

November 6, 2020

Jake Janicek  
EH&S Specialist  
143 Diamond Avenue  
Parachute, Colorado 81635

**RE: Partially Buried Vault Sampling Summary (Remediation Number 16013)  
Puckett #275-1  
Caerus Oil & Gas, LLC  
Garfield County, Colorado**

Dear Mr. Janicek:

LT Environmental, Inc. (LTE) was contracted by Caerus Oil and Gas, LLC (Caerus) to conduct soil sampling associated with the removal of a partially buried vault (PBV) at the PUCKETT-67S97W/1NESE (Well Name: PUCKETT # 275-1) (Facility ID: 324313) (Site). Per the Colorado Oil and Gas Conservation Commission (COGCC) Document Number 402501178, representative confirmation soil samples will be collected from the sidewalls and bottom of the removed PBV tank footprint. The Site is located in Caerus's Logan Mesa area of operation in Garfield County, Colorado (Figure 1).

### SOIL SAMPLING ACTIVITIES

On October 2, 2020, Caerus personnel conducted soil sampling activities associated with the removal of the PBV at the Site. The soil was characterized by visual and olfactory inspection of soil samples. One soil sample was collected from the base of the former PBV location at 7.5 feet below ground surface (bgs). The soil sample was submitted to Pace Analytical (Pace) of Mt. Juliet, Tennessee for laboratory analysis of constituents listed in COGCC Table 910-1.

On October 12, 2020, LTE personnel continued soil sampling activities associated with the removal of the PBV at the Site. Using a spade shovel, a total of four confirmation soil samples were collected from each sidewall of the former PBV tank location. The sidewall confirmation soil samples were collected at a depth of 4 feet bgs. The soil sampling was conducted by an LTE geologist who inspected the soil for the presence or absence of petroleum hydrocarbon odor and/or staining. The soil was characterized by visual and olfactory inspection of the soil samples. Additionally, four background soil samples were collected in each cardinal direction, on and off the original pad disturbance from disturbed to undisturbed soil. The PBV soil samples were submitted for laboratory analysis of constituents listed in COGCC Table 910-1. All background soil samples were submitted for the analysis of arsenic, pH, electrical conductivity (EC), and sodium adsorption ratio (SAR). All soil samples were submitted to Pace of Mt. Juliet, Tennessee. The

excavation extent along with the confirmation soil samples and background soil sample locations are depicted on the attached Figure 2.

## **ANALYTICAL RESULTS**

Laboratory analytical results of all PBV tank confirmation soil samples collected were either below the laboratory detection limit or within the COGCC Table 910-1 Concentration Levels except for arsenic. All of the five confirmation soil samples collected exceeded the COGCC Table 910-1 Concentration Level for arsenic with concentrations ranging from 10.9 milligrams per kilogram (mg/kg) in soil sample 20201002 – PUCKETT 275-1 TANK BOTTOM @ 7.5' to 17.2 mg/kg in soil sample 20201012 – PUCKETT 275-1 (NW WALL) @ 4'. Additionally, the four background soil samples collected were within the COGCC Table 910-1 Concentration Levels for pH, EC, and SAR. All four background soil samples exceeded the COGCC Table 910-1 Concentration Level for arsenic with concentrations ranging from 4.55 mg/kg in soil sample 20201012 – PUCKETT 275-1 (BG04) @ 6" to 23.7 mg/kg in soil sample 20201012 – PUCKETT 275-1 (BG02) @ 6". Laboratory analytical results are included as an attachment and summarized in Table 1.

Please call Dustin Held at (970) 433-8253 if you have any questions regarding this report or require additional information.

Sincerely,

LT ENVIRONMENTAL, INC.



Dustin Held  
Project Geologist



Chris McKisson  
Western Slope Manager

Attachments:

Figure 1 – Site Location Map

Figure 2 – Site Map

Table 1 -Laboratory Results Summary Table

Attachment – Laboratory Analytical Reports





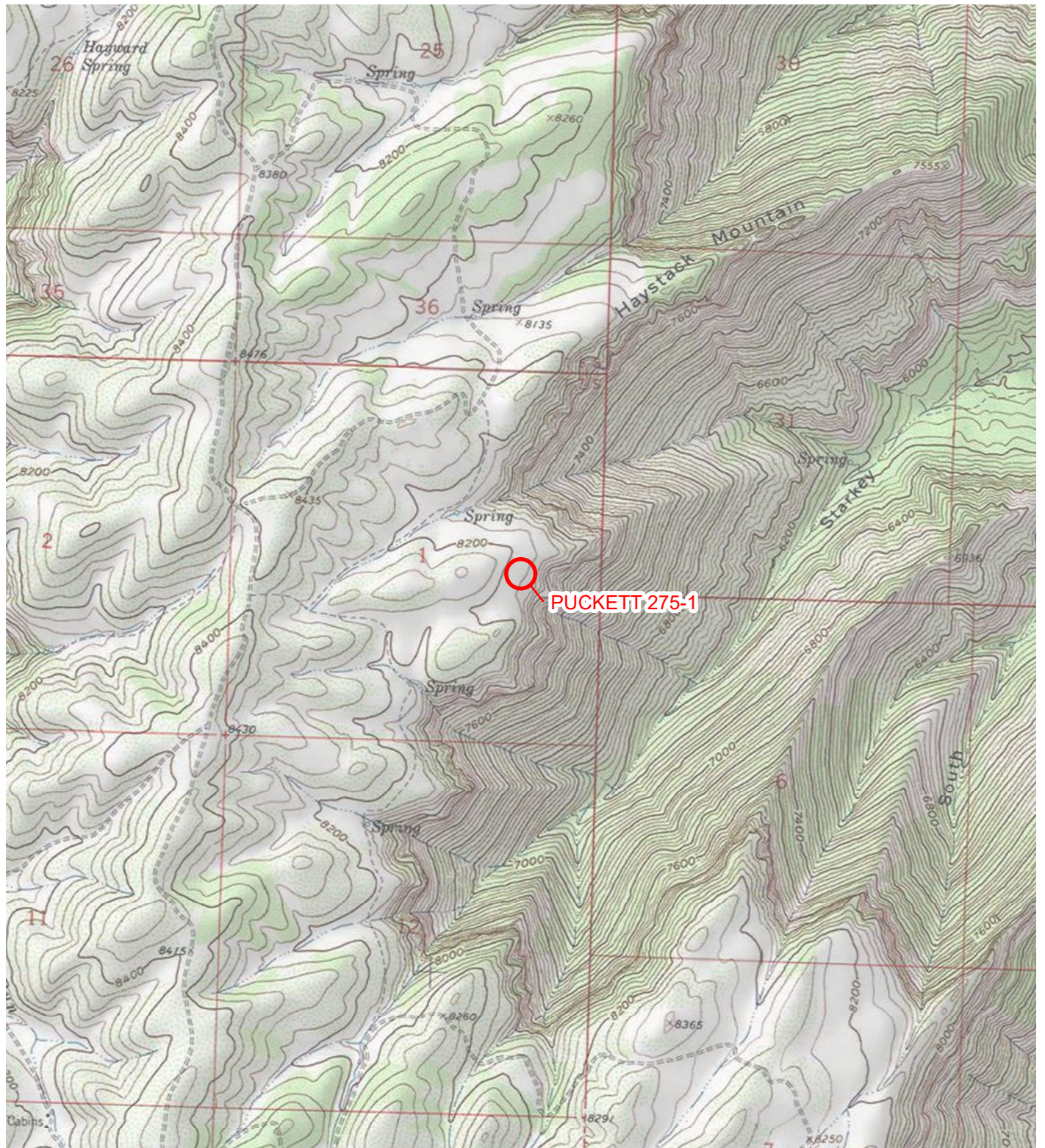
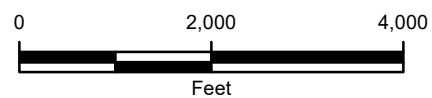


IMAGE COURTESY OF ESRI/USGS

## LEGEND

 SITE LOCATION



**FIGURE 1**  
**SITE LOCATION MAP**  
**PUCKETT 275-1**  
**NESE SEC 1-T7S-R97W**  
**GARFIELD COUNTY, COLORADO**  
**CAERUS OIL AND GAS, LLC**

