

May 4, 2022



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## Report of Work Completed – Historical Spill Assessment

<b>COGCC Location Name (ID)</b>	N. Parachute MF H17 696 (335825)
<b>Client Location Name</b>	H17 (Unocal 16)
<b>COGCC Remediation Project #</b>	19200
<b>Legal Description</b>	NESW Section 28, T9S-R96W
<b>Coordinates (Lat/Long)</b>	39.527342 / -108.123441
<b>County</b>	Garfield County, Colorado

Mr. Rollins,

Confluence Compliance Companies, LLC (Confluence) prepared this Report of Work Completed (ROWC) for Caerus Oil & Gas LLC (Caerus) to document recent investigation activities associated with a historical release of produced water at the H17 (Unocal 16) well pad (Location). The Location is 6.4 miles northwest of Parachute, Colorado, in Garfield County, as illustrated in the attached Topographic Location Map. Additional information on the Location and the associated remediation project is provided in the title block above, the attached Site Diagrams, and laboratory analytical reports. This ROWC provides background on the Location, methods used to complete the remedial investigation, results of the investigation, and recommendations for how to proceed with this information.

### Background

On June 3, 2011, a transducer failed during frac operations allowing pressure to spike. The water was sent to an emergency tank; however, the pump was not shut off quickly enough causing 15 barrels (bbls) of produced water to be released. The release was confined to the Location's working surface and 10 bbls of water were recovered via hydrovacuum truck. The release was reported in Colorado Oil and Gas Conservation Commission (COGCC) Form 19 Document 2214280.

Initial spill investigation was performed July 2021. Analytical results of collected soil samples exceeded COGCC Table 915-1 Residential Soil Screening Levels for metals and Soil Suitability for Reclamation (SSR) constituents. Excavation efforts to remove impacted material were completed September 2021 but were unsuccessful in removing all soil impacts. Soil samples collected after excavation efforts indicate exceedances of metals, SSR constituents, and total petroleum hydrocarbons (TPH).

## Methodology

On March 21, 2022, Confluence coordinated and oversaw site investigation activities to delineate the horizontal and vertical extents of soil impacts associated with the historical produced water release at the Location. All activities were conducted in accordance with approved COGCC Form 27 Document 402845416 and applicable Conditions of Approval (COAs). Using a drill rig, nine soil borings (SB01-SB09) were advanced within the spill investigation area. Investigation activities were directed by Confluence personnel who characterized the soil using visual and olfactory observations and field-screened soil samples for volatile organic compounds using a photoionization detector (PID). Field-screening was conducted every 5 feet. PID measurements ranged from 0.0 parts per million (ppm) in SB06 to 107.8 ppm in SB01. Hydrocarbon odor was noted in SB01 and a degraded hydrocarbon odor was present in SB02, SB03, SB05, SB07, SB08, and SB09. Staining was observed in SB02, SB05, SB07, SB09, and SB09.

SB05, SB07, SB08, and SB09 were characterized strictly using visual and olfactory observations to delineate impacts. Once historic pit material was observed, the borings were abandoned and no samples were collected. Delineation could not be obtained to the north due to health and safety concerns associated with unmarked utilities outside of the project area.

A total of 11 soil samples were collected from SB01, SB02, SB03, SB04, and SB06. Two soil samples were collected from each soil boring except SB02. A third soil sample was collected from SB02 due to a high PID value. Samples were submitted to Pace Analytical for analysis of a reduced suite of TPH, pH, electrical conductivity (EC), sodium adsorption ration (SAR), boron, and hexavalent chromium, as approved in COGCC Form 27 Document 402949362.

## Results

These results summarize observations from onsite investigation efforts and associated laboratory analytical results. For organizational and presentation purposes the results summary is divided between general observations of lithology and hydrogeology for the entire Location and site investigation activities.

Collected spatial data are depicted in the attached Site Diagram. Laboratory analytical reports are attached and summarized in the Laboratory Results Summary Table.

### Lithology and Hydrogeology

Lithology at the Location is characterized by a dense clay to sandy clay. Groundwater is expected to flow southwest toward Parachute Creek and ultimately into the Colorado River, located 6.7 miles southeast of the Location.

### Investigation Results

Laboratory results of soil samples collected from the delineation activities indicate values of TPH, EC, SAR, pH, and chromium (VI) exceeding COGCC Table 915-1 Residential Soil Screening Levels. One TPH exceedance was identified in SB01 with a concentration of 520.1 milligrams per kilogram (mg/kg). Exceedances of pH range from 8.33 in SB06 to 11.6 in SB01. EC exceedances range from 4.61 millimhos per centimeter (mmhos/cm) in SB01 to 7.38 mmhos/cm in SB04. SAR exceedances range from 11.9 in SB03 to 53.9 in SB01. Exceedances of chromium (VI) ranged between 0.557 mg/kg in SB01 to 0.727 mg/kg in SB03.



Although samples were not analyzed from SB05, SB07, SB08 or SB09, they are anticipated to be impacted based on field-screening and observations.

## Analysis and Recommendations

Although SSR values above COGCC Table 915-1 standards remain within the historical spill area, background data suggests that some of the exceedances are within naturally occurring levels at the Location. Background samples collected from the Location indicate a pH value of 8.83, an EC concentration of 10.400 mmhos/cm, and an SAR value of 25.5. Taking into consideration background concentrations, delineation of these impacts has been achieved vertically for all SSR constituents. Horizontal delineation has been achieved for EC and for SAR to the south.

Three chromium (VI) exceedances were measured in SB01, SB03, and SB04 with a concentration of 0.557 mg/kg, 0.727 mg/kg and 0.578 mg/kg, respectively. However, the result was labeled with a “J” qualifier by the laboratory; stating that the identification of the analyte was made, however, the concentration is only an estimate due to the minimal amount of the analyte being exhibited in the sample material. Confluence recommends that Caerus request the consideration of the “J” qualifier from the COGCC and relief from the exceedances based on it being an estimated value.

TPH concentrations above COGCC Table 915-1 standards remain within the historic spill area east of PH02. Delineation of these impacts has been achieved vertically and to the north, west, and south as demonstrated through laboratory analysis of soil samples.

Based on this data and analysis, Confluence recommends additional site investigation to delineate SSR constituent and TPH exceedances. It is also recommended to continue to establish background concentrations as this area appears to have naturally elevated values of SSRs constituents.

Confluence is grateful for the opportunity to support you with this project. If you have any questions about the methods, results or recommendations presented here, please do not hesitate to contact me.

Regards,



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## Attachments

- Topographic Map
- Site Diagram – Background Samples
- Site Diagram – PH02 Excavation
- Site Diagram – Soil Boring Locations
- Laboratory Results Summary Table
- Laboratory Analytical Reports



## Topographic Location Map

**Caerus Oil and Gas LLC**

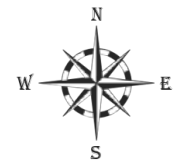
H17 (Unocal 16)

(N. Parachute /MF H17 696)

COGCC Location ID: 335825

Garfield County

Lot 7 Sec. 17 T6S-R96W



Topographic map sourced from 2020 Earth Point  
using data provided by United States Geological  
Survey

Created by: Chris McKisson on 1/21/2022.

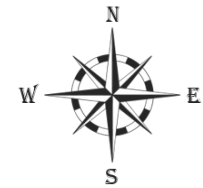
H17 (Unocal 16)



## Site Diagram Background Samples

**Caerus Oil and Gas LLC**

H17 (Unocal 16)  
(N. Parachute /MF H17 696)  
COGCC Location ID: 335825  
Garfield County  
Lot 7 Sec. 17 T6S-R96W



**Legend**

 Background Sample – 07/28/2021

Spatial data was collected using a handheld GPS unit with submeter accuracy. Illustration discrepancies may be present in this diagram due to the inherent limitations of data accuracy for both project data and the underlying aerial imagery. The position of illustrated data may have been manually adjusted to align with the aerial imagery in a manner more representative of field conditions for presentation purposes only.

Map created by: Andrew Smith on 11/30/2021.

20210728 - H17 (BGN@1')

20210728 - H17 (BGE@2')

20210728 - H17 (BGSE@2')

20210728 - H17 (BGS@1')

## Site Diagram PH02 Excavation

**Caerus Oil and Gas LLC**

H17 (Unocal 16)  
(N. Parachute /MF H17 696)  
COGCC Location ID: 335825  
Garfield County  
Lot 7 Sec. 17 T6S-R96W

