



**VIA ELECTRONIC MAIL –**

February 2, 2021

Jake Janicek  
EH&S Specialist  
Caerus Oil and Gas LLC  
143 Diamond Avenue  
Parachute, Colorado 81635

**Subject: Remediation Workplan  
Dumpline Release  
J17E  
Mamm Creek Field  
Garfield County, Colorado**

Dear Mr. Janicek:

WSP USA Inc. (WSP), formerly LT Environmental, Inc. (LTE), on behalf of Caerus Oil and Gas LLC (Caerus), developed this remediation workplan to address impacts to soil associated with a dumpline release at the J17E (Facility ID: 334782) pad location (Site). The remediation workplan is in response to exceedances of Colorado Oil and Gas Conservation Commission (COGCC) Table 910-1 Concentration Levels observed in the initial point of release (POR) sample. The initial correspondence and conditions of approval (COA) issued by the COGCC can be referenced in initial Spill/Release Report Form 19 Document Number 402530584. The initial POR sampling was requested after an unknown volume of produced water was reported to have been released from the produced water dumpline during a routine pressure test at the Site. The failed dumpline was connected to tank 78567. The Site is located in the Caerus Mamm Creek area of operation in Garfield County, Colorado (Figure 1).

## INITIAL SAMPLING ACTIVITIES

On January 8, 2021, WSP personnel completed initial soil sampling activities associated with the produced water dumpline release at the Site. Using a hand auger, soil sample 20210108-J17E (POR)@8.5' was collected at a depth of 8.5 feet below ground surface (bgs). The soil sample was collected directly beneath the exposed dumpline where the release occurred. The soil sampling activities were conducted by a WSP geologist who inspected the soil sample for the presence or absence of petroleum hydrocarbons odor and/or staining. The soil was characterized by visually inspecting the confirmation soil sample and field screening the soil head space using a photoionization detector (PID) to monitor for the presence and or absence of volatile organic vapors. The sample was collected in clean laboratory prepared containers and submitted to Pace Analytical (Pace) of Mount Juliet, Tennessee for analysis of constituents listed in COGCC Table 910-1. The laboratory analytical report is provided as an enclosure. The enclosed Site Map illustrates the sample location (Figure 2).

## ANALYTICAL RESULTS

Laboratory analytical results of soil sample 20210108-J17E (POR)@8.5' indicate exceedances of the COGCC Table 910-1 Concentration Levels for total petroleum hydrocarbons (TPH)-diesel range organics (DRO), TPH-gasoline range organics (GRO), benzene, toluene, total xylenes, arsenic, and sodium adsorption ratio (SAR). The laboratory analytical results are included as Enclosure A and summarized in Table 1.

WSP USA  
820 MEGAN AVENUE, UNIT B  
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## REMEDIATION WORKPLAN ACTIVITIES

Proposed remediation activities include the delineation of the hydrocarbon impacts observed in initial POR sample 20210108 – J17E (POR)8.5'. In order to delineate the vertical and lateral extent of the above-mentioned hydrocarbon impacts, WSP will use a hydro-vacuum truck and a hand auger to collect soil samples at the proposed pothole locations depicted on Figure 3. The proposed pothole locations are located approximately 20 feet laterally from the POR location. Each proposed pothole location will be advanced to a depth of 8.5 feet bgs prior to soil screening activities. Once a vertical depth of 8.5 feet bgs is reached in each proposed pothole location, soil samples will then be collected every two feet until field screening techniques indicate compliance with COGCC Table 915-1. The soil sampling and screening activities will be conducted by a WSP geologist who will inspect each soil sample for the presence or absence of petroleum hydrocarbons odor and/or staining. The soil will be characterized by visually inspecting the soil samples and field screening the soil head space using a PID to monitor for the presence and or absence of volatile organic vapors. All soil sampling equipment will be properly decontaminated between sampling intervals to ensure representative samples are collected. A total of two soil samples will be collected from each pothole location: one observed to be the most impacted based on field screening techniques and one from the terminus of the pothole. All soil samples will be submitted for the analysis of constituents listed in COGCC Table 915-1.

If vertical and lateral delineation is not obtained through the advancement of the four proposed pothole locations, four additional contingency potholes will be advanced. These locations will be advanced approximately 40 feet beyond the initial POR location. Each contingency pothole location will be advanced to a depth of 5 feet bgs prior to the start of soil screening activities, at which point soil samples will then be collected every two feet until field screening techniques indicate compliance with COGCC Table 915-1. The soil samples will be collected, characterized, field screened, and analyzed as previously described. The proposed and contingency pothole locations are depicted on the enclosed Figure 3.

If the initial assessment activities described above are successful in delineating the identified impacts, WSP proposes to remove impacted soil through excavation activities. Prior to excavation activities, all production tanks and the containment ring will be removed. The general excavation lateral and vertical extent will be based on the soil analytical results from the potholing activities. The number of excavation confirmation soil samples will be based on Table 1 referenced in the COGCC Rule 915.e.(2) – Soil Sampling and Analysis Guidance Document: one floor sample will be collected for every 500 square feet and one sidewall sample will be collected from each sidewall if the sidewall is less than 40 linear feet. If the sidewall is greater than 40 linear feet, one sidewall sample will be collected every 20 linear feet. Due to safety concerns associated with entering the open excavation, all soil samples will be collected from the excavator bucket. Prior to sample collection using the excavator bucket, all sampling surfaces will be scraped to removed smeared areas and/or weathered material to ensure each sample is representative of an undisturbed recently exposed surface. All soil samples will be collected, characterized, field screened, and analyzed as previously described.

