

Andrew Verbonitz  
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## Report of Work Completed – Flowline Release

<b>ECMC Location Name (ID)</b>	NPR /A03-596 (335720)
<b>Operator Location Name</b>	A03 596
<b>ECMC Remediation Project Number</b>	25700
<b>Legal Description</b>	SENE Sec. 3 T5S-R96W
<b>Coordinates (Lat/Long)</b>	39.647904/-108.147875
<b>County</b>	Garfield County, Colorado

Mr. Verbonitz,

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 produced water release at the A03 596 well pad (Location). The Location is 14.2 miles north of Parachute, Colorado in Garfield County as illustrated in the attached Topographic Location Map. Additional information on the Location and the associated remedial investigation is provided in the title block above, the attached Site Diagram, and laboratory analytical reports. This ROWC provides background on the Location, methods used to complete the site investigation, results of the investigation, and recommendations for how to proceed with this information.

### Background

On August 15, 2022, a flowline at the Location failed a pressure test. The flowline was exposed, and the point of release (POR) was identified. An unknown volume of produced water was released from the flowline prior to the failed pressure test. The release was reported via Energy & Carbon Management Commission (ECMC) Form 19 Document 403136417 to open Spill/Release Point ID 482722.

On August 31, 2022, Confluence was onsite to conduct initial site investigation. The flowline had been trenched and exposed to identify the POR. Five soil samples were collected from the excavation: one soil sample was collected from the base beneath the POR, two soil samples were collected from the north sidewall, one soil sample was collected from the south sidewall, and one soil sample was collected from the trench base northeast of the POR. A composite sample was also collected from the excavation stockpile. Analytical results of excavation samples were within ECMC Table 915-1 Residential Soil Screening Levels except for total petroleum hydrocarbons (TPH), sodium adsorption ratio (SAR), pH, and arsenic, and analytical results of the stockpile sample were within ECMC Table 915-1 Residential Soil Screening Levels except for pH and arsenic.

On November 2, 2022, the ECMC approved an alternative allowable limit of 11.0 mg/kg for arsenic, removed pH as a constituent of concern based on source characterization, and approved and a reduced analyte list of TPH and SAR via Document 403194784.

## Methodology

On August 14, 2023, Confluence returned to the Location to delineate soil impacts. Using an environmental drill rig, four soil borings were advanced: one at the POR, two to the north, and one to the northwest of the POR. Total depths of soil borings ranged from 6.5 to 14 feet bgs. Two soil samples were collected from each soil boring. Soil was logged, and samples were characterized using visual and olfactory observations and field screened using a photoionization detector (PID).

All soil samples were collected in laboratory provided jars, immediately placed on ice, shipped under a completed chain-of-custody form to Pace Analytical Services (Pace), and analyzed for the approved reduced analyte list of TPH and SAR.

## 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 excavation 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 sandy loam. Based on the elevation difference of 250 feet between the Location and Corral Springs tributary 0.2 miles north of the Location, depth to groundwater at the Location is estimated to be greater than 100 feet below ground surface (bgs). Groundwater is expected to flow north toward Corral Springs tributary and ultimately to the Colorado River, located 14.0 miles southeast of the Location.

### Delineation Results

Field screening results indicated potential impacts within SB04@5-6.5 with the presence of hydrocarbon odor and a PID measurement of 402.8 parts per million (ppm). The remaining soil samples did not indicate hydrocarbon odor or staining, and PID measurements ranged from 0.3 to 3.5 ppm. Analytical results of delineation soil samples are within ECMC Table 915-1 Residential Soil Screening Levels for all analyzed constituents of concern.

## Analysis and Recommendations

Based on the analytical results of recent site investigation efforts, TPH and SAR soil impacts remain in the investigation area; these impacts are delineated vertically and horizontally to the north. At the time of drilling investigation, a soil boring could not be advanced in the general vicinity east of the POR due to health and safety concerns associated with buried lines. Confluence recommends additional investigation to delineate the extent of TPH and SAR exceedances horizontally to the south, west, and east.

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 us.



Regards,



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## Attachments

- Topographic Location Map
- Site Diagram – Site Investigation
- Laboratory Results Summary Table
- Soil Boring Logs
- Laboratory Analytical Reports





## Topographic Location Map

Caerus Oil and Gas LLC

A03 596

(NPR A03-596)

ECMC Location ID: 335720

Garfield County

SESE Sec. 3 T5S-R96W



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

Created by: Miranda Beard on 08/29/2023.



## Site Diagram Site Investigation

Caerus Oil and Gas LLC

A03 596

(NPR/A03-596)

ECMC Location ID: 335720

Garfield County

SENE Sec. 3 T5S-R96W

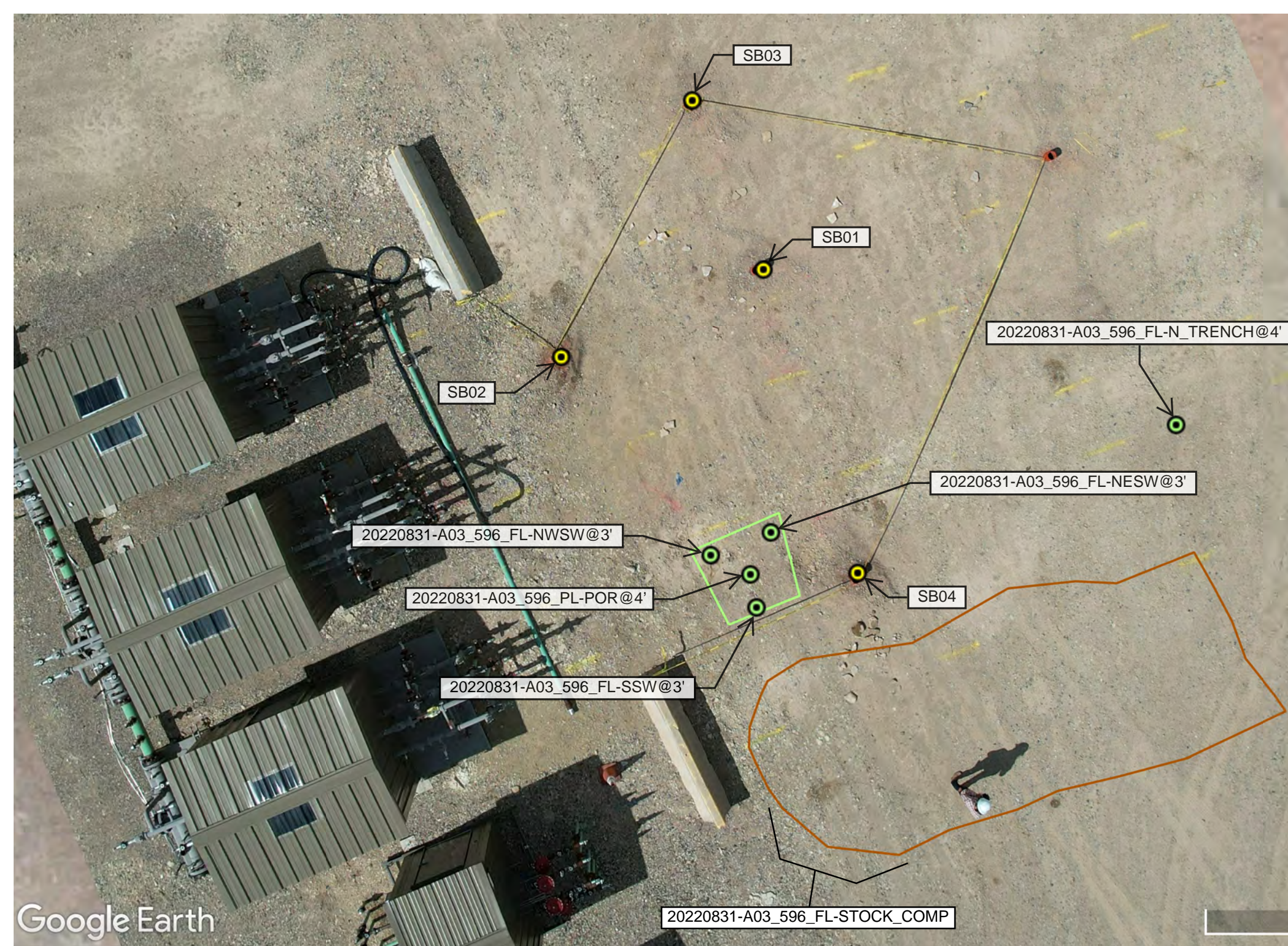


### Legend

- Soil Sample
- Soil Boring
- Soil Stockpile
- Excavation Extent – 08/31/2022

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: Miranda Beard on 09/26/2023.






ECMC Soil Screening Levels					Organic Compounds (mg/kg [ppm])																											
ECMC Table 915-1 Residential -->					NA	500	NA	NA	NA	1.2	490	5.8	58	30	27	360	1800	1.1	0.11	1.1	11	110	0.11	240	240	1.1	18	24	2	180		
Sample Date	Solid/Soil Source (Equipment [Vault/Sump, Separator, Tank Battery, Dump Line, Pit, Cuttings, Background, etc.]	Depth - Z (feet) <b>(NEGATIVE VALUE)</b> below ground surface (bgs)		Sample ID	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	Benz[a]anthracene	Benz[a]pyrene	Benz[b]fluoranthene	Benz[k]fluoranthene	Chrysene	Dibenz[A,h]anthracene	Fluoranthene	Fluorene	Indeno[1,2,3-cd]pyrene	1- Methylanthralene	2- Methylanthralene	Naphthalene	Pyrene		
8/14/2023	Flowline	-6.5		20230814_A03 596_S801@5-6.5	1.4/1.7	3.44	0.0284	1.92	1.49	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		
8/14/2023	Flowline	-9		20230814_A03 596_S801@8-9	1.2	11.08	0.0294	5.76	5.29	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		
8/14/2023	Flowline	-8		20230814_A03 596_S802@6-8	0.6	7.41	0.0245	4.81	2.58	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		
8/14/2023	Flowline	-9.5		20230814_A03 596_S802@8-9.5	0.6	1.37	0.0384	<4.00	1.33	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		
8/14/2023	Flowline	-7.5		20230814_A03 596_S803@5.5-7.5	0.3	12.02	<0.100	5.32	6.70	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		
8/14/2023	Flowline	-9.5		20230814_A03 596_S803@8-9.5	0.3	7.23	0.0306	2.81	4.39	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		
8/14/2023	Flowline	-6.5		20230814_A03 596_S804@5-6.5	402.8	68.0	2.18	63.9	1.92	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		
8/14/2023	Flowline	-14		20230814_A03 596_S804@13-14	3.5	6.88	0.0245	4.11	2.75	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		
8/31/2022	Flowline	0		20220831-A03_596_FL-STOCK_COMP	78.6	458	1.52	299	158	0.0169	0.0955	0.0112	0.178	0.0465	0.176	<0.0060	0.00251	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	0.0218	<0.0060	0.0416	0.0423	0.0159	<0.00600		
8/31/2022	Flowline	-4		20220831-A03_596_FL-POR@4'	3516	4880	0.216	4830	50.1	<0.00100	<0.00500	<0.00250	<0.00650	<0.00500	0.0230	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	0.247	<0.0060	1.40	2.80	0.924	<0.00600	
8/31/2022	Flowline	-4		20220831-A03_596_FL-N_TRENCH@4'	7.4	5130	0.123	5130	<80.0	<0.00100	<0.00500	<0.00250	<0.00650	<0.00500	0.0144	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	0.280	<0.0060	1.27	2.54	0.600	<0.00600	
8/31/2022	Flowline	-3		20220831-A03_596_FL-SSW@3'	1098	6145	520	5540	84.7	<0.0800	<0.400	<0.200	9.76	9.95	10.2	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	0.362	<0.0060	0.870	1.64	0.236	0.00692	
8/31/2022	Flowline	-3		20220831-A03_596_FL-NESW@3'	79.9	150.0	1.30	62.2	86.5	<0.00100	<0.00500	<0.00250	0.165	0.0898	0.104	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0200	<0.0200	<0.0200	<0.00600		
8/31/2022	Flowline	-3		20220831-A03_596_FL-NWSW@3'	320.8	190.1	1.41	91.1	97.6	<0.00100	<0.00500	<0.00250	0.0132	<0.00500	0.132	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	0.0104	<0.0060	0.0809	0.103	0.0450	<0.00600	
7/28/2010	Background	NA		A03-N. BACK-072810	NA	5.0	<0.50	5.0	NA	<0.0025	<0.025	<0.0025	<0.0075	NA	NA	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	0.0073	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	




Laboratory Results Summary Table - Soil  
A03 596


8/29/2023

ECMC Soil Screening Levels					Soil Suitability for Reclamation				Metals (mg/kg [ppm])									
ECMC Table 915-1 Residential -->				NA	4	6	6-8.3	2	0.68	15000	71	0.3	3100	400	1500	390	390	23000
Sample Date	Solid/Soil Source (Equipment) [Vault/Sump, Separator, Tank Battery, Dump Line, Pit, Cuttings, Background, etc.]	Depth - Z (feet) (NEGATIVE VALUE) below ground surface (bgs)	Sample ID	PID (ppm)	EC (Specific Conductance) (millimhos/centimeter) (by saturated paste method)	SAR (Sodium Adsorption Ratio) (calculation) (by saturated paste method)	pH (pH Units) (by saturated paste method)	Boron - Hot Water Soluble (mg/L)	Arsenic	Barium	Cadmium (mg/kg)	Chromium (VI)	Copper	Lead	Nickel	Selenium	Silver	Zinc
8/14/2023	Flowline	-6.5	20230814_A03 596_SB01@5-6.5	1.4/1.7	NA	1.04	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
8/14/2023	Flowline	-9	20230814_A03 596_SB01@8-9	1.2	NA	1.21	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
8/14/2023	Flowline	-8	20230814_A03 596_SB02@6-8	0.6	NA	2.60	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
8/14/2023	Flowline	-9.5	20230814_A03 596_SB02@8-9.5	0.6	NA	1.91	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
8/14/2023	Flowline	-7.5	20230814_A03 596_SB03@5.5-7.5	0.3	NA	3.28	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
8/14/2023	Flowline	-9.5	20230814_A03 596_SB03@8-9.5	0.3	NA	2.14	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
8/14/2023	Flowline	-6.5	20230814_A03 596_SB04@5-6.5	402.8	NA	3.93	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
8/14/2023	Flowline	-14	20230814_A03 596_SB04@13-14	3.5	NA	1.26	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
8/31/2022	Flowline	0	20220831-A03_596_FL-STOCK_COMP	78.6	0.657	4.26	8.87	0.384	3.81	483	0.360	<1.00	13.8	15.6	18.8	<2.00	<1.00	39.8
8/31/2022	Flowline	-4	20220831-A03_596_FL-POR@4'	3516	1.710	8.01	7.73	0.216	2.92	566	<0.500	<1.00	11.6	12.1	12.8	<2.00	<1.00	34.2
8/31/2022	Flowline	-4	20220831-A03_596_FL-N_TRENCH@4'	7.4	0.170	8.17	7.73	0.536	5.54	394	0.523	<1.00	10.5	10.5	20.1	<2.00	<1.00	32.0
8/31/2022	Flowline	-3	20220831-A03_596_FL-SSW@3'	1098	2.180	16.5	8.28	1.02	3.45	667	<0.500	<1.00	14.7	16.4	16.4	<2.00	<1.00	41.2
8/31/2022	Flowline	-3	20220831-A03_596_FL-NESW@3'	79.9	0.702	5.67	8.08	0.555	3.62	725	<0.500	<1.00	16.1	15.6	15.4	<2.00	<1.00	44.2
8/31/2022	Flowline	-3	20220831-A03_596_FL-NWSW@3'	320.8	0.490	4.68	8.54	0.424	3.38	408	<0.500	<1.00	12.5	17.2	14.1	<2.00	<1.00	43.6
7/28/2010	Background	NA	A03-N. BACK-072810	NA	0.079	2.6	6.7	NA	8.8	270	0.54	<10	25	21	26	<1.0	0.54	47


