.0	10	94.6	75-125	L516540-06	WG536335
Zinc	mg/kg	117.	68.0	10	98.0	75-125	L516540-06	WG536335
1-Methylnaphthalene	mg/kg	0.0521	0.0530	.033	0*	19-131	L516190-07	WG536064
2-Chloronaphthalene	mg/kg	0.0268	0	.033	81.2	38-117	L516190-07	WG536064
2-Methylnaphthalene	mg/kg	0.0370	0.0220	.033	45.5	18-125	L516190-07	WG536064
Acenaphthene	mg/kg	0.0497	0.0320	.033	53.6	31-120	L516190-07	WG536064
Acenaphthylene	mg/kg	0.0295	0	.033	89.4	34-116	L516190-07	WG536064
Anthracene	mg/kg	0.0355	0	.033	108.	32-131	L516190-07	WG536064
Benzo(a)anthracene	mg/kg	0.0267	0	.033	81.0	32-131	L516190-07	WG536064
Benzo(a)pyrene	mg/kg	0.0293	0	.033	88.9	28-130	L516190-07	WG536064
Benzo(b)fluoranthene	mg/kg	0.0292	0	.033	88.4	37-130	L516190-07	WG536064
Benzo(g,h,i)perylene	mg/kg	0.0246	0	.033	74.6	10-134	L516190-07	WG536064
Benzo(k)fluoranthene	mg/kg	0.0313	0	.033	94.7	31-129	L516190-07	WG536064
Chrysene	mg/kg	0.0293	0	.033	88.8	25-137	L516190-07	WG536064
Dibenz(a,h)anthracene	mg/kg	0.0246	0	.033	74.6	20-134	L516190-07	WG536064
Fluoranthene	mg/kg	0.0288	0	.033	87.4	27-138	L516190-07	WG536064
Fluorene	mg/kg	0.0482	0.0320	.033	49.2	26-136	L516190-07	WG536064
Indeno(1,2,3-cd)pyrene	mg/kg	0.0245	0	.033	74.3	16-135	L516190-07	WG536064
Naphthalene	mg/kg	0.0312	0	.033	94.6	22-121	L516190-07	WG536064
Phenanthrene	mg/kg	0.0966	0.0890	.033	23.1*	27-133	L516190-07	WG536064
Pyrene	mg/kg	0.0297	0	.033	90.1	22-133	L516190-07	WG536064
2-Fluorobiphenyl					74.29	33-114		WG536064
Nitrobenzene-d5					95.08	21-120		WG536064
p-Terphenyl-d14					76.08	18-142		WG536064
Chromium, Hexavalent	mg/kg	14.0	0	20	70.0	50-150	L516414-02	WG536313

Analyte	Units	MSD	Matrix Spike Duplicate		Limit	RPD	Limit	Ref Samp	Batch
			Ref	%Rec					
TPH (GC/FID) High Fraction	ppm	39.1	40.1	65.1	50-150	2.55	25	L515977-42	WG535938
o-Terphenyl				62.15	50-150				WG535938
Benzene	mg/kg	0.173	0.193	63.5	32-137	10.9	39	L516414-01	WG536255
Ethylbenzene	mg/kg	0.156	0.182	62.3	10-150	15.6	44	L516414-01	WG536255
Toluene	mg/kg	0.162	0.192	64.9	20-142	16.5	42	L516414-01	WG536255
Total Xylene	mg/kg	0.481	0.557	64.2	16-141	14.5	46	L516414-01	WG536255
a,a,a-Trifluorotoluene(PID)				104.1	54-144				WG536255
TPH (GC/FID) Low Fraction	mg/kg	14.7	16.2	53.4*	55-109	9.56	20	L516414-01	WG536255
a,a,a-Trifluorotoluene(FID)				104.2	59-128				WG536255

Arsenic	mg/kg	51.5	51.4	88.5	75-125	0.194	20	L516518-01	WG536186
Mercury	mg/kg	0.278	0.256	108.	70-130	8.24	20	L516495-13	WG536285

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2717 County Road 215, Suite 100
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Quality Assurance Report
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L516540

