STATE OF COLORADO

Arauza - DNR, Steven <steven.arauza@state.co.us>

Doc #1727812
Spill/Release ID #464855
6/21/2019

P27 Point of Release (POR) Results

Arauza - DNR, Steven <steven.arauza@state.co.us> Fri, Jun 21, 2019 at 4:04 PM
To: Jake Janicek <JJanicek@caerusoilandgas.com>
Cc: Brett Middleton <bmiddleton@caerusoilandgas.com>, Lindsey Rider <lrider@caerusoilandgas.com>, Shawn King <sking@caerusoilandgas.com>, Kris Gibson <kgibson@caerusoilandgas.com>, Chad Tompkins <ctompkins@caerusoilandgas.com>, Jake Janicek <JJanicek@caerusoilandgas.com>

Hi Jake,

Thank you for answering my additional questions.

Based on the information provided, the COGCC approves of your request for a reduced analyte suite (TPH, benzene, SAR) under the condition that arsenic exceedances are also addressed by confirmation sampling or by "demonstration that that the Table 910-1 level is exceeded by the background level in native soils," pursuant to FAQ 31.

Please submit the complete laboratory report for the 20190603 P27 samples along with the standard soil sampling documentation (sample location diagram and analytical summary table) as attachments to a Supplemental eForm 19. I will upload a copy of this email to the file for Spill/Release ID #464855 to document COGCC approval of the reduced analyte suite.

Thank you,
Steven J. Arauza, P.G.
Environmental Protection Specialist

COLORADO
Oil & Gas Conservation Commission
Department of Natural Resources

P 303.894.2100, ext. 5689 | C 720.498.5298
818 Taughenbaugh Blvd, Suite 103, Rifle, CO 81650
steven.arauza@state.co.us | www.colorado.gov/cogcc

On Thu, Jun 20, 2019 at 3:16 PM Jake Janicek <JJanicek@caerusoilandgas.com> wrote:

> Steven,
>
> Answers to your questions are below in red.
>
> Jake
>
> Jake Janicek
>
> EHS Lead
>
> 143 Diamond Ave. Parachute, CO 81635
>
> Office: 970-285-2720 | Mobile: 970-778-2314 | jjanicek@caerusoiland gas.com

From: Arauza - DNR, Steven <steven.arauza@state.co.us>
Sent: Tuesday, June 18, 2019 4:43 PM
To: Jake Janicek <JJanicek@caerusoilandgas.com>
Cc: Brett Middleton <bmiddleton@caerusoilandgas.com>; Lindsey Rider <lrider@caerusoilandgas.com>; Shawn King <sking@caerusoilandgas.com>; Kris Gibson <kgibson@caerusoilandgas.com>; Chad Tompkins <ctompkins@caerusoilandgas.com>
Subject: Re: P27 Point of Release (POR) Results

Hi Jake,

Thank you for providing the analytical data. I'd like some more information to determine whether or not to proceed with the requested reduced analytical suite:

- Does Caerus have an estimate for the volumes of condensate and produced water released? No
- What was the depth of the POR sample? ~5' below pad surface which is the elevation of the failed flowline.
- What is the current extent of the excavation? ~20' long x 10' wide x 5' depth
- Is there any staining, sheen, or odor observed in the excavation currently? No
- When does Caerus anticipate collecting confirmation samples (is additional excavation required)? Next Tuesday (6/25)

Please advise.

Steven J. Arauza, P.G.
Environmental Protection Specialist

COLORADO
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Department of Natural Resources

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818 Taughenbaugh Blvd, Suite 103, Rifle, CO 81650
steven.arauza@state.co.us | www.colorado.gov/cogcc

On Mon, Jun 17, 2019 at 12:01 PM Jake Janicek <JJanicek@caerusoilandgas.com> wrote:

> Steven,
>
> I wanted to send you a project update concerning the P27 Flowline Release (COGCC Spill/Release Point ID 464855) remediation. Today, we received the attached results from the sample (20190603-P27 POR) collected from the POR on 6/3. Laboratory analysis of the POR sample indicate SAR, TPH, and benzene exceedances. All other analyte results were compliant with COGCC Table 910-1 Concentration Levels. Based on these results, we request a reduced list of analytes (TPH, benzene, and SAR only) that future confirmation soil samples we collect have to comply with.
>
> Please let us know if you approve of this approach.
>
> Thanks
>
> Jake
>
> Jake Janicek
>
> EHS Lead
>
> 143 Diamond Ave. Parachute, CO 81635
>
> Office: 970-285-2720 | Mobile: 970-778-2314 | jjanicek@caerusoiland gas.com
>
> CAERUS OIL AND GAS LLC
>
>

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National Center for Testing & Innovation