**LTE**  
 A proud member  
 of WSP



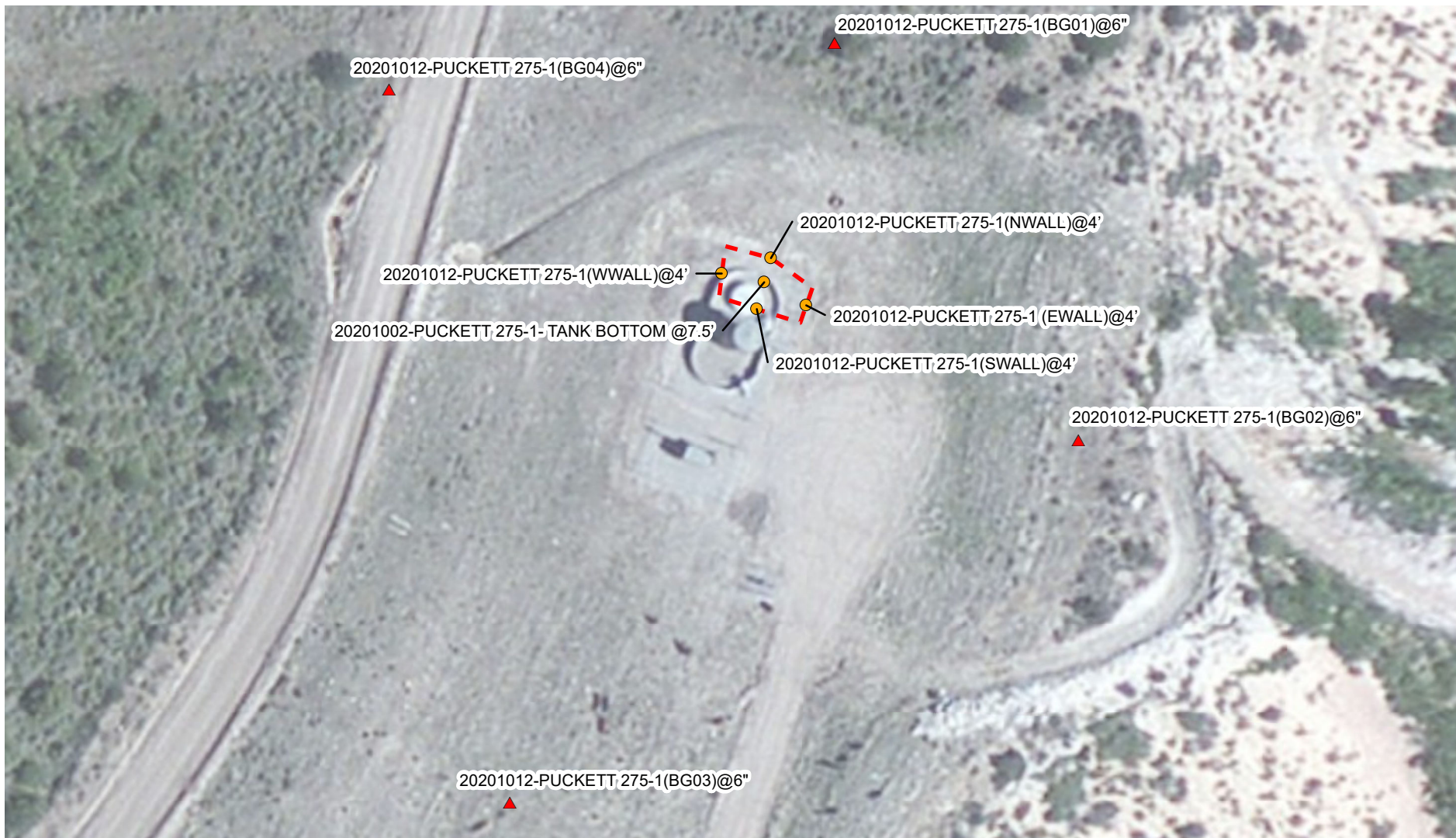


IMAGE COURTESY OF ESRI

## LEGEND

- SOIL SAMPLE
- ▲ BACKGROUND SOIL SAMPLE
- EXCAVATION EXTENT

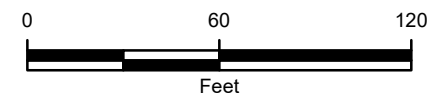


FIGURE 2  
SITE MAP  
PUCKETT 275-1  
NESE SEC 1-T7S-R97W  
GARFIELD COUNTY, COLORADO  
CAERUS OIL AND GAS, LLC





TABLE 1  
LABORATORY RESULTS SUMMARY TABLE

PUCKETT 275-1  
GARFIELD COUNTY, COLORADO  
CAERUS OIL GAS, LLC

PARAMETER	COGCC CONCENTRATION LEVELS	UNITS	CONFIRMATION SOIL SAMPLES					BACKGROUND SOIL SAMPLES			
			20201002-PUCKETT 275-1 TANK BOTTOM @ 7.5'	20201012-PUCKETT 275-1 (NWALL) @ 4'	20201012-PUCKETT 275-1 (SWALL) @ 4'	20201012-PUCKETT 275-1 (WWALL) @ 4'	20201012-PUCKETT 275-1 (EWALL) @ 4'	20201012-PUCKETT 275-1 (BG01) @ 6"	20201012-PUCKETT 275-1 (BG02) @ 6"	20201012-PUCKETT 275-1 (BG03) @ 6"	20201012-PUCKETT 275-1 (BG04) @ 6"
Sample Date			10/2/2020	10/12/2020	10/12/2020	10/12/2020	10/12/2020	10/12/2020	10/12/2020	10/12/2020	10/12/2020
Sample Depth		FEET	7.5'	4'	4'	4'	4'	0.5'	0.5'	0.5'	0.5'
Arsenic	0.39	mg/kg	<b>2.04</b>	<b>17.2</b>	<b>14.1</b>	<b>14.3</b>	<b>10.9</b>	<b>12.6</b>	<b>23.7</b>	<b>12.7</b>	<b>4.55</b>
Barium	15,000	mg/kg	76.0	550	404	420	315	NA	NA	NA	NA
Cadmium	70	mg/kg	ND	ND	ND	ND	ND	NA	NA	NA	NA
Chromium (III)	120,000	mg/kg	5.12	15.2	24.6	20.4	17.3	NA	NA	NA	NA
Chromium (VI)	23	mg/kg	ND	ND	ND	ND	ND	NA	NA	NA	NA
Copper	3,100	mg/kg	4.90	18.0	23.1	19.5	17.8	NA	NA	NA	NA
Lead	400	mg/kg	3.03	25.7	17.3	18.9	13.7	NA	NA	NA	NA
Mercury	23	mg/kg	ND	0.0545	ND	ND	ND	NA	NA	NA	NA
Nickel	1,600	mg/kg	3.52	26.1	20.7	19.3	15.6	NA	NA	NA	NA
Selenium	390	mg/kg	ND	ND	ND	ND	ND	NA	NA	NA	NA
Silver	390	mg/kg	ND	ND	ND	ND	ND	NA	NA	NA	NA
Zinc	23,000	mg/kg	14.1	56.7	58.8	52.4	45.7	NA	NA	NA	NA
EC	4.0	mmhos/cm	0.199	0.181	0.170	0.176	0.131	0.195	0.090	0.0995	0.0508
pH	6 - 9	SU	8.56	8.17	8.17	8.35	8.48	7.16	7.34	7.42	6.52
SAR	12	unitless	1.12	0.867	0.203	0.801	0.748	0.0877	0.121	0.120	0.0595
TPH-GRO		mg/kg	ND	ND	ND	ND	ND	NA	NA	NA	NA
TPH-DRO		mg/kg	20.7	ND	17.5	13.0	13.2	NA	NA	NA	NA
TPH	500	mg/kg	20.7	ND	17.5	13.0	13.2	NA	NA	NA	NA
Benzene	0.17	mg/kg	ND	ND	ND	ND	ND	NA	NA	NA	NA
Toluene	85	mg/kg	ND	ND	ND	ND	ND	NA	NA	NA	NA
Ethylbenzene	100	mg/kg	ND	ND	ND	ND	ND	NA	NA	NA	NA
Total Xylenes	175	mg/kg	ND	ND	ND	ND	ND	NA	NA	NA	NA
Acenaphthene	1000	mg/kg	ND	ND	ND	ND	ND	NA	NA	NA	NA
Anthracene	1000	mg/kg	ND	ND	ND	ND	ND	NA	NA	NA	NA
Benzo(A)anthracene	0.22	mg/kg	ND	ND	ND	ND	ND	NA	NA	NA	NA
Benzo(B)fluoranthene	0.22	mg/kg	ND	ND	ND	ND	ND	NA	NA	NA	NA
Benzo(K)fluoranthene	2.2	mg/kg	ND	ND	ND	ND	ND	NA	NA	NA	NA
Benzo(A)pyrene	0.022	mg/kg	ND	ND	ND	ND	ND	NA	NA	NA	NA
Chrysene	22	mg/kg	ND	ND	ND	ND	ND	NA	NA	NA	NA
Dibenzo(A,H)anthracene	0.022	mg/kg	ND	ND	ND	ND	ND	NA	NA	NA	NA
Fluoranthene	1000	mg/kg	ND	ND	ND	ND	ND	NA	NA	NA	NA
Fluorene	1000	mg/kg	ND	ND	ND	ND	ND	NA	NA	NA	NA
Indeno(1,2,3,C,D)pyrene	0.22	mg/kg	ND	ND	ND	ND	ND	NA	NA	NA	NA
Naphthalene	23	mg/kg	ND	ND	ND	ND	ND	NA	NA	NA	NA
Pyrene	1000	mg/kg	ND	ND	ND	ND	ND	NA	NA	NA	NA

**NOTES:**  
ND - analyte not detected above the stated reporting limit  
COGCC - Colorado Oil and Gas Conservation Commission  
**BOLD** - indicates result exceeds the COGCC concentration level  
EC- electrical conductivity  
mmhos/cm - millimhos per centimeter  
NA - not analyzed  
SU - standard unit  
mg/kg - milligrams per kilogram  
SAR - sodium adsorption ratio  
-- sample depth not associated with sample





## Caerus Oil and Gas

Sample Delivery Group: L1269536

Samples Received: 10/03/2020

Project Number:

Description:

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.



Cp: Cover Page	1
Tc: Table of Contents	2
Ss: Sample Summary	3
Cn: Case Narrative	4
Sr: Sample Results	5
20201002-PUCKETT 275-1-TANK BOTTOM @7.5' L1269536-01	5
Qc: Quality Control Summary	7
Wet Chemistry by Method 3060A/7196A	7
Wet Chemistry by Method 9045D	8
Wet Chemistry by Method 9050AMod	9
Mercury by Method 7471A	10
Metals (ICP) by Method 6010B	11
Metals (ICPMS) by Method 6020	12
Volatile Organic Compounds (GC) by Method 8015D/GRO	13
Volatile Organic Compounds (GC/MS) by Method 8260B	14
Semi-Volatile Organic Compounds (GC) by Method 8015	15
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	16
Gl: Glossary of Terms	18
Al: Accreditations & Locations	19
Sc: Sample Chain of Custody	20



# SAMPLE SUMMARY

ONE LAB. NATIONWIDE.



20201002-PUCKETT 275-1-TANK BOTTOM @7.5' L1269536-01  
Solid

Collected by  
Jake Janicek

Collected date/time  
10/02/20 09:00

Received date/time  
10/03/20 09:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1552122	1	10/07/20 09:40	10/07/20 09:40	CCE	Mt. Juliet, TN
Calculated Results	WG1555080	1	10/06/20 21:59	10/07/20 12:30	KPS	Mt. Juliet, TN
Wet Chemistry by Method 3060A/7196A	WG1554739	1	10/06/20 17:56	10/07/20 12:30	KPS	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1555528	1	10/07/20 14:19	10/07/20 18:36	WOS	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1554714	1	10/06/20 14:46	10/06/20 19:15	MMF	Mt. Juliet, TN
Mercury by Method 7471A	WG1554804	1	10/06/20 11:09	10/06/20 18:41	TCT	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1555080	1	10/06/20 21:59	10/07/20 03:40	CCE	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1555083	5	10/06/20 21:49	10/07/20 01:35	LAT	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG1554577	1	10/05/20 11:50	10/06/20 09:03	DWR	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1554623	1	10/05/20 11:50	10/06/20 00:54	ACG	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1554863	1	10/06/20 16:13	10/07/20 02:01	JN	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG1554898	1	10/07/20 01:47	10/07/20 11:51	AO	Mt. Juliet, TN

<sup>1</sup> Cp

<sup>2</sup> Tc

<sup>3</sup> Ss

<sup>4</sup> Cn

<sup>5</sup> Sr

<sup>6</sup> Qc

<sup>7</sup> Gl

<sup>8</sup> Al

<sup>9</sup> 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

<sup>1</sup> Cp

<sup>2</sup> Tc

<sup>3</sup> Ss

<sup>4</sup> Cn

<sup>5</sup> Sr

<sup>6</sup> Qc

<sup>7</sup> Gl

<sup>8</sup> Al

<sup>9</sup> Sc



Collected date/time: 10/02/20 09:00

L1269536

## Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	1.12		1	10/07/2020 09:40	WG1552122

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	5.12		1.00	1	10/07/2020 12:30	<a href="#">WG1555080</a>

## 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	10/07/2020 12:30	<a href="#">WG1554739</a>

## Wet Chemistry by Method 9045D

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	8.56	<a href="#">T8</a>	1	10/07/2020 18:36	<a href="#">WG1555528</a>

## Sample Narrative:

L1269536-01 WG1555528: 8.56 at 22.5C

## Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	199		10.0	1	10/06/2020 19:15	<a href="#">WG1554714</a>

## Mercury by Method 7471A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Mercury	ND		0.0400	1	10/06/2020 18:41	<a href="#">WG1554804</a>

## Metals (ICP) by Method 6010B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Barium	76.0		0.500	1	10/07/2020 03:40	<a href="#">WG1555080</a>
Cadmium	ND		0.500	1	10/07/2020 03:40	<a href="#">WG1555080</a>
Chromium	5.12		1.00	1	10/07/2020 03:40	<a href="#">WG1555080</a>
Copper	4.90		2.00	1	10/07/2020 03:40	<a href="#">WG1555080</a>
Lead	3.03		0.500	1	10/07/2020 03:40	<a href="#">WG1555080</a>
Nickel	3.52		2.00	1	10/07/2020 03:40	<a href="#">WG1555080</a>
Selenium	ND		2.00	1	10/07/2020 03:40	<a href="#">WG1555080</a>
Silver	ND		1.00	1	10/07/2020 03:40	<a href="#">WG1555080</a>
Zinc	14.1		5.00	1	10/07/2020 03:40	<a href="#">WG1555080</a>

## Metals (ICPMS) by Method 6020

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	2.04		1.00	5	10/07/2020 01:35	<a href="#">WG1555083</a>

## 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	ND		0.100	1	10/06/2020 09:03	<a href="#">WG1554577</a>



Collected date/time: 10/02/20 09:00

L1269536

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
(S) a,a,a-Trifluorotoluene(FID)	87.2		77.0-120		10/06/2020 09:03	<a href="#">WG1554577</a>

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	ND		0.00100	1	10/06/2020 00:54	<a href="#">WG1554623</a>
Toluene	ND		0.00500	1	10/06/2020 00:54	<a href="#">WG1554623</a>
Ethylbenzene	ND		0.00250	1	10/06/2020 00:54	<a href="#">WG1554623</a>
Total Xylenes	ND		0.00650	1	10/06/2020 00:54	<a href="#">WG1554623</a>
(S) Toluene-d8	114		75.0-131		10/06/2020 00:54	<a href="#">WG1554623</a>
(S) 4-Bromofluorobenzene	129		67.0-138		10/06/2020 00:54	<a href="#">WG1554623</a>
(S) 1,2-Dichloroethane-d4	117		70.0-130		10/06/2020 00:54	<a href="#">WG1554623</a>

## 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	20.7		4.00	1	10/07/2020 02:01	<a href="#">WG1554863</a>
(S) o-Terphenyl	44.7		18.0-148		10/07/2020 02:01	<a href="#">WG1554863</a>