Project Name: A03 596 Flowline Release						
Location: A03 596						
Lat/Long:				Project Number:		
Boring Number: SB01		Scope: Delineation			Geologist: Alex Slorby	
Date: 8/14/2023	Start Time: 1000	Finish Time: 1100	DTW: -----	Drilling Equipment: SIMCO 2800		
Drilling Method: Solid Stem		Drilling Contractor: CO Drilling			Driller: Scott McKracken	
Depth (ft)	Time	Recovery	Standard Penetration Test Results	USCS Symbol	Material Description	PID Reading (ppm)
0 - 5					Cleared with hydrovac	Range
5 - 6.5	1030	100	15 - 17 - 30	SC	Brown sandy clay. Medium grain. Low plasticity. Iron oxide presence. Fractured shalestone. Gravel. Poorly graded. No odor or staining.	1.4/1.7
8 - 9	1100	90	11 - 24	SC	Brown sandy clay. Medium grain. Low plasticity. Fractured shalestone. Gravel. Poorly graded. No odor or staining.	1.2
Total Depth of Boring: 8 feet		Samples Collected: 5' - 6.5' 8' - 9'			Comments:	



Project Name: A03 596 Flowline Release						
Location: A03 596						
Lat/Long:				Project Number:		
Boring Number: SB02		Scope: Delineation			Geologist: Alex Slorby	
Date: 8/14/2023	Start Time: 1115	Finish Time: 1140	DTW: -----	Drilling Equipment: SIMCO 2800		
Drilling Method: Solid Stem		Drilling Contractor: CO Drilling			Driller: Scott McKracken	
Depth (ft)	Time	Recovery	Standard Penetration Test Results	USCS Symbol	Material Description	PID Reading (ppm)
0 - 6					Cleared with hydrovac	Range
6 - 8	1120	90	4 - 5 - 7 - 23	SC	Brown. Sandy clay. Medium grain. Low plasticity. Gravel. Poorly graded. Fractured shalestone. White crystalline material. No odor or staining.	0.6
8 - 9.5	1140	90	20 - 25 - 30	SC	Brown. Sandy clay. Medium grain. Low plasticity. Gravel. Poorly graded. Fractured shalestone. White crystalline material. No odor or staining.	0.6
Total Depth of Boring: 8 feet		Samples Collected: 6' - 8' 8' - 9.5'			Comments:	

Project Name: A03 596 Flowline Release						
Location: A03 596						
Lat/Long:				Project Number:		
Boring Number: SB03		Scope: Delineation			Geologist: Alex Slorby	
Date: 8/14/2023	Start Time: 1150	Finish Time: 1205	DTW: -----	Drilling Equipment: SIMCO 2800		
Drilling Method: Solid Stem		Drilling Contractor: CO Drilling			Driller: Scott McKracken	
Depth (ft)	Time	Recovery	Standard Penetration Test Results	USCS Symbol	Material Description	PID Reading (ppm)
0 - 5.5					Cleared with hydrovac	Range
5.5 - 7.5	1155	90	3 - 4.7 - 14	SC	Brown. Sandy clay. Medium grain. Low plasticity. Gravel. Poorly graded. Fractured shalestone. White crystalline material. No odor or staining.	0.3
8 - 9.5	1205	100	8 - 16 - 31	SC	Brown. Sandy clay. Medium grain. Low plasticity. Gravel. Poorly graded. Fractured shalestone. No odor or staining.	0.3
Total Depth of Boring: 8 feet		Samples Collected: 5.5' - 7.5' 8' - 9.5'			Comments:	

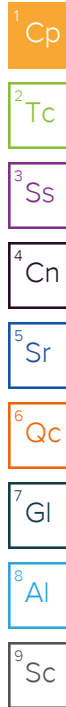


Project Name: A03 596 Flowline Release						
Location: A03 596						
Lat/Long:				Project Number:		
Boring Number: SB04		Scope: Delineation			Geologist: Alex Slorby	
Date: 8/14/2023		Start Time: 1225	Finish Time: 1415	DTW: -----	Drilling Equipment: SIMCO 2800	
Drilling Method: Solid Stem			Drilling Contractor: CO Drilling		Driller: Scott McKracken	
Depth (ft)	Time	Recovery	Standard Penetration Test Results	USCS Symbol	Material Description	PID Reading (ppm)
0 - 5					Cleared with hydrovac	Range
5 - 6.5	1230	100	11 - 16 - 28	SC	Brown. Sandy clay. Medium grain. Low plasticity. Gravel. Poorly graded. Fractured shalestone. Hydrocarbon odor present. No staining.	402.8
8 - 9.5	1245	100	11 - 17 - 30/4	SC	Brown. Sandy clay. Medium grain. Low plasticity. Gravel. Poorly graded. Fractured shalestone. Iron oxide presence. Hydrocarbon odor present. No staining.	320.9
10 - 11.5	1310	90	39 - 44 - 45 - 35/2	SC	Brown. Sandy clay. Medium grain. Low plasticity. Gravel. Poorly graded. Fractured shalestone. Iron oxide presence. No odor or staining.	38.2 / 53.6
11.5 - 12.5	1350	90	39 - 60	SC	Brown. Sandy clay. Medium grain. Low plasticity. Gravel. Poorly graded. Fractured shalestone. Iron oxide presence. No odor or staining.	43.6
13 - 14	1415	60	60 - 60	SC	Brown. Sandy clay. Medium grain. Low plasticity. Gravel. Poorly graded. Fractured shalestone. Iron oxide presence. No odor or staining.	3.5
Total Depth of Boring: 13 feet			Samples Collected: 5' - 6.5' 13' - 14'		Comments:	



# ANALYTICAL REPORT

August 24, 2023



## Caerus Oil and Gas

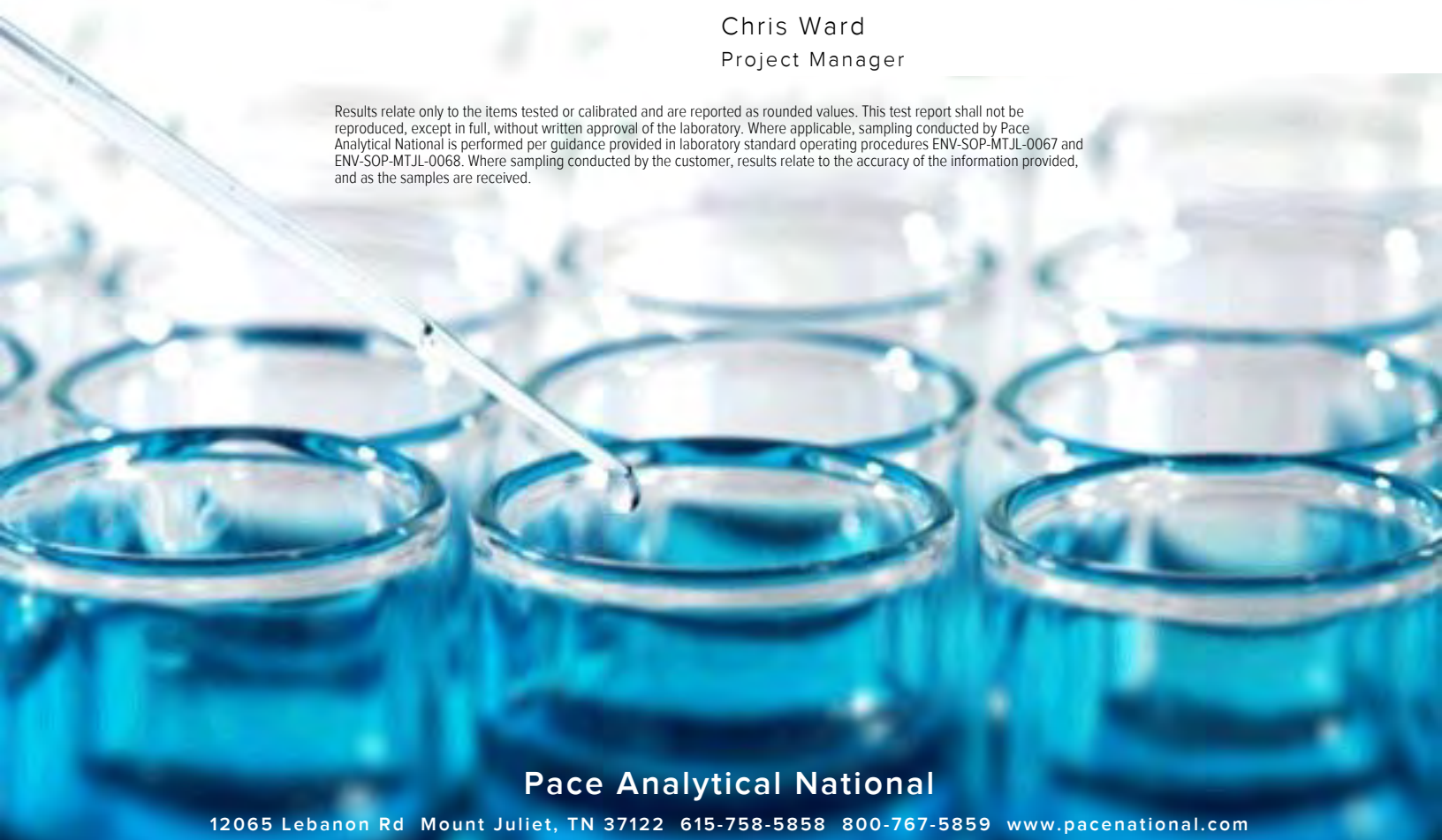
Sample Delivery Group: L1646676  
Samples Received: 08/16/2023  
Project Number:  
Description: A03 Flowline Release  
Site: A03 596  
Report To: Blair Rollins  
143 Diamond Avenue  
Parachute, CO 81635

Entire Report Reviewed By:

*Chris Ward*

Chris Ward  
Project Manager

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



**Pace Analytical National**

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



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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

20230814\_A03 596\_SB01@5-6.5 L1646676-01 Solid

Collected by  
Alex Slorby

Collected date/time  
08/14/23 10:30

Received date/time  
08/16/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG2116767	1	08/22/23 10:27	08/22/23 10:27	ZSA	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG2118894	1	08/20/23 11:29	08/22/23 17:18	JAH	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015M	WG2117865	1	08/22/23 07:40	08/22/23 15:20	JSS	Mt. Juliet, TN

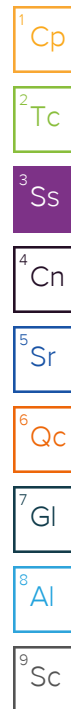
20230814\_A03 596\_SB01@8-9 L1646676-02 Solid

Collected by  
Alex Slorby

Collected date/time  
08/14/23 11:00

Received date/time  
08/16/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG2116767	1	08/22/23 10:30	08/22/23 10:30	ZSA	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG2119358	1	08/20/23 11:29	08/23/23 12:09	DWR	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015M	WG2117865	1	08/22/23 07:40	08/22/23 15:07	JSS	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



Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	1.04		1	08/22/2023 10:27	WG2116767

1  
Cp

2  
Tc

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	0.0284	J	0.0217	0.100	1	08/22/2023 17:18	<a href="#">WG2118894</a>
(S) a,a,a-Trifluorotoluene(FID)	103			77.0-120		08/22/2023 17:18	<a href="#">WG2118894</a>

3  
Ss

4  
Cn

5  
Sr

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	1.92	J J6	1.61	4.00	1	08/22/2023 15:20	<a href="#">WG2117865</a>
C28-C36 Motor Oil Range	1.49	J	0.274	4.00	1	08/22/2023 15:20	<a href="#">WG2117865</a>
(S) o-Terphenyl	63.3			18.0-148		08/22/2023 15:20	<a href="#">WG2117865</a>

6  
Qc

7  
Gl

8  
Al

9  
Sc



Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	1.21		1	08/22/2023 10:30	WG2116767

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	0.0294	J	0.0217	0.100	1	08/23/2023 12:09	<a href="#">WG2119358</a>
(S) a,a,a-Trifluorotoluene(FID)	105			77.0-120		08/23/2023 12:09	<a href="#">WG2119358</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	5.76		1.61	4.00	1	08/22/2023 15:07	<a href="#">WG2117865</a>
C28-C36 Motor Oil Range	5.29		0.274	4.00	1	08/22/2023 15:07	<a href="#">WG2117865</a>
(S) o-Terphenyl	65.7			18.0-148		08/22/2023 15:07	<a href="#">WG2117865</a>

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Method Blank (MB)

(MB) R3964222-2 08/22/23 16:25

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
TPH (GC/FID) Low Fraction	U		0.0217	0.100
(S) a,a,a-Trifluorotoluene(FID)	106			77.0-120

Laboratory Control Sample (LCS)

(LCS) R3964222-1 08/22/23 15:48

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
TPH (GC/FID) Low Fraction	5.50	5.83	106	72.0-127	
(S) a,a,a-Trifluorotoluene(FID)			109	77.0-120	

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc



Method Blank (MB)

(MB) R3964889-2 08/23/23 10:20

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
TPH (GC/FID) Low Fraction	U		0.0217	0.100
(S) a,a,a-Trifluorotoluene(FID)	108			77.0-120

Laboratory Control Sample (LCS)

(LCS) R3964889-1 08/23/23 09:43

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
TPH (GC/FID) Low Fraction	5.50	5.52	100	72.0-127	
(S) a,a,a-Trifluorotoluene(FID)			113	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) R3963996-1 08/22/23 13:33

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	64.7			18.0-148

Laboratory Control Sample (LCS)

(LCS) R3963996-2 08/22/23 13:46

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
C10-C28 Diesel Range	50.0	31.8	63.6	50.0-150	
(S) o-Terphenyl			69.5	18.0-148	

L1646676-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1646676-01 08/22/23 15:20 • (MS) R3964109-1 08/22/23 15:34 • (MSD) R3964109-2 08/22/23 15:47

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	48.5	1.92	26.7	26.0	51.1	49.6	1	50.0-150		J6	2.66	20
(S) o-Terphenyl					59.6	51.5		18.0-148				

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

# GLOSSARY OF TERMS

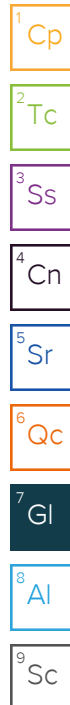
## Guide to Reading and Understanding Your Laboratory Report

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.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.