ANALYTICAL REPORT

June 14, 2019

Caerus Oil and Gas

Sample Delivery Group:	L1104846
Samples Received:	06/04/2019
Project Number:	
Description:	P27 flowline
Site:	P27
Report To:	Blair Rollins 143 Diamond Avenue Parachute, CO 81635

Entire Report Reviewed By: Chris Ward

Chris Ward
Project Manager

TABLE OF CONTENTS

20190603-P27 POR L1104846-01 Solid

Collected by: Blair K. Rollins
Collected date/time: 06/03/19 10:30
Received date/time: 06/04/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1291737	1	06/10/19 00:15	06/10/19 00:15	CCE	Mt. Juliet, TN
Calculated Results	WG1291114	1	06/05/19 08:52	06/11/19 16:40	JIC	Mt. Juliet, TN
Wet Chemistry by Method 3060A/7196A	WG1292731	1	06/11/19 11:00	06/11/19 16:40	JIC	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1291121	1	06/05/19 11:44	06/05/19 12:30	ANP	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1292564	1	06/08/19 10:05	06/08/19 12:34	RDW	Mt. Juliet, TN
Mercury by Method 7471A	WG1290920	10	06/04/19 17:25	06/06/19 01:00	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1291114	1	06/05/19 08:52	06/05/19 23:50	TRB	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG1294201	200	06/04/19 13:49	06/11/19 16:27	JAH	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1291703	20	06/04/19 13:49	06/06/19 01:05	BMB	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1293360	200	06/09/19 13:33	06/10/19 08:28	KME	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG1291751	1	06/06/19 11:50	06/07/19 01:52	DMG	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG1291751	20	06/06/19 11:50	06/07/19 09:01	DMG	Mt. Juliet, TN

20190603-P27 STOCK L1104846-02 Solid

Collected by: Blair K. Rollins
Collected date/time: 06/03/19 10:35
Received date/time: 06/04/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1291737	1	06/10/19 00:18	06/10/19 00:18	CCE	Mt. Juliet, TN
Calculated Results	WG1291114	1	06/05/19 08:52	06/14/19 11:45	EEM	Mt. Juliet, TN
Wet Chemistry by Method 3060A/7196A	WG1295621	1	06/14/19 07:19	06/14/19 11:45	EEM	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1291121	1	06/05/19 11:44	06/05/19 12:30	ANP	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1292564	1	06/08/19 10:05	06/08/19 12:34	RDW	Mt. Juliet, TN
Mercury by Method 7471A	WG1290920	1	06/04/19 17:25	06/06/19 00:58	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1291114	1	06/05/19 08:52	06/05/19 23:52	TRB	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG1292649	1	06/04/19 13:49	06/07/19 18:28	BMB	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1291703	1	06/04/19 13:49	06/06/19 01:23	BMB	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1293360	10	06/09/19 13:33	06/10/19 08:14	KME	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG1291751	1	06/06/19 11:50	06/07/19 02:13	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

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	34.3		1	06/10/2019 00:15	WG1291737

Calculated Results

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Chromium,Trivalent	18.9		1.00	1	06/11/2019 16:40	WG1291114

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	06/11/2019 16:40	WG1292731

Wet Chemistry by Method 9045D

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	7.77	T8	1	06/05/2019 12:30	WG1291121

Sample Narrative:

L1104846-01 WG1291121: 7.77 at 24.2C

Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	1900		10.0	1	06/08/2019 12:34	WG1292564

Mercury by Method 7471A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Mercury	1.62		0.200	10	06/06/2019 01:00	WG1290920

Metals (ICP) by Method 6010B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	21.6		2.00	1	06/05/2019 23:50	WG1291114
Barium	3310		0.500	1	06/05/2019 23:50	WG1291114
Cadmium	ND		0.500	1	06/05/2019 23:50	WG1291114
Chromium	18.9		1.00	1	06/05/2019 23:50	WG1291114
Copper	21.9		2.00	1	06/05/2019 23:50	WG1291114
Lead	12.7		0.500	1	06/05/2019 23:50	WG1291114
Nickel	16.7		2.00	1	06/05/2019 23:50	WG1291114
Selenium	ND		2.00	1	06/05/2019 23:50	WG1291114
Silver	ND		1.00	1	06/05/2019 23:50	WG1291114
Zinc	49.3		5.00	1	06/05/2019 23:50	WG1291114

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	1290		20.0	200	06/11/2019 16:27	WG1294201
(S) a,a,a-Trifluorotoluene(FID)	*94.6*		*77.0-120*		*06/11/2019 16:27*	WG1294201