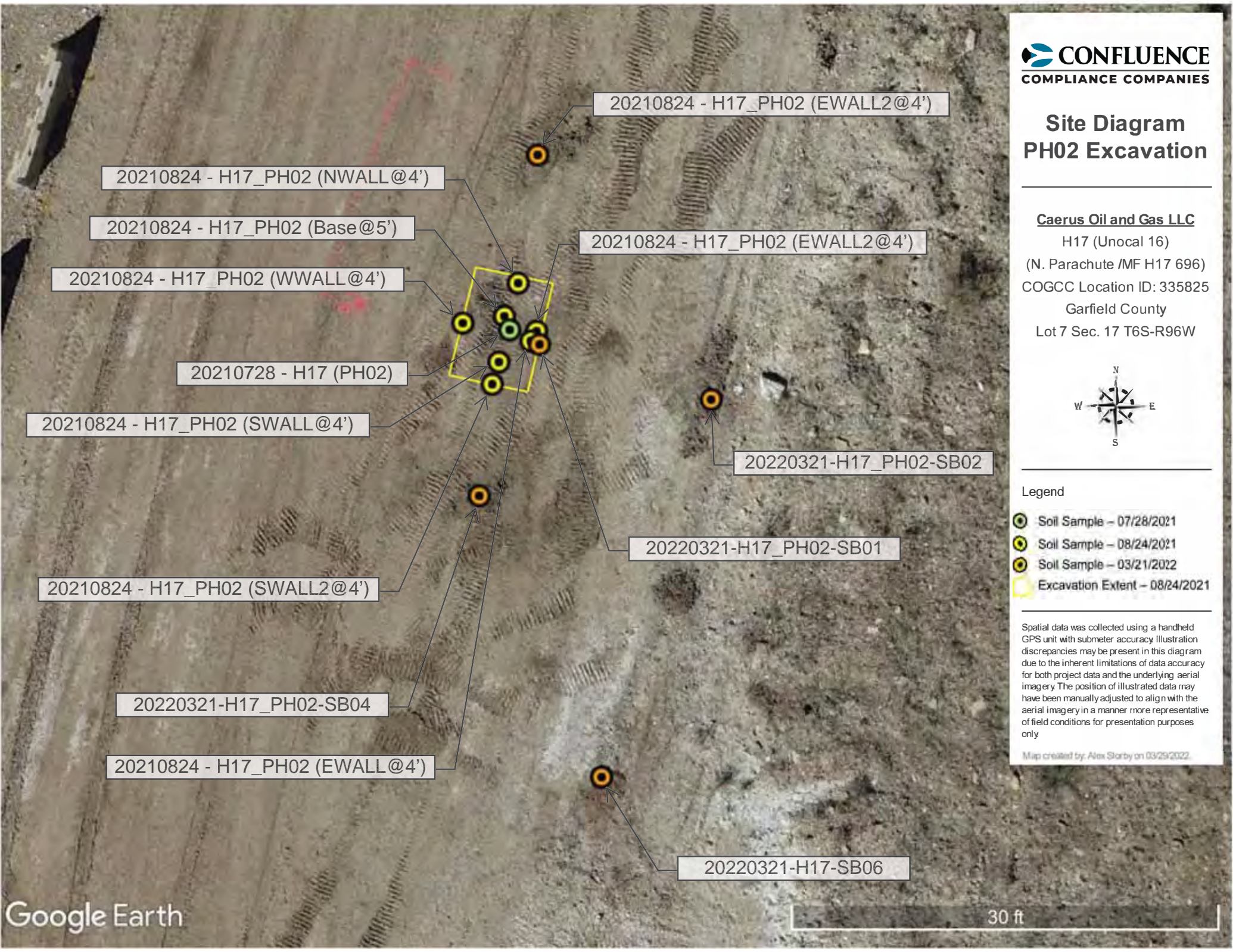


### Legend

- Soil Sample - 07/28/2021
- Soil Sample - 08/24/2021
- Soil Sample - 03/21/2022
- Excavation Extent - 08/24/2021

Spatial data was collected using a handheld GPS unit with submeter accuracy. Illustration discrepancies may be present in this diagram due to the inherent limitations of data accuracy for both project data and the underlying aerial imagery. The position of illustrated data may have been manually adjusted to align with the aerial imagery in a manner more representative of field conditions for presentation purposes only.

Map created by: Alex Storbj on 03/29/2022.



## Site Diagram Soil Boring Locations

**Caerus Oil and Gas LLC**

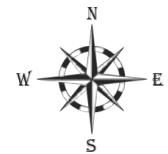
H17 (Unocal 16)

(N. Parachute /MF H17 696)

COGCC Location ID: 335825

Garfield County

Lot 7 Sec. 17 T6S-R96W



### Legend

- Visual Soil Boring – 03/21/2022
- Soil Boring w/ Sample – 03/21/2022
- PH02 Excavation Extent – 08/24/2021

Map created by: Jana Nilsen on 04/26/2022.