## 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	10/07/2020 11:51	<a href="#">WG1554898</a>
Acenaphthene	ND		0.00600	1	10/07/2020 11:51	<a href="#">WG1554898</a>
Acenaphthylene	ND		0.00600	1	10/07/2020 11:51	<a href="#">WG1554898</a>
Benzo(a)anthracene	ND		0.00600	1	10/07/2020 11:51	<a href="#">WG1554898</a>
Benzo(a)pyrene	ND		0.00600	1	10/07/2020 11:51	<a href="#">WG1554898</a>
Benzo(b)fluoranthene	ND		0.00600	1	10/07/2020 11:51	<a href="#">WG1554898</a>
Benzo(g,h,i)perylene	ND		0.00600	1	10/07/2020 11:51	<a href="#">WG1554898</a>
Benzo(k)fluoranthene	ND		0.00600	1	10/07/2020 11:51	<a href="#">WG1554898</a>
Chrysene	ND		0.00600	1	10/07/2020 11:51	<a href="#">WG1554898</a>
Dibenz(a,h)anthracene	ND		0.00600	1	10/07/2020 11:51	<a href="#">WG1554898</a>
Fluoranthene	ND		0.00600	1	10/07/2020 11:51	<a href="#">WG1554898</a>
Fluorene	ND		0.00600	1	10/07/2020 11:51	<a href="#">WG1554898</a>
Indeno(1,2,3-cd)pyrene	ND		0.00600	1	10/07/2020 11:51	<a href="#">WG1554898</a>
Naphthalene	ND		0.0200	1	10/07/2020 11:51	<a href="#">WG1554898</a>
Phenanthrene	ND		0.00600	1	10/07/2020 11:51	<a href="#">WG1554898</a>
Pyrene	ND		0.00600	1	10/07/2020 11:51	<a href="#">WG1554898</a>
1-Methylnaphthalene	ND		0.0200	1	10/07/2020 11:51	<a href="#">WG1554898</a>
2-Methylnaphthalene	ND		0.0200	1	10/07/2020 11:51	<a href="#">WG1554898</a>
2-Chloronaphthalene	ND		0.0200	1	10/07/2020 11:51	<a href="#">WG1554898</a>
(S) p-Terphenyl-d14	115		23.0-120		10/07/2020 11:51	<a href="#">WG1554898</a>
(S) Nitrobenzene-d5	92.1		14.0-149		10/07/2020 11:51	<a href="#">WG1554898</a>
(S) 2-Fluorobiphenyl	76.0		34.0-125		10/07/2020 11:51	<a href="#">WG1554898</a>



Method Blank (MB)

(MB) R3578787-1 10/07/20 12:12

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

L1269536-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1269536-01 10/07/20 12:30 • (DUP) R3578787-3 10/07/20 12:30

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

Laboratory Control Sample (LCS)

(LCS) R3578787-2 10/07/20 12:17

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	mg/kg	mg/kg	%	%	
Chromium,Hexavalent	24.0	23.2	96.7	80.0-120	

L1269623-05 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1269623-05 10/07/20 12:33 • (MS) R3578787-4 10/07/20 12:35 • (MSD) R3578787-5 10/07/20 12:35

	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	11.1	17.4	17.8	31.3	33.2	1	75.0-125	J6	J6	2.22	20

L1269623-05 Original Sample (OS) • Matrix Spike (MS)

(OS) L1269623-05 10/07/20 12:33 • (MS) R3578787-6 10/07/20 12:36

	Spike Amount	Original Result	MS Result	MS Rec.	Dilution	Rec. Limits	MS Qualifier
Analyte	mg/kg	mg/kg	mg/kg	%		%	
Chromium,Hexavalent	636	11.1	624	98.1	50	75.0-125	

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc





L1269299-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1269299-03 10/07/20 18:36 • (DUP) R3578993-2 10/07/20 18:36

	Original Result	DUP Result	Dilution	DUP RPD	<u>DUP Qualifier</u>	DUP RPD Limits
Analyte	su	su		%		%
pH	8.38	8.33	1	0.598		1

Sample Narrative:

OS: 8.38 at 21.8C

DUP: 8.33 at 21.9C

Laboratory Control Sample (LCS)

(LCS) R3578993-1 10/07/20 18:36

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	<u>LCS Qualifier</u>
Analyte	su	su	%	%	
pH	10.0	10.1	101	99.0-101	

Sample Narrative:

LCS: 10.05 at 20.6C

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc



Method Blank (MB)

(MB) R3578512-1 10/06/20 19:15

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

Original Sample (OS) • Duplicate (DUP)

(OS) • (DUP) R3578512-3 10/06/20 19:15

Analyte	Original Result	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance		413	1	2.16		20

Original Sample (OS) • Duplicate (DUP)

(OS) • (DUP) R3578512-4 10/06/20 19:15

Analyte	Original Result	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance		6350	1	2.80		20

Laboratory Control Sample (LCS)

(LCS) R3578512-2 10/06/20 19:15

Analyte	Spike Amount umhos/cm	LCS Result umhos/cm	LCS Rec. %	Rec. Limits %	LCS Qualifier
Specific Conductance	741	739	99.7	85.0-115	

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc



Method Blank (MB)

(MB) R3578564-1 10/06/20 17:35

	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	mg/kg		mg/kg	mg/kg
Mercury	U		0.0180	0.0400

Laboratory Control Sample (LCS)

(LCS) R3578564-2 10/06/20 17:38

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	mg/kg	mg/kg	%	%	
Mercury	0.500	0.539	108	80.0-120	

L1268823-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1268823-02 10/06/20 17:40 • (MS) R3578564-3 10/06/20 17:43 • (MSD) R3578564-4 10/06/20 17:46

	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	ND	0.535	0.559	107	112	1	75.0-125			4.40	20

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc



Method Blank (MB)

(MB) R3578637-1 10/07/20 03:02

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Barium	U		0.240	0.500
Cadmium	U		0.0810	0.500
Chromium	U		0.250	1.00
Copper	U		0.506	2.00
Lead	U		0.208	0.500
Nickel	U		0.490	2.00
Selenium	U		0.617	2.00
Silver	U		0.228	1.00
Zinc	U		0.939	5.00

<sup>1</sup> Cp

<sup>2</sup> Tc

<sup>3</sup> Ss

<sup>4</sup> Cn

<sup>5</sup> Sr

<sup>6</sup> Qc

<sup>7</sup> Gl

<sup>8</sup> Al

<sup>9</sup> Sc

Laboratory Control Sample (LCS)

(LCS) R3578637-2 10/07/20 03:05

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Barium	100	106	106	80.0-120	
Cadmium	100	101	101	80.0-120	
Chromium	100	103	103	80.0-120	
Copper	100	102	102	80.0-120	
Lead	100	102	102	80.0-120	
Nickel	100	105	105	80.0-120	
Selenium	100	102	102	80.0-120	
Silver	20.0	19.2	96.0	80.0-120	
Zinc	100	103	103	80.0-120	

L1269540-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1269540-01 10/07/20 03:08 • (MS) R3578637-5 10/07/20 03:17 • (MSD) R3578637-6 10/07/20 03:20

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 %
Barium	100	302	412	423	111	122	1	75.0-125			2.62	20
Cadmium	100	ND	96.8	92.3	96.5	92.0	1	75.0-125			4.77	20
Chromium	100	12.7	109	105	96.2	92.7	1	75.0-125			3.30	20
Copper	100	14.1	114	110	99.8	95.4	1	75.0-125			3.95	20
Lead	100	12.1	111	105	99.1	92.8	1	75.0-125			5.79	20
Nickel	100	12.0	115	110	103	98.3	1	75.0-125			4.35	20
Selenium	100	ND	95.9	91.6	95.9	91.6	1	75.0-125			4.54	20
Silver	20.0	ND	18.6	17.5	92.8	87.5	1	75.0-125			5.86	20
Zinc	100	35.8	130	126	94.6	90.7	1	75.0-125			3.05	20





Method Blank (MB)

(MB) R3578620-1 10/07/20 01:49

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Arsenic	U		0.100	1.00

Laboratory Control Sample (LCS)

(LCS) R3578620-2 10/07/20 01:52

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Arsenic	100	101	101	80.0-120	

L1269540-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1269540-01 10/07/20 01:56 • (MS) R3578620-5 10/07/20 02:05 • (MSD) R3578620-6 10/07/20 02:09

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	20.0	9.56	101	96.9	91.2	87.3	5	75.0-125			3.89	20

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc



Method Blank (MB)

(MB) R3578631-3 10/06/20 03:43

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
TPH (GC/FID) Low Fraction	0.0313	⬇	0.0217	0.100
(S) a,a,a-Trifluorotoluene(FID)	93.2			77.0-120

<sup>1</sup>Cp

<sup>2</sup>Tc

<sup>3</sup>Ss

<sup>4</sup>Cn

<sup>5</sup>Sr

<sup>6</sup>Qc

<sup>7</sup>Gl

<sup>8</sup>Al

<sup>9</sup>Sc

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

(LCS) R3578631-1 10/06/20 02:41 • (LCSD) R3578631-2 10/06/20 03:01

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 %
TPH (GC/FID) Low Fraction	5.50	5.64	5.48	103	99.6	72.0-127			2.88	20
(S) a,a,a-Trifluorotoluene(FID)				108	107	77.0-120				



Method Blank (MB)

(MB) R3579645-3 10/05/20 23:05

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Benzene	U		0.000467	0.00100
Ethylbenzene	U		0.000737	0.00250
Toluene	U		0.00130	0.00500
Xylenes, Total	U		0.000880	0.00650
(S) Toluene-d8	129			75.0-131
(S) 4-Bromofluorobenzene	104			67.0-138
(S) 1,2-Dichloroethane-d4	106			70.0-130

<sup>1</sup> Cp

<sup>2</sup> Tc

<sup>3</sup> Ss

<sup>4</sup> Cn

<sup>5</sup> Sr

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

(LCS) R3579645-1 10/05/20 21:49 • (LCSD) R3579645-2 10/05/20 22:08

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	0.103	0.105	82.4	84.0	70.0-123			1.92	20
Ethylbenzene	0.125	0.111	0.109	88.8	87.2	74.0-126			1.82	20
Toluene	0.125	0.114	0.104	91.2	83.2	75.0-121			9.17	20
Xylenes, Total	0.375	0.340	0.338	90.7	90.1	72.0-127			0.590	20
(S) Toluene-d8				107	96.6	75.0-131				
(S) 4-Bromofluorobenzene				109	108	67.0-138				
(S) 1,2-Dichloroethane-d4				112	120	70.0-130				

<sup>6</sup> Qc

<sup>7</sup> Gl

<sup>8</sup> Al

<sup>9</sup> Sc



Method Blank (MB)

(MB) R3578628-1 10/06/20 23:53

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	70.9			18.0-148

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Laboratory Control Sample (LCS)

(LCS) R3578628-2 10/07/20 00:06

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
TPH (GC/FID) High Fraction	50.0	30.9	61.8	50.0-150	
(S) o-Terphenyl			68.2	18.0-148	

L1269536-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1269536-01 10/07/20 02:01 • (MS) R3578628-3 10/07/20 02:13 • (MSD) R3578628-4 10/07/20 02:26

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	20.7	64.3	61.7	87.2	82.0	1	50.0-150			4.13	20
(S) o-Terphenyl					63.7	65.5		18.0-148				



Method Blank (MB)

(MB) R3578972-2 10/07/20 11:30

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Anthracene	U		0.00230	0.00600
Acenaphthene	U		0.00209	0.00600
Acenaphthylene	U		0.00216	0.00600
Benzo(a)anthracene	U		0.00173	0.00600
Benzo(a)pyrene	U		0.00179	0.00600
Benzo(b)fluoranthene	U		0.00153	0.00600
Benzo(g,h,i)perylene	U		0.00177	0.00600
Benzo(k)fluoranthene	U		0.00215	0.00600
Chrysene	U		0.00232	0.00600
Dibenz(a,h)anthracene	U		0.00172	0.00600
Fluoranthene	U		0.00227	0.00600
Fluorene	U		0.00205	0.00600
Indeno(1,2,3-cd)pyrene	U		0.00181	0.00600
Naphthalene	U		0.00408	0.0200
Phenanthrene	U		0.00231	0.00600
Pyrene	U		0.00200	0.00600
1-Methylnaphthalene	U		0.00449	0.0200
2-Methylnaphthalene	U		0.00427	0.0200
2-Chloronaphthalene	U		0.00466	0.0200
(S) Nitrobenzene-d5	106			14.0-149
(S) 2-Fluorobiphenyl	92.2			34.0-125
(S) p-Terphenyl-d14	98.4			23.0-120

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Laboratory Control Sample (LCS)

(LCS) R3578972-1 10/07/20 11:10

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Anthracene	0.0800	0.0772	96.5	50.0-126	
Acenaphthene	0.0800	0.0740	92.5	50.0-120	
Acenaphthylene	0.0800	0.0783	97.9	50.0-120	
Benzo(a)anthracene	0.0800	0.0800	100	45.0-120	
Benzo(a)pyrene	0.0800	0.0696	87.0	42.0-120	
Benzo(b)fluoranthene	0.0800	0.0746	93.3	42.0-121	
Benzo(g,h,i)perylene	0.0800	0.0656	82.0	45.0-125	
Benzo(k)fluoranthene	0.0800	0.0762	95.3	49.0-125	
Chrysene	0.0800	0.0815	102	49.0-122	
Dibenz(a,h)anthracene	0.0800	0.0693	86.6	47.0-125	
Fluoranthene	0.0800	0.0852	107	49.0-129	