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	0.194		0.0200	20	06/06/2019 01:05	WG1291703
Toluene	6.49	J5	0.100	20	06/06/2019 01:05	WG1291703
Ethylbenzene	1.20		0.0500	20	06/06/2019 01:05	WG1291703
Total Xylenes	44.2	J5 V	0.130	20	06/06/2019 01:05	WG1291703
(S) Toluene-d8	*97.0*		*75.0-131*		*06/06/2019 01:05*	WG1291703
(S) 4-Bromofluorobenzene	*125*		*67.0-138*		*06/06/2019 01:05*	WG1291703
(S) 1,2-Dichloroethane-d4	*118*		*70.0-130*		*06/06/2019 01:05*	WG1291703

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	17800		800	200	06/10/2019 08:28	WG1293360
(S) o-Terphenyl	*0.000*	J7	*18.0-148*		*06/10/2019 08:28*	WG1293360

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Anthracene	0.191		0.00600	1	06/07/2019 01:52	WG1291751
Acenaphthene	0.688		0.120	20	06/07/2019 09:01	WG1291751
Acenaphthylene	ND		0.120	20	06/07/2019 09:01	WG1291751
Benzo(a)anthracene	ND		0.00600	1	06/07/2019 01:52	WG1291751
Benzo(a)pyrene	ND		0.00600	1	06/07/2019 01:52	WG1291751
Benzo(b)fluoranthene	0.00622		0.00600	1	06/07/2019 01:52	WG1291751
Benzo(g,h,i)perylene	ND		0.00600	1	06/07/2019 01:52	WG1291751
Benzo(k)fluoranthene	0.0190		0.00600	1	06/07/2019 01:52	WG1291751
Chrysene	0.0116		0.00600	1	06/07/2019 01:52	WG1291751
Dibenz(a,h)anthracene	ND		0.00600	1	06/07/2019 01:52	WG1291751
Fluoranthene	0.00940		0.00600	1	06/07/2019 01:52	WG1291751
Fluorene	2.12		0.120	20	06/07/2019 09:01	WG1291751
Indeno(1,2,3-cd)pyrene	ND		0.00600	1	06/07/2019 01:52	WG1291751
Naphthalene	8.34		0.400	20	06/07/2019 09:01	WG1291751
Phenanthrene	1.07		0.00600	1	06/07/2019 01:52	WG1291751
Pyrene	0.0289		0.00600	1	06/07/2019 01:52	WG1291751
1-Methylnaphthalene	11.9		0.400	20	06/07/2019 09:01	WG1291751
2-Methylnaphthalene	34.3		0.400	20	06/07/2019 09:01	WG1291751
2-Chloronaphthalene	ND		0.400	20	06/07/2019 09:01	WG1291751
(S) p-Terphenyl-d14	*96.8*	J7	*23.0-120*		*06/07/2019 09:01*	WG1291751
(S) p-Terphenyl-d14	*96.3*		*23.0-120*		*06/07/2019 01:52*	WG1291751
(S) Nitrobenzene-d5	*0.000*	J2	*14.0-149*		*06/07/2019 01:52*	WG1291751
(S) Nitrobenzene-d5	*9430*	J7	*14.0-149*		*06/07/2019 09:01*	WG1291751
(S) 2-Fluorobiphenyl	*0.000*	J2	*34.0-125*		*06/07/2019 01:52*	WG1291751
(S) 2-Fluorobiphenyl	*183*	J7	*34.0-125*		*06/07/2019 09:01*	WG1291751

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	1.15		1	06/10/2019 00:18	WG1291737

Calculated Results

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Chromium,Trivalent	17.5		1.00	1	06/14/2019 11:45	WG1291114

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	06/14/2019 11:45	WG1295621

Wet Chemistry by Method 9045D

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	8.70	T8	1	06/05/2019 12:30	WG1291121

Sample Narrative:

L1104846-02 WG1291121: 8.7 at 23.6C

Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	121		10.0	1	06/08/2019 12:34	WG1292564

Mercury by Method 7471A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Mercury	ND		0.0200	1	06/06/2019 00:58	WG1290920

Metals (ICP) by Method 6010B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	20.4		2.00	1	06/05/2019 23:52	WG1291114
Barium	2830		0.500	1	06/05/2019 23:52	WG1291114
Cadmium	ND		0.500	1	06/05/2019 23:52	WG1291114
Chromium	17.5		1.00	1	06/05/2019 23:52	WG1291114
Copper	23.5		2.00	1	06/05/2019 23:52	WG1291114
Lead	13.7		0.500	1	06/05/2019 23:52	WG1291114
Nickel	19.7		2.00	1	06/05/2019 23:52	WG1291114
Selenium	ND		2.00	1	06/05/2019 23:52	WG1291114
Silver	ND		1.00	1	06/05/2019 23:52	WG1291114
Zinc	46.0		5.00	1	06/05/2019 23:52	WG1291114