# 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.







# ANALYTICAL REPORT

August 25, 2023

<sup>1</sup> Cp

<sup>2</sup> Tc

<sup>3</sup> Ss

<sup>4</sup> Cn

<sup>5</sup> Sr

<sup>6</sup> Qc

<sup>7</sup> Gl

<sup>8</sup> Al

<sup>9</sup> Sc

## Caerus Oil and Gas

Sample Delivery Group: L1646678  
Samples Received: 08/16/2023  
Project Number:  
Description: A03 Flowline Release  
Site: A03 596  
Report To: Jake J. / Brett M. / Blair R.  
143 Diamond Avenue  
Parachute, CO 81635

Entire Report Reviewed By:

*Chris Ward*

Chris Ward  
Project Manager

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

**Pace Analytical National**

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



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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

20230814\_A03 596\_SB03@5.5-7.5 L1646678-01 Solid

Collected by  
Alex Slorby

Collected date/time  
08/14/23 11:55

Received date/time  
08/16/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG2116767	1	08/22/23 10:33	08/22/23 10:33	ZSA	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG2119358	1	08/20/23 11:38	08/23/23 12:28	DWR	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015M	WG2117865	1	08/22/23 07:40	08/22/23 17:35	JSS	Mt. Juliet, TN

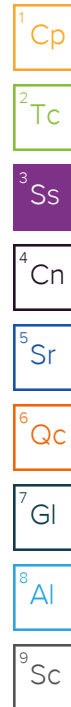
20230814\_A03 596\_SB03@8-9.5 L1646678-02 Solid

Collected by  
Alex Slorby

Collected date/time  
08/14/23 12:05

Received date/time  
08/16/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG2116767	1	08/24/23 14:00	08/24/23 14:00	JTM	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG2119358	1	08/20/23 11:38	08/23/23 12:46	DWR	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015M	WG2117865	1	08/22/23 07:40	08/22/23 16:55	JSS	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





Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	3.28		1	08/22/2023 10:33	WG2116767

1  
Cp

2  
Tc

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	08/23/2023 12:28	<a href="#">WG2119358</a>
(S) a,a,a-Trifluorotoluene(FID)	106			77.0-120		08/23/2023 12:28	<a href="#">WG2119358</a>

3  
Ss

4  
Cn

5  
Sr

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	5.32		1.61	4.00	1	08/22/2023 17:35	<a href="#">WG2117865</a>
C28-C36 Motor Oil Range	6.70		0.274	4.00	1	08/22/2023 17:35	<a href="#">WG2117865</a>
(S) o-Terphenyl	57.4			18.0-148		08/22/2023 17:35	<a href="#">WG2117865</a>

6  
Qc

7  
Gl

8  
Al

9  
Sc

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	2.14		1	08/24/2023 14:00	WG2116767

1  
Cp

2  
Tc

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	0.0306	J	0.0217	0.100	1	08/23/2023 12:46	<a href="#">WG2119358</a>
(S) a,a,a-Trifluorotoluene(FID)	102			77.0-120		08/23/2023 12:46	<a href="#">WG2119358</a>

3  
Ss

4  
Cn

5  
Sr

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	2.81	J	1.61	4.00	1	08/22/2023 16:55	<a href="#">WG2117865</a>
C28-C36 Motor Oil Range	4.39		0.274	4.00	1	08/22/2023 16:55	<a href="#">WG2117865</a>
(S) o-Terphenyl	56.2			18.0-148		08/22/2023 16:55	<a href="#">WG2117865</a>

6  
Qc

7  
Gl

8  
Al

9  
Sc

Method Blank (MB)

(MB) R3964889-2 08/23/23 10:20

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
TPH (GC/FID) Low Fraction	U		0.0217	0.100
(S) a,a,a-Trifluorotoluene(FID)	108			77.0-120

Laboratory Control Sample (LCS)

(LCS) R3964889-1 08/23/23 09:43

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
TPH (GC/FID) Low Fraction	5.50	5.52	100	72.0-127	
(S) a,a,a-Trifluorotoluene(FID)			113	77.0-120	

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc



Method Blank (MB)

(MB) R3963996-1 08/22/23 13:33

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	64.7			18.0-148

Laboratory Control Sample (LCS)

(LCS) R3963996-2 08/22/23 13:46

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
C10-C28 Diesel Range	50.0	31.8	63.6	50.0-150	
(S) o-Terphenyl			69.5	18.0-148	

L1646676-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1646676-01 08/22/23 15:20 • (MS) R3964109-1 08/22/23 15:34 • (MSD) R3964109-2 08/22/23 15:47

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	48.5	1.92	26.7	26.0	51.1	49.6	1	50.0-150		J6	2.66	20
(S) o-Terphenyl					59.6	51.5		18.0-148				

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

# GLOSSARY OF TERMS

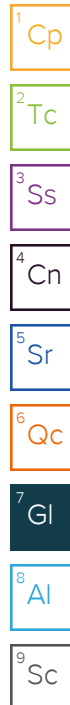
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### Abbreviations and Definitions

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.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.



# 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.



22	LAB Sample Temperature Info:	
	Temp Blank Received: Y <input checked="" type="radio"/> NA	
	Therm ID#: _____	
	Cooler 1 Temp Upon Receipt: _____ °C	
LY	Cooler 1 Therm Corr. Factor: _____ °C	
	Cooler 1 Corrected Temp: _____ °C	
	Comments:	
4.5 + 0 = 4.5 GB48		
	Trip Blank Received: Y <input checked="" type="radio"/> NA	
	HCL MeOH TSP Other	
	Non Conformance(s):	Page: _____
	YES / <input checked="" type="radio"/> NO	of: _____





# ANALYTICAL REPORT

August 23, 2023

<sup>1</sup> Cp

<sup>2</sup> Tc

<sup>3</sup> Ss

<sup>4</sup> Cn

<sup>5</sup> Sr

<sup>6</sup> Qc

<sup>7</sup> Gl

<sup>8</sup> Al

<sup>9</sup> Sc

## Caerus Oil and Gas

Sample Delivery Group: L1646665  
Samples Received: 08/16/2023  
Project Number:  
Description: A03 Flowline Release  
Site: A03 596  
Report To: Blair Rollins  
143 Diamond Avenue  
Parachute, CO 81635

Entire Report Reviewed By:

*Chris Ward*

Chris Ward  
Project Manager

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

**Pace Analytical National**

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

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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

20230814\_A03 596\_SB04@5-6.5 L1646665-01 Solid

Collected by  
Alex Slorby

Collected date/time  
08/14/23 12:30

Received date/time  
08/16/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG2116767	1	08/22/23 10:22	08/22/23 10:22	ZSA	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG2118894	1	08/20/23 11:12	08/22/23 20:57	JAH	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015M	WG2117865	1	08/22/23 07:40	08/22/23 16:14	JSS	Mt. Juliet, TN

20230814\_A03 596\_SB04@13-14 L1646665-02 Solid

Collected by  
Alex Slorby

Collected date/time  
08/14/23 14:15

Received date/time  
08/16/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG2116767	1	08/22/23 10:25	08/22/23 10:25	ZSA	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG2118894	1	08/20/23 11:12	08/22/23 16:59	JAH	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015M	WG2117865	1	08/22/23 07:40	08/22/23 14:53	JSS	Mt. Juliet, TN

<sup>1</sup>Cp

<sup>2</sup>Tc

<sup>3</sup>Ss

<sup>4</sup>Cn

<sup>5</sup>Sr

<sup>6</sup>Qc

<sup>7</sup>Gl

<sup>8</sup>Al

<sup>9</sup>Sc

# 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	3.93		1	08/22/2023 10:22	WG2116767

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	2.18		0.0217	0.100	1	08/22/2023 20:57	<a href="#">WG2118894</a>
(S) a,a,a-Trifluorotoluene(FID)	105			77.0-120		08/22/2023 20:57	<a href="#">WG2118894</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	63.9		1.61	4.00	1	08/22/2023 16:14	<a href="#">WG2117865</a>
C28-C36 Motor Oil Range	1.92	J	0.274	4.00	1	08/22/2023 16:14	<a href="#">WG2117865</a>
(S) o-Terphenyl	50.6			18.0-148		08/22/2023 16:14	<a href="#">WG2117865</a>

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc



Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	1.26		1	08/22/2023 10:25	WG2116767

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	0.0254	J	0.0217	0.100	1	08/22/2023 16:59	<a href="#">WG2118894</a>
(S) a,a,a-Trifluorotoluene(FID)	108			77.0-120		08/22/2023 16:59	<a href="#">WG2118894</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	4.11		1.61	4.00	1	08/22/2023 14:53	<a href="#">WG2117865</a>
C28-C36 Motor Oil Range	2.75	J	0.274	4.00	1	08/22/2023 14:53	<a href="#">WG2117865</a>
(S) o-Terphenyl	59.3			18.0-148		08/22/2023 14:53	<a href="#">WG2117865</a>

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Method Blank (MB)

(MB) R3964222-2 08/22/23 16:25

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
TPH (GC/FID) Low Fraction	U		0.0217	0.100
(S) a,a,a-Trifluorotoluene(FID)	106			77.0-120

Laboratory Control Sample (LCS)

(LCS) R3964222-1 08/22/23 15:48

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
TPH (GC/FID) Low Fraction	5.50	5.83	106	72.0-127	
(S) a,a,a-Trifluorotoluene(FID)			109	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) R3963996-1 08/22/23 13:33

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	64.7			18.0-148

Laboratory Control Sample (LCS)

(LCS) R3963996-2 08/22/23 13:46

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
C10-C28 Diesel Range	50.0	31.8	63.6	50.0-150	
(S) o-Terphenyl			69.5	18.0-148	

L1646676-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1646676-01 08/22/23 15:20 • (MS) R3964109-1 08/22/23 15:34 • (MSD) R3964109-2 08/22/23 15:47

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	48.5	1.92	26.7	26.0	51.1	49.6	1	50.0-150		J6	2.66	20
(S) o-Terphenyl					59.6	51.5		18.0-148				

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

# GLOSSARY OF TERMS

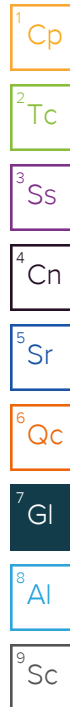
## Guide to Reading and Understanding Your Laboratory Report

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.
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Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.
Qualifier	Description
J	The identification of the analyte is acceptable; the reported value is an estimate.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.



# 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
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Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina <sup>1</sup>	DW21704
Georgia	NELAP	North Carolina <sup>3</sup>	41
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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.







**Caerus Oil and Gas**

Sample Delivery Group: L1532241  
Samples Received: 09/02/2022  
Project Number:  
Description: A03 596 Flowline Release  
Site: A03 596  
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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<b>Al: Accreditations &amp; Locations</b>	<b>26</b>
<b>Sc: Sample Chain of Custody</b>	<b>27</b>



# SAMPLE SUMMARY

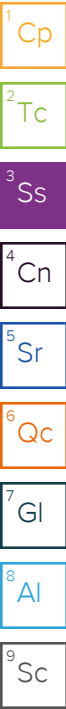
## 20220831-A03\_596\_FL-SSW @ 3' L1532241-01 Solid

Collected by  
A Smith

Collected date/time  
08/31/22 13:45

Received date/time  
09/02/22 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1924600	1	09/15/22 16:35	09/15/22 16:35	ZSA	Mt. Juliet, TN
Wet Chemistry by Method 7199	WG1924000	1	09/10/22 22:05	09/13/22 20:45	ARD	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1925207	1	09/13/22 15:00	09/13/22 16:00	RLS	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1924190	1	09/14/22 10:17	09/16/22 14:10	NTG	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1923240	1	09/12/22 16:58	09/14/22 14:34	ZSA	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG1921387	2	09/05/22 15:36	09/14/22 00:27	CCE	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1923244	5	09/12/22 17:05	09/14/22 00:16	LD	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG1923539	100	09/04/22 13:16	09/10/22 01:40	BAM	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1923301	80	09/04/22 13:16	09/09/22 05:10	JHH	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015M	WG1925133	1	09/13/22 10:10	09/14/22 00:51	TJD	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015M	WG1925133	100	09/13/22 10:10	09/14/22 10:46	JAS	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG1924030	1	09/10/22 06:02	09/10/22 20:34	AMG	Mt. Juliet, TN



## 20220831-A03\_596\_FL-NESW @ 3' L1532241-02 Solid

Collected by  
A Smith

Collected date/time  
08/31/22 13:50

Received date/time  
09/02/22 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1924600	1	09/15/22 16:38	09/15/22 16:38	ZSA	Mt. Juliet, TN
Wet Chemistry by Method 7199	WG1924000	1	09/10/22 22:05	09/13/22 20:50	ARD	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1925207	1	09/13/22 15:00	09/13/22 16:00	RLS	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1924190	1	09/14/22 10:17	09/16/22 14:10	NTG	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1923240	1	09/12/22 16:58	09/14/22 14:37	ZSA	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG1921387	1	09/05/22 15:36	09/14/22 00:30	CCE	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1923244	5	09/12/22 17:05	09/14/22 00:19	LD	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG1921706	1	09/04/22 13:16	09/07/22 16:20	BAM	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1923301	1	09/04/22 13:16	09/08/22 23:08	JHH	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015M	WG1925133	1	09/13/22 10:10	09/14/22 00:38	TJD	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG1924030	1	09/10/22 06:02	09/10/22 17:38	AMG	Mt. Juliet, TN

## 20220831-A03\_596\_FL-NWSW @ 3' L1532241-03 Solid

Collected by  
A Smith

Collected date/time  
08/31/22 13:55

Received date/time  
09/02/22 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1924600	1	09/15/22 16:40	09/15/22 16:40	ZSA	Mt. Juliet, TN
Wet Chemistry by Method 7199	WG1924006	1	09/14/22 11:07	09/18/22 11:37	ARD	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1925207	1	09/13/22 15:00	09/13/22 16:00	RLS	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1924190	1	09/14/22 10:17	09/16/22 14:10	NTG	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1923240	1	09/12/22 16:58	09/14/22 14:39	ZSA	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG1921387	1	09/05/22 15:36	09/14/22 00:38	CCE	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1923244	5	09/12/22 17:05	09/14/22 00:23	LD	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG1921706	1	09/04/22 13:16	09/07/22 16:41	BAM	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1923301	1	09/04/22 13:16	09/08/22 23:27	JHH	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015M	WG1925133	1	09/13/22 10:10	09/14/22 01:05	TJD	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG1924030	1	09/10/22 06:02	09/10/22 17:57	AMG	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	16.5		1	09/15/2022 16:35	WG1924600

## Wet Chemistry by Method 7199

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Hexavalent Chromium	ND		1.00	1	09/13/2022 20:45	<a href="#">WG1924000</a>

## Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	8.28	<a href="#">T8</a>	1	09/13/2022 16:00	<a href="#">WG1925207</a>

## Sample Narrative:

L1532241-01 WG1925207: 8.28 at 20.6C

## Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Specific Conductance	2180		10.0	1	09/16/2022 14:10	<a href="#">WG1924190</a>

## Sample Narrative:

L1532241-01 WG1924190: at 25C

## Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Barium	667		0.500	1	09/14/2022 14:34	<a href="#">WG1923240</a>
Cadmium	ND		0.500	1	09/14/2022 14:34	<a href="#">WG1923240</a>
Copper	14.7		2.00	1	09/14/2022 14:34	<a href="#">WG1923240</a>
Lead	16.4		0.500	1	09/14/2022 14:34	<a href="#">WG1923240</a>
Nickel	16.4		2.00	1	09/14/2022 14:34	<a href="#">WG1923240</a>
Selenium	ND		2.00	1	09/14/2022 14:34	<a href="#">WG1923240</a>
Silver	ND		1.00	1	09/14/2022 14:34	<a href="#">WG1923240</a>
Zinc	41.2		5.00	1	09/14/2022 14:34	<a href="#">WG1923240</a>

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

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Hot Water Sol. Boron	1.02		0.400	2	09/14/2022 00:27	<a href="#">WG1921387</a>

## Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Arsenic	3.45		1.00	5	09/14/2022 00:16	<a href="#">WG1923244</a>

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

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	520		10.0	100	09/10/2022 01:40	<a href="#">WG1923539</a>
(S) a,a,a-Trifluorotoluene(FID)	86.1		77.0-120		09/10/2022 01:40	<a href="#">WG1923539</a>



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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.0800	80	09/09/2022 05:10	<a href="#">WG1923301</a>
Toluene	ND		0.400	80	09/09/2022 05:10	<a href="#">WG1923301</a>
Ethylbenzene	ND		0.200	80	09/09/2022 05:10	<a href="#">WG1923301</a>
Xylenes, Total	9.76		0.520	80	09/09/2022 05:10	<a href="#">WG1923301</a>
1,2,4-Trimethylbenzene	9.95		0.400	80	09/09/2022 05:10	<a href="#">WG1923301</a>
1,3,5-Trimethylbenzene	10.2		0.400	80	09/09/2022 05:10	<a href="#">WG1923301</a>
(S) Toluene-d8	97.4		75.0-131		09/09/2022 05:10	<a href="#">WG1923301</a>
(S) 4-Bromofluorobenzene	103		67.0-138		09/09/2022 05:10	<a href="#">WG1923301</a>
(S) 1,2-Dichloroethane-d4	116		70.0-130		09/09/2022 05:10	<a href="#">WG1923301</a>

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	5540		400	100	09/14/2022 10:46	<a href="#">WG1925133</a>
C28-C36 Motor Oil Range	84.7		4.00	1	09/14/2022 00:51	<a href="#">WG1925133</a>
(S) o-Terphenyl	0.000	<a href="#">J7</a>	18.0-148		09/14/2022 10:46	<a href="#">WG1925133</a>
(S) o-Terphenyl	0.000	<a href="#">J2</a>	18.0-148		09/14/2022 00:51	<a href="#">WG1925133</a>