Soil Screening and Remediation Limits			Organic Compounds (mg/kg [ppm])																														
Sample Date	Soil/Soil Source (Equipment) (Pumps, Separator, Tank (Leakage, Spills, Background, etc.))	Sample ID	COGCC Table 915-1 Residential ->																														
			PID (ppm)	TPH (total volatile and extractable petroleum hydrocarbons) (GRO-DRO+ORO)	TPH-GRO (C6-C10) Low Fraction	TPH-DRO (C10-C28) High Fraction	TPH-ORO (C28-C36) High Fraction	Benzene	Toluene	Ethylbenzene	Xylenes - total (sum of o-, m-, p-isomers)	1,2,4-trimethylbenzene	1,3,5-trimethylbenzene	Acenaphthene	Anthracene	Acenaphthylene	Benzo(A)anthracene	Benzo(B)pyrene	Benzo(K)fluoranthene	Benzo(g,h,i)perylene	Chrysene	Dibenzo(A,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	1-Methylnaphthalene	2-Methylnaphthalene	2-Chloronaphthalene	Naphthalene	Phenanthrene	Pyrene		
7/28/2021	Water Tank	20210728-H17 (PH01@30")	0.7	74.8	0.665	17.4	56.7	<0.00100	<0.00500	<0.00250	<0.00650	<0.00500	<0.00500	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	
7/28/2021	Water Tank	20210728-H17 (PH02@30")	6.3	300.5	0.457	129	171	<0.00100	<0.00500	<0.00250	<0.00650	<0.00500	<0.00500	<0.00600	0.00443	<0.00600	0.00368	0.00197	0.00474	<0.00600	0.00326	0.0114	<0.00600	0.00711	<0.00600	<0.00600	0.166	0.780	<0.0200	0.443	0.168	0.0256	
7/28/2021	Water Tank	20210728-H17 (PH03@30")	0.4	ND	<0.100	<4.00	<4.00	<0.00100	<0.00500	<0.00250	<0.00650	<0.00500	<0.00500	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	
7/28/2021	Water Tank	20210728-H17 (PH04@30")	1.6	37.2	0.785	19.9	16.5	<0.00100	<0.00500	<0.00250	<0.00650	<0.00500	<0.00500	0.00219	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	0.00354	<0.00600	0.0126	0.0293	<0.0200	0.00945	0.0239	0.0039
7/28/2021	Water Tank	20210728-H17 (PH05@30")	0.7	ND	<0.100	<4.00	<4.00	<0.00100	<0.00500	<0.00250	<0.00650	<0.00500	<0.00500	<0.00600	<0.00600	<0.00600	<0.00600	0.00192	<0.00600	0.00586	0.00288	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	0.00212	<0.0200	<0.0200	<0.0200	<0.00600	0.00600
8/24/2021	Water Tank	20210824 - H17_PH02 (BASE@5')	21.1	79.2	1.03	23.3	54.9	<0.00100	0.0573	0.0313	0.629	0.0526	0.0609	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	0.00216	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600
8/24/2021	Water Tank	20210824 - H17_PH02 (EWALL@4')	786.1	2003.0	305	1330	368	<0.0200	0.136	0.155	3.27	2.56	2.83	0.130	0.0133	<0.00600	0.0140	0.00764	0.0167	0.00343	0.00867	0.0349	0.00326	0.0334	0.0839	0.00359	1.34	2.60	<0.0200	1.11	0.671	0.809	
8/24/2021	Water Tank	20210824 - H17_PH02 (NWALL@4')	32.1	507.5	0.464	245	262	0.000625	0.00585	0.00320	0.0641	0.0299	0.0733	0.0190	0.00499	<0.00600	0.00828	0.00540	0.0130	0.00266	0.0100	0.0140	0.00232	0.0158	0.0137	0.00506	0.125	0.251	<0.0200	0.0893	0.173	0.0479	
8/24/2021	Water Tank	20210824 - H17_PH02 (WWALL@4')	38.0	11.0	0.208	3.86	6.94	<0.00100	<0.00500	<0.00250	0.00842	0.00375	0.00760	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600
8/24/2021	Water Tank	20210824 - H17_PH05 (BASE@5')	3.2	ND	<0.100	<4.00	<4.00	<0.00100	<0.00500	<0.00250	0.00293	0.00210	<0.00500	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600
8/24/2021	Water Tank	20210824 - H17_PH05 (EWALL@4')	5.7	28.9	<0.100	6.55	22.3	<0.00100	<0.00500	<0.00250	0.00490	0.00188	<0.00500	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600
8/24/2021	Water Tank	20210824 - H17_PH05 (NWALL@4')	2.7	17.8	<0.100	6.63	11.2	<0.00100	0.00222	<0.00250	0.0112	0.00330	0.00247	<0.00600	<0.00600	<0.00600	0.00270	<0.00600	0.00842	0.00373	0.00403	<0.00600	0.00281	<0.00600	0.00312	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	0.00296	0.00296	
8/24/2021	Water Tank	20210824 - H17_PH05 (SWALL@4')	4	2.8	<0.100	1.93	0.848	<0.00100	<0.00500	<0.00250	0.00695	0.00240	0.00245	0.00764	0.0171	<0.00600	0.0295	0.0265	0.0366	0.0146	0.0200	0.0326	0.00409	0.0752	0.00755	0.0190	<0.0200	<0.0200	<0.0200	<0.0200	0.0672	0.0642	
8/24/2021	Water Tank	20210824 - H17_PH05 (WWALL@4')	6.5	ND	<1.00	<4.00	<4.00	<0.00100	<0.00500	<0.00250	0.00328	<0.00500	<0.00500	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	
3/21/2022	Historical	20220321-H17_PH02-SB01@6'-8'	107.8	520.1	66.1	347	107	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
3/21/2022	Historical	20220321-H17_PH02-SB01@9'-11'	2.4	0.7	0.0689	<1.61	0.668	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3/21/2022	Historical	20220321-H17_PH02-SB02@1'-3'	3.6	364.5	5.47	141	218	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3/21/2022	Historical	20220321-H17_PH02-SB02@14'-16'	2.8	0.6	<0.0217	<1.61	0.606	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3/21/2022	Historical	20220321-H17_PH02-SB02@9'-11'	20.8	288.5	8.04	182	98.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3/21/2022	Historical	20220321-H17_PH02-SB03@1'-3'	5.5	456.6	0.558	278	178	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3/21/2022	Historical	20220321-H17_PH02-SB03@9'-11'	0.0	24.0	0.540	5.56	17.9	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3/21/2022	Historical	20220321-H17_PH02-SB04@1'-3'	26.3	327.8	16.8	155	156	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3/21/2022	Historical	20220321-H17_PH02-SB04@9'-11'	0.1	40.7	0.621	10.8	29.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3/21/2022	Historical	20220321-H17-SB06@14'-15'	0.0	10.9	0.225	3.61	7.11	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3/21/2022	Historical	20220321-H17-SB06@8'-10'	0.0	1.3	0.384	<1.61	0.877	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7/28/2021	Background	20210728-H17 (BGE@2')	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7/28/2021	Background	20210728-H17 (BGN@1')	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7/28/2021	Background	20210728-H17 (BGS@1')	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7/28/2021	Background	20210728-H17 (BGSE@2')	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Soil Screening and Remediation Limits			Soil Suitability for Reclamation					Metals (mg/kg [ppm])									
Sample Date	Solid/Soil Source (Equipment Separator, Tank Battery, Dump Line, Pit, Cuttings, Background, etc.)	Sample ID	COGCC Table 915-1 Residential -->					Arsenic	Barium	Cadmium (mg/kg)	Chromium (VI)	Copper	Lead	Nickel	Selenium	Silver	Zinc
			EC (Specific Conductance) (microsiemenmeter) (by saturated paste method)	6	6-8.3	2	0.68										
			4	SAR (Sodium Adsorption Ratio) (calculation) (by saturated paste method)	pH (pH Units) (by saturated paste method)	Boron - Hot Water Soluble (mg/L)											
7/28/2021	Water Tank	20210728-H17 (PH01@30")	8.990	16.1	7.95	1.41	6.25	141	0.750	<1.00	17.5	12.2	18.4	<2.00	<1.00	66.2	
7/28/2021	Water Tank	20210728-H17 (PH02@30")	5.530	14.8	9.28	0.849	3.89	8570	<0.500	<1.00	16.1	16.1	13.1	1.64	<1.00	44.8	
7/28/2021	Water Tank	20210728-H17 (PH03@30")	9.700	17.3	8.10	0.521	3.93	104	0.300	<1.00	18.9	9.02	2.71	<2.00	<1.00	82.5	
7/28/2021	Water Tank	20210728-H17 (PH04@30")	8.430	15.7	8.52	0.620	5.39	6880	<0.500	<1.00	16.1	11.9	14.9	1.07	<1.00	50.6	
7/28/2021	Water Tank	20210728-H17 (PH05@30")	13.500	4.93	8.29	0.134	3.46	133	0.177	<1.00	23.1	13.0	23.1	<2.00	<1.00	64.1	
8/24/2021	Water Tank	20210824 - H17_PH02 (BASE@5')	5.970	9.59	8.26	0.145	5.26	114	0.693	<1.00	16.1	11.1	16.8	2.23	<1.00	58.9	
8/24/2021	Water Tank	20210824 - H17_PH02 (EWALL@4')	5.060	43.1	11.7	0.552	4.46	10600	<0.500	0.968	18.2	25.4	13.1	3.71	<1.00	43.4	
8/24/2021	Water Tank	20210824 - H17_PH02 (NWALL@4')	5.220	17.2	8.60	0.616	5.31	11700	<0.500	<1.00	19.7	26.8	15.7	2.41	<1.00	51.1	
8/24/2021	Water Tank	20210824 - H17_PH02 (WWALL@4')	5.430	18.4	8.21	0.219	5.28	675	0.559	<1.00	20.6	12.0	29.2	<2.00	<1.00	77.6	
8/24/2021	Water Tank	20210824 - H17_PH05 (BASE@5')	9.620	47.5	8.12	0.115	3.66	379	0.234	<1.00	13.3	9.57	42.9	<2.00	<1.00	99.3	
8/24/2021	Water Tank	20210824 - H17_PH05 (EWALL@4')	9.630	50.5	8.81	0.130	4.36	257	0.312	<1.00	12.5	10.1	41.0	<2.00	<1.00	105	
8/24/2021	Water Tank	20210824 - H17_PH05 (NWALL@4')	10.300	38.4	8.67	0.137	4.03	346	0.273	<1.00	19.2	10.5	31.5	<2.00	<1.00	78.8	
8/24/2021	Water Tank	20210824 - H17_PH05 (SWALL@4')	12.400	36.7	8.55	0.0849	3.14	216	0.239	<1.00	10.5	9.73	33.6	<2.00	<1.00	82.5	
8/24/2021	Water Tank	20210824 - H17_PH05 (WWALL@4')	9.860	35.8	8.30	0.117	3.69	753	0.154	<1.00	20.4	8.20	39.5	<2.00	<1.00	99.9	
3/21/2022	Historical	20220321-H17_PH02-SB01@6'-8'	4.610	53.9	11.6	0.665	NA	NA	NA	0.557	NA	NA	NA	NA	NA	NA	
3/21/2022	Historical	20220321-H17_PH02-SB01@9'-11'	5.070	16.0	8.73	0.289	NA	NA	NA	<0.255	NA	NA	NA	NA	NA	NA	
3/21/2022	Historical	20220321-H17_PH02-SB02@1'-3'	3.750	29.2	11.4	1.18	NA	NA	NA	<0.255	NA	NA	NA	NA	NA	NA	
3/21/2022	Historical	20220321-H17_PH02-SB02@14'-16'	3.670	14.6	8.67	0.235	NA	NA	NA	<0.255	NA	NA	NA	NA	NA	NA	
3/21/2022	Historical	20220321-H17_PH02-SB02@9'-11'	3.460	31.0	11.5	0.482	NA	NA	NA	<0.255	NA	NA	NA	NA	NA	NA	
3/21/2022	Historical	20220321-H17_PH02-SB03@1'-3'	5.450	39.0	11.1	1.15	NA	NA	NA	0.727	NA	NA	NA	NA	NA	NA	
3/21/2022	Historical	20220321-H17_PH02-SB03@9'-11'	6.600	11.9	8.20	0.247	NA	NA	NA	<0.255	NA	NA	NA	NA	NA	NA	
3/21/2022	Historical	20220321-H17_PH02-SB04@1'-3'	4.780	46.0	11.5	0.882	NA	NA	NA	0.578	NA	NA	NA	NA	NA	NA	
3/21/2022	Historical	20220321-H17_PH02-SB04@9'-11'	7.380	16.7	7.94	0.263	NA	NA	NA	<0.255	NA	NA	NA	NA	NA	NA	
3/21/2022	Historical	20220321-H17-SB06@14'-15'	3.110	23.5	9.81	0.109	NA	NA	NA	<0.255	NA	NA	NA	NA	NA	NA	
3/21/2022	Historical	20220321-H17-SB06@8'-10'	5.700	17.9	8.33	0.306	NA	NA	NA	<0.255	NA	NA	NA	NA	NA	NA	
7/28/2021	Background	20210728-H17 (BGE@2')	10.400	25.5	8.10	NA	8.05	NA	NA	NA	NA	NA	NA	NA	NA	NA	
7/28/2021	Background	20210728-H17 (BGN@1')	0.402	2.23	8.83	NA	2.49	NA	NA	NA	NA	NA	NA	NA	NA	NA	
7/28/2021	Background	20210728-H17 (BGS@1')	0.256	1.56	8.79	NA	9.07	NA	NA	NA	NA	NA	NA	NA	NA	NA	
7/28/2021	Background	20210728-H17 (BGSE@2')	4.610	9.02	8.00	NA	4.66	NA	NA	NA	NA	NA	NA	NA	NA	NA	

## Caerus Oil and Gas

Sample Delivery Group: L1474450  
Samples Received: 03/23/2022  
Project Number:  
Description: H17 Historical PH02  
Site: H17  
Report To: Brett Middleton  
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.