All excavated soil determined to be impacted will be stored in a containment berm on the working surface of the pad. In order to adequately characterize the stockpiled soil for onsite landfarming and/or landfill disposal, five-point composite soil samples will be collected for every 1,000 cubic yards of excavated soil. Each aliquot will be collected at depth of approximately half of the thickness of the stockpile at each sample location. Once the stockpiled soil has been removed, the surface area beneath the stockpile location will be sampled. One five-point composite sample will be collected for every 500 square feet of surface area beneath the stockpile area. All composite soil samples will be collected, characterized, field screened, and analyzed as previously described.

Following excavation activities, WSP will collect soil samples from beneath the above ground storage tanks which are planned to be removed prior to excavation activities. If the excavation extent encompasses the soil beneath where the above ground tanks were originally staged, then no soil sample will be collected as the soil would have been removed during excavation activities. If the excavation extent doesn't cover the soil beneath the above ground storage tanks, then one representative soil sample will be collected beneath each former above ground tank location at approximately 2 feet bgs. The soil samples will be collected, characterized, field screened, and analyzed as previously described. The proposed confirmation soil samples are depicted on the enclosed Figure 4.



Following the proposed excavation and soil sampling activities, the dumpline right-of-way (ROW) will be excavated to remove the piping infrastructure. Once the dumplines are removed from the ROW, WSP will collect a series of confirmation soil samples within the ROW corridor to confirm no additional impacts associated with the release remain. WSP will collect confirmation soil samples every 100 linear feet, including one floor sample and one wall sample in each cardinal direction. All floor samples will be collected beneath the piping infrastructure. An estimated 11 soil samples from within the dumpline ROW will be collected, characterized, field screened, and analyzed as previously described. The dumpline ROW sampling locations are depicted on the enclosed Figure 5.

Please contact us at (970) 618-4514 or (720) 490-6758 if you have any questions regarding this report or require additional information.

Kind regards,

A handwritten signature in black ink, appearing to read 'D. Held'.

Dustin Held  
Consultant, Environmental Geologist

A handwritten signature in black ink, appearing to read 'Chris McKisson'.

Chris McKisson  
Senior Consultant, Environmental Scientist

Encl.

## FIGURES

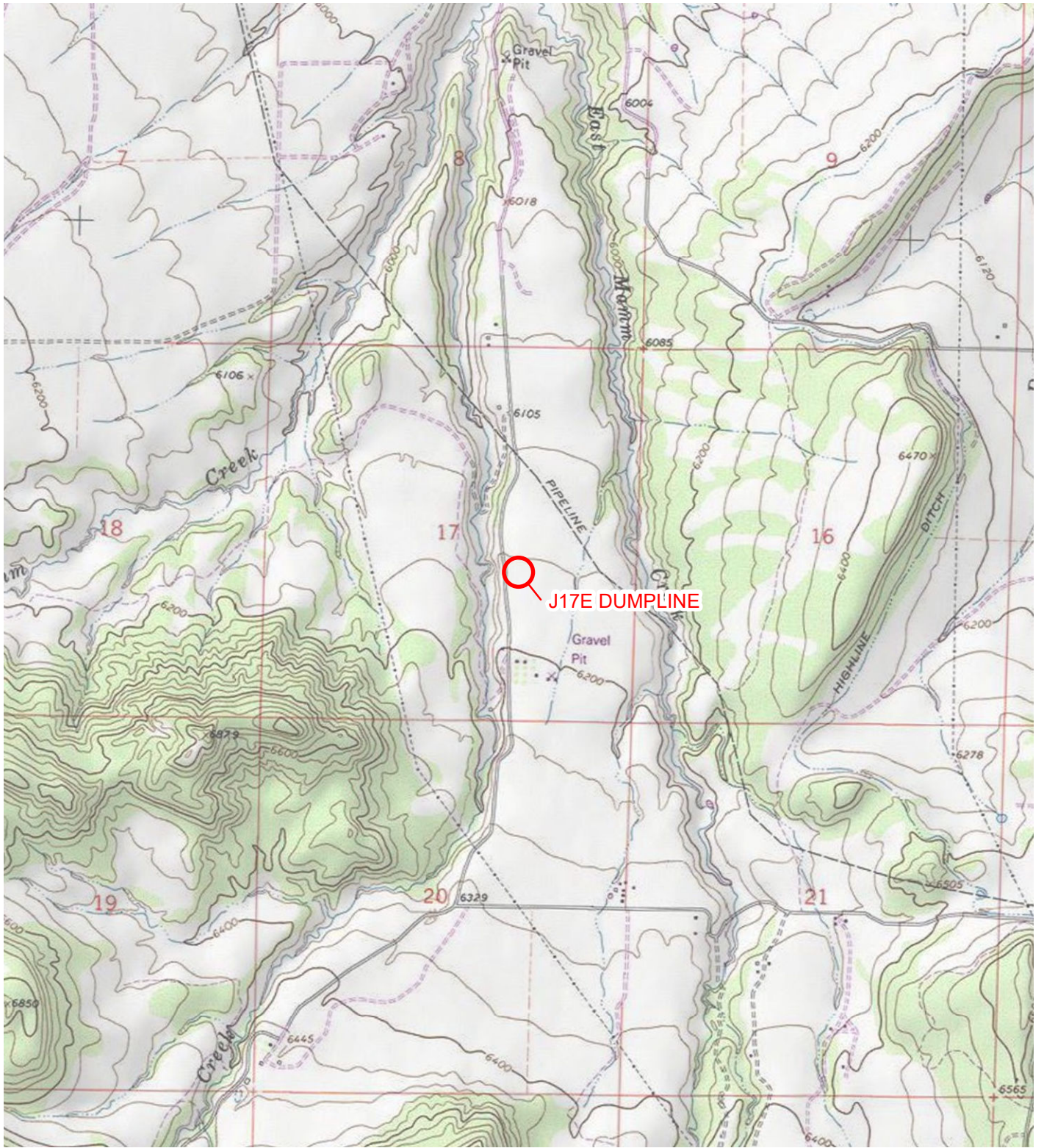
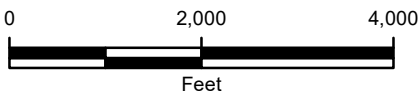