## Sample Narrative:

L1532241-01 WG1925133: Surrogate failure due to matrix interference

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Acenaphthene	0.0810		0.00600	1	09/10/2022 20:34	<a href="#">WG1924030</a>
Anthracene	ND		0.00600	1	09/10/2022 20:34	<a href="#">WG1924030</a>
Benzo(a)anthracene	ND		0.00600	1	09/10/2022 20:34	<a href="#">WG1924030</a>
Benzo(b)fluoranthene	ND		0.00600	1	09/10/2022 20:34	<a href="#">WG1924030</a>
Benzo(k)fluoranthene	ND		0.00600	1	09/10/2022 20:34	<a href="#">WG1924030</a>
Benzo(a)pyrene	ND		0.00600	1	09/10/2022 20:34	<a href="#">WG1924030</a>
Chrysene	ND		0.00600	1	09/10/2022 20:34	<a href="#">WG1924030</a>
Dibenz(a,h)anthracene	ND		0.00600	1	09/10/2022 20:34	<a href="#">WG1924030</a>
Fluoranthene	ND		0.00600	1	09/10/2022 20:34	<a href="#">WG1924030</a>
Fluorene	0.362		0.00600	1	09/10/2022 20:34	<a href="#">WG1924030</a>
Indeno(1,2,3-cd)pyrene	ND		0.00600	1	09/10/2022 20:34	<a href="#">WG1924030</a>
1-Methylnaphthalene	0.870		0.0200	1	09/10/2022 20:34	<a href="#">WG1924030</a>
2-Methylnaphthalene	1.64		0.0200	1	09/10/2022 20:34	<a href="#">WG1924030</a>
Naphthalene	0.236		0.0200	1	09/10/2022 20:34	<a href="#">WG1924030</a>
Pyrene	0.00692		0.00600	1	09/10/2022 20:34	<a href="#">WG1924030</a>
(S) p-Terphenyl-d14	55.3		23.0-120		09/10/2022 20:34	<a href="#">WG1924030</a>
(S) Nitrobenzene-d5	3220	<a href="#">J1</a>	14.0-149		09/10/2022 20:34	<a href="#">WG1924030</a>
(S) 2-Fluorobiphenyl	86.2		34.0-125		09/10/2022 20:34	<a href="#">WG1924030</a>

## Sample Narrative:

L1532241-01 WG1924030: Surrogate failure due to matrix interference

1  
Cp2  
Tc3  
Ss4  
Cn5  
Sr6  
Qc7  
Gl8  
Al9  
Sc

## Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	5.67		1	09/15/2022 16:38	WG1924600

## Wet Chemistry by Method 7199

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Hexavalent Chromium	ND		1.00	1	09/13/2022 20:50	<a href="#">WG1924000</a>

## Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	8.08	<a href="#">T8</a>	1	09/13/2022 16:00	<a href="#">WG1925207</a>

## Sample Narrative:

L1532241-02 WG1925207: 8.08 at 20.8C

## Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Specific Conductance	702		10.0	1	09/16/2022 14:10	<a href="#">WG1924190</a>

## Sample Narrative:

L1532241-02 WG1924190: at 25C

## Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Barium	725		0.500	1	09/14/2022 14:37	<a href="#">WG1923240</a>
Cadmium	ND		0.500	1	09/14/2022 14:37	<a href="#">WG1923240</a>
Copper	16.1		2.00	1	09/14/2022 14:37	<a href="#">WG1923240</a>
Lead	15.6		0.500	1	09/14/2022 14:37	<a href="#">WG1923240</a>
Nickel	15.4		2.00	1	09/14/2022 14:37	<a href="#">WG1923240</a>
Selenium	ND		2.00	1	09/14/2022 14:37	<a href="#">WG1923240</a>
Silver	ND		1.00	1	09/14/2022 14:37	<a href="#">WG1923240</a>
Zinc	44.2		5.00	1	09/14/2022 14:37	<a href="#">WG1923240</a>

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

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Hot Water Sol. Boron	0.555		0.200	1	09/14/2022 00:30	<a href="#">WG1921387</a>

## Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Arsenic	3.62		1.00	5	09/14/2022 00:19	<a href="#">WG1923244</a>

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

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	1.30		0.100	1	09/07/2022 16:20	<a href="#">WG1921706</a>
(S) a,a,a-Trifluorotoluene(FID)	89.1		77.0-120		09/07/2022 16:20	<a href="#">WG1921706</a>

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00100	1	09/08/2022 23:08	<a href="#">WG1923301</a>
Toluene	ND		0.00500	1	09/08/2022 23:08	<a href="#">WG1923301</a>
Ethylbenzene	ND		0.00250	1	09/08/2022 23:08	<a href="#">WG1923301</a>
Xylenes, Total	0.165		0.00650	1	09/08/2022 23:08	<a href="#">WG1923301</a>
1,2,4-Trimethylbenzene	0.0898		0.00500	1	09/08/2022 23:08	<a href="#">WG1923301</a>
1,3,5-Trimethylbenzene	0.104		0.00500	1	09/08/2022 23:08	<a href="#">WG1923301</a>
(S) Toluene-d8	96.6		75.0-131		09/08/2022 23:08	<a href="#">WG1923301</a>
(S) 4-Bromofluorobenzene	101		67.0-138		09/08/2022 23:08	<a href="#">WG1923301</a>
(S) 1,2-Dichloroethane-d4	107		70.0-130		09/08/2022 23:08	<a href="#">WG1923301</a>

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	62.2		4.00	1	09/14/2022 00:38	<a href="#">WG1925133</a>
C28-C36 Motor Oil Range	86.5		4.00	1	09/14/2022 00:38	<a href="#">WG1925133</a>
(S) o-Terphenyl	49.8		18.0-148		09/14/2022 00:38	<a href="#">WG1925133</a>

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Acenaphthene	ND		0.00600	1	09/10/2022 17:38	<a href="#">WG1924030</a>
Anthracene	ND		0.00600	1	09/10/2022 17:38	<a href="#">WG1924030</a>
Benzo(a)anthracene	ND		0.00600	1	09/10/2022 17:38	<a href="#">WG1924030</a>
Benzo(b)fluoranthene	ND		0.00600	1	09/10/2022 17:38	<a href="#">WG1924030</a>
Benzo(k)fluoranthene	ND		0.00600	1	09/10/2022 17:38	<a href="#">WG1924030</a>
Benzo(a)pyrene	ND		0.00600	1	09/10/2022 17:38	<a href="#">WG1924030</a>
Chrysene	ND		0.00600	1	09/10/2022 17:38	<a href="#">WG1924030</a>
Dibenz(a,h)anthracene	ND		0.00600	1	09/10/2022 17:38	<a href="#">WG1924030</a>
Fluoranthene	ND		0.00600	1	09/10/2022 17:38	<a href="#">WG1924030</a>
Fluorene	ND		0.00600	1	09/10/2022 17:38	<a href="#">WG1924030</a>
Indeno(1,2,3-cd)pyrene	ND		0.00600	1	09/10/2022 17:38	<a href="#">WG1924030</a>
1-Methylnaphthalene	ND		0.0200	1	09/10/2022 17:38	<a href="#">WG1924030</a>
2-Methylnaphthalene	ND		0.0200	1	09/10/2022 17:38	<a href="#">WG1924030</a>
Naphthalene	ND		0.0200	1	09/10/2022 17:38	<a href="#">WG1924030</a>
Pyrene	ND		0.00600	1	09/10/2022 17:38	<a href="#">WG1924030</a>
(S) p-Terphenyl-d14	53.0		23.0-120		09/10/2022 17:38	<a href="#">WG1924030</a>
(S) Nitrobenzene-d5	55.6		14.0-149		09/10/2022 17:38	<a href="#">WG1924030</a>
(S) 2-Fluorobiphenyl	54.4		34.0-125		09/10/2022 17:38	<a href="#">WG1924030</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	4.68		1	09/15/2022 16:40	WG1924600

## Wet Chemistry by Method 7199

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Hexavalent Chromium	ND		1.00	1	09/18/2022 11:37	<a href="#">WG1924006</a>

## Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	8.54	<a href="#">T8</a>	1	09/13/2022 16:00	<a href="#">WG1925207</a>

## Sample Narrative:

L1532241-03 WG1925207: 8.54 at 20.3C

## Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Specific Conductance	490		10.0	1	09/16/2022 14:10	<a href="#">WG1924190</a>

## Sample Narrative:

L1532241-03 WG1924190: at 25C

## Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Barium	408		0.500	1	09/14/2022 14:39	<a href="#">WG1923240</a>
Cadmium	ND		0.500	1	09/14/2022 14:39	<a href="#">WG1923240</a>
Copper	12.5		2.00	1	09/14/2022 14:39	<a href="#">WG1923240</a>
Lead	17.2		0.500	1	09/14/2022 14:39	<a href="#">WG1923240</a>
Nickel	14.1		2.00	1	09/14/2022 14:39	<a href="#">WG1923240</a>
Selenium	ND		2.00	1	09/14/2022 14:39	<a href="#">WG1923240</a>
Silver	ND		1.00	1	09/14/2022 14:39	<a href="#">WG1923240</a>
Zinc	43.6		5.00	1	09/14/2022 14:39	<a href="#">WG1923240</a>

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

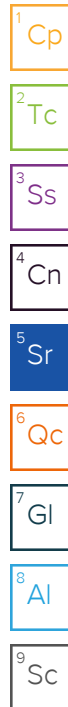
Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Hot Water Sol. Boron	0.424		0.200	1	09/14/2022 00:38	<a href="#">WG1921387</a>

## Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Arsenic	3.38		1.00	5	09/14/2022 00:23	<a href="#">WG1923244</a>

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

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	1.41		0.100	1	09/07/2022 16:41	<a href="#">WG1921706</a>
(S) a,a,a-Trifluorotoluene(FID)	88.2		77.0-120		09/07/2022 16:41	<a href="#">WG1921706</a>





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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00100	1	09/08/2022 23:27	<a href="#">WG1923301</a>
Toluene	ND		0.00500	1	09/08/2022 23:27	<a href="#">WG1923301</a>
Ethylbenzene	ND		0.00250	1	09/08/2022 23:27	<a href="#">WG1923301</a>
Xylenes, Total	0.0132		0.00650	1	09/08/2022 23:27	<a href="#">WG1923301</a>
1,2,4-Trimethylbenzene	ND		0.00500	1	09/08/2022 23:27	<a href="#">WG1923301</a>
1,3,5-Trimethylbenzene	0.132		0.00500	1	09/08/2022 23:27	<a href="#">WG1923301</a>
(S) Toluene-d8	94.3		75.0-131		09/08/2022 23:27	<a href="#">WG1923301</a>
(S) 4-Bromofluorobenzene	113		67.0-138		09/08/2022 23:27	<a href="#">WG1923301</a>
(S) 1,2-Dichloroethane-d4	116		70.0-130		09/08/2022 23:27	<a href="#">WG1923301</a>

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	91.1		4.00	1	09/14/2022 01:05	<a href="#">WG1925133</a>
C28-C36 Motor Oil Range	97.6		4.00	1	09/14/2022 01:05	<a href="#">WG1925133</a>
(S) o-Terphenyl	57.2		18.0-148		09/14/2022 01:05	<a href="#">WG1925133</a>

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Acenaphthene	ND		0.00600	1	09/10/2022 17:57	<a href="#">WG1924030</a>
Anthracene	ND		0.00600	1	09/10/2022 17:57	<a href="#">WG1924030</a>
Benzo(a)anthracene	ND		0.00600	1	09/10/2022 17:57	<a href="#">WG1924030</a>
Benzo(b)fluoranthene	ND		0.00600	1	09/10/2022 17:57	<a href="#">WG1924030</a>
Benzo(k)fluoranthene	ND		0.00600	1	09/10/2022 17:57	<a href="#">WG1924030</a>
Benzo(a)pyrene	ND		0.00600	1	09/10/2022 17:57	<a href="#">WG1924030</a>
Chrysene	ND		0.00600	1	09/10/2022 17:57	<a href="#">WG1924030</a>
Dibenz(a,h)anthracene	ND		0.00600	1	09/10/2022 17:57	<a href="#">WG1924030</a>
Fluoranthene	ND		0.00600	1	09/10/2022 17:57	<a href="#">WG1924030</a>
Fluorene	0.0104		0.00600	1	09/10/2022 17:57	<a href="#">WG1924030</a>
Indeno(1,2,3-cd)pyrene	ND		0.00600	1	09/10/2022 17:57	<a href="#">WG1924030</a>
1-Methylnaphthalene	0.0809		0.0200	1	09/10/2022 17:57	<a href="#">WG1924030</a>
2-Methylnaphthalene	0.103		0.0200	1	09/10/2022 17:57	<a href="#">WG1924030</a>
Naphthalene	0.0450		0.0200	1	09/10/2022 17:57	<a href="#">WG1924030</a>
Pyrene	ND		0.00600	1	09/10/2022 17:57	<a href="#">WG1924030</a>
(S) p-Terphenyl-d14	53.5		23.0-120		09/10/2022 17:57	<a href="#">WG1924030</a>
(S) Nitrobenzene-d5	53.9		14.0-149		09/10/2022 17:57	<a href="#">WG1924030</a>
(S) 2-Fluorobiphenyl	54.5		34.0-125		09/10/2022 17:57	<a href="#">WG1924030</a>

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Method Blank (MB)

(MB) R3837202-1 09/13/22 18:09

	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	mg/kg		mg/kg	mg/kg
Hexavalent Chromium	U		0.255	1.00

L1532232-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1532232-03 09/13/22 19:11 • (DUP) R3837202-11 09/13/22 19:16

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

L1532232-10 Original Sample (OS) • Duplicate (DUP)

(OS) L1532232-10 09/13/22 19:53 • (DUP) R3837202-12 09/13/22 19:58

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

Laboratory Control Sample (LCS)

(LCS) R3837202-2 09/13/22 18:14

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	mg/kg	mg/kg	%	%	
Hexavalent Chromium	10.0	10.3	103	80.0-120	

L1532219-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1532219-01 09/13/22 18:24 • (MS) R3837202-7 09/13/22 18:30 • (MSD) R3837202-8 09/13/22 18:35

	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Analyte	mg/kg	mg/kg	mg/kg	mg/kg	%	%		%			%	%
Hexavalent Chromium	20.0	ND	12.7	14.3	63.4	71.6	1	75.0-125	J6	J6	12.1	20

Sample Narrative:

OS: Sample is a reducer.

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

L1532219-01 Original Sample (OS) • Matrix Spike (MS)

(OS) L1532219-01 09/13/22 18:24 • (MS) R3837202-10 09/13/22 18:45

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MS Rec. %	Dilution	Rec. Limits %	<u>MS Qualifier</u>
Hexavalent Chromium	636	ND	368	57.9	50	75.0-125	<u>J6</u>

Sample Narrative:

OS: Sample is a reducer.