Pace Analytical National

12065 Lebanon Rd Mount Juliet, TN 37122 615-758-5858 800-767-5859 www.pacenational.com

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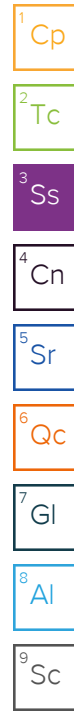
<sup>1</sup> Cp
<sup>2</sup> Tc
<sup>3</sup> Ss
<sup>4</sup> Cn
<sup>5</sup> Sr
<sup>6</sup> Qc
<sup>7</sup> Gl
<sup>8</sup> Al
<sup>9</sup> Sc

# SAMPLE SUMMARY

## 20220321-H17\_PH02-SB01@6'-8' L1474450-01 Solid

Collected by Andrew Smith      Collected date/time 03/21/22 10:05      Received date/time 03/23/22 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1837455	1	03/26/22 14:24	03/26/22 14:24	KMG	Mt. Juliet, TN
Wet Chemistry by Method 7199	WG1839107	1	03/27/22 21:08	03/28/22 17:53	JER	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1838184	1	03/25/22 08:00	03/25/22 10:00	GI	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1839170	1	03/28/22 01:47	03/28/22 08:25	ARD	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG1839830	1	03/29/22 08:28	03/29/22 19:39	CCE	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG1837939	200	03/24/22 14:33	03/25/22 06:10	ACG	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015M	WG1839734	10	03/29/22 04:05	03/29/22 16:54	TJD	Mt. Juliet, TN



## 20220321-H17\_PH02-SB01@9'-11' L1474450-02 Solid

Collected by Andrew Smith      Collected date/time 03/21/22 10:25      Received date/time 03/23/22 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1837455	1	03/26/22 14:27	03/26/22 14:27	KMG	Mt. Juliet, TN
Wet Chemistry by Method 7199	WG1839107	1	03/27/22 21:08	03/28/22 18:19	JER	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1838184	1	03/25/22 08:00	03/25/22 10:00	GI	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1839170	1	03/28/22 01:47	03/28/22 08:25	ARD	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG1839830	1	03/29/22 08:28	03/29/22 19:48	CCE	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG1837942	1	03/24/22 14:33	03/25/22 19:19	JAH	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015M	WG1839734	1	03/29/22 04:05	03/29/22 13:42	TJD	Mt. Juliet, TN

## 20220321-H17\_PH02-SB02@1'-3' L1474450-03 Solid

Collected by Andrew Smith      Collected date/time 03/21/22 10:55      Received date/time 03/23/22 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1837455	1	03/26/22 14:30	03/26/22 14:30	KMG	Mt. Juliet, TN
Wet Chemistry by Method 7199	WG1839107	1	03/27/22 21:08	03/28/22 18:24	JER	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1838184	1	03/25/22 08:00	03/25/22 10:00	GI	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1839170	1	03/28/22 01:47	03/28/22 08:25	ARD	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG1839884	1	03/29/22 21:41	03/30/22 09:56	CCE	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG1838331	25	03/24/22 14:33	03/25/22 19:25	ADM	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015M	WG1839734	5	03/29/22 04:05	03/29/22 16:03	TJD	Mt. Juliet, TN

## 20220321-H17\_PH02-SB02@9'-11' L1474450-04 Solid

Collected by Andrew Smith      Collected date/time 03/21/22 11:25      Received date/time 03/23/22 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1837455	1	03/26/22 14:38	03/26/22 14:38	KMG	Mt. Juliet, TN
Wet Chemistry by Method 7199	WG1839107	1	03/27/22 21:08	03/28/22 18:30	JER	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1838184	1	03/25/22 08:00	03/25/22 10:00	GI	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1839170	1	03/28/22 01:47	03/28/22 08:25	ARD	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG1839830	1	03/29/22 08:28	03/29/22 19:51	CCE	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG1838331	25	03/24/22 14:33	03/25/22 19:49	ADM	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015M	WG1839734	10	03/29/22 04:05	03/29/22 16:29	TJD	Mt. Juliet, TN

## 20220321-H17\_PH02-SB02@14'-16' L1474450-05 Solid

Collected by Andrew Smith      Collected date/time 03/21/22 11:40      Received date/time 03/23/22 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1837455	1	03/26/22 14:41	03/26/22 14:41	KMG	Mt. Juliet, TN
Wet Chemistry by Method 7199	WG1839107	1	03/27/22 21:08	03/28/22 18:45	JER	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1838184	1	03/25/22 08:00	03/25/22 10:00	GI	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1839170	1	03/28/22 01:47	03/28/22 08:25	ARD	Mt. Juliet, TN

# SAMPLE SUMMARY

## 20220321-H17\_PH02-SB02@14'-16' L1474450-05 Solid

Collected by: Andrew Smith  
 Collected date/time: 03/21/22 11:40  
 Received date/time: 03/23/22 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Metals (ICP) by Method 6010B-NE493 Ch 2	WG1839830	1	03/29/22 08:28	03/29/22 19:54	CCE	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG1837942	1	03/24/22 14:33	03/25/22 19:41	JAH	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015M	WG1839734	1	03/29/22 04:05	03/29/22 13:29	TJD	Mt. Juliet, TN

## 20220321-H17\_PH02-SB03@1'-3' L1474450-06 Solid

Collected by: Andrew Smith  
 Collected date/time: 03/21/22 12:00  
 Received date/time: 03/23/22 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1837455	1	03/26/22 14:44	03/26/22 14:44	KMG	Mt. Juliet, TN
Wet Chemistry by Method 7199	WG1839107	1	03/27/22 21:08	03/28/22 18:50	JER	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1838184	1	03/25/22 08:00	03/25/22 10:00	GI	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1839170	1	03/28/22 01:47	03/28/22 08:25	ARD	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG1839830	1	03/29/22 08:28	03/29/22 19:57	CCE	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG1837942	1	03/24/22 14:33	03/25/22 20:02	JAH	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015M	WG1840017	2	03/30/22 08:26	03/30/22 15:17	JDG	Mt. Juliet, TN

## 20220321-H17\_PH02-SB03@9'-11' L1474450-07 Solid

Collected by: Andrew Smith  
 Collected date/time: 03/21/22 12:30  
 Received date/time: 03/23/22 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1837455	1	03/26/22 14:47	03/26/22 14:47	KMG	Mt. Juliet, TN
Wet Chemistry by Method 7199	WG1839107	1	03/27/22 21:08	03/28/22 18:56	JER	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1838184	1	03/25/22 08:00	03/25/22 10:00	GI	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1839170	1	03/28/22 01:47	03/28/22 08:25	ARD	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG1839830	1	03/29/22 08:28	03/29/22 20:00	CCE	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG1837942	1	03/24/22 14:33	03/25/22 20:24	JAH	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015M	WG1840017	1	03/30/22 08:26	03/30/22 14:36	JDG	Mt. Juliet, TN

## 20220321-H17\_PH02-SB04@1'-3' L1474450-08 Solid

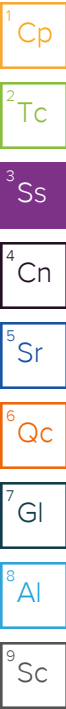
Collected by: Andrew Smith  
 Collected date/time: 03/21/22 12:45  
 Received date/time: 03/23/22 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1837455	1	03/26/22 14:50	03/26/22 14:50	KMG	Mt. Juliet, TN
Wet Chemistry by Method 7199	WG1839107	1	03/27/22 21:08	03/28/22 19:01	JER	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1838184	1	03/25/22 08:00	03/25/22 10:00	GI	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1839170	1	03/28/22 01:47	03/28/22 08:25	ARD	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG1839830	1	03/29/22 08:28	03/29/22 20:04	CCE	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG1838807	25	03/24/22 14:33	03/28/22 17:44	ACG	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015M	WG1840017	2	03/30/22 08:26	03/30/22 15:03	JDG	Mt. Juliet, TN

## 20220321-H17\_PH02-SB04@9'-11' L1474450-09 Solid

Collected by: Andrew Smith  
 Collected date/time: 03/21/22 13:15  
 Received date/time: 03/23/22 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1837455	1	03/26/22 14:53	03/26/22 14:53	KMG	Mt. Juliet, TN
Wet Chemistry by Method 7199	WG1839107	1	03/27/22 21:08	03/28/22 19:06	JER	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1838184	1	03/25/22 08:00	03/25/22 10:00	GI	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1839170	1	03/28/22 01:47	03/28/22 08:25	ARD	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG1839830	1	03/29/22 08:28	03/29/22 20:07	CCE	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG1837942	1	03/24/22 14:33	03/25/22 20:45	JAH	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015M	WG1840017	1	03/30/22 08:26	03/30/22 14:50	JDG	Mt. Juliet, TN



# CASE NARRATIVE

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	53.9		1	03/26/2022 14:24	WG1837455

Wet Chemistry by Method 7199

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Hexavalent Chromium	0.557	J	0.255	1.00	1	03/28/2022 17:53	<a href="#">WG1839107</a>

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	11.6	T8	1	03/25/2022 10:00	<a href="#">WG1838184</a>

Sample Narrative:

L1474450-01 WG1838184: 11.64 at 20.8C

Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	4610		10.0	1	03/28/2022 08:25	<a href="#">WG1839170</a>

Sample Narrative:

L1474450-01 WG1839170: at 25C

Metals (ICP) by Method 6010B-NE493 Ch 2

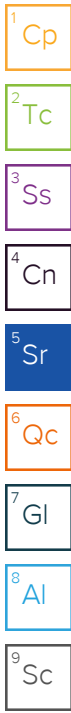
Analyte	Result mg/l	Qualifier	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
Hot Water Sol. Boron	0.665		0.0167	0.200	1	03/29/2022 19:39	<a href="#">WG1839830</a>

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

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	66.1	B	4.34	20.0	200	03/25/2022 06:10	<a href="#">WG1837939</a>
(S) a,a,a-Trifluorotoluene(FID)	95.7			77.0-120		03/25/2022 06:10	<a href="#">WG1837939</a>

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

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	347		16.1	40.0	10	03/29/2022 16:54	<a href="#">WG1839734</a>
C28-C36 Motor Oil Range	107		2.74	40.0	10	03/29/2022 16:54	<a href="#">WG1839734</a>
(S) o-Terphenyl	47.1			18.0-148		03/29/2022 16:54	<a href="#">WG1839734</a>



## Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	16.0		1	03/26/2022 14:27	WG1837455

## Wet Chemistry by Method 7199

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Hexavalent Chromium	U		0.255	1.00	1	03/28/2022 18:19	<a href="#">WG1839107</a>

## Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	8.73	<u>T8</u>	1	03/25/2022 10:00	<a href="#">WG1838184</a>