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	0.703		0.100	1	06/07/2019 18:28	WG1292649
(S) a,a,a-Trifluorotoluene(FID)	*96.7*		*77.0-120*		*06/07/2019 18:28*	WG1292649

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	0.00309		0.00100	1	06/06/2019 01:23	WG1291703
Toluene	0.0197		0.00500	1	06/06/2019 01:23	WG1291703
Ethylbenzene	0.00769		0.00250	1	06/06/2019 01:23	WG1291703
Total Xylenes	0.132		0.00650	1	06/06/2019 01:23	WG1291703
(S) Toluene-d8	*104*		*75.0-131*		*06/06/2019 01:23*	WG1291703
(S) 4-Bromofluorobenzene	*95.4*		*67.0-138*		*06/06/2019 01:23*	WG1291703
(S) 1,2-Dichloroethane-d4	*99.9*		*70.0-130*		*06/06/2019 01:23*	WG1291703

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	97.5		40.0	10	06/10/2019 08:14	WG1293360
(S) o-Terphenyl	*95.4*		*18.0-148*		*06/10/2019 08:14*	WG1293360

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	06/07/2019 02:13	WG1291751
Acenaphthene	ND		0.00600	1	06/07/2019 02:13	WG1291751
Acenaphthylene	ND		0.00600	1	06/07/2019 02:13	WG1291751
Benzo(a)anthracene	ND		0.00600	1	06/07/2019 02:13	WG1291751
Benzo(a)pyrene	ND		0.00600	1	06/07/2019 02:13	WG1291751
Benzo(b)fluoranthene	ND		0.00600	1	06/07/2019 02:13	WG1291751
Benzo(g,h,i)perylene	ND		0.00600	1	06/07/2019 02:13	WG1291751
Benzo(k)fluoranthene	ND		0.00600	1	06/07/2019 02:13	WG1291751
Chrysene	ND		0.00600	1	06/07/2019 02:13	WG1291751
Dibenz(a,h)anthracene	ND		0.00600	1	06/07/2019 02:13	WG1291751
Fluoranthene	ND		0.00600	1	06/07/2019 02:13	WG1291751
Fluorene	ND		0.00600	1	06/07/2019 02:13	WG1291751
Indeno(1,2,3-cd)pyrene	ND		0.00600	1	06/07/2019 02:13	WG1291751
Naphthalene	0.137		0.0200	1	06/07/2019 02:13	WG1291751
Phenanthrene	0.00754		0.00600	1	06/07/2019 02:13	WG1291751
Pyrene	ND		0.00600	1	06/07/2019 02:13	WG1291751
1-Methylnaphthalene	0.0626		0.0200	1	06/07/2019 02:13	WG1291751
2-Methylnaphthalene	0.180		0.0200	1	06/07/2019 02:13	WG1291751
2-Chloronaphthalene	ND		0.0200	1	06/07/2019 02:13	WG1291751
(S) p-Terphenyl-d14	*95.6*		*23.0-120*		*06/07/2019 02:13*	WG1291751
(S) Nitrobenzene-d5	*79.2*		*14.0-149*		*06/07/2019 02:13*	WG1291751
(S) 2-Fluorobiphenyl	*89.6*		*34.0-125*		*06/07/2019 02:13*	WG1291751

Method Blank (MB)

(MB) R3420084-1 06/11/19 16:38

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

L1104846-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1104846-01 06/11/19 16:40 • (DUP) R3420084-3 06/11/19 16:40

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

L1106840-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1106840-01 06/11/19 17:02 • (DUP) R3420084-8 06/11/19 17:02

Analyte	Original Result (dry) mg/kg	DUP Result (dry) mg/kg	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chromium,Hexavalent	U	0.000	1	0.000		20

Laboratory Control Sample (LCS)

(LCS) R3420084-2 06/11/19 16:38

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Chromium,Hexavalent	24.0	25.2	105	80.0-120	

L1106172-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1106172-03 06/11/19 16:55 • (MS) R3420084-4 06/11/19 16:56 • (MSD) R3420084-5 06/11/19 16:57

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 %
Chromium,Hexavalent	20.0	ND	17.2	17.1	86.0	85.6	1	75.0-125			0.466	20

L1106172-03 Original Sample (OS) • Matrix Spike (MS)

(OS) L1106172-03 06/11/19 16:55 • (MS) R3420084-6 06/11/19 16:57

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Chromium,Hexavalent	708	ND	590	83.4	50	75.0-125	

Method Blank (MB)

(MB) R3421100-1 06/14/19 11:45

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

L1104846-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1104846-02 06/14/19 11:45 • (DUP) R3421100-3 06/14/19 11:45

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

L1105163-25 Original Sample (OS) • Duplicate (DUP)