<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) R3838482-1 09/18/22 11:23

	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	mg/kg		mg/kg	mg/kg
Hexavalent Chromium	U		0.255	1.00

L1532270-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1532270-02 09/18/22 11:50 • (DUP) R3838482-3 09/18/22 11:55

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

L1533056-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1533056-01 09/18/22 12:47 • (DUP) R3838482-4 09/18/22 12:52

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

Laboratory Control Sample (LCS)

(LCS) R3838482-2 09/18/22 11:31

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	mg/kg	mg/kg	%	%	
Hexavalent Chromium	10.0	9.84	98.4	80.0-120	

L1533063-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1533063-01 09/18/22 13:17 • (MS) R3838482-5 09/18/22 13:23 • (MSD) R3838482-6 09/18/22 13:38

	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Analyte	mg/kg	mg/kg	mg/kg	mg/kg	%	%		%			%	%
Hexavalent Chromium	20.0	ND	17.2	15.7	85.8	78.5	1	75.0-125			8.86	20

L1533063-01 Original Sample (OS) • Matrix Spike (MS)

(OS) L1533063-01 09/18/22 13:17 • (MS) R3838482-8 09/18/22 13:49

	Spike Amount	Original Result	MS Result	MS Rec.	Dilution	Rec. Limits	MS Qualifier
Analyte	mg/kg	mg/kg	mg/kg	%		%	
Hexavalent Chromium	633	ND	512	80.8	50	75.0-125	

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

L1532241-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1532241-02 09/13/22 16:00 • (DUP) R3836727-2 09/13/22 16:00

	Original Result	DUP Result	Dilution	DUP RPD	<u>DUP Qualifier</u>	DUP RPD Limits
Analyte	pH	su		%		%
pH	8.08	8.14	1	0.740		1

Sample Narrative:

OS: 8.08 at 20.8C

DUP: 8.14 at 20.3C

<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

L1532263-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1532263-02 09/13/22 16:00 • (DUP) R3836727-3 09/13/22 16:00

	Original Result	DUP Result	Dilution	DUP RPD	<u>DUP Qualifier</u>	DUP RPD Limits
Analyte	pH	su		%		%
pH	8.14	8.09	1	0.616		1

Sample Narrative:

OS: 8.14 at 20.7C

DUP: 8.09 at 20.8C

Laboratory Control Sample (LCS)

(LCS) R3836727-1 09/13/22 16:00

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	<u>LCS Qualifier</u>
Analyte	su	su	%	%	
pH	10.0	9.92	99.2	99.0-101	

Sample Narrative:

LCS: 9.92 at 19.4C

Method Blank (MB)

(MB) R3838102-1 09/16/22 14:10

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

L1532241-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1532241-03 09/16/22 14:10 • (DUP) R3838102-3 09/16/22 14:10

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	490	488	1	0.409		20

Sample Narrative:

OS: at 25C

DUP: at 25C

L1532610-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1532610-01 09/16/22 14:10 • (DUP) R3838102-4 09/16/22 14:10

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	151	152	1	0.662		20

Sample Narrative:

OS: at 25C

DUP: at 25C

Laboratory Control Sample (LCS)

(LCS) R3838102-2 09/16/22 14:10

Analyte	Spike Amount umhos/cm	LCS Result umhos/cm	LCS Rec. %	Rec. Limits %	LCS Qualifier
Specific Conductance	1120	1150	102	85.0-115	

Sample Narrative:

LCS: at 25C

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc



Method Blank (MB)

(MB) R3837336-1 09/14/22 13:57

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Barium	U		0.0852	0.500
Cadmium	U		0.0471	0.500
Copper	U		0.400	2.00
Lead	U		0.208	0.500
Nickel	U		0.132	2.00
Selenium	U		0.764	2.00
Silver	U		0.127	1.00
Zinc	U		0.832	5.00

<sup>1</sup>Cp

<sup>2</sup>Tc

<sup>3</sup>Ss

<sup>4</sup>Cn

<sup>5</sup>Sr

<sup>6</sup>Qc

Laboratory Control Sample (LCS)

(LCS) R3837336-2 09/14/22 14:00

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Barium	100	96.8	96.8	80.0-120	
Cadmium	100	91.7	91.7	80.0-120	
Copper	100	93.4	93.4	80.0-120	
Lead	100	90.2	90.2	80.0-120	
Nickel	100	91.2	91.2	80.0-120	
Selenium	100	90.9	90.9	80.0-120	
Silver	20.0	17.4	86.9	80.0-120	
Zinc	100	89.5	89.5	80.0-120	

<sup>7</sup>Gl

<sup>8</sup>Al

<sup>9</sup>Sc

L1532615-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1532615-01 09/14/22 14:03 • (MS) R3837336-5 09/14/22 14:14 • (MSD) R3837336-6 09/14/22 14:17

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Barium	100	436	629	505	193	69.2	1	75.0-125	V	J3 V	21.9	20
Cadmium	100	ND	96.2	94.5	95.9	94.2	1	75.0-125			1.77	20
Copper	100	13.6	114	109	100	95.9	1	75.0-125			4.07	20
Lead	100	14.1	114	109	99.5	94.9	1	75.0-125			4.07	20
Nickel	100	24.9	127	120	102	95.5	1	75.0-125			4.97	20
Selenium	100	ND	94.5	89.8	94.5	89.8	1	75.0-125			5.04	20
Silver	20.0	ND	18.3	17.9	91.4	89.5	1	75.0-125			2.15	20
Zinc	100	47.8	135	125	87.2	77.2	1	75.0-125			7.68	20

Method Blank (MB)

(MB) R3836834-1 09/14/22 00:04

Analyte	MB Result mg/l	<u>MB Qualifier</u>	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) R3836834-2 09/14/22 00:07 • (LCSD) R3836834-3 09/14/22 00:10

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	<u>LCS Qualifier</u>	<u>LCSD Qualifier</u>	RPD %	RPD Limits %
Hot Water Sol. Boron	1.00	1.07	1.04	107	104	80.0-120			2.98	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) R3836787-1 09/13/22 23:35

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

Laboratory Control Sample (LCS)

(LCS) R3836787-2 09/13/22 23:40

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Arsenic	100	84.2	84.2	80.0-120	

L1532615-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1532615-01 09/13/22 23:43 • (MS) R3836787-5 09/13/22 23:53 • (MSD) R3836787-6 09/13/22 23:56

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Arsenic	100	5.77	87.4	87.5	81.7	81.7	5	75.0-125			0.0769	20

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Method Blank (MB)

(MB) R3834752-2 09/07/22 09:32

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
TPH (GC/FID) Low Fraction	U		0.0217	0.100
(S) a,a,a-Trifluorotoluene(FID)	95.6			77.0-120

Laboratory Control Sample (LCS)

(LCS) R3834752-1 09/07/22 08:31

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
TPH (GC/FID) Low Fraction	5.50	5.84	106	72.0-127	
(S) a,a,a-Trifluorotoluene(FID)			101	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) R3836240-2 09/09/22 20:56

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
TPH (GC/FID) Low Fraction	U		0.543	2.50
(S) a,a,a-Trifluorotoluene(FID)	91.1			77.0-120

Laboratory Control Sample (LCS)

(LCS) R3836240-1 09/09/22 19:54

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
TPH (GC/FID) Low Fraction	5.50	5.73	104	72.0-127	
(S) a,a,a-Trifluorotoluene(FID)			108	77.0-120	

L1532136-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1532136-01 09/10/22 00:18 • (MS) R3836240-3 09/10/22 04:24 • (MSD) R3836240-4 09/10/22 04:44

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
TPH (GC/FID) Low Fraction	132	46.8	135	129	90.1	84.0	25	10.0-151			4.55	28
(S) a,a,a-Trifluorotoluene(FID)					115	113		77.0-120				

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Method Blank (MB)

(MB) R3836958-3 09/08/22 22:49

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Benzene	U		0.000467	0.00100
Toluene	U		0.00130	0.00500
Ethylbenzene	U		0.000737	0.00250
Xylenes, Total	U		0.000880	0.00650
1,2,4-Trimethylbenzene	U		0.00158	0.00500
1,3,5-Trimethylbenzene	U		0.00200	0.00500
(S) Toluene-d8	99.9			75.0-131
(S) 4-Bromofluorobenzene	102			67.0-138
(S) 1,2-Dichloroethane-d4	105			70.0-130

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

(LCS) R3836958-1 09/08/22 21:33 • (LCSD) R3836958-2 09/08/22 21:53

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Benzene	0.125	0.121	0.120	96.8	96.0	70.0-123			0.830	20
Toluene	0.125	0.115	0.109	92.0	87.2	75.0-121			5.36	20
Ethylbenzene	0.125	0.118	0.116	94.4	92.8	74.0-126			1.71	20
Xylenes, Total	0.375	0.346	0.350	92.3	93.3	72.0-127			1.15	20
1,2,4-Trimethylbenzene	0.125	0.114	0.109	91.2	87.2	70.0-126			4.48	20
1,3,5-Trimethylbenzene	0.125	0.114	0.104	91.2	83.2	73.0-127			9.17	20
(S) Toluene-d8				97.9	93.4	75.0-131				
(S) 4-Bromofluorobenzene				99.9	109	67.0-138				
(S) 1,2-Dichloroethane-d4				119	121	70.0-130				

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc



Method Blank (MB)

(MB) R3836901-1 09/13/22 21:09

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	68.9			18.0-148

Laboratory Control Sample (LCS)

(LCS) R3836901-2 09/13/22 21:22

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
C10-C28 Diesel Range	50.0	38.6	77.2	50.0-150	
(S) o-Terphenyl			94.4	18.0-148	

L1532236-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1532236-01 09/14/22 01:44 • (MS) R3836901-3 09/14/22 01:57 • (MSD) R3836901-4 09/14/22 02:10

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	49.5	5380	4530	3990	0.000	0.000	5	50.0-150	E V	E V	12.7	20
(S) o-Terphenyl					0.000	0.000		18.0-148	J2	J2		

Sample Narrative:

OS: Surrogate failure due to matrix interference

1  
Cp

2  
Tc

3  
Ss

4  
Cn

5  
Sr

6  
Qc

7  
Gl

8  
Al

9  
Sc

Method Blank (MB)

(MB) R3836089-2 09/10/22 17:18

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Acenaphthene	U		0.00209	0.00600
Anthracene	U		0.00230	0.00600
Benzo(a)anthracene	U		0.00173	0.00600
Benzo(b)fluoranthene	U		0.00153	0.00600
Benzo(k)fluoranthene	U		0.00215	0.00600
Benzo(a)pyrene	U		0.00179	0.00600
Chrysene	U		0.00232	0.00600
Dibenz(a,h)anthracene	U		0.00172	0.00600
Fluoranthene	U		0.00227	0.00600
Fluorene	U		0.00205	0.00600
Indeno(1,2,3-cd)pyrene	U		0.00181	0.00600
1-Methylnaphthalene	U		0.00449	0.0200
2-Methylnaphthalene	U		0.00427	0.0200
Naphthalene	U		0.00408	0.0200
Pyrene	U		0.00200	0.00600
(S) p-Terphenyl-d14	68.6			23.0-120
(S) Nitrobenzene-d5	53.6			14.0-149
(S) 2-Fluorobiphenyl	66.9			34.0-125

<sup>1</sup>Cp

<sup>2</sup>Tc

<sup>3</sup>Ss

<sup>4</sup>Cn

<sup>5</sup>Sr

<sup>6</sup>Qc

<sup>7</sup>Gl

<sup>8</sup>Al

<sup>9</sup>Sc

Laboratory Control Sample (LCS)

(LCS) R3836089-1 09/10/22 16:47

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Acenaphthene	0.0800	0.0630	78.8	50.0-120	
Anthracene	0.0800	0.0640	80.0	50.0-126	
Benzo(a)anthracene	0.0800	0.0649	81.1	45.0-120	
Benzo(b)fluoranthene	0.0800	0.0655	81.9	42.0-121	
Benzo(k)fluoranthene	0.0800	0.0618	77.3	49.0-125	
Benzo(a)pyrene	0.0800	0.0658	82.3	42.0-120	
Chrysene	0.0800	0.0667	83.4	49.0-122	
Dibenz(a,h)anthracene	0.0800	0.0607	75.9	47.0-125	
Fluoranthene	0.0800	0.0663	82.9	49.0-129	
Fluorene	0.0800	0.0634	79.3	49.0-120	
Indeno(1,2,3-cd)pyrene	0.0800	0.0626	78.3	46.0-125	
1-Methylnaphthalene	0.0800	0.0630	78.8	51.0-121	
2-Methylnaphthalene	0.0800	0.0631	78.9	50.0-120	
Naphthalene	0.0800	0.0589	73.6	50.0-120	
Pyrene	0.0800	0.0677	84.6	43.0-123	

Laboratory Control Sample (LCS)

(LCS) R3836089-1 09/10/22 16:47

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
(S) p-Terphenyl-d14			72.1	23.0-120	
(S) Nitrobenzene-d5			72.9	14.0-149	
(S) 2-Fluorobiphenyl			74.9	34.0-125	

L1532192-06 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1532192-06 09/10/22 22:12 • (MS) R3836089-3 09/10/22 22:32 • (MSD) R3836089-4 09/10/22 22:52

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 %
Acenaphthene	0.0776	ND	0.0605	0.0607	78.0	77.4	1	14.0-127			0.330	27
Anthracene	0.0776	0.0242	0.138	0.310	147	365	1	10.0-145	J5	J3 J5	76.8	30
Benzo(a)anthracene	0.0776	0.181	0.420	1.09	308	1160	1	10.0-139	J5	J3 J5	88.7	30
Benzo(b)fluoranthene	0.0776	0.320	0.617	0.957	383	813	1	10.0-140	V	J3 V	43.2	36
Benzo(k)fluoranthene	0.0776	0.122	0.266	0.410	186	367	1	10.0-137	J5	J3 J5	42.6	31
Benzo(a)pyrene	0.0776	0.235	0.479	0.854	314	790	1	10.0-141	J5	J3 J5	56.3	31
Chrysene	0.0776	0.197	0.526	1.01	424	1040	1	10.0-145	J5	J3 J5	63.0	30
Dibenz(a,h)anthracene	0.0776	0.0330	0.0990	0.136	85.1	131	1	10.0-132		J3	31.5	31
Fluoranthene	0.0776	0.345	1.07	2.10	934	2240	1	10.0-153	V	J3 V	65.0	33
Fluorene	0.0776	ND	0.0865	0.0870	111	111	1	11.0-130			0.576	29
Indeno(1,2,3-cd)pyrene	0.0776	0.205	0.386	0.499	233	375	1	10.0-137	J5	J5	25.5	32
1-Methylnaphthalene	0.0776	0.0232	0.127	0.0627	134	50.4	1	10.0-142		J3	67.8	28
2-Methylnaphthalene	0.0776	0.0331	0.144	0.0653	143	41.1	1	10.0-137	J5	J3	75.2	28
Naphthalene	0.0776	0.0284	0.114	0.0723	110	56.0	1	10.0-135		J3	44.8	27
Pyrene	0.0776	0.302	0.855	1.76	713	1860	1	10.0-148	J5	J3 J5	69.2	35
(S) p-Terphenyl-d14					52.2	51.3		23.0-120				
(S) Nitrobenzene-d5					53.6	56.9		14.0-149				
(S) 2-Fluorobiphenyl					60.7	59.6		34.0-125				

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

# GLOSSARY OF TERMS

## Guide to Reading and Understanding Your Laboratory Report

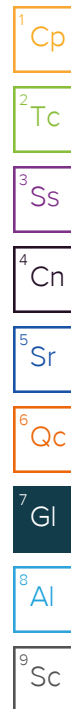
The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

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

Qualifier	Description
E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL).
J1	Surrogate recovery limits have been exceeded; values are outside upper control limits.
J2	Surrogate recovery limits have been exceeded; values are outside lower control limits.
J3	The associated batch QC was outside the established quality control range for precision.
J5	The sample matrix interfered with the ability to make any accurate determination; spike value is high.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.
J7	Surrogate recovery cannot be used for control limit evaluation due to dilution.
T8	Sample(s) received past/too close to holding time expiration.
V	The sample concentration is too high to evaluate accurate spike recoveries.



# 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.







**Caerus Oil and Gas**

Sample Delivery Group: L1532239  
Samples Received: 09/02/2022  
Project Number:  
Description: A03 596 Flowline Release  
Site: A03 596  
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

20220831-A03\_596\_FL-N\_TRENCH @4' L1532239-01 Solid

Collected by  
A Smith

Collected date/time  
08/31/22 13:35

Received date/time  
09/02/22 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1924600	1	09/15/22 16:32	09/15/22 16:32	ZSA	Mt. Juliet, TN
Wet Chemistry by Method 7199	WG1924000	1	09/10/22 22:05	09/13/22 20:39	ARD	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1925207	1	09/13/22 15:00	09/13/22 16:00	RLS	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1924190	1	09/14/22 10:17	09/16/22 14:10	NTG	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1923240	1	09/12/22 16:58	09/14/22 14:26	ZSA	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG1921387	1	09/05/22 15:36	09/14/22 00:24	CCE	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1923244	5	09/12/22 17:05	09/14/22 00:06	LD	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG1921706	1	09/04/22 13:16	09/07/22 16:00	BAM	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1923252	1	09/04/22 13:16	09/08/22 20:18	JAH	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015M	WG1925133	20	09/13/22 10:10	09/14/22 02:36	TJD	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG1924032	1	09/10/22 06:15	09/10/22 20:41	AMG	Mt. Juliet, TN

<sup>1</sup>Cp

<sup>2</sup>Tc

<sup>3</sup>Ss

<sup>4</sup>Cn

<sup>5</sup>Sr

<sup>6</sup>Qc

<sup>7</sup>Gl

<sup>8</sup>Al

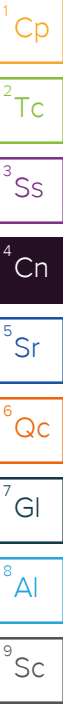
<sup>9</sup>Sc

# 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



## Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	8.17		1	09/15/2022 16:32	WG1924600

## Wet Chemistry by Method 7199

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Hexavalent Chromium	ND		1.00	1	09/13/2022 20:39	<a href="#">WG1924000</a>

## Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	7.73	<a href="#">T8</a>	1	09/13/2022 16:00	<a href="#">WG1925207</a>

## Sample Narrative:

L1532239-01 WG1925207: 7.73 at 20.8C

## Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Specific Conductance	170		10.0	1	09/16/2022 14:10	<a href="#">WG1924190</a>