## Sample Narrative:

L1474450-02 WG1838184: 8.73 at 20.5C

## Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	5070		10.0	1	03/28/2022 08:25	<a href="#">WG1839170</a>

## Sample Narrative:

L1474450-02 WG1839170: at 25C

## Metals (ICP) by Method 6010B-NE493 Ch 2

Analyte	Result mg/l	Qualifier	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
Hot Water Sol. Boron	0.289		0.0167	0.200	1	03/29/2022 19:48	<a href="#">WG1839830</a>

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

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	0.0689	<u>J</u>	0.0217	0.100	1	03/25/2022 19:19	<a href="#">WG1837942</a>
(S) <i>a,a,a</i> -Trifluorotoluene(FID)	107			77.0-120		03/25/2022 19:19	<a href="#">WG1837942</a>

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

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	U		1.61	4.00	1	03/29/2022 13:42	<a href="#">WG1839734</a>
C28-C36 Motor Oil Range	0.668	<u>B J</u>	0.274	4.00	1	03/29/2022 13:42	<a href="#">WG1839734</a>
(S) <i>o</i> -Terphenyl	61.7			18.0-148		03/29/2022 13:42	<a href="#">WG1839734</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	29.2		1	03/26/2022 14:30	WG1837455

Wet Chemistry by Method 7199

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Hexavalent Chromium	U		0.255	1.00	1	03/28/2022 18:24	<a href="#">WG1839107</a>

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	11.4	<u>T8</u>	1	03/25/2022 10:00	<a href="#">WG1838184</a>

Sample Narrative:

L1474450-03 WG1838184: 11.4 at 20.4C

Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	3750		10.0	1	03/28/2022 08:25	<a href="#">WG1839170</a>

Sample Narrative:

L1474450-03 WG1839170: at 25C

Metals (ICP) by Method 6010B-NE493 Ch 2

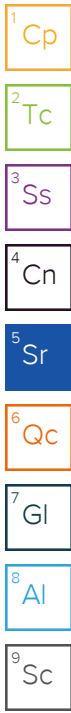
Analyte	Result mg/l	Qualifier	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
Hot Water Sol. Boron	1.18		0.0167	0.200	1	03/30/2022 09:56	<a href="#">WG1839884</a>

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

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	5.47	<u>B</u>	0.543	2.50	25	03/25/2022 19:25	<a href="#">WG1838331</a>
(S) a,a,a-Trifluorotoluene(FID)	96.6			77.0-120		03/25/2022 19:25	<a href="#">WG1838331</a>

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

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	141		8.05	20.0	5	03/29/2022 16:03	<a href="#">WG1839734</a>
C28-C36 Motor Oil Range	218		1.37	20.0	5	03/29/2022 16:03	<a href="#">WG1839734</a>
(S) o-Terphenyl	48.9			18.0-148		03/29/2022 16:03	<a href="#">WG1839734</a>



## Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	31.0		1	03/26/2022 14:38	WG1837455

## Wet Chemistry by Method 7199

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Hexavalent Chromium	U		0.255	1.00	1	03/28/2022 18:30	<a href="#">WG1839107</a>

## Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	11.5	<u>T8</u>	1	03/25/2022 10:00	<a href="#">WG1838184</a>

## Sample Narrative:

L1474450-04 WG1838184: 11.49 at 20.3C

## Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	3460		10.0	1	03/28/2022 08:25	<a href="#">WG1839170</a>

## Sample Narrative:

L1474450-04 WG1839170: at 25C

## Metals (ICP) by Method 6010B-NE493 Ch 2

Analyte	Result mg/l	Qualifier	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
Hot Water Sol. Boron	0.482		0.0167	0.200	1	03/29/2022 19:51	<a href="#">WG1839830</a>

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

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	8.04		0.543	2.50	25	03/25/2022 19:49	<a href="#">WG1838331</a>
(S) <i>a,a,a</i> -Trifluorotoluene(FID)	95.8			77.0-120		03/25/2022 19:49	<a href="#">WG1838331</a>

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

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	182		16.1	40.0	10	03/29/2022 16:29	<a href="#">WG1839734</a>
C28-C36 Motor Oil Range	98.5		2.74	40.0	10	03/29/2022 16:29	<a href="#">WG1839734</a>
(S) <i>o</i> -Terphenyl	51.2			18.0-148		03/29/2022 16:29	<a href="#">WG1839734</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	14.6		1	03/26/2022 14:41	WG1837455

Wet Chemistry by Method 7199

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Hexavalent Chromium	U		0.255	1.00	1	03/28/2022 18:45	<a href="#">WG1839107</a>

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	8.67	<u>T8</u>	1	03/25/2022 10:00	<a href="#">WG1838184</a>

Sample Narrative:

L1474450-05 WG1838184: 8.67 at 20.6C

Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	3670		10.0	1	03/28/2022 08:25	<a href="#">WG1839170</a>

Sample Narrative:

L1474450-05 WG1839170: at 25C

Metals (ICP) by Method 6010B-NE493 Ch 2

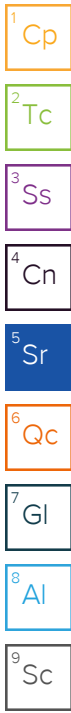
Analyte	Result mg/l	Qualifier	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
Hot Water Sol. Boron	0.235		0.0167	0.200	1	03/29/2022 19:54	<a href="#">WG1839830</a>

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

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	U		0.0217	0.100	1	03/25/2022 19:41	<a href="#">WG1837942</a>
(S) <i>a,a,a</i> -Trifluorotoluene(FID)	110			77.0-120		03/25/2022 19:41	<a href="#">WG1837942</a>

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

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	U		1.61	4.00	1	03/29/2022 13:29	<a href="#">WG1839734</a>
C28-C36 Motor Oil Range	0.606	<u>B J</u>	0.274	4.00	1	03/29/2022 13:29	<a href="#">WG1839734</a>
(S) <i>o</i> -Terphenyl	56.5			18.0-148		03/29/2022 13:29	<a href="#">WG1839734</a>



## Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	39.0		1	03/26/2022 14:44	WG1837455

## Wet Chemistry by Method 7199

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
Hexavalent Chromium	0.727	J	0.255	1.00	1	03/28/2022 18:50	<a href="#">WG1839107</a>

## Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	11.1	T8	1	03/25/2022 10:00	<a href="#">WG1838184</a>

## Sample Narrative:

L1474450-06 WG1838184: 11.12 at 20.5C

## Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Specific Conductance	5450		10.0	1	03/28/2022 08:25	<a href="#">WG1839170</a>

## Sample Narrative:

L1474450-06 WG1839170: at 25C

## Metals (ICP) by Method 6010B-NE493 Ch 2

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
Hot Water Sol. Boron	1.15		0.0167	0.200	1	03/29/2022 19:57	<a href="#">WG1839830</a>

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

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	0.558		0.0217	0.100	1	03/25/2022 20:02	<a href="#">WG1837942</a>
(S) <i>a,a,a</i> -Trifluorotoluene(FID)	101			77.0-120		03/25/2022 20:02	<a href="#">WG1837942</a>

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

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	278		3.22	8.00	2	03/30/2022 15:17	<a href="#">WG1840017</a>
C28-C36 Motor Oil Range	178		0.548	8.00	2	03/30/2022 15:17	<a href="#">WG1840017</a>
(S) <i>o</i> -Terphenyl	57.9			18.0-148		03/30/2022 15:17	<a href="#">WG1840017</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	11.9		1	03/26/2022 14:47	WG1837455

## Wet Chemistry by Method 7199

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Hexavalent Chromium	U		0.255	1.00	1	03/28/2022 18:56	<a href="#">WG1839107</a>

## Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	8.20	<u>T8</u>	1	03/25/2022 10:00	<a href="#">WG1838184</a>

## Sample Narrative:

L1474450-07 WG1838184: 8.2 at 20.6C

## Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	6600		10.0	1	03/28/2022 08:25	<a href="#">WG1839170</a>

## Sample Narrative:

L1474450-07 WG1839170: at 25C

## Metals (ICP) by Method 6010B-NE493 Ch 2

Analyte	Result mg/l	Qualifier	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
Hot Water Sol. Boron	0.247		0.0167	0.200	1	03/29/2022 20:00	<a href="#">WG1839830</a>

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

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	0.540		0.0217	0.100	1	03/25/2022 20:24	<a href="#">WG1837942</a>
(S) <i>a,a,a</i> -Trifluorotoluene(FID)	90.5			77.0-120		03/25/2022 20:24	<a href="#">WG1837942</a>

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

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	5.56		1.61	4.00	1	03/30/2022 14:36	<a href="#">WG1840017</a>
C28-C36 Motor Oil Range	17.9		0.274	4.00	1	03/30/2022 14:36	<a href="#">WG1840017</a>
(S) <i>o</i> -Terphenyl	60.2			18.0-148		03/30/2022 14:36	<a href="#">WG1840017</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	46.0		1	03/26/2022 14:50	WG1837455

## Wet Chemistry by Method 7199

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
Hexavalent Chromium	0.578	J	0.255	1.00	1	03/28/2022 19:01	<a href="#">WG1839107</a>

## Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	11.5	T8	1	03/25/2022 10:00	<a href="#">WG1838184</a>

## Sample Narrative:

L1474450-08 WG1838184: 11.47 at 20.3C

## Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Specific Conductance	4780		10.0	1	03/28/2022 08:25	<a href="#">WG1839170</a>