IMAGE COURTESY OF ESRI/USGS

**LEGEND**

 SITE LOCATION



**FIGURE 1**  
**SITE LOCATION MAP**  
**J17E DUMPLINE**  
**NWSE SEC 17-T7S-R92W**  
**GARFIELD COUNTY, COLORADO**  
**CAERUS OIL AND GAS LLC**

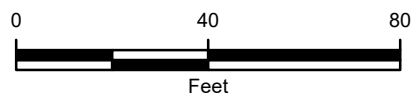




IMAGE COURTESY OF GOOGLE EARTH 2016

**LEGEND**

- SOIL SAMPLE



**FIGURE 2**  
**SITE MAP**  
**J17E DUMPLINE**  
**NWSE SEC 17-T7S-R92W**  
**GARFIELD COUNTY, COLORADO**  
**CAERUS OIL AND GAS LLC**

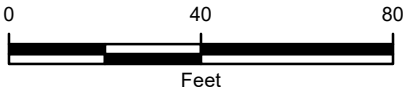




IMAGE COURTESY OF GOOGLE EARTH 2016

**LEGEND**

- SOIL SAMPLE
- ⊙ PROPOSED POTHOLE DELINEATION SAMPLE
- ⊙ CONTINGENCY POTHOLE DELINEATION SAMPLE



**FIGURE 3**  
**POTHOLE DELINEATION SAMPLE LOCATIONS**  
**J17E DUMPLINE**  
**NWSE SEC 17-T7S-R92W**  
**GARFIELD COUNTY, COLORADO**  
**CAERUS OIL AND GAS LLC**

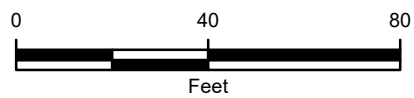




IMAGE COURTESY OF GOOGLE EARTH 2016

**LEGEND**

- SOIL SAMPLE
- PROPOSED AST SOIL SAMPLE



AST: ABOVEGROUND STORAGE TANK

**FIGURE 4**  
**PROPOSED AST SOIL SAMPLE LOCATIONS**  
**J17E DUMPLINE**  
**NWSE SEC 17-T7S-R92W**  
**GARFIELD COUNTY, COLORADO**  
**CAERUS OIL AND GAS LLC**

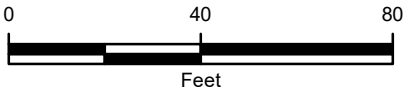




IMAGE COURTESY OF GOOGLE EARTH 2016

**LEGEND**

- SOIL SAMPLE
- PROPOSED ROW CORRIDOR SOIL SAMPLE
- ROW CORRIDOR



**FIGURE 5**  
**PROPOSED ROW SOIL SAMPLE LOCATIONS**  
**J17E DUMPLINE**  
**NWSE SEC 17-T7S-R92W**  
**GARFIELD COUNTY, COLORADO**  
**CAERUS OIL AND GAS LLC**