(OS) L1105163-25 06/14/19 11:55 • (DUP) R3421100-4 06/14/19 11:56

Analyte	Original Result (dry) mg/kg	DUP Result (dry) mg/kg	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chromium,Hexavalent	U	0.000	1	0.000		20

Laboratory Control Sample (LCS)

(LCS) R3421100-2 06/14/19 11:45

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

L1107466-04 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1107466-04 06/14/19 11:56 • (MS) R3421100-5 06/14/19 11:57 • (MSD) R3421100-6 06/14/19 11:57

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 %
Chromium,Hexavalent	20.0	U	21.3	20.8	106	104	1	75.0-125			2.09	20

L1107466-04 Original Sample (OS) • Matrix Spike (MS)

(OS) L1107466-04 06/14/19 11:56 • (MS) R3421100-8 06/14/19 11:57

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Chromium,Hexavalent	701	U	781	111	50	75.0-125	

L1104939-05 Original Sample (OS) • Duplicate (DUP)

(OS) L1104939-05 06/05/19 12:30 • (DUP) R3417988-3 06/05/19 12:30

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	12.5	12.3	1	1.62	J3	1

Sample Narrative:

OS: 12.48 at 26C

DUP: 12.28 at 26C

Laboratory Control Sample (LCS)

(LCS) R3417988-1 06/05/19 12:30

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

Sample Narrative:

LCS: 9.93 at 21.9C

Method Blank (MB)

(MB) R3419147-1 06/08/19 12:34

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

L1104242-18 Original Sample (OS) • Duplicate (DUP)

(OS) L1104242-18 06/08/19 12:34 • (DUP) R3419147-3 06/08/19 12:34

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	2210	2210	1	0.0452		20

L1106137-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1106137-01 06/08/19 12:34 • (DUP) R3419147-4 06/08/19 12:34

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	191	191	1	0.000		20

Laboratory Control Sample (LCS)

(LCS) R3419147-2 06/08/19 12:34

Analyte	Spike Amount umhos/cm	LCS Result umhos/cm	LCS Rec. %	Rec. Limits %	LCS Qualifier
Specific Conductance	445	444	99.8	85.0-115	

Method Blank (MB)

(MB) R3418213-1 06/06/19 00:01

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Mercury	U		0.00280	0.0200

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

(LCS) R3418213-2 06/06/19 00:03 • (LCSD) R3418213-3 06/06/19 00:05

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 %
Mercury	0.300	0.255	0.251	84.9	83.7	80.0-120			1.45	20

L1104270-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1104270-01 06/06/19 00:07 • (MS) R3418213-4 06/06/19 00:09 • (MSD) R3418213-5 06/06/19 00:12

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 %
Mercury	0.363	0.0246	0.302	0.326	76.3	82.9	1	75.0-125			7.61	20

Method Blank (MB)

(MB) R3417982-1 06/05/19 11:56

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

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

(LCS) R3417982-2 06/05/19 11:58 • (LCSD) R3417982-3 06/05/19 12:01

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	99.6	95.8	99.6	95.8	80.0-120			3.90	20
Barium	100	107	101	107	101	80.0-120			6.04	20
Cadmium	100	102	96.4	102	96.4	80.0-120			5.27	20
Chromium	100	103	98.1	103	98.1	80.0-120			5.07	20
Copper	100	100	94.0	100	94.0	80.0-120			6.44	20
Lead	100	103	98.9	103	98.9	80.0-120			3.90	20
Nickel	100	108	103	108	103	80.0-120			4.60	20
Selenium	100	99.8	95.4	99.8	95.4	80.0-120			4.52	20
Silver	20.0	20.9	20.2	104	101	80.0-120			3.22	20
Zinc	100	102	97.7	102	97.7	80.0-120			4.50	20

L1104690-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1104690-01 06/05/19 12:03 • (MS) R3417982-6 06/05/19 12:11 • (MSD) R3417982-7 06/05/19 12:13

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 %
Arsenic	101	6.99	98.9	106	91.0	98.1	1	75.0-125			7.05	20
Barium	101	205	270	307	64.1	101	1	75.0-125	J6		13.1	20
Cadmium	101	ND	93.5	94.1	92.6	93.1	1	75.0-125			0.569	20
Chromium	101	6.26	99.5	103	92.3	95.3	1	75.0-125			3.03	20
Copper	101	33.4	119	129	85.0	94.9	1	75.0-125			8.07	20
Lead	101	5.91	105	106	97.8	99.1	1	75.0-125			1.27	20

L1104690-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1104690-01 06/05/19 12:03 • (MS) R3417982-6 06/05/19 12:11 • (MSD) R3417982-7 06/05/19 12:13