## Sample Narrative:

L1474450-08 WG1839170: at 25C

## Metals (ICP) by Method 6010B-NE493 Ch 2

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
Hot Water Sol. Boron	0.882		0.0167	0.200	1	03/29/2022 20:04	<a href="#">WG1839830</a>

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

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	16.8		0.543	2.50	25	03/28/2022 17:44	<a href="#">WG1838807</a>
(S) <i>a,a,a</i> -Trifluorotoluene(FID)	99.3			77.0-120		03/28/2022 17:44	<a href="#">WG1838807</a>

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

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	155		3.22	8.00	2	03/30/2022 15:03	<a href="#">WG1840017</a>
C28-C36 Motor Oil Range	156		0.548	8.00	2	03/30/2022 15:03	<a href="#">WG1840017</a>
(S) <i>o</i> -Terphenyl	49.9			18.0-148		03/30/2022 15:03	<a href="#">WG1840017</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	16.7		1	03/26/2022 14:53	WG1837455

## Wet Chemistry by Method 7199

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Hexavalent Chromium	U		0.255	1.00	1	03/28/2022 19:06	<a href="#">WG1839107</a>

## Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	7.94	T8	1	03/25/2022 10:00	<a href="#">WG1838184</a>

## Sample Narrative:

L1474450-09 WG1838184: 7.94 at 20.3C

## Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	7380		10.0	1	03/28/2022 08:25	<a href="#">WG1839170</a>

## Sample Narrative:

L1474450-09 WG1839170: at 25C

## Metals (ICP) by Method 6010B-NE493 Ch 2

Analyte	Result mg/l	Qualifier	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
Hot Water Sol. Boron	0.263		0.0167	0.200	1	03/29/2022 20:07	<a href="#">WG1839830</a>

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

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	0.621		0.0217	0.100	1	03/25/2022 20:45	<a href="#">WG1837942</a>
(S) <i>a,a,a</i> -Trifluorotoluene(FID)	87.1			77.0-120		03/25/2022 20:45	<a href="#">WG1837942</a>

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

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	10.8		1.61	4.00	1	03/30/2022 14:50	<a href="#">WG1840017</a>
C28-C36 Motor Oil Range	29.3		0.274	4.00	1	03/30/2022 14:50	<a href="#">WG1840017</a>
(S) <i>o</i> -Terphenyl	54.4			18.0-148		03/30/2022 14:50	<a href="#">WG1840017</a>

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Method Blank (MB)

(MB) R3775144-1 03/28/22 16:41

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
Hexavalent Chromium	U		0.255	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

<sup>7</sup>Gl

<sup>8</sup>Al

<sup>9</sup>Sc

L1474259-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1474259-01 03/28/22 16:51 • (DUP) R3775144-3 03/28/22 16:56

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Hexavalent Chromium	U	U	1	0.000		20

L1474452-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1474452-01 03/28/22 19:11 • (DUP) R3775144-8 03/28/22 19:16

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Hexavalent Chromium	U	U	1	0.000		20

Laboratory Control Sample (LCS)

(LCS) R3775144-2 03/28/22 16:46

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Hexavalent Chromium	10.0	9.55	95.5	80.0-120	

L1474450-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1474450-01 03/28/22 17:53 • (MS) R3775144-4 03/28/22 17:59 • (MSD) R3775144-5 03/28/22 18:04

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Hexavalent Chromium	20.0	0.557	19.4	20.6	94.1	100	1	75.0-125			6.27	20

L1474450-01 Original Sample (OS) • Matrix Spike (MS)

(OS) L1474450-01 03/28/22 17:53 • (MS) R3775144-6 03/28/22 18:09

Analyte	Spike Amount	Original Result	MS Result	MS Rec.	Dilution	Rec. Limits	MS Qualifier
Hexavalent Chromium	673	0.557	708	105	50	75.0-125	

L1474449-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1474449-01 03/25/22 10:00 • (DUP) R3773970-2 03/25/22 10:00

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	8.78	8.82	1	0.455		1

Sample Narrative:

OS: 8.78 at 20.8C  
 DUP: 8.82 at 20.8C

L1474450-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1474450-01 03/25/22 10:00 • (DUP) R3773970-3 03/25/22 10:00

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	pH	su		%		%
pH	11.6	11.6	1	0.258		1

Sample Narrative:

OS: 11.64 at 20.8C  
 DUP: 11.61 at 20.8C

Laboratory Control Sample (LCS)

(LCS) R3773970-1 03/25/22 10:00

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	su	su	%	%	
pH	10.0	9.95	99.5	99.0-101	

Sample Narrative:

LCS: 9.95 at 19.6C

<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) R3774554-1 03/28/22 08:25

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

Sample Narrative:

BLANK: at 25C

L1474761-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1474761-01 03/28/22 08:25 • (DUP) R3774554-3 03/28/22 08:25

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits
Specific Conductance	4950	4920	1	0.608		20

Sample Narrative:

OS: at 25C

DUP: at 25C

L1474960-05 Original Sample (OS) • Duplicate (DUP)

(OS) L1474960-05 03/28/22 08:25 • (DUP) R3774554-4 03/28/22 08:25

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits
Specific Conductance	216	195	1	10.4		20

Sample Narrative:

OS: at 25C

DUP: at 25C

Laboratory Control Sample (LCS)

(LCS) R3774554-2 03/28/22 08:25

Analyte	Spike Amount umhos/cm	LCS Result umhos/cm	LCS Rec. %	Rec. Limits %	LCS Qualifier
Specific Conductance	268	270	101	85.0-115	

Sample Narrative:

LCS: at 25C

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Method Blank (MB)

(MB) R3775423-1 03/29/22 19:13

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Hot Water Sol. Boron	U		0.0167	0.200

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

(LCS) R3775423-2 03/29/22 19:16 • (LCSD) R3775423-3 03/29/22 19:19

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Hot Water Sol. Boron	1.00	1.05	1.06	105	106	80.0-120			0.172	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) R3775672-1 03/30/22 09:47

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Hot Water Sol. Boron	U		0.0167	0.200

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

(LCS) R3775672-2 03/30/22 09:50 • (LCSD) R3775672-3 03/30/22 09:52

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Hot Water Sol. Boron	1.00	1.08	1.02	108	102	80.0-120			5.68	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) R3773974-3 03/25/22 01:28

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
TPH (GC/FID) Low Fraction	1.50	<u>J</u>	0.543	2.50
(S) a,a,a-Trifluorotoluene(FID)	97.2			77.0-120

1 Cp

2 Tc

3 Ss

4 Cn

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

(LCS) R3773974-1 03/25/22 00:21 • (LCSD) R3773974-2 03/25/22 00:42

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	4.79	5.23	87.1	95.1	72.0-127			8.78	20
(S) a,a,a-Trifluorotoluene(FID)				106	112	77.0-120				

5 Sr

6 Qc

7 Gl

L1473439-09 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1473439-09 03/25/22 04:57 • (MS) R3773974-4 03/25/22 08:12 • (MSD) R3773974-5 03/25/22 08:32

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
TPH (GC/FID) Low Fraction	165	1.25	102	193	73.0	139	25	10.0-151		<u>J3</u>	61.7	28
(S) a,a,a-Trifluorotoluene(FID)					107	145		77.0-120		<u>J1</u>		

8 Al

9 Sc

Method Blank (MB)

(MB) R3774201-2 03/25/22 12:55

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
TPH (GC/FID) Low Fraction	U		0.0217	0.100
<sup>(S)</sup> a,a,a-Trifluorotoluene(FID)	109			77.0-120

Laboratory Control Sample (LCS)

(LCS) R3774201-1 03/25/22 12:11

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
TPH (GC/FID) Low Fraction	5.50	5.06	92.0	72.0-127	
<sup>(S)</sup> a,a,a-Trifluorotoluene(FID)			91.1	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

Method Blank (MB)

(MB) R3774305-3 03/25/22 17:56

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
TPH (GC/FID) Low Fraction	0.625	↓	0.543	2.50
(S) a,a,a-Trifluorotoluene(FID)	94.2			77.0-120

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

(LCS) R3774305-1 03/25/22 15:28 • (LCSD) R3774305-2 03/25/22 17:09

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	5.80	5.02	105	91.3	72.0-127			14.4	20
(S) a,a,a-Trifluorotoluene(FID)				101	99.6	77.0-120				

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

Method Blank (MB)

(MB) R3774851-2 03/28/22 13:17

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
TPH (GC/FID) Low Fraction	0.731	↓	0.543	2.50
(S) a,a,a-Trifluorotoluene(FID)	95.3			77.0-120

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

(LCS) R3774851-1 03/28/22 12:30 • (LCSD) R3774851-3 03/28/22 14:01

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	4.70	5.38	85.5	97.8	72.0-127			13.5	20
(S) a,a,a-Trifluorotoluene(FID)				99.9	102	77.0-120				

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

Method Blank (MB)

(MB) R3775141-1 03/29/22 09:46

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	mg/kg		mg/kg	mg/kg
C10-C28 Diesel Range	U		1.61	4.00
C28-C36 Motor Oil Range	0.611	<span style="color: red;">J</span>	0.274	4.00
<i>(S) o-Terphenyl</i>	72.7			18.0-148

Laboratory Control Sample (LCS)

(LCS) R3775141-2 03/29/22 10:00

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	mg/kg	mg/kg	%	%	
C10-C28 Diesel Range	50.0	33.5	67.0	50.0-150	
<i>(S) o-Terphenyl</i>			79.9	18.0-148	

L1474259-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1474259-03 03/29/22 15:12 • (MS) R3775387-1 03/29/22 15:24 • (MSD) R3775387-2 03/29/22 15:37