## TABLE

TABLE 1

**SOIL ANALYTICAL RESULTS  
J17E DUMPLINE  
GARFIELD COUNTY, COLORADO  
CAERUS OIL AND GAS LLC**

PARAMETER	COGCC CONCENTRATION LEVELS	UNITS	CONFIRMATION SOIL SAMPLE
			20210108-J17E(POR)@8.5'
Sample Date			1/8/2021
Sample Depth Range (feet)			8.5
Sample Type			Confirmation
Arsenic	0.39	mg/kg	<b>7.48</b>
Barium	15,000	mg/kg	145
Cadmium	70	mg/kg	ND
Chromium (III)	120,000	mg/kg	11.9
Chromium (VI)	23	mg/kg	ND
Copper	3,100	mg/kg	9.44
Lead	400	mg/kg	6.42
Mercury	23	mg/kg	ND
Nickel	1,600	mg/kg	12.7
Selenium	390	mg/kg	ND
Silver	390	mg/kg	ND
Zinc	23,000	mg/kg	27.8
EC	4.0	mmhos/cm	3.410
pH	6 - 9	SU	8.92
SAR	12	unitless	<b>48.8</b>
TPH-GRO		mg/kg	16,200
TPH-DRO		mg/kg	5,600
TPH	500	mg/kg	<b>21,800</b>
Benzene	0.17	mg/kg	<b>21.9</b>
Toluene	85	mg/kg	<b>275</b>
Ethylbenzene	100	mg/kg	35.9
Total Xylenes	175	mg/kg	<b>734</b>
Acenaphthene	1,000	mg/kg	0.281
Anthracene	1,000	mg/kg	0.424
Benzo(A)anthracene	0.22	mg/kg	ND
Benzo(B)fluoranthene	0.22	mg/kg	0.0155
Benzo(K)fluoranthene	2.2	mg/kg	0.00623
Benzo(A)pyrene	0.022	mg/kg	0.00690
Chrysene	22	mg/kg	0.0463
Dibenzo(A,H)anthracene	0.022	mg/kg	ND
Fluoranthene	1,000	mg/kg	0.0696
Fluorene	1,000	mg/kg	0.850
Indeno(1,2,3,C,D)pyrene	0.22	mg/kg	ND
Naphthalene	23	mg/kg	6.41
Pyrene	1,000	mg/kg	0.0494

**NOTES:**

ND - less than the stated reporting limit

**BOLD** - indicates result exceeds the COGCC concentration level

COGCC - Colorado Oil and Gas Conservation Commission

EC- electrical conductivity

mg/kg - milligrams per kilogram

mmhos/cm - millimhos per centimeter

SAR - sodium adsorption ratio

SU - standard unit

TPH-GRO - total petroleum hydrocarbons-gasoline range organics

TPH-DRO - total petroleum hydrocarbons-diesel range organics

TPH - combination of TPH-GRO and TPH-DRO

NA - analyte not analyzed

ND - analyte not detected

ENCLOSURE A – LABATORY ANALYTICAL REPORT

January 18, 2021

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

## Caerus Oil and Gas

Sample Delivery Group: L1304670  
Samples Received: 01/09/2021  
Project Number: J17E  
Description: J17E Dumpline Release  
Site: J17E  
Report To: Brett Middleton  
143 Diamond Avenue  
Parachute, CO 81635

Entire Report Reviewed By:

*Chris Ward*

Chris Ward  
Project Manager

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

**Pace Analytical National**

12065 Lebanon Rd Mount Juliet, TN 37122 615-758-5858 800-767-5859 [www.pacenational.com](http://www.pacenational.com)



<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>
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<b>Sr: Sample Results</b>	<b>5</b>
<b>20210108-J17E (POR) @8.5' L1304670-01</b>	<b>5</b>
<b>Qc: Quality Control Summary</b>	<b>7</b>
<b>Wet Chemistry by Method 3060A/7196A</b>	<b>7</b>
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<b>Al: Accreditations &amp; Locations</b>	<b>20</b>
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1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

# SAMPLE SUMMARY



20210108-J17E (POR) @8.5' L1304670-01 Solid

Collected by: Evan Mason  
 Collected date/time: 01/08/21 11:00  
 Received date/time: 01/09/21 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1603767	1	01/17/21 19:52	01/17/21 19:52	EL	Mt. Juliet, TN
Calculated Results	WG1603285	1	01/10/21 02:09	01/15/21 19:55	BJD	Mt. Juliet, TN
Wet Chemistry by Method 3060A/7196A	WG1604907	1	01/13/21 19:37	01/15/21 19:55	BJD	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1604374	1	01/13/21 10:45	01/13/21 13:24	KEG	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1603495	1	01/10/21 22:08	01/12/21 13:00	JRB	Mt. Juliet, TN
Mercury by Method 7471A	WG1603318	1	01/11/21 10:57	01/11/21 17:34	BMF	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1603285	1	01/10/21 02:09	01/11/21 11:41	EL	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1603286	5	01/10/21 02:14	01/11/21 10:09	LAT	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG1606006	10000	01/12/21 18:36	01/15/21 08:33	ADM	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1604696	80	01/12/21 18:36	01/13/21 04:16	ADM	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1604836	200	01/12/21 18:36	01/13/21 10:03	BMB	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1604750	50	01/12/21 23:32	01/13/21 11:53	JDG	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG1604749	1	01/13/21 01:16	01/13/21 08:18	LEA	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG1604749	10	01/13/21 01:16	01/13/21 16:13	LEA	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	48.8		1	01/17/2021 19:52	WG1603767

<sup>1</sup> Cp

<sup>2</sup> Tc

Calculated Results

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Chromium, Trivalent	11.9		1.00	1	01/15/2021 19:55	<a href="#">WG1603285</a>

<sup>3</sup> Ss

<sup>4</sup> Cn

Wet Chemistry by Method 3060A/7196A

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Chromium, Hexavalent	ND	<u>J6 O1</u>	2.00	1	01/15/2021 19:55	<a href="#">WG1604907</a>

<sup>5</sup> Sr

<sup>6</sup> Qc

Sample Narrative:

L1304670-01 WG1604907: sample is a reducer

<sup>7</sup> Gl

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	8.92	<u>T8</u>	1	01/13/2021 13:24	<a href="#">WG1604374</a>

<sup>8</sup> Al

Sample Narrative:

L1304670-01 WG1604374: 8.92 at 21.4C

<sup>9</sup> Sc

Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Specific Conductance	3410		10.0	1	01/12/2021 13:00	<a href="#">WG1603495</a>