## Sample Narrative:

L1532239-01 WG1924190: at 25C

## Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Barium	394		0.500	1	09/14/2022 14:26	<a href="#">WG1923240</a>
Cadmium	0.523		0.500	1	09/14/2022 14:26	<a href="#">WG1923240</a>
Copper	10.5		2.00	1	09/14/2022 14:26	<a href="#">WG1923240</a>
Lead	10.5		0.500	1	09/14/2022 14:26	<a href="#">WG1923240</a>
Nickel	20.1		2.00	1	09/14/2022 14:26	<a href="#">WG1923240</a>
Selenium	ND		2.00	1	09/14/2022 14:26	<a href="#">WG1923240</a>
Silver	ND		1.00	1	09/14/2022 14:26	<a href="#">WG1923240</a>
Zinc	32.0		5.00	1	09/14/2022 14:26	<a href="#">WG1923240</a>

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

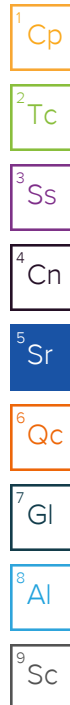
Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Hot Water Sol. Boron	0.536		0.200	1	09/14/2022 00:24	<a href="#">WG1921387</a>

## Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Arsenic	5.54		1.00	5	09/14/2022 00:06	<a href="#">WG1923244</a>

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

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	0.123		0.100	1	09/07/2022 16:00	<a href="#">WG1921706</a>
(S) a,a,a-Trifluorotoluene(FID)	91.5		77.0-120		09/07/2022 16:00	<a href="#">WG1921706</a>



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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00100	1	09/08/2022 20:18	<a href="#">WG1923252</a>
Toluene	ND		0.00500	1	09/08/2022 20:18	<a href="#">WG1923252</a>
Ethylbenzene	ND		0.00250	1	09/08/2022 20:18	<a href="#">WG1923252</a>
Xylenes, Total	ND		0.00650	1	09/08/2022 20:18	<a href="#">WG1923252</a>
1,2,4-Trimethylbenzene	ND		0.00500	1	09/08/2022 20:18	<a href="#">WG1923252</a>
1,3,5-Trimethylbenzene	0.0144		0.00500	1	09/08/2022 20:18	<a href="#">WG1923252</a>
(S) Toluene-d8	97.1		75.0-131		09/08/2022 20:18	<a href="#">WG1923252</a>
(S) 4-Bromofluorobenzene	101		67.0-138		09/08/2022 20:18	<a href="#">WG1923252</a>
(S) 1,2-Dichloroethane-d4	107		70.0-130		09/08/2022 20:18	<a href="#">WG1923252</a>

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	5130		80.0	20	09/14/2022 02:36	<a href="#">WG1925133</a>
C28-C36 Motor Oil Range	ND		80.0	20	09/14/2022 02:36	<a href="#">WG1925133</a>
(S) o-Terphenyl	0.000	<a href="#">J7</a>	18.0-148		09/14/2022 02:36	<a href="#">WG1925133</a>

## Sample Narrative:

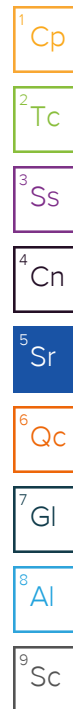
L1532239-01 WG1925133: Dilution due to matrix.

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Acenaphthene	ND		0.00600	1	09/10/2022 20:41	<a href="#">WG1924032</a>
Anthracene	ND		0.00600	1	09/10/2022 20:41	<a href="#">WG1924032</a>
Benzo(a)anthracene	ND		0.00600	1	09/10/2022 20:41	<a href="#">WG1924032</a>
Benzo(b)fluoranthene	ND		0.00600	1	09/10/2022 20:41	<a href="#">WG1924032</a>
Benzo(k)fluoranthene	ND		0.00600	1	09/10/2022 20:41	<a href="#">WG1924032</a>
Benzo(a)pyrene	ND		0.00600	1	09/10/2022 20:41	<a href="#">WG1924032</a>
Chrysene	ND		0.00600	1	09/10/2022 20:41	<a href="#">WG1924032</a>
Dibenz(a,h)anthracene	ND		0.00600	1	09/10/2022 20:41	<a href="#">WG1924032</a>
Fluoranthene	ND		0.00600	1	09/10/2022 20:41	<a href="#">WG1924032</a>
Fluorene	0.280		0.00600	1	09/10/2022 20:41	<a href="#">WG1924032</a>
Indeno(1,2,3-cd)pyrene	ND		0.00600	1	09/10/2022 20:41	<a href="#">WG1924032</a>
1-Methylnaphthalene	1.27		0.0200	1	09/10/2022 20:41	<a href="#">WG1924032</a>
2-Methylnaphthalene	2.54		0.0200	1	09/10/2022 20:41	<a href="#">WG1924032</a>
Naphthalene	0.600		0.0200	1	09/10/2022 20:41	<a href="#">WG1924032</a>
Pyrene	ND		0.00600	1	09/10/2022 20:41	<a href="#">WG1924032</a>
(S) p-Terphenyl-d14	80.7		23.0-120		09/10/2022 20:41	<a href="#">WG1924032</a>
(S) Nitrobenzene-d5	2120	<a href="#">J1</a>	14.0-149		09/10/2022 20:41	<a href="#">WG1924032</a>
(S) 2-Fluorobiphenyl	96.1		34.0-125		09/10/2022 20:41	<a href="#">WG1924032</a>

## Sample Narrative:

L1532239-01 WG1924032: Surrogate failure due to matrix interference





Method Blank (MB)

(MB) R3837202-1 09/13/22 18:09

	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	mg/kg		mg/kg	mg/kg
Hexavalent Chromium	U		0.255	1.00

L1532232-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1532232-03 09/13/22 19:11 • (DUP) R3837202-11 09/13/22 19:16

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

L1532232-10 Original Sample (OS) • Duplicate (DUP)

(OS) L1532232-10 09/13/22 19:53 • (DUP) R3837202-12 09/13/22 19:58

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

Laboratory Control Sample (LCS)

(LCS) R3837202-2 09/13/22 18:14

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	mg/kg	mg/kg	%	%	
Hexavalent Chromium	10.0	10.3	103	80.0-120	

L1532219-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1532219-01 09/13/22 18:24 • (MS) R3837202-7 09/13/22 18:30 • (MSD) R3837202-8 09/13/22 18:35

	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Analyte	mg/kg	mg/kg	mg/kg	mg/kg	%	%		%			%	%
Hexavalent Chromium	20.0	ND	12.7	14.3	63.4	71.6	1	75.0-125	J6	J6	12.1	20

Sample Narrative:

OS: Sample is a reducer.

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

L1532219-01 Original Sample (OS) • Matrix Spike (MS)

(OS) L1532219-01 09/13/22 18:24 • (MS) R3837202-10 09/13/22 18:45

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Hexavalent Chromium	636	ND	368	57.9	50	75.0-125	J6

Sample Narrative:

OS: Sample is a reducer.

<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

L1532241-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1532241-02 09/13/22 16:00 • (DUP) R3836727-2 09/13/22 16:00

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	pH	su		%		%
pH	8.08	8.14	1	0.740		1

Sample Narrative:

OS: 8.08 at 20.8C

DUP: 8.14 at 20.3C

L1532263-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1532263-02 09/13/22 16:00 • (DUP) R3836727-3 09/13/22 16:00

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	pH	su		%		%
pH	8.14	8.09	1	0.616		1

Sample Narrative:

OS: 8.14 at 20.7C

DUP: 8.09 at 20.8C

Laboratory Control Sample (LCS)

(LCS) R3836727-1 09/13/22 16:00

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	su	su	%	%	
pH	10.0	9.92	99.2	99.0-101	

Sample Narrative:

LCS: 9.92 at 19.4C

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Method Blank (MB)

(MB) R3838102-1 09/16/22 14:10

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

L1532241-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1532241-03 09/16/22 14:10 • (DUP) R3838102-3 09/16/22 14:10

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	490	488	1	0.409		20

Sample Narrative:

OS: at 25C

DUP: at 25C

L1532610-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1532610-01 09/16/22 14:10 • (DUP) R3838102-4 09/16/22 14:10

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	151	152	1	0.662		20

Sample Narrative:

OS: at 25C

DUP: at 25C

Laboratory Control Sample (LCS)

(LCS) R3838102-2 09/16/22 14:10

Analyte	Spike Amount umhos/cm	LCS Result umhos/cm	LCS Rec. %	Rec. Limits %	LCS Qualifier
Specific Conductance	1120	1150	102	85.0-115	

Sample Narrative:

LCS: at 25C



Method Blank (MB)

(MB) R3837336-1 09/14/22 13:57

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Barium	U		0.0852	0.500
Cadmium	U		0.0471	0.500
Copper	U		0.400	2.00
Lead	U		0.208	0.500
Nickel	U		0.132	2.00
Selenium	U		0.764	2.00
Silver	U		0.127	1.00
Zinc	U		0.832	5.00

Laboratory Control Sample (LCS)

(LCS) R3837336-2 09/14/22 14:00

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Barium	100	96.8	96.8	80.0-120	
Cadmium	100	91.7	91.7	80.0-120	
Copper	100	93.4	93.4	80.0-120	
Lead	100	90.2	90.2	80.0-120	
Nickel	100	91.2	91.2	80.0-120	
Selenium	100	90.9	90.9	80.0-120	
Silver	20.0	17.4	86.9	80.0-120	
Zinc	100	89.5	89.5	80.0-120	

L1532615-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1532615-01 09/14/22 14:03 • (MS) R3837336-5 09/14/22 14:14 • (MSD) R3837336-6 09/14/22 14:17

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Barium	100	436	629	505	193	69.2	1	75.0-125	V	J3 V	21.9	20
Cadmium	100	ND	96.2	94.5	95.9	94.2	1	75.0-125			1.77	20
Copper	100	13.6	114	109	100	95.9	1	75.0-125			4.07	20
Lead	100	14.1	114	109	99.5	94.9	1	75.0-125			4.07	20
Nickel	100	24.9	127	120	102	95.5	1	75.0-125			4.97	20
Selenium	100	ND	94.5	89.8	94.5	89.8	1	75.0-125			5.04	20
Silver	20.0	ND	18.3	17.9	91.4	89.5	1	75.0-125			2.15	20
Zinc	100	47.8	135	125	87.2	77.2	1	75.0-125			7.68	20

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Method Blank (MB)

(MB) R3836834-1 09/14/22 00:04

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) R3836834-2 09/14/22 00:07 • (LCSD) R3836834-3 09/14/22 00:10

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	1.07	1.04	107	104	80.0-120			2.98	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) R3836787-1 09/13/22 23:35

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

Laboratory Control Sample (LCS)

(LCS) R3836787-2 09/13/22 23:40

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	mg/kg	mg/kg	%	%	
Arsenic	100	84.2	84.2	80.0-120	

L1532615-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1532615-01 09/13/22 23:43 • (MS) R3836787-5 09/13/22 23:53 • (MSD) R3836787-6 09/13/22 23:56

	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Analyte	mg/kg	mg/kg	mg/kg	mg/kg	%	%		%			%	%
Arsenic	100	5.77	87.4	87.5	81.7	81.7	5	75.0-125			0.0769	20

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc



Method Blank (MB)

(MB) R3834752-2 09/07/22 09:32

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
TPH (GC/FID) Low Fraction	U		0.0217	0.100
(S) a,a,a-Trifluorotoluene(FID)	95.6			77.0-120

Laboratory Control Sample (LCS)

(LCS) R3834752-1 09/07/22 08:31

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
TPH (GC/FID) Low Fraction	5.50	5.84	106	72.0-127	
(S) a,a,a-Trifluorotoluene(FID)			101	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) R3835373-3 09/08/22 13:12

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Benzene	U		0.000467	0.00100
Toluene	U		0.00130	0.00500
Ethylbenzene	U		0.000737	0.00250
Xylenes, Total	U		0.000880	0.00650
1,2,4-Trimethylbenzene	U		0.00158	0.00500
1,3,5-Trimethylbenzene	U		0.00200	0.00500
(S) Toluene-d8	95.4			75.0-131
(S) 4-Bromofluorobenzene	107			67.0-138
(S) 1,2-Dichloroethane-d4	113			70.0-130

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

(LCS) R3835373-1 09/08/22 11:01 • (LCSD) R3835373-2 09/08/22 11:20

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Benzene	0.125	0.117	0.123	93.6	98.4	70.0-123			5.00	20
Toluene	0.125	0.107	0.115	85.6	92.0	75.0-121			7.21	20
Ethylbenzene	0.125	0.111	0.124	88.8	99.2	74.0-126			11.1	20
Xylenes, Total	0.375	0.321	0.369	85.6	98.4	72.0-127			13.9	20
1,2,4-Trimethylbenzene	0.125	0.107	0.109	85.6	87.2	70.0-126			1.85	20
1,3,5-Trimethylbenzene	0.125	0.109	0.104	87.2	83.2	73.0-127			4.69	20
(S) Toluene-d8				99.9	94.8	75.0-131				
(S) 4-Bromofluorobenzene				99.0	108	67.0-138				
(S) 1,2-Dichloroethane-d4				115	117	70.0-130				

1  
Cp

2  
Tc

3  
Ss

4  
Cn

5  
Sr

6  
Qc

7  
Gl

8  
Al

9  
Sc

Method Blank (MB)

(MB) R3836901-1 09/13/22 21:09

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	68.9			18.0-148

Laboratory Control Sample (LCS)

(LCS) R3836901-2 09/13/22 21:22

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
C10-C28 Diesel Range	50.0	38.6	77.2	50.0-150	
(S) o-Terphenyl			94.4	18.0-148	

L1532236-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1532236-01 09/14/22 01:44 • (MS) R3836901-3 09/14/22 01:57 • (MSD) R3836901-4 09/14/22 02:10

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	49.5	5380	4530	3990	0.000	0.000	5	50.0-150	E V	E V	12.7	20
(S) o-Terphenyl					0.000	0.000		18.0-148	J2	J2		

Sample Narrative:

OS: Surrogate failure due to matrix interference

1  
Cp

2  
Tc

3  
Ss

4  
Cn

5  
Sr

6  
Qc

7  
Gl

8  
Al

9  
Sc

Method Blank (MB)

(MB) R3836023-2 09/10/22 16:55

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Acenaphthene	U		0.00209	0.00600
Anthracene	U		0.00230	0.00600
Benzo(a)anthracene	U		0.00173	0.00600
Benzo(b)fluoranthene	U		0.00153	0.00600
Benzo(k)fluoranthene	U		0.00215	0.00600
Benzo(a)pyrene	U		0.00179	0.00600
Chrysene	U		0.00232	0.00600
Dibenz(a,h)anthracene	U		0.00172	0.00600
Fluoranthene	U		0.00227	0.00600
Fluorene	U		0.00205	0.00600
Indeno(1,2,3-cd)pyrene	U		0.00181	0.00600
1-Methylnaphthalene	U		0.00449	0.0200
2-Methylnaphthalene	U		0.00427	0.0200
Naphthalene	U		0.00408	0.0200
Pyrene	U		0.00200	0.00600
(S) p-Terphenyl-d14	68.9			23.0-120
(S) Nitrobenzene-d5	47.8			14.0-149
(S) 2-Fluorobiphenyl	57.2			34.0-125

<sup>1</sup>Cp

<sup>2</sup>Tc

<sup>3</sup>Ss

<sup>4</sup>Cn

<sup>5</sup>Sr

<sup>6</sup>Qc

<sup>7</sup>Gl

<sup>8</sup>Al

<sup>9</sup>Sc

Laboratory Control Sample (LCS)

(LCS) R3836023-1 09/10/22 16:38

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Acenaphthene	0.0800	0.0525	65.6	50.0-120	
Anthracene	0.0800	0.0530	66.3	50.0-126	
Benzo(a)anthracene	0.0800	0.0551	68.9	45.0-120	
Benzo(b)fluoranthene	0.0800	0.0614	76.8	42.0-121	
Benzo(k)fluoranthene	0.0800	0.0590	73.8	49.0-125	
Benzo(a)pyrene	0.0800	0.0531	66.4	42.0-120	
Chrysene	0.0800	0.0596	74.5	49.0-122	
Dibenz(a,h)anthracene	0.0800	0.0553	69.1	47.0-125	
Fluoranthene	0.0800	0.0560	70.0	49.0-129	
Fluorene	0.0800	0.0561	70.1	49.0-120	
Indeno(1,2,3-cd)pyrene	0.0800	0.0542	67.8	46.0-125	
1-Methylnaphthalene	0.0800	0.0513	64.1	51.0-121	
2-Methylnaphthalene	0.0800	0.0481	60.1	50.0-120	
Naphthalene	0.0800	0.0483	60.4	50.0-120	
Pyrene	0.0800	0.0575	71.9	43.0-123	