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Analyte	Units	MSD	Matrix Spike Duplicate		Limit	RPD	Limit	Ref Samp	Batch
			Ref	%Rec					
Arsenic	mg/kg	55.1	59.2	80.2	75-125	7.17	20	L516540-06	WG536335
Cadmium	mg/kg	37.7	36.9	74.8*	75-125	2.14	20	L516540-06	WG536335
Chromium	mg/kg	56.0	56.7	74.0*	75-125	1.24	20	L516540-06	WG536335
Copper	mg/kg	62.8	64.3	87.6	75-125	2.36	20	L516540-06	WG536335
Lead	mg/kg	55.4	57.7	82.8	75-125	4.07	20	L516540-06	WG536335
Selenium	mg/kg	40.4	39.4	80.8	75-125	2.51	20	L516540-06	WG536335
Silver	mg/kg	43.3	42.6	86.6	75-125	1.63	20	L516540-06	WG536335
Barium	mg/kg	4940	5110	0*	75-125	3.38	20	L516540-06	WG536335
Nickel	mg/kg	56.6	59.3	89.2	75-125	4.66	20	L516540-06	WG536335
Zinc	mg/kg	115.	117.	94.0	75-125	1.72	20	L516540-06	WG536335
1-Methylnaphthalene	mg/kg	0.0742	0.0521	64.3	19-131	35.0*	30	L516190-07	WG536064
2-Chloronaphthalene	mg/kg	0.0307	0.0268	92.9	38-117	13.4	26	L516190-07	WG536064
2-Methylnaphthalene	mg/kg	0.0422	0.0370	61.2	18-125	13.1	29	L516190-07	WG536064
Acenaphthene	mg/kg	0.0657	0.0497	102.	31-120	27.7	30	L516190-07	WG536064
Acenaphthylene	mg/kg	0.0323	0.0295	97.8	34-116	8.96	29	L516190-07	WG536064
Anthracene	mg/kg	0.0359	0.0355	109.	32-131	0.996	26	L516190-07	WG536064
Benzo(a)anthracene	mg/kg	0.0289	0.0267	87.5	32-131	7.71	31	L516190-07	WG536064
Benzo(a)pyrene	mg/kg	0.0302	0.0293	91.5	28-130	2.84	28	L516190-07	WG536064
Benzo(b)fluoranthene	mg/kg	0.0277	0.0292	84.0	37-130	5.19	41	L516190-07	WG536064
Benzo(g,h,i)perylene	mg/kg	0.0239	0.0246	72.4	10-134	3.01	26	L516190-07	WG536064
Benzo(k)fluoranthene	mg/kg	0.0310	0.0313	93.9	31-129	0.862	42	L516190-07	WG536064
Chrysene	mg/kg	0.0301	0.0293	91.2	25-137	2.61	22	L516190-07	WG536064
Dibenz(a,h)anthracene	mg/kg	0.0241	0.0246	72.9	20-134	2.31	25	L516190-07	WG536064
Fluoranthene	mg/kg	0.0278	0.0288	84.1	27-138	3.87	35	L516190-07	WG536064
Fluorene	mg/kg	0.0545	0.0482	68.3	26-136	12.3	30	L516190-07	WG536064
Indeno(1,2,3-cd)pyrene	mg/kg	0.0238	0.0245	72.1	16-135	2.96	26	L516190-07	WG536064
Naphthalene	mg/kg	0.0435	0.0312	132.*	22-121	33.0*	30	L516190-07	WG536064
Phenanthrene	mg/kg	0.142	0.0966	161.*	27-133	38.2*	36	L516190-07	WG536064
Pyrene	mg/kg	0.0321	0.0297	97.2	22-133	7.50	33	L516190-07	WG536064
2-Fluorobiphenyl				91.70	33-114				WG536064
Nitrobenzene-d5				154.4*	21-120				WG536064
p-Terphenyl-d14				75.04	18-142				WG536064
Chromium, Hexavalent	mg/kg	15.0	14.0	75.0	50-150	6.90	20	L516414-02	WG536313

Batch number /Run number / Sample number cross reference

WG535938: R1692609: L516540-06
WG536255: R1692629: L516540-06
WG536186: R1692811: L516540-01 02 03 04 05
WG536285: R1693454: L516540-06
WG536408: R1693790: L516540-06
WG536335: R1694295: L516540-06
WG536378: R1694376: L516540-06
WG536064: R1694509: L516540-06
WG536551: R1694830: L516540-06
WG536313: R1694831: L516540-06
WG536562: R1694969: L516540-06

* * Calculations are performed prior to rounding of reported values.

* Performance of this Analyte is outside of established criteria.

For additional information, please see Attachment A 'List of Analytes with QC Qualifiers.'



YOUR LAB OF CHOICE

EnCana Oil & Gas Inc. - CO
Chris Hines
2717 County Road 215, Suite 100

Parachute, CO 81635

Quality Assurance Report
Level II

L516540

12065 Lebanon Rd.
Mt. Juliet, TN 37122
(615) 758-5858
1-800-767-5859
Fax (615) 758-5859

Tax I.D. 62-0814289

Est. 1970

May 20, 2011

The data package includes a summary of the analytic results of the quality control samples required by the SW-846 or CWA methods. The quality control samples include a method blank, a laboratory control sample, and the matrix spike/matrix spike duplicate analysis. If a target parameter is outside the method limits, every sample that is effected is flagged with the appropriate qualifier in Appendix B of the analytic report.

Method Blank - an aliquot of reagent water carried through the entire analytic process. The method blank results indicate if any possible contamination exposure during the sample handling, digestion or extraction process, and analysis. Concentrations of target analytes above the reporting limit in the method blank are qualified with the "B" qualifier.

Laboratory Control Sample - is a sample of known concentration that is carried through the digestion/extraction and analysis process. The percent recovery, expressed as a percentage of the theoretical concentration, has statistical control limits indicating that the analytic process is "in control". If a target analyte is outside the control limits for the laboratory control sample or any other control sample, the parameter is flagged with a "J4" qualifier for all effected samples.

Matrix Spike and Matrix Spike Duplicate - is two aliquots of an environmental sample that is spiked with known concentrations of target analytes. The percent recovery of the target analytes also has statistical control limits. If any recoveries that are outside the method control limits, the sample that was selected for matrix spike/matrix spike duplicate analysis is flagged with either a "J5" or a "J6". The relative percent difference (%RPD) between the matrix spike and the matrix spike duplicate recoveries is all calculated. If the RPD is above the method limit, the effected samples are flagged with a "J3" qualifier.