Mercury by Method 7471A

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Mercury	ND		0.0400	1	01/11/2021 17:34	<a href="#">WG1603318</a>

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Barium	145		0.500	1	01/11/2021 11:41	<a href="#">WG1603285</a>
Cadmium	ND		0.500	1	01/11/2021 11:41	<a href="#">WG1603285</a>
Chromium	11.9		1.00	1	01/11/2021 11:41	<a href="#">WG1603285</a>
Copper	9.44		2.00	1	01/11/2021 11:41	<a href="#">WG1603285</a>
Lead	6.42		0.500	1	01/11/2021 11:41	<a href="#">WG1603285</a>
Nickel	12.7		2.00	1	01/11/2021 11:41	<a href="#">WG1603285</a>
Selenium	ND		2.00	1	01/11/2021 11:41	<a href="#">WG1603285</a>
Silver	ND		1.00	1	01/11/2021 11:41	<a href="#">WG1603285</a>
Zinc	27.8		5.00	1	01/11/2021 11:41	<a href="#">WG1603285</a>

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Arsenic	7.48		1.00	5	01/11/2021 10:09	<a href="#">WG1603286</a>



Collected date/time: 01/08/21 11:00

L1304670

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

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	16200		1000	10000	01/15/2021 08:33	<a href="#">WG1606006</a>
(S) <i>a,a,a</i> -Trifluorotoluene(FID)	89.5		77.0-120		01/15/2021 08:33	<a href="#">WG1606006</a>

1 Cp

2 Tc

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

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Benzene	21.9		0.0800	80	01/13/2021 04:16	<a href="#">WG1604696</a>
Toluene	275		1.00	200	01/13/2021 10:03	<a href="#">WG1604836</a>
Ethylbenzene	35.9		0.200	80	01/13/2021 04:16	<a href="#">WG1604696</a>
Total Xylenes	734		1.30	200	01/13/2021 10:03	<a href="#">WG1604836</a>
(S) Toluene-d8	78.5		75.0-131		01/13/2021 04:16	<a href="#">WG1604696</a>
(S) Toluene-d8	92.1		75.0-131		01/13/2021 10:03	<a href="#">WG1604836</a>
(S) 4-Bromofluorobenzene	93.3		67.0-138		01/13/2021 04:16	<a href="#">WG1604696</a>
(S) 4-Bromofluorobenzene	96.3		67.0-138		01/13/2021 10:03	<a href="#">WG1604836</a>
(S) 1,2-Dichloroethane-d4	90.9		70.0-130		01/13/2021 04:16	<a href="#">WG1604696</a>
(S) 1,2-Dichloroethane-d4	89.5		70.0-130		01/13/2021 10:03	<a href="#">WG1604836</a>

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

## Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	5600		200	50	01/13/2021 11:53	<a href="#">WG1604750</a>
(S) <i>o</i> -Terphenyl	0.000	J7	18.0-148		01/13/2021 11:53	<a href="#">WG1604750</a>

9 Sc

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

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Anthracene	0.424		0.00600	1	01/13/2021 08:18	<a href="#">WG1604749</a>
Acenaphthene	0.281		0.0600	10	01/13/2021 16:13	<a href="#">WG1604749</a>
Acenaphthylene	ND		0.0600	10	01/13/2021 16:13	<a href="#">WG1604749</a>
Benzo(a)anthracene	ND		0.00600	1	01/13/2021 08:18	<a href="#">WG1604749</a>
Benzo(a)pyrene	0.00690		0.00600	1	01/13/2021 08:18	<a href="#">WG1604749</a>
Benzo(b)fluoranthene	0.0155		0.00600	1	01/13/2021 08:18	<a href="#">WG1604749</a>
Benzo(g,h,i)perylene	ND		0.00600	1	01/13/2021 08:18	<a href="#">WG1604749</a>
Benzo(k)fluoranthene	0.00623		0.00600	1	01/13/2021 08:18	<a href="#">WG1604749</a>
Chrysene	0.0463		0.00600	1	01/13/2021 08:18	<a href="#">WG1604749</a>
Dibenz(a,h)anthracene	ND		0.00600	1	01/13/2021 08:18	<a href="#">WG1604749</a>
Fluoranthene	0.0696		0.00600	1	01/13/2021 08:18	<a href="#">WG1604749</a>
Fluorene	0.850		0.0600	10	01/13/2021 16:13	<a href="#">WG1604749</a>
Indeno(1,2,3-cd)pyrene	ND		0.00600	1	01/13/2021 08:18	<a href="#">WG1604749</a>
Naphthalene	6.41		0.200	10	01/13/2021 16:13	<a href="#">WG1604749</a>
Phenanthrene	1.05		0.00600	1	01/13/2021 08:18	<a href="#">WG1604749</a>
Pyrene	0.0494		0.00600	1	01/13/2021 08:18	<a href="#">WG1604749</a>
1-Methylnaphthalene	7.32		0.200	10	01/13/2021 16:13	<a href="#">WG1604749</a>
2-Methylnaphthalene	16.3		0.200	10	01/13/2021 16:13	<a href="#">WG1604749</a>
2-Chloronaphthalene	ND		0.200	10	01/13/2021 16:13	<a href="#">WG1604749</a>
(S) <i>p</i> -Terphenyl-d14	82.0		23.0-120		01/13/2021 08:18	<a href="#">WG1604749</a>
(S) <i>p</i> -Terphenyl-d14	59.0		23.0-120		01/13/2021 16:13	<a href="#">WG1604749</a>
(S) Nitrobenzene-d5	0.000	J2	14.0-149		01/13/2021 16:13	<a href="#">WG1604749</a>
(S) Nitrobenzene-d5	590	J1	14.0-149		01/13/2021 08:18	<a href="#">WG1604749</a>
(S) 2-Fluorobiphenyl	0.000	J2	34.0-125		01/13/2021 08:18	<a href="#">WG1604749</a>
(S) 2-Fluorobiphenyl	78.1		34.0-125		01/13/2021 16:13	<a href="#">WG1604749</a>