Laboratory Control Sample (LCS)

(LCS) R3578972-1 10/07/20 11:10

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Fluorene	0.0800	0.0726	90.8	49.0-120	
Indeno(1,2,3-cd)pyrene	0.0800	0.0689	86.1	46.0-125	
Naphthalene	0.0800	0.0698	87.3	50.0-120	
Phenanthrene	0.0800	0.0741	92.6	47.0-120	
Pyrene	0.0800	0.0741	92.6	43.0-123	
1-Methylnaphthalene	0.0800	0.0671	83.9	51.0-121	
2-Methylnaphthalene	0.0800	0.0644	80.5	50.0-120	
2-Chloronaphthalene	0.0800	0.0702	87.8	50.0-120	
(S) Nitrobenzene-d5			109	14.0-149	
(S) 2-Fluorobiphenyl			90.8	34.0-125	
(S) p-Terphenyl-d14			96.6	23.0-120	

L1269781-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1269781-01 10/07/20 16:02 • (MS) R3578972-3 10/07/20 16:23 • (MSD) R3578972-4 10/07/20 16:44

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	0.0788	ND	0.0692	0.0648	87.8	81.8	1	10.0-145			6.57	30
Acenaphthene	0.0788	ND	0.0580	0.0551	73.6	69.6	1	14.0-127			5.13	27
Acenaphthylene	0.0788	ND	0.0619	0.0595	78.6	75.1	1	21.0-124			3.95	25
Benzo(a)anthracene	0.0788	ND	0.0747	0.0693	94.8	87.5	1	10.0-139			7.50	30
Benzo(a)pyrene	0.0788	ND	0.0693	0.0656	87.9	82.8	1	10.0-141			5.49	31
Benzo(b)fluoranthene	0.0788	ND	0.0636	0.0583	80.7	73.6	1	10.0-140			8.70	36
Benzo(g,h,i)perylene	0.0788	ND	0.0639	0.0594	81.1	75.0	1	10.0-140			7.30	33
Benzo(k)fluoranthene	0.0788	ND	0.0728	0.0721	92.4	91.0	1	10.0-137			0.966	31
Chrysene	0.0788	ND	0.0803	0.0749	102	94.6	1	10.0-145			6.96	30
Dibenz(a,h)anthracene	0.0788	ND	0.0688	0.0670	87.3	84.6	1	10.0-132			2.65	31
Fluoranthene	0.0788	ND	0.0750	0.0679	95.2	85.7	1	10.0-153			9.94	33
Fluorene	0.0788	ND	0.0596	0.0557	75.6	70.3	1	11.0-130			6.76	29
Indeno(1,2,3-cd)pyrene	0.0788	ND	0.0662	0.0621	84.0	78.4	1	10.0-137			6.39	32
Naphthalene	0.0788	ND	0.0484	0.0493	61.4	62.2	1	10.0-135			1.84	27
Phenanthrene	0.0788	ND	0.0642	0.0592	81.5	74.7	1	10.0-144			8.10	31
Pyrene	0.0788	ND	0.0669	0.0608	84.9	76.8	1	10.0-148			9.55	35
1-Methylnaphthalene	0.0788	ND	0.0470	0.0478	59.6	60.4	1	10.0-142			1.69	28
2-Methylnaphthalene	0.0788	ND	0.0432	0.0471	54.8	59.5	1	10.0-137			8.64	28
2-Chloronaphthalene	0.0788	ND	0.0534	0.0524	67.8	66.2	1	29.0-120			1.89	24
(S) Nitrobenzene-d5					124	113		14.0-149				
(S) 2-Fluorobiphenyl					66.1	70.2		34.0-125				
(S) p-Terphenyl-d14					68.7	83.4		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

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.
T8	Sample(s) received past/too close to holding time expiration.

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 <sup>1</sup>	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina <sup>1</sup>	DW21704
Georgia	NELAP	North Carolina <sup>3</sup>	41
Georgia <sup>1</sup>	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 <sup>1 6</sup>	90010	South Carolina	84004
Kentucky <sup>2</sup>	16	South Dakota	n/a
Louisiana	AI30792	Tennessee <sup>1 4</sup>	2006
Louisiana <sup>1</sup>	LA180010	Texas	T104704245-18-15
Maine	TN0002	Texas <sup>5</sup>	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 <sup>5</sup>	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

<sup>1</sup> Drinking Water <sup>2</sup> Underground Storage Tanks <sup>3</sup> Aquatic Toxicity <sup>4</sup> Chemical/Microbiological <sup>5</sup> Mold <sup>6</sup> 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 23, 2020

<sup>1</sup> Cp

<sup>2</sup> Tc

<sup>3</sup> Ss

<sup>4</sup> Cn

<sup>5</sup> Sr

<sup>6</sup> Qc

<sup>7</sup> Gl

<sup>8</sup> Al

<sup>9</sup> Sc

## Caerus Oil and Gas

Sample Delivery Group: L1273324  
Samples Received: 10/14/2020  
Project Number: PUCKETT 275-1  
Description: PUCKETT 275-1  
Site: PUCKETT 275-1  
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.



<b>Cp: Cover Page</b>	<b>1</b>
<b>Tc: Table of Contents</b>	<b>2</b>
<b>Ss: Sample Summary</b>	<b>3</b>
<b>Cn: Case Narrative</b>	<b>5</b>
<b>Sr: Sample Results</b>	<b>6</b>
20201012- PUCKETT 275-1 (NWALL) @ 4' L1273324-01	6
20201012- PUCKETT 275-1 (SWALL) @ 4' L1273324-02	8
20201012- PUCKETT 275-1 (WWALL) @ 4' L1273324-03	10
20201012- PUCKETT 275-1 (EWALL) @ 4' L1273324-04	12
<b>Qc: Quality Control Summary</b>	<b>14</b>
Wet Chemistry by Method 3060A/7196A	14
Wet Chemistry by Method 9045D	15
Wet Chemistry by Method 9050AMod	16
Mercury by Method 7471A	17
Metals (ICP) by Method 6010B	18
Metals (ICPMS) by Method 6020	19
Volatile Organic Compounds (GC) by Method 8015D/GRO	20
Volatile Organic Compounds (GC/MS) by Method 8260B	21
Semi-Volatile Organic Compounds (GC) by Method 8015	22
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	23
<b>Gl: Glossary of Terms</b>	<b>25</b>
<b>Al: Accreditations &amp; Locations</b>	<b>26</b>
<b>Sc: Sample Chain of Custody</b>	<b>27</b>





# SAMPLE SUMMARY

ONE LAB. NATIONWIDE.



## 20201012- PUCKETT 275-1 (NWALL) @ 4' L1273324-01 Solid

Collected by  
Evan Mason

Collected date/time  
10/12/20 11:40

Received date/time  
10/14/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1561067	1	10/19/20 17:38	10/19/20 17:38	CCE	Mt. Juliet, TN
Calculated Results	WG1560550	1	10/16/20 14:38	10/19/20 20:51	KPS	Mt. Juliet, TN
Wet Chemistry by Method 3060A/7196A	WG1561330	1	10/18/20 17:16	10/19/20 20:51	KPS	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1561493	1	10/19/20 09:33	10/19/20 12:25	KLS	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1561981	1	10/20/20 13:09	10/20/20 16:04	MMF	Mt. Juliet, TN
Mercury by Method 7471A	WG1561135	1	10/19/20 10:48	10/19/20 17:49	TCT	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1560550	1	10/16/20 14:38	10/17/20 10:03	EL	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1560554	5	10/16/20 14:40	10/17/20 15:43	JPD	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG1561394	1	10/17/20 20:39	10/19/20 05:26	BMB	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1562367	1	10/17/20 20:39	10/20/20 23:24	JHH	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1562190	1	10/20/20 16:42	10/21/20 11:09	DMG	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG1561699	1	10/20/20 11:47	10/20/20 23:58	JNJ	Mt. Juliet, TN

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

## 20201012- PUCKETT 275-1 (SWALL) @ 4' L1273324-02 Solid

Collected by  
Evan Mason

Collected date/time  
10/12/20 11:45

Received date/time  
10/14/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1561067	1	10/19/20 17:41	10/19/20 17:41	CCE	Mt. Juliet, TN
Calculated Results	WG1560550	1	10/16/20 14:38	10/19/20 20:51	KPS	Mt. Juliet, TN
Wet Chemistry by Method 3060A/7196A	WG1561330	1	10/18/20 17:16	10/19/20 20:51	KPS	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1561493	1	10/19/20 09:33	10/19/20 12:25	KLS	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1561981	1	10/20/20 13:09	10/20/20 16:04	MMF	Mt. Juliet, TN
Mercury by Method 7471A	WG1561135	1	10/19/20 10:48	10/19/20 17:52	TCT	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1560550	1	10/16/20 14:38	10/17/20 10:34	EL	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1560554	5	10/16/20 14:40	10/17/20 15:59	JPD	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG1561394	1	10/17/20 20:39	10/19/20 05:51	BMB	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1562367	1	10/17/20 20:39	10/20/20 23:43	JHH	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1562190	1	10/20/20 16:42	10/21/20 09:36	DMG	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG1561699	1	10/20/20 11:47	10/21/20 03:01	JNJ	Mt. Juliet, TN

## 20201012- PUCKETT 275-1 (WWALL) @ 4' L1273324-03 Solid

Collected by  
Evan Mason

Collected date/time  
10/12/20 11:50

Received date/time  
10/14/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1561067	1	10/19/20 17:43	10/19/20 17:43	CCE	Mt. Juliet, TN
Calculated Results	WG1560550	1	10/16/20 14:38	10/19/20 20:52	KPS	Mt. Juliet, TN
Wet Chemistry by Method 3060A/7196A	WG1561330	1	10/18/20 17:16	10/19/20 20:52	KPS	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1561493	1	10/19/20 09:33	10/19/20 12:25	KLS	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1561981	1	10/20/20 13:09	10/20/20 16:04	MMF	Mt. Juliet, TN
Mercury by Method 7471A	WG1561135	1	10/19/20 10:48	10/19/20 17:54	TCT	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1560550	1	10/16/20 14:38	10/17/20 10:36	EL	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1560554	5	10/16/20 14:40	10/17/20 16:02	JPD	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG1561394	1	10/17/20 20:39	10/19/20 06:13	BMB	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1562367	1	10/17/20 20:39	10/21/20 00:02	JHH	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1562190	1	10/20/20 16:42	10/21/20 09:49	DMG	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG1561699	1	10/20/20 11:47	10/21/20 00:21	JNJ	Mt. Juliet, TN

# SAMPLE SUMMARY

ONE LAB. NATIONWIDE.