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	%	%		%			%	%
C10-C28 Diesel Range	48.6	71.7	41.7	75.2	0.000	7.00	1	50.0-150	<span style="color: red;">J6</span>	<span style="color: red;">J3 J6</span>	57.3	20
<i>(S) o-Terphenyl</i>					43.7	53.9		18.0-148				

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Method Blank (MB)

(MB) R3775800-1 03/30/22 13:14

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
C10-C28 Diesel Range	U		1.61	4.00
C28-C36 Motor Oil Range	U		0.274	4.00
(S) o-Terphenyl	72.8			18.0-148

Laboratory Control Sample (LCS)

(LCS) R3775800-2 03/30/22 13:28

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
C10-C28 Diesel Range	50.0	35.2	70.4	50.0-150	
(S) o-Terphenyl			86.9	18.0-148	

L1474452-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1474452-01 03/30/22 13:42 • (MS) R3775800-3 03/30/22 13:55 • (MSD) R3775800-4 03/30/22 14:09

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 %
C10-C28 Diesel Range	48.8	U	48.5	38.2	99.4	78.3	1	50.0-150		J3	23.8	20
(S) o-Terphenyl					65.1	73.5		18.0-148				

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

# GLOSSARY OF TERMS

## 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.

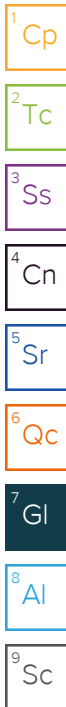
Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location.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

B	The same analyte is found in the associated blank.
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.
J3	The associated batch QC was outside the established quality control range for precision.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.
T8	Sample(s) received past/too close to holding time expiration.



# ACCREDITATIONS & LOCATIONS

## Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

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	84004002
Kentucky <sup>2</sup>	16	South Dakota	n/a
Louisiana	AI30792	Tennessee <sup>1,4</sup>	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas <sup>5</sup>	LAB0152
Maryland	324	Utah	TN000032021-11
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	110033
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	998093910
Montana	CERT0086	Wyoming	A2LA
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

\* 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 Analytical.

<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



### CHAIN-OF-CUSTODY Analytical Request Document

Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: <https://info.pacelabs.com/hubfs/pas-standard-terms.pdf>  
Chain-of-Custody is a LEGAL DOCUMENT - Complete all relevant fields

Company: Caerus Oil and Gas LLC	Billing Information: Info on file
Address: Info on file	Info on file
Report To: Jake Janicek, Brett Middleton, Blair Rollins	Email To: info on file
Copy To: Chris McKisson, remediation@confluence-cc.com	Site Collection Info/Address:

Customer Project Name/Number: H17 Historical PH02	State: CO / County/City: Garfield	Time Zone Collected: [ ] PT [X] MT [ ] CT [ ] ET
Phone: Email:	Site/Facility ID #: H17	Compliance Monitoring? [ ] Yes [X] No
Collected By (print): Andrew Smith	Purchase Order #: Quote #:	DW PWS ID #: DW Location Code:
Collected By (signature): <i>A. Smith</i>	Turnaround Date Required: Standard 5-day	Immediately Packed on Ice: [X] Yes [ ] No
Sample Disposal: [ ] Dispose as appropriate [ ] Return [ ] Archive: [ ] Hold:	Rush: (Expedite Charges Apply) [ ] Same Day [ ] Next Day [ ] 2 Day [ ] 3 Day [ ] 4 Day [ ] 5 Day	Field Filtered (if applicable): [ ] Yes [ ] No Analysis: _____

\* Matrix Codes (Insert in Matrix box below): Drinking Water (DW), Ground Water (GW), Wastewater (WW), Product (P), Soil/Solid (SL), Oil (OL), Wipe (WP), Air (AR), Tissue (TS), Bioassay (B), Vapor (V), Other (OT)

Customer Sample ID	Matrix *	Comp / Grab	Collected (or Composite Start)		Composite End		Res Cl	# of Ctns	Container Type: Plastic (P) or Glass (G)
			Date	Time	Date	Time			
20220321-H17_PH02-SB01@6'-8'	SL	G	3/21/2022	1005			2	G	
20220321-H17_PH02-SB01@9'-11'	SL	G	3/21/2022	1025			2	G	
20220321-H17_PH02-SB02@1'-3'	SL	G	3/21/2022	1055			2	G	
20220321-H17_PH02-SB02@9'-11'	SL	G	3/21/2022	1125			2	G	
20220321-H17_PH02-SB02@14'-16'	SL	G	3/21/2022	1140			2	G	
20220321-H17_PH02-SB03@1'-3'	SL	G	3/21/2022	1200			2	G	
20220321-H17_PH02-SB03@9'-11'	SL	G	3/21/2022	1230			2	G	
20220321-H17_PH02-SB04@1'-3'	SL	G	3/21/2022	1245			2	G	
20220321-H17_PH02-SB04@9'-11'	SL	G	3/21/2022	1315			2	G	

LAB USE ONLY- Affix Workorder/Login Label Here or List Pace Workorder Number or MTJL Log-in Number Here

**ALL BOLD OUTLINED AREAS are for LAB USE ONLY**

Container Preservative Type \*\*      Lab Project Manager:

\*\* Preservative Types: (1) nitric acid, (2) sulfuric acid, (3) hydrochloric acid, (4) sodium hydroxide, (5) zinc acetate, (6) methanol, (7) sodium bisulfate, (8) sodium thiosulfate, (9) hexane, (A) ascorbic acid, (B) ammonium sulfate, (C) ammonium hydroxide, (D) TSP, (U) Unpreserved, (O) Other \_\_\_\_\_

Analyses	Lab Profile/Line:
Table 915-1 VOCs	Lab Sample Receipt Checklist:
TPH (ORO, GRO, DRO)	Custody Seals Present/Intact Y N NA
Table 915-1 Metals	Custody Signatures Present Y N NA
Table 915-1 PAHs	Collector Signature Present Y N NA
pH, EC, SAR	Bottles Intact Y N NA
Boron (Hot Water Soluble Soil)	Correct Bottles Y N NA
Hexavalent Chromium	Sufficient Volume Y N NA
	Samples Received on Ice Y N NA
	VOA - Headspace Acceptable Y N NA
	USDA Regulated Soils Y N NA
	Samples in Holding Time Y N NA
	Residual Chlorine Present Y N NA
	Cl Strips: _____
	Sample pH Acceptable Y N NA
	pH Strips: _____
	Sulfide Present Y N NA
	Lead Acetate Strips: _____

Customer Remarks / Special Conditions / Possible Hazards:	Type of Ice Used: Wet Blue Dry None	SHORT HOLDS PRESENT (<72 hours): Y N N/A	LAB Sample Temperature Info:
	Packing Material Used:	Lab Tracking #:	Temp Blank Received: Y N NA
	Radchem sample(s) screened (<500 cpm): Y N NA	Samples received via: FEDEX UPS Client Courier Pace Courier	Therm ID#:
			Cooler 1 Temp Upon Receipt: °C
			Cooler 1 Therm Corr. Factor: °C
			Cooler 1 Corrected Temp: °C
			Comments:

Relinquished by/Company: (Signature) <i>A. Smith</i>	Date/Time: 03/21/22 1200	Received by/Company: (Signature) <i>[Signature]</i>	Date/Time: 3/22 1200	J130
Relinquished by/Company: (Signature) <i>[Signature]</i>	Date/Time: 3/22 1506	Received by/Company: (Signature) <i>[Signature]</i>	Date/Time: 3/22/22 0900	
Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:	

Acctnum:	Trip Blank Received: Y N NA
Template:	HCL MeOH TSP Other
Prelogin:	
PM:	Non Conformance(s):
PB:	YES / NO
	Page: _____ of: _____

March 31, 2022

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: L1474452  
Samples Received: 03/23/2022  
Project Number:  
Description: H17 Historical Pit  
Site: H17  
Report To: Brett Middleton  
143 Diamond Avenue  
Parachute, CO 81635

Entire Report Reviewed By:



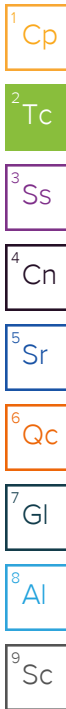
Chris Ward  
Project Manager

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.