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 %
Nickel	101	22.2	124	128	101	105	1	75.0-125			3.13	20
Selenium	101	ND	93.6	94.3	91.3	92.0	1	75.0-125			0.743	20
Silver	20.2	ND	19.7	19.8	97.6	98.1	1	75.0-125			0.459	20
Zinc	101	11.5	107	109	95.0	96.4	1	75.0-125			1.34	20

Method Blank (MB)

(MB) R3419013-2 06/07/19 12:32

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
TPH (GC/FID) Low Fraction	0.0412	J	0.0217	0.100
(S) a,a,a-Trifluorotoluene(FID)	*104*			*77.0-120*

Laboratory Control Sample (LCS)

(LCS) R3419013-1 06/07/19 12:10

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
TPH (GC/FID) Low Fraction	5.50	6.00	109	72.0-127	
(S) a,a,a-Trifluorotoluene(FID)			*101*	*77.0-120*	

L1104481-05 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1104481-05 06/07/19 17:21 • (MS) R3419013-3 06/07/19 19:34 • (MSD) R3419013-4 06/07/19 19:57

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	7.57	1.21	201	188	106	99.0	25	10.0-151			6.36	28
(S) a,a,a-Trifluorotoluene(FID)					*110*	*106*		*77.0-120*				

Method Blank (MB)

(MB) R3420073-3 06/11/19 12:55

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)	*104*			*77.0-120*

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

(LCS) R3420073-1 06/11/19 11:48 • (LCSD) R3420073-2 06/11/19 12:10

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	6.51	5.84	118	106	72.0-127			10.7	20
(S) a,a,a-Trifluorotoluene(FID)				*103*	*100*	*77.0-120*				

Method Blank (MB)

(MB) R3418702-3 06/05/19 19:03

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	*101*			*75.0-131*
(S) 4-Bromofluorobenzene	*97.2*			*67.0-138*
(S) 1,2-Dichloroethane-d4	*107*			*70.0-130*

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

(LCS) R3418702-1 06/05/19 17:49 • (LCSD) R3418702-2 06/05/19 18:07

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	0.108	0.104	86.4	83.4	70.0-123			3.53	20
Ethylbenzene	0.125	0.108	0.107	86.5	85.5	74.0-126			1.23	20
Toluene	0.125	0.103	0.101	82.3	80.7	75.0-121			2.00	20
Xylenes, Total	0.375	0.342	0.341	91.2	90.9	72.0-127			0.293	20
(S) Toluene-d8				*98.2*	*97.6*	*75.0-131*				
(S) 4-Bromofluorobenzene				*99.6*	*101*	*67.0-138*				
(S) 1,2-Dichloroethane-d4				*126*	*124*	*70.0-130*				

L1104846-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1104846-01 06/06/19 01:05 • (MS) R3418702-4 06/06/19 02:38 • (MSD) R3418702-5 06/06/19 02:57

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 %
Benzene	0.125	0.194	3.01	2.90	112	108	20	10.0-149			3.72	37
Ethylbenzene	0.125	1.20	5.18	4.63	159	137	20	10.0-160			11.1	38
Toluene	0.125	6.49	16.4	15.5	398	360	20	10.0-156	J5	J5	6.02	38
Xylenes, Total	0.375	44.2	97.8	86.8	714	568	20	10.0-160	J5 V	J5 V	11.9	38
(S) Toluene-d8					*99.3*	*98.1*		*75.0-131*				
(S) 4-Bromofluorobenzene					*135*	*124*		*67.0-138*				
(S) 1,2-Dichloroethane-d4					*95.6*	*102*		*70.0-130*				

Method Blank (MB)

(MB) R3419389-1 06/10/19 00:26

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	*59.8*			*18.0-148*

Laboratory Control Sample (LCS)

(LCS) R3419389-2 06/10/19 00:40

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
TPH (GC/FID) High Fraction	50.0	38.4	76.8	50.0-150	
(S) o-Terphenyl			*80.6*	*18.0-148*	

L1104522-04 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1104522-04 06/10/19 01:59 • (MS) R3419389-3 06/10/19 02:13 • (MSD) R3419389-4 06/10/19 02:28

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	64.1	65.7	102	105	2	50.0-150			2.47	20
(S) o-Terphenyl					*77.7*	*85.0*		*18.0-148*				

Method Blank (MB)

(MB) R3418657-2 06/06/19 20:00

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	*58.4*			*14.0-149*
(S) 2-Fluorobiphenyl	*75.7*			*34.0-125*
(S) p-Terphenyl-d14	*81.1*			*23.0-120*

Laboratory Control Sample (LCS)