Laboratory Control Sample (LCS)

(LCS) R3836023-1 09/10/22 16:38

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	<u>LCS Qualifier</u>
(S) p-Terphenyl-d14			79.4	23.0-120	
(S) Nitrobenzene-d5			60.7	14.0-149	
(S) 2-Fluorobiphenyl			69.8	34.0-125	

L1532445-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1532445-01 09/10/22 17:13 • (MS) R3836023-3 09/10/22 17:30 • (MSD) R3836023-4 09/10/22 17:47

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	<u>MS Qualifier</u>	<u>MSD Qualifier</u>	RPD %	RPD Limits %
Acenaphthene	0.0800	ND	0.0538	0.0559	67.3	69.9	1	14.0-127			3.83	27
Anthracene	0.0800	ND	0.0547	0.0576	68.4	72.0	1	10.0-145			5.16	30
Benzo(a)anthracene	0.0800	ND	0.0589	0.0601	73.6	75.1	1	10.0-139			2.02	30
Benzo(b)fluoranthene	0.0800	ND	0.0618	0.0644	77.3	80.5	1	10.0-140			4.12	36
Benzo(k)fluoranthene	0.0800	ND	0.0619	0.0623	77.4	77.9	1	10.0-137			0.644	31
Benzo(a)pyrene	0.0800	ND	0.0594	0.0602	74.3	75.3	1	10.0-141			1.34	31
Chrysene	0.0800	ND	0.0616	0.0626	77.0	78.3	1	10.0-145			1.61	30
Dibenz(a,h)anthracene	0.0800	ND	0.0583	0.0587	72.9	73.4	1	10.0-132			0.684	31
Fluoranthene	0.0800	ND	0.0583	0.0608	72.9	76.0	1	10.0-153			4.20	33
Fluorene	0.0800	ND	0.0583	0.0590	72.9	73.8	1	11.0-130			1.19	29
Indeno(1,2,3-cd)pyrene	0.0800	ND	0.0567	0.0580	70.9	72.5	1	10.0-137			2.27	32
1-Methylnaphthalene	0.0800	ND	0.0529	0.0555	66.1	69.4	1	10.0-142			4.80	28
2-Methylnaphthalene	0.0800	ND	0.0499	0.0523	62.4	65.4	1	10.0-137			4.70	28
Naphthalene	0.0800	ND	0.0501	0.0532	62.6	66.5	1	10.0-135			6.00	27
Pyrene	0.0800	ND	0.0601	0.0616	75.1	77.0	1	10.0-148			2.47	35
(S) p-Terphenyl-d14					80.9	81.7		23.0-120				
(S) Nitrobenzene-d5					63.7	64.1		14.0-149				
(S) 2-Fluorobiphenyl					72.7	73.3		34.0-125				

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

# GLOSSARY OF TERMS

## Guide to Reading and Understanding Your Laboratory Report

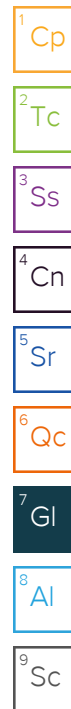
The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

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

Qualifier	Description
E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL).
J1	Surrogate recovery limits have been exceeded; values are outside upper control limits.
J2	Surrogate recovery limits have been exceeded; values are outside lower control limits.
J3	The associated batch QC was outside the established quality control range for precision.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.
J7	Surrogate recovery cannot be used for control limit evaluation due to dilution.
T8	Sample(s) received past/too close to holding time expiration.
V	The sample concentration is too high to evaluate accurate spike recoveries.



# ACCREDITATIONS & LOCATIONS

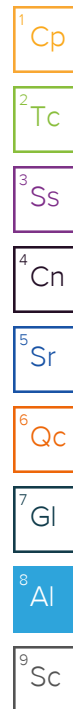
## Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

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.

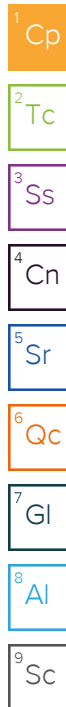
\* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace Analytical.





Trip Blank Received: Y <input checked="" type="radio"/> N <input type="radio"/> HCL MeOH TSP Other	
Non Conformance(s): YES / <input checked="" type="radio"/> NO <input type="radio"/>	Page: _____ of: _____

September 19, 2022



## Caerus Oil and Gas

Sample Delivery Group: L1532236  
Samples Received: 09/02/2022  
Project Number:  
Description: A03 596 Flowline Release  
Site: A03 596  
Report To: Brett Middleton  
143 Diamond Avenue  
Parachute, CO 81635

Entire Report Reviewed By:



Chris Ward  
Project Manager

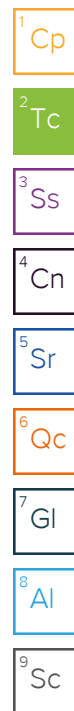
Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace Analytical National is performed per guidance provided in laboratory 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

20220831-A03\_596\_FL-POR @ 4' L1532236-01 Solid

Collected by  
A Smith

Collected date/time  
08/31/22 13:40

Received date/time  
09/02/22 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1924599	1	09/16/22 23:08	09/16/22 23:08	KMG	Mt. Juliet, TN
Wet Chemistry by Method 7199	WG1924000	1	09/10/22 22:05	09/13/22 20:34	ARD	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1925213	1	09/15/22 13:00	09/15/22 15:00	SGB	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1924190	1	09/14/22 10:17	09/16/22 14:10	NTG	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1923240	1	09/12/22 16:58	09/14/22 14:23	ZSA	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG1921387	1	09/05/22 15:36	09/14/22 00:21	CCE	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1923244	5	09/12/22 17:05	09/14/22 00:03	LD	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG1921706	1	09/04/22 13:16	09/07/22 15:40	BAM	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1923252	1	09/04/22 13:16	09/08/22 19:59	JAH	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015M	WG1925133	5	09/13/22 10:10	09/14/22 01:44	NH	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015M	WG1925133	50	09/13/22 10:10	09/14/22 10:46	JAS	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG1922988	1	09/09/22 04:22	09/09/22 13:54	JMB	Mt. Juliet, TN

<sup>1</sup>Cp

<sup>2</sup>Tc

<sup>3</sup>Ss

<sup>4</sup>Cn

<sup>5</sup>Sr

<sup>6</sup>Qc

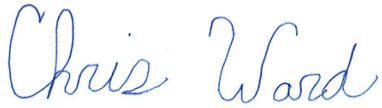
<sup>7</sup>Gl

<sup>8</sup>Al

<sup>9</sup>Sc

# 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	8.01		1	09/16/2022 23:08	WG1924599

## Wet Chemistry by Method 7199

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Hexavalent Chromium	ND		1.00	1	09/13/2022 20:34	<a href="#">WG1924000</a>

## Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	7.73	<a href="#">T8</a>	1	09/15/2022 15:00	<a href="#">WG1925213</a>

## Sample Narrative:

L1532236-01 WG1925213: 7.73 at 20C

## Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Specific Conductance	1710		10.0	1	09/16/2022 14:10	<a href="#">WG1924190</a>

## Sample Narrative:

L1532236-01 WG1924190: at 25C

## Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Barium	566		0.500	1	09/14/2022 14:23	<a href="#">WG1923240</a>
Cadmium	ND		0.500	1	09/14/2022 14:23	<a href="#">WG1923240</a>
Copper	11.6		2.00	1	09/14/2022 14:23	<a href="#">WG1923240</a>
Lead	12.1		0.500	1	09/14/2022 14:23	<a href="#">WG1923240</a>
Nickel	12.8		2.00	1	09/14/2022 14:23	<a href="#">WG1923240</a>
Selenium	ND		2.00	1	09/14/2022 14:23	<a href="#">WG1923240</a>
Silver	ND		1.00	1	09/14/2022 14:23	<a href="#">WG1923240</a>
Zinc	34.2		5.00	1	09/14/2022 14:23	<a href="#">WG1923240</a>

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

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Hot Water Sol. Boron	0.668		0.200	1	09/14/2022 00:21	<a href="#">WG1921387</a>

## Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Arsenic	2.92		1.00	5	09/14/2022 00:03	<a href="#">WG1923244</a>

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

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	0.216		0.100	1	09/07/2022 15:40	<a href="#">WG1921706</a>
(S) a,a,a-Trifluorotoluene(FID)	90.6		77.0-120		09/07/2022 15:40	<a href="#">WG1921706</a>

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00100	1	09/08/2022 19:59	<a href="#">WG1923252</a>
Toluene	ND		0.00500	1	09/08/2022 19:59	<a href="#">WG1923252</a>
Ethylbenzene	ND		0.00250	1	09/08/2022 19:59	<a href="#">WG1923252</a>
Xylenes, Total	ND		0.00650	1	09/08/2022 19:59	<a href="#">WG1923252</a>
1,2,4-Trimethylbenzene	ND		0.00500	1	09/08/2022 19:59	<a href="#">WG1923252</a>
1,3,5-Trimethylbenzene	0.0230		0.00500	1	09/08/2022 19:59	<a href="#">WG1923252</a>
(S) Toluene-d8	94.6		75.0-131		09/08/2022 19:59	<a href="#">WG1923252</a>
(S) 4-Bromofluorobenzene	109		67.0-138		09/08/2022 19:59	<a href="#">WG1923252</a>
(S) 1,2-Dichloroethane-d4	112		70.0-130		09/08/2022 19:59	<a href="#">WG1923252</a>

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	4830		200	50	09/14/2022 10:46	<a href="#">WG1925133</a>
C28-C36 Motor Oil Range	50.1		20.0	5	09/14/2022 01:44	<a href="#">WG1925133</a>
(S) o-Terphenyl	0.000	<a href="#">J2</a>	18.0-148		09/14/2022 01:44	<a href="#">WG1925133</a>
(S) o-Terphenyl	0.000	<a href="#">J7</a>	18.0-148		09/14/2022 10:46	<a href="#">WG1925133</a>

## Sample Narrative:

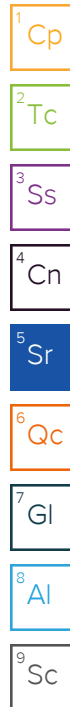
L1532236-01 WG1925133: Surrogate failure due to matrix interference

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Acenaphthene	ND		0.00600	1	09/09/2022 13:54	<a href="#">WG1922988</a>
Anthracene	ND		0.00600	1	09/09/2022 13:54	<a href="#">WG1922988</a>
Benzo(a)anthracene	ND		0.00600	1	09/09/2022 13:54	<a href="#">WG1922988</a>
Benzo(b)fluoranthene	ND		0.00600	1	09/09/2022 13:54	<a href="#">WG1922988</a>
Benzo(k)fluoranthene	ND		0.00600	1	09/09/2022 13:54	<a href="#">WG1922988</a>
Benzo(a)pyrene	ND		0.00600	1	09/09/2022 13:54	<a href="#">WG1922988</a>
Chrysene	ND		0.00600	1	09/09/2022 13:54	<a href="#">WG1922988</a>
Dibenz(a,h)anthracene	ND		0.00600	1	09/09/2022 13:54	<a href="#">WG1922988</a>
Fluoranthene	ND		0.00600	1	09/09/2022 13:54	<a href="#">WG1922988</a>
Fluorene	0.247		0.00600	1	09/09/2022 13:54	<a href="#">WG1922988</a>
Indeno(1,2,3-cd)pyrene	ND		0.00600	1	09/09/2022 13:54	<a href="#">WG1922988</a>
1-Methylnaphthalene	1.40		0.0200	1	09/09/2022 13:54	<a href="#">WG1922988</a>
2-Methylnaphthalene	2.80		0.0200	1	09/09/2022 13:54	<a href="#">WG1922988</a>
Naphthalene	0.924		0.0200	1	09/09/2022 13:54	<a href="#">WG1922988</a>
Pyrene	ND		0.00600	1	09/09/2022 13:54	<a href="#">WG1922988</a>
(S) p-Terphenyl-d14	99.5		23.0-120		09/09/2022 13:54	<a href="#">WG1922988</a>
(S) Nitrobenzene-d5	2370	<a href="#">J1</a>	14.0-149		09/09/2022 13:54	<a href="#">WG1922988</a>
(S) 2-Fluorobiphenyl	137	<a href="#">J1</a>	34.0-125		09/09/2022 13:54	<a href="#">WG1922988</a>

## Sample Narrative:

L1532236-01 WG1922988: Surrogate failure due to matrix interference





Method Blank (MB)

(MB) R3837202-1 09/13/22 18:09

	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	mg/kg		mg/kg	mg/kg
Hexavalent Chromium	U		0.255	1.00

L1532232-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1532232-03 09/13/22 19:11 • (DUP) R3837202-11 09/13/22 19:16

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

L1532232-10 Original Sample (OS) • Duplicate (DUP)

(OS) L1532232-10 09/13/22 19:53 • (DUP) R3837202-12 09/13/22 19:58

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

Laboratory Control Sample (LCS)

(LCS) R3837202-2 09/13/22 18:14

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	mg/kg	mg/kg	%	%	
Hexavalent Chromium	10.0	10.3	103	80.0-120	

L1532219-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1532219-01 09/13/22 18:24 • (MS) R3837202-7 09/13/22 18:30 • (MSD) R3837202-8 09/13/22 18:35

	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Analyte	mg/kg	mg/kg	mg/kg	mg/kg	%	%		%			%	%
Hexavalent Chromium	20.0	ND	12.7	14.3	63.4	71.6	1	75.0-125	J6	J6	12.1	20

Sample Narrative:

OS: Sample is a reducer.

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

L1532219-01 Original Sample (OS) • Matrix Spike (MS)

(OS) L1532219-01 09/13/22 18:24 • (MS) R3837202-10 09/13/22 18:45

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MS Rec. %	Dilution	Rec. Limits %	<u>MS Qualifier</u>
Hexavalent Chromium	636	ND	368	57.9	50	75.0-125	<u>J6</u>

Sample Narrative:

OS: Sample is a reducer.