## Sample Narrative:

L1304670-01 WG1604749: Surrogate failure due to matrix interference

L1304670-01 WG1604749: IS/SURR failed on lower dilution.



Method Blank (MB)

(MB) R3613097-1 01/15/21 19:53

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL 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

L1303096-04 Original Sample (OS) • Duplicate (DUP)

(OS) L1303096-04 01/15/21 19:54 • (DUP) R3613097-3 01/15/21 19:54

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

Laboratory Control Sample (LCS)

(LCS) R3613097-2 01/15/21 19:53

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Chromium,Hexavalent	24.0	24.2	101	80.0-120	

L1304670-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1304670-01 01/15/21 19:55 • (MS) R3613097-4 01/15/21 19:55 • (MSD) R3613097-5 01/15/21 19:56

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 %
Chromium,Hexavalent	20.0	ND	8.73	8.69	43.6	43.4	1	75.0-125	<u>J6</u>	<u>J6</u>	0.458	20

Sample Narrative:

OS: sample is a reducer

L1304670-01 Original Sample (OS) • Matrix Spike (MS)

(OS) L1304670-01 01/15/21 19:55 • (MS) R3613097-6 01/15/21 19:56

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Chromium,Hexavalent	634	ND	527	83.2	50	75.0-125	

Sample Narrative:

OS: sample is a reducer



L1303834-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1303834-02 01/13/21 13:24 • (DUP) R3612164-2 01/13/21 13:24

Analyte	Original Result	DUP Result	Dilution	DUP RPD	<u>DUP Qualifier</u>	DUP RPD Limits
pH	su	su		%		%
	5.59	5.63	1	0.713		1

Sample Narrative:

OS: 5.59 at 21.8C

DUP: 5.63 at 21.2C

Laboratory Control Sample (LCS)

(LCS) R3612164-1 01/13/21 13:24

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

Sample Narrative:

LCS: 10.03 at 19.5C

<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) R3611793-1 01/12/21 13:00

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

<sup>1</sup> Cp

<sup>2</sup> Tc

<sup>3</sup> Ss

<sup>4</sup> Cn

<sup>5</sup> Sr

<sup>6</sup> Qc

L1302733-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1302733-01 01/12/21 13:00 • (DUP) R3611793-3 01/12/21 13:00

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	217	207	1	4.73		20

<sup>7</sup> Gl

<sup>8</sup> Al

L1304308-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1304308-02 01/12/21 13:00 • (DUP) R3611793-4 01/12/21 13:00

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	1900	1930	1	1.41		20

<sup>9</sup> Sc

Laboratory Control Sample (LCS)

(LCS) R3611793-2 01/12/21 13:00

Analyte	Spike Amount umhos/cm	LCS Result umhos/cm	LCS Rec. %	Rec. Limits %	LCS Qualifier
Specific Conductance	483	488	101	85.0-115	



Method Blank (MB)

(MB) R3611575-1 01/11/21 17:29

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
Mercury	U		0.0180	0.0400

Laboratory Control Sample (LCS)

(LCS) R3611575-2 01/11/21 17:31

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Mercury	0.500	0.482	96.4	80.0-120	

L1304670-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1304670-01 01/11/21 17:34 • (MS) R3611575-3 01/11/21 17:36 • (MSD) R3611575-4 01/11/21 17:39

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Mercury	0.500	ND	0.448	0.464	86.0	89.2	1	75.0-125			3.54	20

<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) R3611600-1 01/11/21 11:35

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Barium	U		0.0852	0.500
Cadmium	U		0.0471	0.500
Chromium	U		0.133	1.00
Copper	U		0.400	2.00
Lead	U		0.208	0.500
Nickel	U		0.132	2.00
Selenium	U		0.764	2.00
Silver	U		0.127	1.00
Zinc	U		0.832	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

Laboratory Control Sample (LCS)

(LCS) R3611600-2 01/11/21 11:38

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Barium	100	97.4	97.4	80.0-120	
Cadmium	100	92.9	92.9	80.0-120	
Chromium	100	93.6	93.6	80.0-120	
Copper	100	92.4	92.4	80.0-120	
Lead	100	94.0	94.0	80.0-120	
Nickel	100	96.5	96.5	80.0-120	
Selenium	100	94.7	94.7	80.0-120	
Silver	20.0	18.5	92.6	80.0-120	
Zinc	100	94.0	94.0	80.0-120	

<sup>7</sup> Gl

<sup>8</sup> Al

<sup>9</sup> Sc

L1304670-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1304670-01 01/11/21 11:41 • (MS) R3611600-5 01/11/21 11:50 • (MSD) R3611600-6 01/11/21 11:53