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

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# SAMPLE SUMMARY

## 20220321-H17-SB06@8'-10' L1474452-01 Solid

Collected by: Andrew Smith  
 Collected date/time: 03/21/22 13:45  
 Received date/time: 03/23/22 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1837455	1	03/26/22 14:55	03/26/22 14:55	KMG	Mt. Juliet, TN
Wet Chemistry by Method 7199	WG1839107	1	03/27/22 21:08	03/28/22 19:11	JER	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1838795	1	03/26/22 14:00	03/26/22 16:00	GI	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1839170	1	03/28/22 01:47	03/28/22 08:25	ARD	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG1839830	1	03/29/22 08:28	03/29/22 20:10	CCE	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG1837942	1	03/24/22 13:16	03/25/22 21:07	JAH	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015M	WG1840017	1	03/30/22 08:26	03/30/22 13:42	JDG	Mt. Juliet, TN

1  
Cp

2  
Tc

3  
Ss

4  
Cn

5  
Sr

6  
Qc

## 20220321-H17-SB06@14'-15' L1474452-02 Solid

Collected by: Andrew Smith  
 Collected date/time: 03/21/22 14:00  
 Received date/time: 03/23/22 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1837455	1	03/26/22 14:58	03/26/22 14:58	KMG	Mt. Juliet, TN
Wet Chemistry by Method 7199	WG1839107	1	03/27/22 21:08	03/28/22 19:22	JER	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1838205	1	03/25/22 09:00	03/25/22 13:00	GI	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1839170	1	03/28/22 01:47	03/28/22 08:25	ARD	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG1839830	1	03/29/22 08:28	03/29/22 20:13	CCE	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG1837942	1	03/24/22 13:16	03/25/22 21:28	JAH	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015M	WG1840017	1	03/30/22 08:26	03/30/22 14:22	JDG	Mt. Juliet, TN

7  
Gl

8  
Al

9  
Sc

# CASE NARRATIVE

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	17.9		1	03/26/2022 14:55	WG1837455

## Wet Chemistry by Method 7199

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Hexavalent Chromium	U		0.255	1.00	1	03/28/2022 19:11	<a href="#">WG1839107</a>

## Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	8.33	<u>T8</u>	1	03/26/2022 16:00	<a href="#">WG1838795</a>

## Sample Narrative:

L1474452-01 WG1838795: 8.33 at 19.5C

## Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	5700		10.0	1	03/28/2022 08:25	<a href="#">WG1839170</a>

## Sample Narrative:

L1474452-01 WG1839170: at 25C

## Metals (ICP) by Method 6010B-NE493 Ch 2

Analyte	Result mg/l	Qualifier	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
Hot Water Sol. Boron	0.306		0.0167	0.200	1	03/29/2022 20:10	<a href="#">WG1839830</a>

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

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	0.384		0.0217	0.100	1	03/25/2022 21:07	<a href="#">WG1837942</a>
(S) <i>a,a,a</i> -Trifluorotoluene(FID)	94.4			77.0-120		03/25/2022 21:07	<a href="#">WG1837942</a>

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

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	U	<u>J3</u>	1.61	4.00	1	03/30/2022 13:42	<a href="#">WG1840017</a>
C28-C36 Motor Oil Range	0.877	<u>J</u>	0.274	4.00	1	03/30/2022 13:42	<a href="#">WG1840017</a>
(S) <i>o</i> -Terphenyl	51.7			18.0-148		03/30/2022 13:42	<a href="#">WG1840017</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	23.5		1	03/26/2022 14:58	WG1837455

## Wet Chemistry by Method 7199

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Hexavalent Chromium	U		0.255	1.00	1	03/28/2022 19:22	<a href="#">WG1839107</a>

## Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	9.18	<u>T8</u>	1	03/25/2022 13:00	<a href="#">WG1838205</a>

## Sample Narrative:

L1474452-02 WG1838205: 9.18 at 20C

## Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	3110		10.0	1	03/28/2022 08:25	<a href="#">WG1839170</a>

## Sample Narrative:

L1474452-02 WG1839170: at 25C

## Metals (ICP) by Method 6010B-NE493 Ch 2

Analyte	Result mg/l	Qualifier	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
Hot Water Sol. Boron	0.109	<u>J</u>	0.0167	0.200	1	03/29/2022 20:13	<a href="#">WG1839830</a>

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

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	0.225		0.0217	0.100	1	03/25/2022 21:28	<a href="#">WG1837942</a>
(S) <i>a,a,a</i> -Trifluorotoluene(FID)	101			77.0-120		03/25/2022 21:28	<a href="#">WG1837942</a>

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

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	3.61	<u>J</u>	1.61	4.00	1	03/30/2022 14:22	<a href="#">WG1840017</a>
C28-C36 Motor Oil Range	7.11		0.274	4.00	1	03/30/2022 14:22	<a href="#">WG1840017</a>
(S) <i>o</i> -Terphenyl	68.1			18.0-148		03/30/2022 14:22	<a href="#">WG1840017</a>

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Method Blank (MB)

(MB) R3775144-1 03/28/22 16:41

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
Hexavalent Chromium	U		0.255	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

<sup>7</sup>Gl

<sup>8</sup>Al

<sup>9</sup>Sc

L1474259-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1474259-01 03/28/22 16:51 • (DUP) R3775144-3 03/28/22 16:56

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Hexavalent Chromium	U	U	1	0.000		20

L1474452-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1474452-01 03/28/22 19:11 • (DUP) R3775144-8 03/28/22 19:16

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Hexavalent Chromium	U	U	1	0.000		20

Laboratory Control Sample (LCS)

(LCS) R3775144-2 03/28/22 16:46

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Hexavalent Chromium	10.0	9.55	95.5	80.0-120	

L1474450-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1474450-01 03/28/22 17:53 • (MS) R3775144-4 03/28/22 17:59 • (MSD) R3775144-5 03/28/22 18:04

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Hexavalent Chromium	20.0	0.557	19.4	20.6	94.1	100	1	75.0-125			6.27	20

L1474450-01 Original Sample (OS) • Matrix Spike (MS)

(OS) L1474450-01 03/28/22 17:53 • (MS) R3775144-6 03/28/22 18:09

Analyte	Spike Amount	Original Result	MS Result	MS Rec.	Dilution	Rec. Limits	MS Qualifier
Hexavalent Chromium	673	0.557	708	105	50	75.0-125	

L1473396-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1473396-01 03/25/22 13:00 • (DUP) R3774071-2 03/25/22 13:00

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
pH	7.84	7.78	1	0.768		1

Sample Narrative:

OS: 7.84 at 20.1C

DUP: 7.78 at 20.2C

Laboratory Control Sample (LCS)

(LCS) R3774071-1 03/25/22 13:00

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
pH	10.0	9.94	99.4	99.0-101	

Sample Narrative:

LCS: 9.94 at 18.9C

<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

L1474452-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1474452-01 03/26/22 16:00 • (DUP) R3774343-2 03/26/22 16:00

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
pH	8.33	8.32	1	0.120		1

Sample Narrative:

OS: 8.33 at 19.5C  
 DUP: 8.32 at 19.5C

L1474960-18 Original Sample (OS) • Duplicate (DUP)

(OS) L1474960-18 03/26/22 16:00 • (DUP) R3774343-3 03/26/22 16:00

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
pH	7.91	7.90	1	0.127		1

Sample Narrative:

OS: 7.91 at 19.7C  
 DUP: 7.9 at 19.7C

Laboratory Control Sample (LCS)

(LCS) R3774343-1 03/26/22 16:00

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
pH	10.0	9.95	99.5	99.0-101	

Sample Narrative:

LCS: 9.95 at 18.4C

<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) R3774554-1 03/28/22 08:25

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
Specific Conductance	U		10.0	10.0

Sample Narrative:

BLANK: at 25C

L1474761-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1474761-01 03/28/22 08:25 • (DUP) R3774554-3 03/28/22 08:25

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Specific Conductance	4950	4920	1	0.608		20

Sample Narrative:

OS: at 25C

DUP: at 25C

L1474960-05 Original Sample (OS) • Duplicate (DUP)

(OS) L1474960-05 03/28/22 08:25 • (DUP) R3774554-4 03/28/22 08:25

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Specific Conductance	216	195	1	10.4		20

Sample Narrative:

OS: at 25C

DUP: at 25C

Laboratory Control Sample (LCS)

(LCS) R3774554-2 03/28/22 08:25

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Specific Conductance	268	270	101	85.0-115	

Sample Narrative:

LCS: at 25C

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Method Blank (MB)

(MB) R3775423-1 03/29/22 19:13

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Hot Water Sol. Boron	U		0.0167	0.200

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

(LCS) R3775423-2 03/29/22 19:16 • (LCSD) R3775423-3 03/29/22 19:19

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Hot Water Sol. Boron	1.00	1.05	1.06	105	106	80.0-120			0.172	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) R3774201-2 03/25/22 12:55

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
TPH (GC/FID) Low Fraction	U		0.0217	0.100
<sup>(S)</sup> a,a,a-Trifluorotoluene(FID)	109			77.0-120

Laboratory Control Sample (LCS)

(LCS) R3774201-1 03/25/22 12:11

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
TPH (GC/FID) Low Fraction	5.50	5.06	92.0	72.0-127	
<sup>(S)</sup> a,a,a-Trifluorotoluene(FID)			91.1	77.0-120	

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

Method Blank (MB)

(MB) R3775800-1 03/30/22 13:14

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	mg/kg		mg/kg	mg/kg
C10-C28 Diesel Range	U		1.61	4.00
C28-C36 Motor Oil Range	U		0.274	4.00
(S) o-Terphenyl	72.8			18.0-148

Laboratory Control Sample (LCS)

(LCS) R3775800-2 03/30/22 13:28

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	mg/kg	mg/kg	%	%	
C10-C28 Diesel Range	50.0	35.2	70.4	50.0-150	
(S) o-Terphenyl			86.9	18.0-148	

L1474452-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1474452-01 03/30/22 13:42 • (MS) R3775800-3 03/30/22 13:55 • (MSD) R3775800-4 03/30/22 14:09

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	%	%		%			%	%
C10-C28 Diesel Range	48.8	U	48.5	38.2	99.4	78.3	1	50.0-150		J3	23.8	20
(S) o-Terphenyl					65.1	73.5		18.0-148				

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

# GLOSSARY OF TERMS

## 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.
(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.
J3	The associated batch QC was outside the established quality control range for precision.
T8	Sample(s) received past/too close to holding time expiration.

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 GI

8 AI

9 Sc

# ACCREDITATIONS & LOCATIONS

## Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

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	84004002
Kentucky <sup>2</sup>	16	South Dakota	n/a
Louisiana	AI30792	Tennessee <sup>1,4</sup>	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas <sup>5</sup>	LAB0152
Maryland	324	Utah	TN000032021-11
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	110033
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	998093910
Montana	CERT0086	Wyoming	A2LA
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

\* 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 Analytical.

<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