20201012- PUCKETT 275-1 (EWALL) @ 4' L1273324-04 Solid

Collected by  
Evan Mason

Collected date/time  
10/12/20 11:55

Received date/time  
10/14/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1561067	1	10/19/20 17:46	10/19/20 17:46	CCE	Mt. Juliet, TN
Calculated Results	WG1560550	1	10/16/20 14:38	10/19/20 20:55	KPS	Mt. Juliet, TN
Wet Chemistry by Method 3060A/7196A	WG1561330	1	10/18/20 17:16	10/19/20 20:55	KPS	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1561493	1	10/19/20 09:33	10/19/20 12:25	KLS	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1561981	1	10/20/20 13:09	10/20/20 16:04	MMF	Mt. Juliet, TN
Mercury by Method 7471A	WG1561135	1	10/19/20 10:48	10/19/20 17:57	TCT	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1560550	1	10/16/20 14:38	10/17/20 10:39	EL	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1560554	5	10/16/20 14:40	10/17/20 16:05	JPD	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG1561394	1	10/17/20 20:39	10/19/20 06:36	BMB	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1562367	1	10/17/20 20:39	10/21/20 00:21	JHH	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1562190	1	10/20/20 16:42	10/21/20 09:22	DMG	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG1561699	1	10/20/20 11:47	10/21/20 00:44	JNJ	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

<sup>1</sup> Cp

<sup>2</sup> Tc

<sup>3</sup> Ss

<sup>4</sup> Cn

<sup>5</sup> Sr

<sup>6</sup> Qc

<sup>7</sup> Gl

<sup>8</sup> Al

<sup>9</sup> Sc



## Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	0.867		1	10/19/2020 17:38	WG1561067

## Calculated Results

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Chromium, Trivalent	15.2		1.00	1	10/19/2020 20:51	<a href="#">WG1560550</a>

## 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	10/19/2020 20:51	<a href="#">WG1561330</a>

## Wet Chemistry by Method 9045D

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	8.17	<a href="#">T8</a>	1	10/19/2020 12:25	<a href="#">WG1561493</a>

## Sample Narrative:

L1273324-01 WG1561493: 8.17 at 22.2C

## Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	181		10.0	1	10/20/2020 16:04	<a href="#">WG1561981</a>

## Mercury by Method 7471A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Mercury	0.0545		0.0400	1	10/19/2020 17:49	<a href="#">WG1561135</a>

## Metals (ICP) by Method 6010B

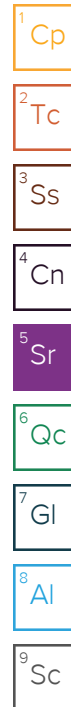
Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Barium	550	<a href="#">Q1</a>	0.500	1	10/17/2020 10:03	<a href="#">WG1560550</a>
Cadmium	ND		0.500	1	10/17/2020 10:03	<a href="#">WG1560550</a>
Chromium	15.2	<a href="#">Q1</a>	1.00	1	10/17/2020 10:03	<a href="#">WG1560550</a>
Copper	18.0		2.00	1	10/17/2020 10:03	<a href="#">WG1560550</a>
Lead	25.7	<a href="#">Q1</a>	0.500	1	10/17/2020 10:03	<a href="#">WG1560550</a>
Nickel	26.1	<a href="#">Q1</a>	2.00	1	10/17/2020 10:03	<a href="#">WG1560550</a>
Selenium	ND		2.00	1	10/17/2020 10:03	<a href="#">WG1560550</a>
Silver	ND		1.00	1	10/17/2020 10:03	<a href="#">WG1560550</a>
Zinc	56.7	<a href="#">Q1</a>	5.00	1	10/17/2020 10:03	<a href="#">WG1560550</a>

## Metals (ICPMS) by Method 6020

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	17.2		1.00	5	10/17/2020 15:43	<a href="#">WG1560554</a>

## 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	ND		0.100	1	10/19/2020 05:26	<a href="#">WG1561394</a>





Collected date/time: 10/12/20 11:40

L1273324

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
(S) <i>a,a,a</i> -Trifluorotoluene(FID)	98.3		77.0-120		10/19/2020 05:26	<a href="#">WG1561394</a>

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	ND		0.00100	1	10/20/2020 23:24	<a href="#">WG1562367</a>
Toluene	ND		0.00500	1	10/20/2020 23:24	<a href="#">WG1562367</a>
Ethylbenzene	ND		0.00250	1	10/20/2020 23:24	<a href="#">WG1562367</a>
Total Xylenes	ND		0.00650	1	10/20/2020 23:24	<a href="#">WG1562367</a>
(S) <i>Toluene-d8</i>	117		75.0-131		10/20/2020 23:24	<a href="#">WG1562367</a>
(S) <i>4-Bromofluorobenzene</i>	90.8		67.0-138		10/20/2020 23:24	<a href="#">WG1562367</a>
(S) <i>1,2-Dichloroethane-d4</i>	80.7		70.0-130		10/20/2020 23:24	<a href="#">WG1562367</a>

## 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	ND	<u>J6</u>	4.00	1	10/21/2020 11:09	<a href="#">WG1562190</a>
(S) <i>o</i> -Terphenyl	48.6		18.0-148		10/21/2020 11:09	<a href="#">WG1562190</a>

## 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	10/20/2020 23:58	<a href="#">WG1561699</a>
Acenaphthene	ND		0.00600	1	10/20/2020 23:58	<a href="#">WG1561699</a>
Acenaphthylene	ND		0.00600	1	10/20/2020 23:58	<a href="#">WG1561699</a>
Benzo(a)anthracene	ND	<u>J4</u>	0.00600	1	10/20/2020 23:58	<a href="#">WG1561699</a>
Benzo(a)pyrene	ND		0.00600	1	10/20/2020 23:58	<a href="#">WG1561699</a>
Benzo(b)fluoranthene	ND		0.00600	1	10/20/2020 23:58	<a href="#">WG1561699</a>
Benzo(g,h,i)perylene	ND		0.00600	1	10/20/2020 23:58	<a href="#">WG1561699</a>
Benzo(k)fluoranthene	ND		0.00600	1	10/20/2020 23:58	<a href="#">WG1561699</a>
Chrysene	ND		0.00600	1	10/20/2020 23:58	<a href="#">WG1561699</a>
Dibenz(a,h)anthracene	ND	<u>J4</u>	0.00600	1	10/20/2020 23:58	<a href="#">WG1561699</a>
Fluoranthene	ND		0.00600	1	10/20/2020 23:58	<a href="#">WG1561699</a>
Fluorene	ND		0.00600	1	10/20/2020 23:58	<a href="#">WG1561699</a>
Indeno(1,2,3-cd)pyrene	ND		0.00600	1	10/20/2020 23:58	<a href="#">WG1561699</a>
Naphthalene	ND		0.0200	1	10/20/2020 23:58	<a href="#">WG1561699</a>
Phenanthrene	ND		0.00600	1	10/20/2020 23:58	<a href="#">WG1561699</a>
Pyrene	ND		0.00600	1	10/20/2020 23:58	<a href="#">WG1561699</a>
1-Methylnaphthalene	ND		0.0200	1	10/20/2020 23:58	<a href="#">WG1561699</a>
2-Methylnaphthalene	ND		0.0200	1	10/20/2020 23:58	<a href="#">WG1561699</a>
2-Chloronaphthalene	ND		0.0200	1	10/20/2020 23:58	<a href="#">WG1561699</a>
(S) <i>p</i> -Terphenyl-d14	92.0		23.0-120		10/20/2020 23:58	<a href="#">WG1561699</a>
(S) Nitrobenzene-d5	81.9		14.0-149		10/20/2020 23:58	<a href="#">WG1561699</a>
(S) <i>2</i> -Fluorobiphenyl	87.2		34.0-125		10/20/2020 23:58	<a href="#">WG1561699</a>



Collected date/time: 10/12/20 11:45

L1273324

## Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	0.203		1	10/19/2020 17:41	WG1561067

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

## Calculated Results

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Chromium, Trivalent	24.6		1.00	1	10/19/2020 20:51	<a href="#">WG1560550</a>

## 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	10/19/2020 20:51	<a href="#">WG1561330</a>

## Wet Chemistry by Method 9045D

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	8.17	<a href="#">T8</a>	1	10/19/2020 12:25	<a href="#">WG1561493</a>

## Sample Narrative:

L1273324-02 WG1561493: 8.17 at 22.2C

## Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	170		10.0	1	10/20/2020 16:04	<a href="#">WG1561981</a>

## Mercury by Method 7471A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Mercury	ND		0.0400	1	10/19/2020 17:52	<a href="#">WG1561135</a>

## Metals (ICP) by Method 6010B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Barium	404		0.500	1	10/17/2020 10:34	<a href="#">WG1560550</a>
Cadmium	ND		0.500	1	10/17/2020 10:34	<a href="#">WG1560550</a>
Chromium	24.6		1.00	1	10/17/2020 10:34	<a href="#">WG1560550</a>
Copper	23.1		2.00	1	10/17/2020 10:34	<a href="#">WG1560550</a>
Lead	17.3		0.500	1	10/17/2020 10:34	<a href="#">WG1560550</a>
Nickel	20.7		2.00	1	10/17/2020 10:34	<a href="#">WG1560550</a>
Selenium	ND		2.00	1	10/17/2020 10:34	<a href="#">WG1560550</a>
Silver	ND		1.00	1	10/17/2020 10:34	<a href="#">WG1560550</a>
Zinc	58.8		5.00	1	10/17/2020 10:34	<a href="#">WG1560550</a>

## Metals (ICPMS) by Method 6020

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	14.1		1.00	5	10/17/2020 15:59	<a href="#">WG1560554</a>

## 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	ND		0.100	1	10/19/2020 05:51	<a href="#">WG1561394</a>



Collected date/time: 10/12/20 11:45

L1273324

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
(S) <i>a,a,a</i> -Trifluorotoluene(FID)	96.5		77.0-120		10/19/2020 05:51	<a href="#">WG1561394</a>

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	ND		0.00100	1	10/20/2020 23:43	<a href="#">WG1562367</a>
Toluene	ND		0.00500	1	10/20/2020 23:43	<a href="#">WG1562367</a>
Ethylbenzene	ND		0.00250	1	10/20/2020 23:43	<a href="#">WG1562367</a>
Total Xylenes	ND		0.00650	1	10/20/2020 23:43	<a href="#">WG1562367</a>
(S) <i>Toluene-d8</i>	115		75.0-131		10/20/2020 23:43	<a href="#">WG1562367</a>
(S) <i>4-Bromofluorobenzene</i>	87.1		67.0-138		10/20/2020 23:43	<a href="#">WG1562367</a>
(S) <i>1,2-Dichloroethane-d4</i>	84.3		70.0-130		10/20/2020 23:43	<a href="#">WG1562367</a>

## 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	17.5		4.00	1	10/21/2020 09:36	<a href="#">WG1562190</a>
(S) <i>o</i> -Terphenyl	56.9		18.0-148		10/21/2020 09:36	<a href="#">WG1562190</a>

## 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	10/21/2020 03:01	<a href="#">WG1561699</a>
Acenaphthene	ND		0.00600	1	10/21/2020 03:01	<a href="#">WG1561699</a>
Acenaphthylene	ND		0.00600	1	10/21/2020 03:01	<a href="#">WG1561699</a>
Benzo(a)anthracene	ND	J4	0.00600	1	10/21/2020 03:01	<a href="#">WG1561699</a>
Benzo(a)pyrene	ND		0.00600	1	10/21/2020 03:01	<a href="#">WG1561699</a>
Benzo(b)fluoranthene	ND		0.00600	1	10/21/2020 03:01	<a href="#">WG1561699</a>
Benzo(g,h,i)perylene	ND		0.00600	1	10/21/2020 03:01	<a href="#">WG1561699</a>
Benzo(k)fluoranthene	ND		0.00600	1	10/21/2020 03:01	<a href="#">WG1561699</a>
Chrysene	ND		0.00600	1	10/21/2020 03:01	<a href="#">WG1561699</a>
Dibenz(a,h)anthracene	ND	J4	0.00600	1	10/21/2020 03:01	<a href="#">WG1561699</a>
Fluoranthene	ND		0.00600	1	10/21/2020 03:01	<a href="#">WG1561699</a>
Fluorene	ND		0.00600	1	10/21/2020 03:01	<a href="#">WG1561699</a>
Indeno(1,2,3-cd)pyrene	ND		0.00600	1	10/21/2020 03:01	<a href="#">WG1561699</a>
Naphthalene	ND		0.0200	1	10/21/2020 03:01	<a href="#">WG1561699</a>
Phenanthrene	ND		0.00600	1	10/21/2020 03:01	<a href="#">WG1561699</a>
Pyrene	ND		0.00600	1	10/21/2020 03:01	<a href="#">WG1561699</a>
1-Methylnaphthalene	ND		0.0200	1	10/21/2020 03:01	<a href="#">WG1561699</a>
2-Methylnaphthalene	ND		0.0200	1	10/21/2020 03:01	<a href="#">WG1561699</a>
2-Chloronaphthalene	ND		0.0200	1	10/21/2020 03:01	<a href="#">WG1561699</a>
(S) <i>p</i> -Terphenyl-d14	104		23.0-120		10/21/2020 03:01	<a href="#">WG1561699</a>
(S) Nitrobenzene-d5	92.9		14.0-149		10/21/2020 03:01	<a href="#">WG1561699</a>
(S) <i>2</i> -Fluorobiphenyl	96.7		34.0-125		10/21/2020 03:01	<a href="#">WG1561699</a>





## Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	0.801		1	10/19/2020 17:43	WG1561067

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

## Calculated Results

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Chromium, Trivalent	20.4		1.00	1	10/19/2020 20:52	<a href="#">WG1560550</a>

## 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	10/19/2020 20:52	<a href="#">WG1561330</a>

## Wet Chemistry by Method 9045D

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	8.35	<a href="#">T8</a>	1	10/19/2020 12:25	<a href="#">WG1561493</a>