(LCS) R3418657-1 06/06/19 19:39

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Anthracene	0.0800	0.0646	80.7	50.0-126	
Acenaphthene	0.0800	0.0564	70.5	50.0-120	
Acenaphthylene	0.0800	0.0586	73.3	50.0-120	
Benzo(a)anthracene	0.0800	0.0657	82.1	45.0-120	
Benzo(a)pyrene	0.0800	0.0650	81.3	42.0-120	
Benzo(b)fluoranthene	0.0800	0.0623	77.9	42.0-121	
Benzo(g,h,i)perylene	0.0800	0.0637	79.6	45.0-125	
Benzo(k)fluoranthene	0.0800	0.0678	84.8	49.0-125	
Chrysene	0.0800	0.0618	77.3	49.0-122	
Dibenz(a,h)anthracene	0.0800	0.0648	81.0	47.0-125	
Fluoranthene	0.0800	0.0711	88.9	49.0-129	

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

Laboratory Control Sample (LCS)

(LCS) R3418657-1 06/06/19 19:39

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Fluorene	0.0800	0.0621	77.6	49.0-120	
Indeno(1,2,3-cd)pyrene	0.0800	0.0644	80.5	46.0-125	
Naphthalene	0.0800	0.0521	65.1	50.0-120	
Phenanthrene	0.0800	0.0608	76.0	47.0-120	
Pyrene	0.0800	0.0578	72.3	43.0-123	
1-Methylnaphthalene	0.0800	0.0657	82.1	51.0-121	
2-Methylnaphthalene	0.0800	0.0630	78.8	50.0-120	
2-Chloronaphthalene	0.0800	0.0603	75.4	50.0-120	
(S) Nitrobenzene-d5			*60.9*	*14.0-149*	
(S) 2-Fluorobiphenyl			*77.3*	*34.0-125*	
(S) p-Terphenyl-d14			*75.9*	*23.0-120*	

L1104933-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1104933-01 06/06/19 23:48 • (MS) R3418657-3 06/07/19 00:09 • (MSD) R3418657-4 06/07/19 00:29

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 %
Anthracene	0.0960	U	0.0807	0.0622	84.0	64.8	1	10.0-145			25.9	30
Acenaphthene	0.0960	U	0.0703	0.0550	73.3	57.3	1	14.0-127			24.5	27
Acenaphthylene	0.0960	U	0.0719	0.0565	74.9	58.9	1	21.0-124			23.9	25
Benzo(a)anthracene	0.0960	U	0.0820	0.0588	85.4	61.3	1	10.0-139		J3	32.9	30
Benzo(a)pyrene	0.0960	U	0.0805	0.0598	83.9	62.3	1	10.0-141			29.6	31
Benzo(b)fluoranthene	0.0960	U	0.0765	0.0528	79.6	55.0	1	10.0-140		J3	36.6	36
Benzo(g,h,i)perylene	0.0960	U	0.0743	0.0532	77.4	55.4	1	10.0-140		J3	33.1	33
Benzo(k)fluoranthene	0.0960	U	0.0787	0.0615	82.0	64.0	1	10.0-137			24.7	31
Chrysene	0.0960	U	0.0755	0.0579	78.6	60.3	1	10.0-145			26.5	30
Dibenz(a,h)anthracene	0.0960	U	0.0807	0.0567	84.0	59.0	1	10.0-132		J3	35.0	31
Fluoranthene	0.0960	U	0.0907	0.0679	94.5	70.8	1	10.0-153			28.7	33
Fluorene	0.0960	U	0.0774	0.0583	80.6	60.8	1	11.0-130			28.1	29
Indeno(1,2,3-cd)pyrene	0.0960	U	0.0771	0.0550	80.3	57.3	1	10.0-137		J3	33.5	32
Naphthalene	0.0960	U	0.0671	0.0553	69.9	57.6	1	10.0-135			19.2	27
Phenanthrene	0.0960	U	0.0750	0.0601	78.1	62.6	1	10.0-144			22.0	31
Pyrene	0.0960	U	0.0711	0.0544	74.0	56.6	1	10.0-148			26.6	35
1-Methylnaphthalene	0.0960	U	0.0852	0.0666	88.8	69.4	1	10.0-142			24.5	28
2-Methylnaphthalene	0.0960	U	0.0834	0.0634	86.9	66.0	1	10.0-137			27.3	28
2-Chloronaphthalene	0.0960	U	0.0759	0.0593	79.0	61.8	1	29.0-120		J3	24.5	24
(S) Nitrobenzene-d5					*66.7*	*48.3*		*14.0-149*				
(S) 2-Fluorobiphenyl					*81.3*	*64.5*		*34.0-125*				
(S) p-Terphenyl-d14					*77.6*	*56.1*		*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.

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.
J2	Surrogate recovery limits have been exceeded; values are outside lower control limits.
J3	The associated batch QC was outside the established quality control range for precision.
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.
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.