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	145	256	244	110	98.4	1	75.0-125			4.76	20
Cadmium	100	ND	93.9	93.3	93.6	93.0	1	75.0-125			0.642	20
Chromium	100	11.9	104	103	92.0	91.1	1	75.0-125			0.897	20
Copper	100	9.44	102	102	93.0	92.5	1	75.0-125			0.465	20
Lead	100	6.42	102	101	95.3	94.6	1	75.0-125			0.738	20
Nickel	100	12.7	113	112	100	99.6	1	75.0-125			0.583	20
Selenium	100	ND	94.8	94.7	93.5	93.4	1	75.0-125			0.0398	20
Silver	20.0	ND	19.0	18.8	94.9	93.8	1	75.0-125			1.11	20
Zinc	100	27.8	117	117	88.8	88.8	1	75.0-125			0.0703	20



Method Blank (MB)

(MB) R3611351-1 01/11/21 10:02

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) R3611351-2 01/11/21 10:05

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Arsenic	100	96.8	96.8	80.0-120	

<sup>7</sup>Gl

<sup>8</sup>Al

L1304670-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1304670-01 01/11/21 10:09 • (MS) R3611351-5 01/11/21 10:19 • (MSD) R3611351-6 01/11/21 10:22

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	7.48	102	104	94.5	96.8	5	75.0-125			2.29	20

<sup>9</sup>Sc



Method Blank (MB)

(MB) R3612886-3 01/15/21 02:10

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
<sup>(S)</sup> a,a,a-Trifluorotoluene(FID)	98.0			77.0-120

<sup>1</sup> Cp

<sup>2</sup> Tc

<sup>3</sup> Ss

<sup>4</sup> Cn

Laboratory Control Sample (LCS)

(LCS) R3612886-2 01/15/21 01:23

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
TPH (GC/FID) Low Fraction	5.50	6.03	110	72.0-127	
<sup>(S)</sup> a,a,a-Trifluorotoluene(FID)			102	77.0-120	

<sup>5</sup> Sr

<sup>6</sup> Qc

<sup>7</sup> Gl

<sup>8</sup> Al

<sup>9</sup> Sc



Method Blank (MB)

(MB) R3612010-3 01/12/21 20:53

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	mg/kg		mg/kg	mg/kg
Benzene	U		0.000467	0.00100
Ethylbenzene	U		0.000737	0.00250
(S) Toluene-d8	93.1			75.0-131
(S) 4-Bromofluorobenzene	102			67.0-138
(S) 1,2-Dichloroethane-d4	89.1			70.0-130

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

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

(LCS) R3612010-1 01/12/21 19:39 • (LCSD) R3612010-2 01/12/21 19:57

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	mg/kg	mg/kg	mg/kg	%	%	%			%	%
Benzene	0.125	0.149	0.145	119	116	70.0-123			2.72	20
Ethylbenzene	0.125	0.135	0.131	108	105	74.0-126			3.01	20
(S) Toluene-d8				96.1	91.8	75.0-131				
(S) 4-Bromofluorobenzene				97.2	96.3	67.0-138				
(S) 1,2-Dichloroethane-d4				92.4	96.7	70.0-130				

6 Qc

7 Gl

8 Al

9 Sc

L1304680-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1304680-01 01/13/21 04:34 • (MS) R3612010-4 01/13/21 05:11 • (MSD) R3612010-5 01/13/21 05:30

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	mg/kg	mg/kg	mg/kg	mg/kg	%	%		%			%	%
Benzene	1.23	2.85	8.76	8.67	480	473	9.84	10.0-149	J5	J5	1.03	37
Ethylbenzene	1.23	3.57	10.5	10.1	563	531	9.84	10.0-160	J5	J5	3.88	38
(S) Toluene-d8					94.2	91.3		75.0-131				
(S) 4-Bromofluorobenzene					96.6	95.3		67.0-138				
(S) 1,2-Dichloroethane-d4					92.4	92.9		70.0-130				



Method Blank (MB)

(MB) R3613282-2 01/13/21 07:21

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Toluene	U		0.00130	0.00500
Xylenes, Total	U		0.000880	0.00650
<i>(S) Toluene-d8</i>	93.3			75.0-131
<i>(S) 4-Bromofluorobenzene</i>	100			67.0-138
<i>(S) 1,2-Dichloroethane-d4</i>	86.9			70.0-130

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

Laboratory Control Sample (LCS)

(LCS) R3613282-1 01/13/21 06:25

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Toluene	0.125	0.133	106	75.0-121	
Xylenes, Total	0.375	0.401	107	72.0-127	
<i>(S) Toluene-d8</i>			93.2	75.0-131	
<i>(S) 4-Bromofluorobenzene</i>			97.9	67.0-138	
<i>(S) 1,2-Dichloroethane-d4</i>			93.8	70.0-130	

6 Qc

7 Gl

8 Al

9 Sc



Method Blank (MB)

(MB) R3612046-1 01/13/21 06:34

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
<i>(S) o-Terphenyl</i>	68.6			18.0-148

Laboratory Control Sample (LCS)

(LCS) R3612046-2 01/13/21 06:47

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
TPH (GC/FID) High Fraction	50.0	36.2	72.4	50.0-150	
<i>(S) o-Terphenyl</i>			58.3	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



Method Blank (MB)