## Sample Narrative:

L1273324-03 WG1561493: 8.35 at 22.3C

## Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	176		10.0	1	10/20/2020 16:04	<a href="#">WG1561981</a>

## Mercury by Method 7471A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Mercury	ND		0.0400	1	10/19/2020 17:54	<a href="#">WG1561135</a>

## Metals (ICP) by Method 6010B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Barium	420		0.500	1	10/17/2020 10:36	<a href="#">WG1560550</a>
Cadmium	ND		0.500	1	10/17/2020 10:36	<a href="#">WG1560550</a>
Chromium	20.4		1.00	1	10/17/2020 10:36	<a href="#">WG1560550</a>
Copper	19.5		2.00	1	10/17/2020 10:36	<a href="#">WG1560550</a>
Lead	18.9		0.500	1	10/17/2020 10:36	<a href="#">WG1560550</a>
Nickel	19.3		2.00	1	10/17/2020 10:36	<a href="#">WG1560550</a>
Selenium	ND		2.00	1	10/17/2020 10:36	<a href="#">WG1560550</a>
Silver	ND		1.00	1	10/17/2020 10:36	<a href="#">WG1560550</a>
Zinc	52.4		5.00	1	10/17/2020 10:36	<a href="#">WG1560550</a>

## Metals (ICPMS) by Method 6020

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	14.3		1.00	5	10/17/2020 16:02	<a href="#">WG1560554</a>

## 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	ND		0.100	1	10/19/2020 06:13	<a href="#">WG1561394</a>



Collected date/time: 10/12/20 11:50

L1273324

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
(S) <i>a,a,a</i> -Trifluorotoluene(FID)	95.6		77.0-120		10/19/2020 06:13	<a href="#">WG1561394</a>

1  
Cp2  
Tc3  
Ss4  
Cn5  
Sr6  
Qc7  
Gl8  
Al9  
Sc

## 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	10/21/2020 00:02	<a href="#">WG1562367</a>
Toluene	ND		0.00500	1	10/21/2020 00:02	<a href="#">WG1562367</a>
Ethylbenzene	ND		0.00250	1	10/21/2020 00:02	<a href="#">WG1562367</a>
Total Xylenes	ND		0.00650	1	10/21/2020 00:02	<a href="#">WG1562367</a>
(S) <i>Toluene-d8</i>	115		75.0-131		10/21/2020 00:02	<a href="#">WG1562367</a>
(S) <i>4-Bromofluorobenzene</i>	85.9		67.0-138		10/21/2020 00:02	<a href="#">WG1562367</a>
(S) <i>1,2-Dichloroethane-d4</i>	84.6		70.0-130		10/21/2020 00:02	<a href="#">WG1562367</a>

## 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	13.0		4.00	1	10/21/2020 09:49	<a href="#">WG1562190</a>
(S) <i>o</i> -Terphenyl	68.6		18.0-148		10/21/2020 09:49	<a href="#">WG1562190</a>

## 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	10/21/2020 00:21	<a href="#">WG1561699</a>
Acenaphthene	ND		0.00600	1	10/21/2020 00:21	<a href="#">WG1561699</a>
Acenaphthylene	ND		0.00600	1	10/21/2020 00:21	<a href="#">WG1561699</a>
Benzo(a)anthracene	ND	J4	0.00600	1	10/21/2020 00:21	<a href="#">WG1561699</a>
Benzo(a)pyrene	ND		0.00600	1	10/21/2020 00:21	<a href="#">WG1561699</a>
Benzo(b)fluoranthene	ND		0.00600	1	10/21/2020 00:21	<a href="#">WG1561699</a>
Benzo(g,h,i)perylene	ND		0.00600	1	10/21/2020 00:21	<a href="#">WG1561699</a>
Benzo(k)fluoranthene	ND		0.00600	1	10/21/2020 00:21	<a href="#">WG1561699</a>
Chrysene	ND		0.00600	1	10/21/2020 00:21	<a href="#">WG1561699</a>
Dibenz(a,h)anthracene	ND	J4	0.00600	1	10/21/2020 00:21	<a href="#">WG1561699</a>
Fluoranthene	ND		0.00600	1	10/21/2020 00:21	<a href="#">WG1561699</a>
Fluorene	ND		0.00600	1	10/21/2020 00:21	<a href="#">WG1561699</a>
Indeno(1,2,3-cd)pyrene	ND		0.00600	1	10/21/2020 00:21	<a href="#">WG1561699</a>
Naphthalene	ND		0.0200	1	10/21/2020 00:21	<a href="#">WG1561699</a>
Phenanthrene	ND		0.00600	1	10/21/2020 00:21	<a href="#">WG1561699</a>
Pyrene	ND		0.00600	1	10/21/2020 00:21	<a href="#">WG1561699</a>
1-Methylnaphthalene	ND		0.0200	1	10/21/2020 00:21	<a href="#">WG1561699</a>
2-Methylnaphthalene	ND		0.0200	1	10/21/2020 00:21	<a href="#">WG1561699</a>
2-Chloronaphthalene	ND		0.0200	1	10/21/2020 00:21	<a href="#">WG1561699</a>
(S) <i>p</i> -Terphenyl-d14	95.5		23.0-120		10/21/2020 00:21	<a href="#">WG1561699</a>
(S) Nitrobenzene-d5	86.7		14.0-149		10/21/2020 00:21	<a href="#">WG1561699</a>
(S) <i>2</i> -Fluorobiphenyl	88.6		34.0-125		10/21/2020 00:21	<a href="#">WG1561699</a>



Collected date/time: 10/12/20 11:55

L1273324

## Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	0.748		1	10/19/2020 17:46	WG1561067

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

## Calculated Results

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Chromium, Trivalent	17.3		1.00	1	10/19/2020 20:55	<a href="#">WG1560550</a>

## 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	10/19/2020 20:55	<a href="#">WG1561330</a>

## Wet Chemistry by Method 9045D

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	8.48	<a href="#">T8</a>	1	10/19/2020 12:25	<a href="#">WG1561493</a>

## Sample Narrative:

L1273324-04 WG1561493: 8.48 at 22.2C

## Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	131		10.0	1	10/20/2020 16:04	<a href="#">WG1561981</a>

## Mercury by Method 7471A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Mercury	ND		0.0400	1	10/19/2020 17:57	<a href="#">WG1561135</a>

## Metals (ICP) by Method 6010B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Barium	315		0.500	1	10/17/2020 10:39	<a href="#">WG1560550</a>
Cadmium	ND		0.500	1	10/17/2020 10:39	<a href="#">WG1560550</a>
Chromium	17.3		1.00	1	10/17/2020 10:39	<a href="#">WG1560550</a>
Copper	17.8		2.00	1	10/17/2020 10:39	<a href="#">WG1560550</a>
Lead	13.7		0.500	1	10/17/2020 10:39	<a href="#">WG1560550</a>
Nickel	15.6		2.00	1	10/17/2020 10:39	<a href="#">WG1560550</a>
Selenium	ND		2.00	1	10/17/2020 10:39	<a href="#">WG1560550</a>
Silver	ND		1.00	1	10/17/2020 10:39	<a href="#">WG1560550</a>
Zinc	45.7		5.00	1	10/17/2020 10:39	<a href="#">WG1560550</a>

## Metals (ICPMS) by Method 6020

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	10.9		1.00	5	10/17/2020 16:05	<a href="#">WG1560554</a>

## 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	ND		0.100	1	10/19/2020 06:36	<a href="#">WG1561394</a>



Collected date/time: 10/12/20 11:55

L1273324

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
(S) <i>a,a,a</i> -Trifluorotoluene(FID)	96.5		77.0-120		10/19/2020 06:36	<a href="#">WG1561394</a>

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	ND		0.00100	1	10/21/2020 00:21	<a href="#">WG1562367</a>
Toluene	ND		0.00500	1	10/21/2020 00:21	<a href="#">WG1562367</a>
Ethylbenzene	ND		0.00250	1	10/21/2020 00:21	<a href="#">WG1562367</a>
Total Xylenes	ND		0.00650	1	10/21/2020 00:21	<a href="#">WG1562367</a>
(S) <i>Toluene-d8</i>	118		75.0-131		10/21/2020 00:21	<a href="#">WG1562367</a>
(S) <i>4-Bromofluorobenzene</i>	88.6		67.0-138		10/21/2020 00:21	<a href="#">WG1562367</a>
(S) <i>1,2-Dichloroethane-d4</i>	80.9		70.0-130		10/21/2020 00:21	<a href="#">WG1562367</a>

## 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	13.2		4.00	1	10/21/2020 09:22	<a href="#">WG1562190</a>
(S) <i>o</i> -Terphenyl	48.9		18.0-148		10/21/2020 09:22	<a href="#">WG1562190</a>

## 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	10/21/2020 00:44	<a href="#">WG1561699</a>
Acenaphthene	ND		0.00600	1	10/21/2020 00:44	<a href="#">WG1561699</a>
Acenaphthylene	ND		0.00600	1	10/21/2020 00:44	<a href="#">WG1561699</a>
Benzo(a)anthracene	ND	J4	0.00600	1	10/21/2020 00:44	<a href="#">WG1561699</a>
Benzo(a)pyrene	ND		0.00600	1	10/21/2020 00:44	<a href="#">WG1561699</a>
Benzo(b)fluoranthene	ND		0.00600	1	10/21/2020 00:44	<a href="#">WG1561699</a>
Benzo(g,h,i)perylene	ND		0.00600	1	10/21/2020 00:44	<a href="#">WG1561699</a>
Benzo(k)fluoranthene	ND		0.00600	1	10/21/2020 00:44	<a href="#">WG1561699</a>
Chrysene	ND		0.00600	1	10/21/2020 00:44	<a href="#">WG1561699</a>
Dibenz(a,h)anthracene	ND	J4	0.00600	1	10/21/2020 00:44	<a href="#">WG1561699</a>
Fluoranthene	ND		0.00600	1	10/21/2020 00:44	<a href="#">WG1561699</a>
Fluorene	ND		0.00600	1	10/21/2020 00:44	<a href="#">WG1561699</a>
Indeno(1,2,3-cd)pyrene	ND		0.00600	1	10/21/2020 00:44	<a href="#">WG1561699</a>
Naphthalene	ND		0.0200	1	10/21/2020 00:44	<a href="#">WG1561699</a>
Phenanthrene	ND		0.00600	1	10/21/2020 00:44	<a href="#">WG1561699</a>
Pyrene	ND		0.00600	1	10/21/2020 00:44	<a href="#">WG1561699</a>
1-Methylnaphthalene	ND		0.0200	1	10/21/2020 00:44	<a href="#">WG1561699</a>
2-Methylnaphthalene	ND		0.0200	1	10/21/2020 00:44	<a href="#">WG1561699</a>
2-Chloronaphthalene	ND		0.0200	1	10/21/2020 00:44	<a href="#">WG1561699</a>
(S) <i>p</i> -Terphenyl-d14	78.7		23.0-120		10/21/2020 00:44	<a href="#">WG1561699</a>
(S) Nitrobenzene-d5	70.8		14.0-149		10/21/2020 00:44	<a href="#">WG1561699</a>
(S) <i>2</i> -Fluorobiphenyl	76.5		34.0-125		10/21/2020 00:44	<a href="#">WG1561699</a>



Method Blank (MB)

(MB) R3583232-1 10/19/20 20:48

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

<sup>1</sup>Cp

<sup>2</sup>Tc

<sup>3</sup>Ss

<sup>4</sup>Cn

<sup>5</sup>Sr

<sup>6</sup>Qc

<sup>7</sup>Gl

<sup>8</sup>Al

<sup>9</sup>Sc

L1273327-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1273327-01 10/19/20 20:55 • (DUP) R3583232-7 10/19/20 20:56

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

L1273331-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1273331-02 10/19/20 21:01 • (DUP) R3583232-8 10/19/20 21:02

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

Laboratory Control Sample (LCS)

(LCS) R3583232-2 10/19/20 20:48

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	mg/kg	mg/kg	%	%	
Chromium,Hexavalent	24.0	23.0	96.0	80.0-120	

L1273324-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1273324-03 10/19/20 20:52 • (MS) R3583232-3 10/19/20 20:53 • (MSD) R3583232-4 10/19/20 20:53

	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	17.6	17.2	88.0	85.9	1	75.0-125			2.52	20



Original Sample (OS) • Duplicate (DUP)

(OS) • (DUP) R3583019-2 10/19/20 12:25

	Original Result	DUP Result	Dilution	DUP RPD	<u>DUP Qualifier</u>	DUP RPD Limits
Analyte	su			%		%
pH	10.9		1	0.823		1