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	LAO00356
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

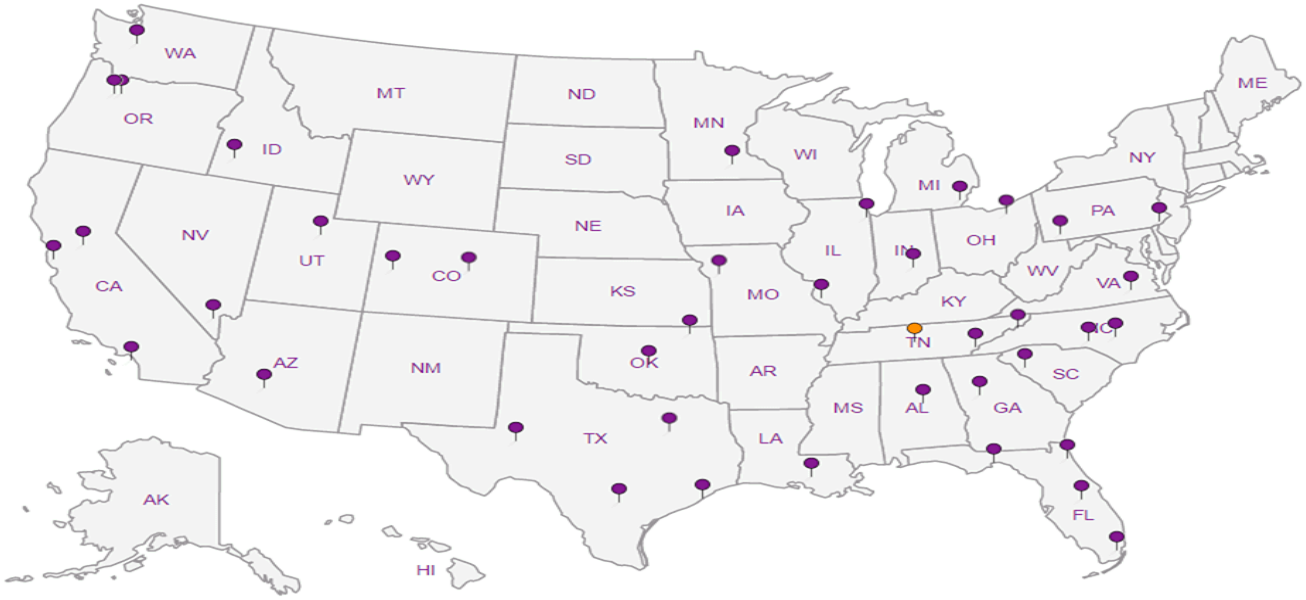
Third Party Federal Accreditations

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.



Caerus Oil and Gas
143 Diamond Avenue
Parachute, CO 81635

Billing Information: **Same as left**

Report to: **Blair Rollins**

Email To: **brollins@caerusoilandgas.com**

Project Description: P27 flowline

City/State Collected: **CO**

Phone: **(970) 778-2314**
Fax:

Client Project #

Lab Project #

Collected by (print): **Blair K. Rollins**

Site/Facility ID #: P27

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y X

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #

Date Results Needed

Analysis / Container / Preservative

Pres Chk

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	TPH (DRO and GRO)	BTEX	EC, SAR, pH	Table 910-1 metals	PAHs	Remarks	Sample # (lab only)
20190603-P27 POR	G	SS		6/3/19	1030	3	X	X	X	X	X		-01
20190603-P27 Stock	G	SS		6/3/19	1035	3	X	X	X	X	X		-02

Chain of Custody Page ___ of ___

Pace Analytical®
National Center for Testing & Innovation

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L # L1104846
A152

Acctnum:
Template:
Prelogin:
TSR:
PB:
Shipped Via:

* Matrix:
SS - Soil **AIR** - Air **F** - Filter
GW - Groundwater **B** - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:

pH _____ Temp _____
Flow _____ Other _____

Samples returned via:
__ UPS ✓ FedEx __ Courier __ _____

Tracking # 4510 1663 2334

Sample Receipt Checklist
COC Seal Present/Intact: ✓NP __Y __N
COC Signed/Accurate: ✓Y __N
Bottles arrive intact: ✓Y __N
Correct bottles used: ✓Y __N
Sufficient volume sent: ✓Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: __Y __N
RAD SCREEN: <0.5 MR/Hr

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR	If preservation required by Login: Date/Time
	6/3/19	1630		Ø	
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Temp: 4.2 °C Bottles Received:	
	6/3/19	1700		4.4±0=4.4 6	
Relinquished by: (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: Time:	Hold: Condition: NCF / OK
				6-4-19 8:45	