(MB) R3612266-2 01/13/21 07:38

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	89.1			14.0-149
(S) 2-Fluorobiphenyl	87.4			34.0-125
(S) p-Terphenyl-d14	103			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) R3612266-1 01/13/21 07:18

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Anthracene	0.0800	0.0500	62.5	50.0-126	
Acenaphthene	0.0800	0.0540	67.5	50.0-120	
Acenaphthylene	0.0800	0.0550	68.8	50.0-120	
Benzo(a)anthracene	0.0800	0.0508	63.5	45.0-120	
Benzo(a)pyrene	0.0800	0.0461	57.6	42.0-120	
Benzo(b)fluoranthene	0.0800	0.0533	66.6	42.0-121	
Benzo(g,h,i)perylene	0.0800	0.0550	68.8	45.0-125	
Benzo(k)fluoranthene	0.0800	0.0503	62.9	49.0-125	
Chrysene	0.0800	0.0538	67.3	49.0-122	
Dibenz(a,h)anthracene	0.0800	0.0551	68.9	47.0-125	
Fluoranthene	0.0800	0.0534	66.8	49.0-129	



Laboratory Control Sample (LCS)

(LCS) R3612266-1 01/13/21 07:18

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	<u>LCS Qualifier</u>
Fluorene	0.0800	0.0553	69.1	49.0-120	
Indeno(1,2,3-cd)pyrene	0.0800	0.0532	66.5	46.0-125	
Naphthalene	0.0800	0.0543	67.9	50.0-120	
Phenanthrene	0.0800	0.0518	64.8	47.0-120	
Pyrene	0.0800	0.0531	66.4	43.0-123	
1-Methylnaphthalene	0.0800	0.0575	71.9	51.0-121	
2-Methylnaphthalene	0.0800	0.0541	67.6	50.0-120	
2-Chloronaphthalene	0.0800	0.0528	66.0	50.0-120	
<i>(S)</i> Nitrobenzene-d5			75.5	14.0-149	
<i>(S)</i> 2-Fluorobiphenyl			73.7	34.0-125	
<i>(S)</i> p-Terphenyl-d14			84.5	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



## 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

J1	Surrogate recovery limits have been exceeded; values are outside upper control limits.
J2	Surrogate recovery limits have been exceeded; values are outside lower control limits.
J5	The sample matrix interfered with the ability to make any accurate determination; spike value is high.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.
J7	Surrogate recovery cannot be used for control limit evaluation due to dilution.
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	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey-NELAP	TN002
California	2932	New Mexico <sup>1</sup>	TN00003
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>	KY90010	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	T104704245-20-18
Maine	TN00003	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	998093910
Montana	CERT0086	Wyoming	A2LA

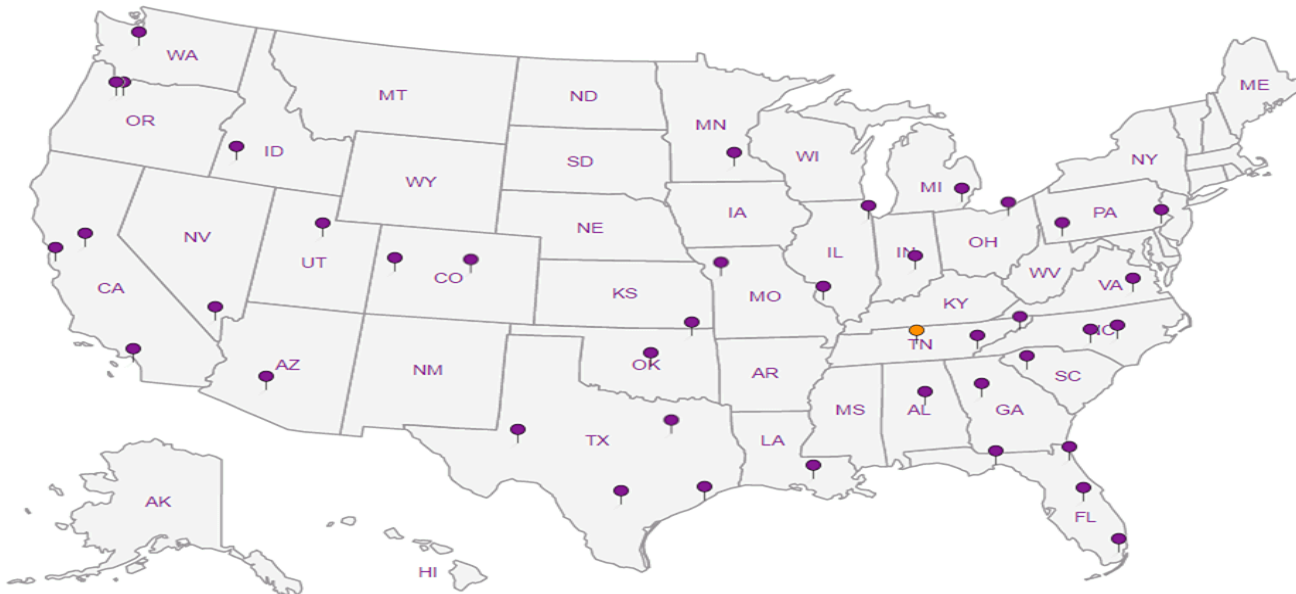
## Third Party Federal Accreditations

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.



1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