Sample Narrative:

DUP: 10.89 at 23C

L1273327-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1273327-01 10/19/20 12:25 • (DUP) R3583019-3 10/19/20 12:25

	Original Result	DUP Result	Dilution	DUP RPD	<u>DUP Qualifier</u>	DUP RPD Limits
Analyte	su	su		%		%
pH	8.24	8.24	1	0.000		1

Sample Narrative:

OS: 8.24 at 22.2C

DUP: 8.24 at 22C

Laboratory Control Sample (LCS)

(LCS) R3583019-1 10/19/20 12:25

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	<u>LCS Qualifier</u>
Analyte	su	su	%	%	
pH	10.0	10.1	101	99.0-101	

Sample Narrative:

LCS: 10.05 at 20.6C



Method Blank (MB)

(MB) R3583533-1 10/20/20 16:04

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

1

Cp

2

Tc

3

Ss

4

Cn

5

Sr

6

Qc

7

Gl

8

Al

9

Sc

L1270863-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1270863-01 10/20/20 16:04 • (DUP) R3583533-3 10/20/20 16:04

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	umhos/cm	umhos/cm		%		%
Specific Conductance	740	718	1	3.02		20

L1273331-05 Original Sample (OS) • Duplicate (DUP)

(OS) L1273331-05 10/20/20 16:04 • (DUP) R3583533-4 10/20/20 16:04

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	umhos/cm	umhos/cm		%		%
Specific Conductance	326	325	1	0.307		20

Laboratory Control Sample (LCS)

(LCS) R3583533-2 10/20/20 16:04

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	umhos/cm	umhos/cm	%	%	
Specific Conductance	326	326	100	85.0-115	



Method Blank (MB)

(MB) R3583251-1 10/19/20 17:37

	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	mg/kg		mg/kg	mg/kg
Mercury	U		0.0180	0.0400

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

Laboratory Control Sample (LCS)

(LCS) R3583251-2 10/19/20 17:39

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	mg/kg	mg/kg	%	%	
Mercury	0.500	0.499	99.9	80.0-120	

7 Gl

8 Al

9 Sc

L1273358-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1273358-02 10/19/20 17:42 • (MS) R3583251-3 10/19/20 17:44 • (MSD) R3583251-4 10/19/20 17:47

	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	ND	0.430	0.422	82.0	80.4	1	75.0-125			1.89	20



Method Blank (MB)

(MB) R3582797-1 10/17/20 09:58

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Barium	U		0.240	0.500
Cadmium	U		0.0810	0.500
Chromium	U	J	0.250	1.00
Copper	U		0.506	2.00
Lead	U		0.208	0.500
Nickel	U		0.490	2.00
Selenium	U		0.617	2.00
Silver	U		0.228	1.00
Zinc	U		0.939	5.00

<sup>1</sup>Cp

<sup>2</sup>Tc

<sup>3</sup>Ss

<sup>4</sup>Cn

<sup>5</sup>Sr

<sup>6</sup>Qc

<sup>7</sup>Gl

<sup>8</sup>Al

<sup>9</sup>Sc

Laboratory Control Sample (LCS)

(LCS) R3582797-2 10/17/20 10:00

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Barium	100	97.3	97.3	80.0-120	
Cadmium	100	95.3	95.3	80.0-120	
Chromium	100	97.5	97.5	80.0-120	
Copper	100	96.4	96.4	80.0-120	
Lead	100	95.7	95.7	80.0-120	
Nickel	100	97.0	97.0	80.0-120	
Selenium	100	96.5	96.5	80.0-120	
Silver	20.0	17.9	89.4	80.0-120	
Zinc	100	94.5	94.5	80.0-120	

L1273324-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1273324-01 10/17/20 10:03 • (MS) R3582797-5 10/17/20 10:10 • (MSD) R3582797-6 10/17/20 10:13

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 %
Barium	100	550	653	637	102	86.9	1	75.0-125			2.37	20
Cadmium	100	ND	97.7	96.7	97.7	96.7	1	75.0-125			1.08	20
Chromium	100	15.2	112	112	97.1	97.1	1	75.0-125			0.0148	20
Copper	100	18.0	121	120	103	102	1	75.0-125			0.934	20
Lead	100	25.7	125	126	99.3	100	1	75.0-125			0.595	20
Nickel	100	26.1	126	123	100	97.2	1	75.0-125			2.35	20
Selenium	100	ND	98.9	97.6	98.9	97.6	1	75.0-125			1.31	20
Silver	20.0	ND	18.0	17.6	89.8	87.9	1	75.0-125			2.13	20
Zinc	100	56.7	153	151	96.1	94.2	1	75.0-125			1.25	20



Method Blank (MB)

(MB) R3582624-1 10/17/20 15:36

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Arsenic	U		0.100	1.00

<sup>1</sup>Cp

<sup>2</sup>Tc

<sup>3</sup>Ss

<sup>4</sup>Cn

<sup>5</sup>Sr

<sup>6</sup>Qc

Laboratory Control Sample (LCS)

(LCS) R3582624-2 10/17/20 15:39

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Arsenic	100	97.1	97.1	80.0-120	

<sup>7</sup>Gl

<sup>8</sup>Al

L1273324-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1273324-01 10/17/20 15:43 • (MS) R3582624-5 10/17/20 15:52 • (MSD) R3582624-6 10/17/20 15:56

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	20.0	17.2	110	111	93.1	94.2	5	75.0-125			0.965	20

<sup>9</sup>Sc

Method Blank (MB)

(MB) R3584619-1 10/18/20 15:06

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)	100			77.0-120

Laboratory Control Sample (LCS)

(LCS) R3584619-2 10/18/20 16:09

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
TPH (GC/FID) Low Fraction	5.50	5.55	101	72.0-127	
(S) a,a,a-Trifluorotoluene(FID)			99.9	77.0-120	

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc



Method Blank (MB)

(MB) R3583832-3 10/20/20 22:46

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Benzene	U		0.000467	0.00100
Ethylbenzene	U		0.000737	0.00250
Toluene	U		0.00130	0.00500
Xylenes, Total	U		0.000880	0.00650
(S) Toluene-d8	118			75.0-131
(S) 4-Bromofluorobenzene	90.0			67.0-138
(S) 1,2-Dichloroethane-d4	86.4			70.0-130

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

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

(LCS) R3583832-1 10/20/20 21:31 • (LCSD) R3583832-2 10/20/20 21:50

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	0.113	86.4	90.4	70.0-123			4.52	20
Ethylbenzene	0.125	0.119	0.120	95.2	96.0	74.0-126			0.837	20
Toluene	0.125	0.134	0.137	107	110	75.0-121			2.21	20
Xylenes, Total	0.375	0.348	0.353	92.8	94.1	72.0-127			1.43	20
(S) Toluene-d8				118	116	75.0-131				
(S) 4-Bromofluorobenzene				86.3	85.1	67.0-138				
(S) 1,2-Dichloroethane-d4				87.8	91.6	70.0-130				

L1273324-04 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1273324-04 10/21/20 00:21 • (MS) R3583832-4 10/21/20 05:23 • (MSD) R3583832-5 10/21/20 05:42

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	0.124	ND	0.0895	0.0820	72.2	66.1	1	10.0-149			8.75	37
Ethylbenzene	0.124	ND	0.115	0.0920	92.7	74.2	1	10.0-160			22.2	38
Toluene	0.124	ND	0.137	0.110	110	88.7	1	10.0-156			21.9	38
Xylenes, Total	0.372	ND	0.407	0.305	109	82.0	1	10.0-160			28.7	38
(S) Toluene-d8					116	116		75.0-131				
(S) 4-Bromofluorobenzene					92.0	88.4		67.0-138				
(S) 1,2-Dichloroethane-d4					82.2	82.6		70.0-130				



Method Blank (MB)

(MB) R3583816-1 10/21/20 03:32

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

<sup>1</sup>Cp

<sup>2</sup>Tc

<sup>3</sup>Ss

<sup>4</sup>Cn

<sup>5</sup>Sr

<sup>6</sup>Qc

<sup>7</sup>Gl

<sup>8</sup>Al

<sup>9</sup>Sc

Laboratory Control Sample (LCS)

(LCS) R3583816-2 10/21/20 03:45

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
TPH (GC/FID) High Fraction	50.0	30.0	60.0	50.0-150	
(S) o-Terphenyl			75.5	18.0-148	

L1273324-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1273324-01 10/21/20 11:09 • (MS) R3583816-3 10/21/20 11:22 • (MSD) R3583816-4 10/21/20 11:35

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	49.8	ND	27.4	22.9	55.0	46.0	1	50.0-150		J6	17.9	20
(S) o-Terphenyl					65.4	57.7		18.0-148				



Method Blank (MB)

(MB) R3583854-2 10/20/20 20:09

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Anthracene	U		0.00230	0.00600
Acenaphthene	U		0.00209	0.00600
Acenaphthylene	U		0.00216	0.00600
Benzo(a)anthracene	U		0.00173	0.00600
Benzo(a)pyrene	U		0.00179	0.00600
Benzo(b)fluoranthene	U		0.00153	0.00600
Benzo(g,h,i)perylene	U		0.00177	0.00600
Benzo(k)fluoranthene	U		0.00215	0.00600
Chrysene	U		0.00232	0.00600
Dibenz(a,h)anthracene	U		0.00172	0.00600
Fluoranthene	U		0.00227	0.00600
Fluorene	U		0.00205	0.00600
Indeno(1,2,3-cd)pyrene	U		0.00181	0.00600
Naphthalene	U		0.00408	0.0200
Phenanthrene	U		0.00231	0.00600
Pyrene	U		0.00200	0.00600
1-Methylnaphthalene	U		0.00449	0.0200
2-Methylnaphthalene	U		0.00427	0.0200
2-Chloronaphthalene	U		0.00466	0.0200
(S) Nitrobenzene-d5	87.9			14.0-149
(S) 2-Fluorobiphenyl	97.8			34.0-125
(S) p-Terphenyl-d14	110			23.0-120

<sup>1</sup>Cp

<sup>2</sup>Tc

<sup>3</sup>Ss

<sup>4</sup>Cn

<sup>5</sup>Sr

<sup>6</sup>Qc

<sup>7</sup>Gl

<sup>8</sup>Al

<sup>9</sup>Sc

Laboratory Control Sample (LCS)

(LCS) R3583854-1 10/20/20 19:47

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Anthracene	0.0800	0.0890	111	50.0-126	
Acenaphthene	0.0800	0.0940	117	50.0-120	
Acenaphthylene	0.0800	0.0839	105	50.0-120	
Benzo(a)anthracene	0.0800	0.0979	122	45.0-120	J4
Benzo(a)pyrene	0.0800	0.0739	92.4	42.0-120	
Benzo(b)fluoranthene	0.0800	0.0841	105	42.0-121	
Benzo(g,h,i)perylene	0.0800	0.0991	124	45.0-125	
Benzo(k)fluoranthene	0.0800	0.0884	111	49.0-125	
Chrysene	0.0800	0.0965	121	49.0-122	
Dibenz(a,h)anthracene	0.0800	0.101	126	47.0-125	J4
Fluoranthene	0.0800	0.0891	111	49.0-129	

Laboratory Control Sample (LCS)

(LCS) R3583854-1 10/20/20 19:47

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	<u>LCS Qualifier</u>
Fluorene	0.0800	0.0933	117	49.0-120	
Indeno(1,2,3-cd)pyrene	0.0800	0.0985	123	46.0-125	
Naphthalene	0.0800	0.0872	109	50.0-120	
Phenanthrene	0.0800	0.0935	117	47.0-120	
Pyrene	0.0800	0.0962	120	43.0-123	
1-Methylnaphthalene	0.0800	0.0827	103	51.0-121	
2-Methylnaphthalene	0.0800	0.0779	97.4	50.0-120	
2-Chloronaphthalene	0.0800	0.0908	114	50.0-120	
(S) Nitrobenzene-d5			100	14.0-149	
(S) 2-Fluorobiphenyl			112	34.0-125	
(S) p-Terphenyl-d14			127	23.0-120	<a href="#">J1</a>

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

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.
J4	The associated batch QC was outside the established quality control range for accuracy.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.
O1	The analyte failed the method required serial dilution test and/or subsequent post-spike criteria. These failures indicate matrix interference.
T8	Sample(s) received past/too close to holding time expiration.

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 <sup>1</sup>	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina <sup>1</sup>	DW21704
Georgia	NELAP	North Carolina <sup>3</sup>	41
Georgia <sup>1</sup>	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 <sup>1 6</sup>	90010	South Carolina	84004
Kentucky <sup>2</sup>	16	South Dakota	n/a
Louisiana	AI30792	Tennessee <sup>1 4</sup>	2006
Louisiana <sup>1</sup>	LA180010	Texas	T104704245-18-15
Maine	TN0002	Texas <sup>5</sup>	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 <sup>5</sup>	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

<sup>1</sup> Drinking Water <sup>2</sup> Underground Storage Tanks <sup>3</sup> Aquatic Toxicity <sup>4</sup> Chemical/Microbiological <sup>5</sup> Mold <sup>6</sup> 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 & Gas LLC  
143 Diamond Avenue  
Parachute, CO 81635  
970-285-9606

Report to:  
jjanicek@caerusoilandgas.com

Project Description:  
Puckett 275-1

Phone:  
Fax:

Client Project #  
Puckett 275-1

City/State  
Collected: Piceance, CO

Lab Project #  
Puckett 275-1

Collected by (print):  
Evan Mason

Site/Facility ID #  
Puckett 275-1

P.O. #  
Puckett 275-1

Collected by (signature):  
[Signature]

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  
Standard TAT

Immediately  
Packed on Ice N Y X

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs
20201012-Puckett 275-1 (NWALL) @ 4'	Grab	SS	4'	10/12/20	1140	2
20201012-Puckett 275-1 (SWALL) @ 4'			4'		1145	2
20201012-Puckett 275-1 (W WALL) @ 4'			4'		1150	2
20201012-Puckett 275-1 (EWALL) @ 4'			4'		1155	2
20201012-Puckett 275-1 (BOTTOM) @ 6'			6'		1135	2

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

Remarks:  
Standard TAT

Samples returned via:  
UPS FedEx Courier

Relinquished by: (Signature) [Signature]  
Date: 10/13/20 Time: 1130  
Relinquished by: (Signature) [Signature]  
Date: 10/13/20 Time: 1700  
Relinquished by: (Signature) [Signature]  
Date: Time:

Received by: (Signature) [Signature]  
Received by: (Signature) [Signature]  
Received for lab by: (Signature) [Signature]  
Trip Blank Received: Yes/No  
HCL / MeOH TBR  
Temp: 13°C  
Bottles Received: 10  
Date: 10-14-20 Time: 900

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

If preservation required by Login: Date/Time  
Hold:  
Condition: NCF / 0

Billing Information:

Same as above

Email To:  
jjanicek@caerusoilandgas.com

Pres Chk

Analysis / Container / Preservative

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 # 127324  
H027

Acctnum:

Template:

Prelogin:

TSR:

PB:

Shipped Via:

Remarks Sample # (lab only)

TPH- GRO/DRO

BTEX

TABLE 910- PAH's

SAR, EC, pH

TABLE 910- Metals

October 21, 2020

<sup>1</sup> Cp

<sup>2</sup> Tc

<sup>3</sup> Ss

<sup>4</sup> Cn

<sup>5</sup> Sr

<sup>6</sup> Qc

<sup>7</sup> Gl


<sup>8</sup> Al

<sup>9</sup> Sc

## Caerus Oil and Gas

Sample Delivery Group: L1273320  
Samples Received: 10/14/2020  
Project Number: PUCKETT 275-1  
Description: PUCKETT 275-1  
Site: PUCKETT 275-1  
Report To: Jake Janicek  
143 Diamond Avenue  
Parachute, CO 81635

Entire Report Reviewed By:



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.



Cp: Cover Page	1
Tc: Table of Contents	2
Ss: Sample Summary	3
Cn: Case Narrative	4
Sr: Sample Results	5
20201012-PUCKETT 275-1 (BG01) @ 6" L1273320-01	5
20201012-PUCKETT 275-1 (BG02) @ 6" L1273320-02	6
20201012-PUCKETT 275-1 (BG03) @ 6" L1273320-03	7
20201012-PUCKETT 275-1 (BG04) @ 6" L1273320-04	8
Qc: Quality Control Summary	9
Wet Chemistry by Method 9045D	9
Wet Chemistry by Method 9050AMod	10
Metals (ICP) by Method 6010B	11
Gl: Glossary of Terms	12
Al: Accreditations & Locations	13
Sc: Sample Chain of Custody	14





## 20201012-PUCKETT 275-1 (BG01) @ 6" L1273320-01 Solid

Collected by  
Evan MasonCollected date/time  
10/12/20 12:00Received date/time  
10/14/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1561067	1	10/20/20 02:43	10/20/20 02:43	CCE	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1561493	1	10/19/20 09:33	10/19/20 12:25	KLS	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1561981	1	10/20/20 13:09	10/20/20 16:04	MMF	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1560550	1	10/16/20 14:38	10/17/20 10:18	EL	Mt. Juliet, TN

1  
Cp2  
Tc3  
Ss4  
Cn5  
Sr6  
Qc7  
Gl8  
Al9  
Sc

## 20201012-PUCKETT 275-1 (BG02) @ 6" L1273320-02 Solid

Collected by  
Evan MasonCollected date/time  
10/12/20 12:10Received date/time  
10/14/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1561067	1	10/20/20 02:46	10/20/20 02:46	CCE	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1561493	1	10/19/20 09:33	10/19/20 12:25	KLS	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1561981	1	10/20/20 13:09	10/20/20 16:04	MMF	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1560550	1	10/16/20 14:38	10/17/20 10:21	EL	Mt. Juliet, TN

## 20201012-PUCKETT 275-1 (BG03) @ 6" L1273320-03 Solid

Collected by  
Evan MasonCollected date/time  
10/12/20 12:20Received date/time  
10/14/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1561067	1	10/20/20 02:49	10/20/20 02:49	CCE	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1561493	1	10/19/20 09:33	10/19/20 12:25	KLS	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1561981	1	10/20/20 13:09	10/20/20 16:04	MMF	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1560550	1	10/16/20 14:38	10/17/20 10:29	EL	Mt. Juliet, TN

## 20201012-PUCKETT 275-1 (BG04) @ 6" L1273320-04 Solid

Collected by  
Evan MasonCollected date/time  
10/12/20 12:30Received date/time  
10/14/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1561067	1	10/20/20 02:51	10/20/20 02:51	CCE	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1561493	1	10/19/20 09:33	10/19/20 12:25	KLS	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1561981	1	10/20/20 13:09	10/20/20 16:04	MMF	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1560550	1	10/16/20 14:38	10/17/20 10:31	EL	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

<sup>1</sup> Cp

<sup>2</sup> Tc

<sup>3</sup> Ss

<sup>4</sup> Cn

<sup>5</sup> Sr

<sup>6</sup> Qc

<sup>7</sup> Gl

<sup>8</sup> Al

<sup>9</sup> Sc





## Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	0.0877		1	10/20/2020 02:43	WG1561067

## Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	7.16	T8	1	10/19/2020 12:25	<a href="#">WG1561493</a>

## Sample Narrative:

L1273320-01 WG1561493: 7.16 at 21.4C

## Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Specific Conductance	umhos/cm		umhos/cm			
Specific Conductance	195		10.0	1	10/20/2020 16:04	<a href="#">WG1561981</a>

## Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Arsenic	mg/kg		mg/kg			
Arsenic	12.6		2.00	1	10/17/2020 10:18	<a href="#">WG1560550</a>

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	0.121		1	10/20/2020 02:46	WG1561067

## Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	7.34	<u>T8</u>	1	10/19/2020 12:25	<a href="#">WG1561493</a>

## Sample Narrative:

L1273320-02 WG1561493: 7.34 at 21.2C

## Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Specific Conductance	umhos/cm		umhos/cm			
Specific Conductance	90.0		10.0	1	10/20/2020 16:04	<a href="#">WG1561981</a>

## Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Arsenic	mg/kg		mg/kg			
Arsenic	23.7		2.00	1	10/17/2020 10:21	<a href="#">WG1560550</a>

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





## Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	0.120		1	10/20/2020 02:49	WG1561067

## Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	7.42	<u>T8</u>	1	10/19/2020 12:25	<a href="#">WG1561493</a>

## Sample Narrative:

L1273320-03 WG1561493: 7.42 at 21.1C

## Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Specific Conductance	umhos/cm		umhos/cm			
Specific Conductance	99.5		10.0	1	10/20/2020 16:04	<a href="#">WG1561981</a>

## Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Arsenic	mg/kg		mg/kg			
Arsenic	12.7		2.00	1	10/17/2020 10:29	<a href="#">WG1560550</a>

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



## Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	0.0595		1	10/20/2020 02:51	WG1561067

<sup>1</sup> Cp<sup>2</sup> Tc

## Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	6.52	<u>T8</u>	1	10/19/2020 12:25	<a href="#">WG1561493</a>

<sup>3</sup> Ss<sup>4</sup> Cn

## Sample Narrative:

L1273320-04 WG1561493: 6.52 at 22.6C

<sup>5</sup> Sr

## Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Specific Conductance	umhos/cm		umhos/cm			
Specific Conductance	50.8		10.0	1	10/20/2020 16:04	<a href="#">WG1561981</a>

<sup>6</sup> Qc<sup>7</sup> Gl

## Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
	mg/kg		mg/kg			
Arsenic	4.55		2.00	1	10/17/2020 10:31	<a href="#">WG1560550</a>

<sup>8</sup> Al<sup>9</sup> Sc



Laboratory Control Sample (LCS)

(LCS) R3583019-1 10/19/20 12:25

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	<u>LCS Qualifier</u>
	su	su	%	%	
pH	10.0	10.1	101	99.0-101	

Sample Narrative:

LCS: 10.05 at 20.6C

<sup>1</sup>Cp

<sup>2</sup>Tc

<sup>3</sup>Ss

<sup>4</sup>Cn

<sup>5</sup>Sr

<sup>6</sup>Qc

<sup>7</sup>Gl

<sup>8</sup>Al

<sup>9</sup>Sc

Method Blank (MB)

(MB) R3583533-1 10/20/20 16:04

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

1

Cp

2

Tc

3

Ss

4

Cn

5

Sr

6

Qc

7

Gl

8

Al

9

Sc

L1270863-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1270863-01 10/20/20 16:04 • (DUP) R3583533-3 10/20/20 16:04

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	umhos/cm	umhos/cm		%		%
Specific Conductance	740	718	1	3.02		20

L1273331-05 Original Sample (OS) • Duplicate (DUP)

(OS) L1273331-05 10/20/20 16:04 • (DUP) R3583533-4 10/20/20 16:04

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	umhos/cm	umhos/cm		%		%
Specific Conductance	326	325	1	0.307		20

Laboratory Control Sample (LCS)

(LCS) R3583533-2 10/20/20 16:04

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	umhos/cm	umhos/cm	%	%	
Specific Conductance	326	326	100	85.0-115	



Method Blank (MB)

(MB) R3582797-1 10/17/20 09:58

	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	mg/kg		mg/kg	mg/kg
Arsenic	U		0.460	2.00

<sup>1</sup> Cp

<sup>2</sup> Tc

<sup>3</sup> Ss

<sup>4</sup> Cn

<sup>5</sup> Sr

<sup>6</sup> Qc

<sup>7</sup> Gl

<sup>8</sup> Al

<sup>9</sup> Sc

Laboratory Control Sample (LCS)

(LCS) R3582797-2 10/17/20 10:00

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	mg/kg	mg/kg	%	%	
Arsenic	100	93.8	93.8	80.0-120	

L1273324-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1273324-01 10/17/20 10:03 • (MS) R3582797-5 10/17/20 10:10 • (MSD) R3582797-6 10/17/20 10:13

	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	%	%		%			%	%
Arsenic	100	16.1	111	110	94.7	94.1	1	75.0-125			0.598	20



## 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.
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
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

T8	Sample(s) received past/too close to holding time expiration.
----	---

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 <sup>1</sup>	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina <sup>1</sup>	DW21704
Georgia	NELAP	North Carolina <sup>3</sup>	41
Georgia <sup>1</sup>	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 <sup>1 6</sup>	90010	South Carolina	84004
Kentucky <sup>2</sup>	16	South Dakota	n/a
Louisiana	AI30792	Tennessee <sup>1 4</sup>	2006
Louisiana <sup>1</sup>	LA180010	Texas	T104704245-18-15
Maine	TN0002	Texas <sup>5</sup>	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 <sup>5</sup>	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

<sup>1</sup> Drinking Water <sup>2</sup> Underground Storage Tanks <sup>3</sup> Aquatic Toxicity <sup>4</sup> Chemical/Microbiological <sup>5</sup> Mold <sup>6</sup> 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.



Condition:  
NCF / OK