<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

L1532352-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1532352-01 09/15/22 15:00 • (DUP) R3837654-2 09/15/22 15:00

	Original Result	DUP Result	Dilution	DUP RPD	<u>DUP Qualifier</u>	DUP RPD Limits
Analyte	su	su		%		%
pH	6.59	6.64	1	0.756		1

Sample Narrative:

OS: 6.59 at 19.9C

DUP: 6.64 at 19.8C

<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

L1533460-07 Original Sample (OS) • Duplicate (DUP)

(OS) L1533460-07 09/15/22 15:00 • (DUP) R3837654-3 09/15/22 15:00

	Original Result	DUP Result	Dilution	DUP RPD	<u>DUP Qualifier</u>	DUP RPD Limits
Analyte	su	su		%		%
pH	8.29	8.27	1	0.242		1

Sample Narrative:

OS: 8.29 at 19.9C

DUP: 8.27 at 20C

Laboratory Control Sample (LCS)

(LCS) R3837654-1 09/15/22 15:00

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	<u>LCS Qualifier</u>
Analyte	su	su	%	%	
pH	10.0	9.90	99.0	99.0-101	

Sample Narrative:

LCS: 9.9 at 19.4C

Method Blank (MB)

(MB) R3838102-1 09/16/22 14:10

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

L1532241-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1532241-03 09/16/22 14:10 • (DUP) R3838102-3 09/16/22 14:10

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	490	488	1	0.409		20

Sample Narrative:

OS: at 25C

DUP: at 25C

L1532610-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1532610-01 09/16/22 14:10 • (DUP) R3838102-4 09/16/22 14:10

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	151	152	1	0.662		20

Sample Narrative:

OS: at 25C

DUP: at 25C

Laboratory Control Sample (LCS)

(LCS) R3838102-2 09/16/22 14:10

Analyte	Spike Amount umhos/cm	LCS Result umhos/cm	LCS Rec. %	Rec. Limits %	LCS Qualifier
Specific Conductance	1120	1150	102	85.0-115	

Sample Narrative:

LCS: at 25C

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Method Blank (MB)

(MB) R3837336-1 09/14/22 13:57

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Barium	U		0.0852	0.500
Cadmium	U		0.0471	0.500
Copper	U		0.400	2.00
Lead	U		0.208	0.500
Nickel	U		0.132	2.00
Selenium	U		0.764	2.00
Silver	U		0.127	1.00
Zinc	U		0.832	5.00

Laboratory Control Sample (LCS)

(LCS) R3837336-2 09/14/22 14:00

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Barium	100	96.8	96.8	80.0-120	
Cadmium	100	91.7	91.7	80.0-120	
Copper	100	93.4	93.4	80.0-120	
Lead	100	90.2	90.2	80.0-120	
Nickel	100	91.2	91.2	80.0-120	
Selenium	100	90.9	90.9	80.0-120	
Silver	20.0	17.4	86.9	80.0-120	
Zinc	100	89.5	89.5	80.0-120	

L1532615-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1532615-01 09/14/22 14:03 • (MS) R3837336-5 09/14/22 14:14 • (MSD) R3837336-6 09/14/22 14:17

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Barium	100	436	629	505	193	69.2	1	75.0-125	V	J3 V	21.9	20
Cadmium	100	ND	96.2	94.5	95.9	94.2	1	75.0-125			1.77	20
Copper	100	13.6	114	109	100	95.9	1	75.0-125			4.07	20
Lead	100	14.1	114	109	99.5	94.9	1	75.0-125			4.07	20
Nickel	100	24.9	127	120	102	95.5	1	75.0-125			4.97	20
Selenium	100	ND	94.5	89.8	94.5	89.8	1	75.0-125			5.04	20
Silver	20.0	ND	18.3	17.9	91.4	89.5	1	75.0-125			2.15	20
Zinc	100	47.8	135	125	87.2	77.2	1	75.0-125			7.68	20

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Method Blank (MB)

(MB) R3836834-1 09/14/22 00:04

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) R3836834-2 09/14/22 00:07 • (LCSD) R3836834-3 09/14/22 00:10

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	1.07	1.04	107	104	80.0-120			2.98	20

1

Cp

2

Tc

3

Ss

4

Cn

5

Sr

6

Qc

7

Gl

8

Al

9

Sc

Method Blank (MB)

(MB) R3836787-1 09/13/22 23:35

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

Laboratory Control Sample (LCS)

(LCS) R3836787-2 09/13/22 23:40

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	mg/kg	mg/kg	%	%	
Arsenic	100	84.2	84.2	80.0-120	

L1532615-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1532615-01 09/13/22 23:43 • (MS) R3836787-5 09/13/22 23:53 • (MSD) R3836787-6 09/13/22 23:56

	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Analyte	mg/kg	mg/kg	mg/kg	mg/kg	%	%		%			%	%
Arsenic	100	5.77	87.4	87.5	81.7	81.7	5	75.0-125			0.0769	20

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc



Method Blank (MB)

(MB) R3834752-2 09/07/22 09:32

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
TPH (GC/FID) Low Fraction	U		0.0217	0.100
(S) a,a,a-Trifluorotoluene(FID)	95.6			77.0-120

Laboratory Control Sample (LCS)

(LCS) R3834752-1 09/07/22 08:31

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
TPH (GC/FID) Low Fraction	5.50	5.84	106	72.0-127	
(S) a,a,a-Trifluorotoluene(FID)			101	77.0-120	

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Method Blank (MB)

(MB) R3835373-3 09/08/22 13:12

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Benzene	U		0.000467	0.00100
Toluene	U		0.00130	0.00500
Ethylbenzene	U		0.000737	0.00250
Xylenes, Total	U		0.000880	0.00650
1,2,4-Trimethylbenzene	U		0.00158	0.00500
1,3,5-Trimethylbenzene	U		0.00200	0.00500
(S) Toluene-d8	95.4			75.0-131
(S) 4-Bromofluorobenzene	107			67.0-138
(S) 1,2-Dichloroethane-d4	113			70.0-130

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

(LCS) R3835373-1 09/08/22 11:01 • (LCSD) R3835373-2 09/08/22 11:20

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Benzene	0.125	0.117	0.123	93.6	98.4	70.0-123			5.00	20
Toluene	0.125	0.107	0.115	85.6	92.0	75.0-121			7.21	20
Ethylbenzene	0.125	0.111	0.124	88.8	99.2	74.0-126			11.1	20
Xylenes, Total	0.375	0.321	0.369	85.6	98.4	72.0-127			13.9	20
1,2,4-Trimethylbenzene	0.125	0.107	0.109	85.6	87.2	70.0-126			1.85	20
1,3,5-Trimethylbenzene	0.125	0.109	0.104	87.2	83.2	73.0-127			4.69	20
(S) Toluene-d8				99.9	94.8	75.0-131				
(S) 4-Bromofluorobenzene				99.0	108	67.0-138				
(S) 1,2-Dichloroethane-d4				115	117	70.0-130				

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Method Blank (MB)

(MB) R3836901-1 09/13/22 21:09

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	68.9			18.0-148

Laboratory Control Sample (LCS)

(LCS) R3836901-2 09/13/22 21:22

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
C10-C28 Diesel Range	50.0	38.6	77.2	50.0-150	
(S) o-Terphenyl			94.4	18.0-148	

L1532236-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1532236-01 09/14/22 01:44 • (MS) R3836901-3 09/14/22 01:57 • (MSD) R3836901-4 09/14/22 02:10

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	49.5	5380	4530	3990	0.000	0.000	5	50.0-150	E V	E V	12.7	20
(S) o-Terphenyl					0.000	0.000		18.0-148	J2	J2		

Sample Narrative:

OS: Surrogate failure due to matrix interference

1  
Cp

2  
Tc

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Ss

4  
Cn

5  
Sr

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Qc

7  
Gl

8  
Al

9  
Sc

Method Blank (MB)

(MB) R3835423-2 09/09/22 09:16

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Acenaphthene	U		0.00209	0.00600
Anthracene	U		0.00230	0.00600
Benzo(a)anthracene	U		0.00173	0.00600
Benzo(b)fluoranthene	U		0.00153	0.00600
Benzo(k)fluoranthene	U		0.00215	0.00600
Benzo(a)pyrene	U		0.00179	0.00600
Chrysene	U		0.00232	0.00600
Dibenz(a,h)anthracene	U		0.00172	0.00600
Fluoranthene	U		0.00227	0.00600
Fluorene	U		0.00205	0.00600
Indeno(1,2,3-cd)pyrene	U		0.00181	0.00600
1-Methylnaphthalene	U		0.00449	0.0200
2-Methylnaphthalene	U		0.00427	0.0200
Naphthalene	U		0.00408	0.0200
Pyrene	U		0.00200	0.00600
(S) p-Terphenyl-d14	106			23.0-120
(S) Nitrobenzene-d5	80.6			14.0-149
(S) 2-Fluorobiphenyl	92.9			34.0-125

<sup>1</sup>Cp

<sup>2</sup>Tc

<sup>3</sup>Ss

<sup>4</sup>Cn

<sup>5</sup>Sr

<sup>6</sup>Qc

<sup>7</sup>Gl

<sup>8</sup>Al

<sup>9</sup>Sc

Laboratory Control Sample (LCS)

(LCS) R3835423-1 09/09/22 08:58

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Acenaphthene	0.0800	0.0724	90.5	50.0-120	
Anthracene	0.0800	0.0689	86.1	50.0-126	
Benzo(a)anthracene	0.0800	0.0723	90.4	45.0-120	
Benzo(b)fluoranthene	0.0800	0.0790	98.8	42.0-121	
Benzo(k)fluoranthene	0.0800	0.0784	98.0	49.0-125	
Benzo(a)pyrene	0.0800	0.0685	85.6	42.0-120	
Chrysene	0.0800	0.0770	96.3	49.0-122	
Dibenz(a,h)anthracene	0.0800	0.0704	88.0	47.0-125	
Fluoranthene	0.0800	0.0714	89.3	49.0-129	
Fluorene	0.0800	0.0756	94.5	49.0-120	
Indeno(1,2,3-cd)pyrene	0.0800	0.0700	87.5	46.0-125	
1-Methylnaphthalene	0.0800	0.0731	91.4	51.0-121	
2-Methylnaphthalene	0.0800	0.0693	86.6	50.0-120	
Naphthalene	0.0800	0.0706	88.3	50.0-120	
Pyrene	0.0800	0.0760	95.0	43.0-123	

Laboratory Control Sample (LCS)

(LCS) R3835423-1 09/09/22 08:58

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	<u>LCS Qualifier</u>
(S) p-Terphenyl-d14			119	23.0-120	
(S) Nitrobenzene-d5			93.2	14.0-149	
(S) 2-Fluorobiphenyl			104	34.0-125	

<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

# GLOSSARY OF TERMS

## Guide to Reading and Understanding Your Laboratory Report

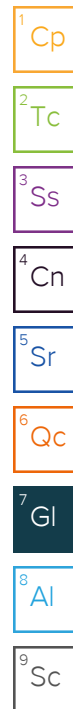
The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

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

Qualifier	Description
E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL).
J1	Surrogate recovery limits have been exceeded; values are outside upper control limits.
J2	Surrogate recovery limits have been exceeded; values are outside lower control limits.
J3	The associated batch QC was outside the established quality control range for precision.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.
J7	Surrogate recovery cannot be used for control limit evaluation due to dilution.
T8	Sample(s) received past/too close to holding time expiration.
V	The sample concentration is too high to evaluate accurate spike recoveries.



# ACCREDITATIONS & LOCATIONS

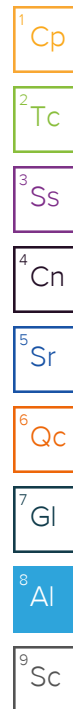
## Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

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.







## Caerus Oil and Gas

Sample Delivery Group: L1532234  
Samples Received: 09/02/2022  
Project Number:  
Description: A03 596 Flowline Release  
Site: A03 596  
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

20220831-A03\_596\_FL-STOCK\_COMP L1532234-01 Solid

Collected by  
Tristan Schmalz

Collected date/time  
08/31/22 14:00

Received date/time  
09/02/22 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1924599	1	09/16/22 21:50	09/16/22 21:50	KMG	Mt. Juliet, TN
Wet Chemistry by Method 7199	WG1924000	1	09/10/22 22:05	09/13/22 20:29	ARD	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1925207	1	09/13/22 15:00	09/13/22 16:00	RLS	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1924190	1	09/14/22 10:17	09/16/22 14:10	NTG	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1923240	1	09/12/22 16:58	09/14/22 14:20	ZSA	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG1921387	1	09/05/22 15:36	09/14/22 00:18	CCE	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1923244	5	09/12/22 17:05	09/13/22 23:59	LD	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG1924052	1	09/07/22 16:21	09/10/22 10:22	BAM	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1923252	1	09/07/22 15:31	09/08/22 19:40	JAH	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015M	WG1924331	10	09/12/22 09:17	09/12/22 22:36	TJD	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG1922993	1	09/09/22 04:42	09/09/22 18:14	AMM	Mt. Juliet, TN

<sup>1</sup>Cp

<sup>2</sup>Tc

<sup>3</sup>Ss

<sup>4</sup>Cn

<sup>5</sup>Sr

<sup>6</sup>Qc

<sup>7</sup>Gl

<sup>8</sup>Al

<sup>9</sup>Sc

# 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

## Report Revision History

---

Level II Report - Version 1: 09/19/22 11:42

## Project Narrative

---

Rerun for correct project info



## Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	4.26		1	09/16/2022 21:50	WG1924599

## 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	09/13/2022 20:29	<a href="#">WG1924000</a>

## Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	8.87	<a href="#">T8</a>	1	09/13/2022 16:00	<a href="#">WG1925207</a>

## Sample Narrative:

L1532234-01 WG1925207: 8.87 at 20.7C

## Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	657		10.0	1	09/16/2022 14:10	<a href="#">WG1924190</a>

## Sample Narrative:

L1532234-01 WG1924190: at 25C

## Metals (ICP) by Method 6010B

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Barium	483		0.0852	0.500	1	09/14/2022 14:20	<a href="#">WG1923240</a>
Cadmium	0.360	<a href="#">J</a>	0.0471	0.500	1	09/14/2022 14:20	<a href="#">WG1923240</a>
Copper	13.8		0.400	2.00	1	09/14/2022 14:20	<a href="#">WG1923240</a>
Lead	15.6		0.208	0.500	1	09/14/2022 14:20	<a href="#">WG1923240</a>
Nickel	18.8		0.132	2.00	1	09/14/2022 14:20	<a href="#">WG1923240</a>
Selenium	U		0.764	2.00	1	09/14/2022 14:20	<a href="#">WG1923240</a>
Silver	U		0.127	1.00	1	09/14/2022 14:20	<a href="#">WG1923240</a>
Zinc	39.8		0.832	5.00	1	09/14/2022 14:20	<a href="#">WG1923240</a>

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

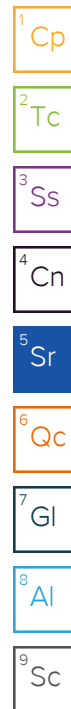
Analyte	Result mg/l	Qualifier	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
Hot Water Sol. Boron	0.384		0.0167	0.200	1	09/14/2022 00:18	<a href="#">WG1921387</a>

## Metals (ICPMS) by Method 6020

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	3.81		0.100	1.00	5	09/13/2022 23:59	<a href="#">WG1923244</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	1.52		0.0217	0.100	1	09/10/2022 10:22	<a href="#">WG1924052</a>
(S) <i>a,a,a</i> -Trifluorotoluene(FID)	97.8			77.0-120		09/10/2022 10:22	<a href="#">WG1924052</a>





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

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	0.0169		0.000467	0.00100	1	09/08/2022 19:40	<a href="#">WG1923252</a>
Toluene	0.0955		0.00130	0.00500	1	09/08/2022 19:40	<a href="#">WG1923252</a>
Ethylbenzene	0.0112		0.000737	0.00250	1	09/08/2022 19:40	<a href="#">WG1923252</a>
Xylenes, Total	0.178		0.000880	0.00650	1	09/08/2022 19:40	<a href="#">WG1923252</a>
1,2,4-Trimethylbenzene	0.0465		0.00158	0.00500	1	09/08/2022 19:40	<a href="#">WG1923252</a>
1,3,5-Trimethylbenzene	0.176		0.00200	0.00500	1	09/08/2022 19:40	<a href="#">WG1923252</a>
(S) Toluene-d8	101			75.0-131		09/08/2022 19:40	<a href="#">WG1923252</a>
(S) 4-Bromofluorobenzene	104			67.0-138		09/08/2022 19:40	<a href="#">WG1923252</a>
(S) 1,2-Dichloroethane-d4	103			70.0-130		09/08/2022 19:40	<a href="#">WG1923252</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	299		16.1	40.0	10	09/12/2022 22:36	<a href="#">WG1924331</a>
C28-C36 Motor Oil Range	158		2.74	40.0	10	09/12/2022 22:36	<a href="#">WG1924331</a>
(S) o-Terphenyl	54.1			18.0-148		09/12/2022 22:36	<a href="#">WG1924331</a>

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

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Acenaphthene	U		0.00209	0.00600	1	09/09/2022 18:14	<a href="#">WG1922993</a>
Anthracene	0.00251	U	0.00230	0.00600	1	09/09/2022 18:14	<a href="#">WG1922993</a>
Benzo(a)anthracene	U		0.00173	0.00600	1	09/09/2022 18:14	<a href="#">WG1922993</a>
Benzo(b)fluoranthene	U		0.00153	0.00600	1	09/09/2022 18:14	<a href="#">WG1922993</a>
Benzo(k)fluoranthene	U		0.00215	0.00600	1	09/09/2022 18:14	<a href="#">WG1922993</a>
Benzo(a)pyrene	U		0.00179	0.00600	1	09/09/2022 18:14	<a href="#">WG1922993</a>
Chrysene	U		0.00232	0.00600	1	09/09/2022 18:14	<a href="#">WG1922993</a>
Dibenz(a,h)anthracene	U		0.00172	0.00600	1	09/09/2022 18:14	<a href="#">WG1922993</a>
Fluoranthene	U		0.00227	0.00600	1	09/09/2022 18:14	<a href="#">WG1922993</a>
Fluorene	0.0218		0.00205	0.00600	1	09/09/2022 18:14	<a href="#">WG1922993</a>
Indeno(1,2,3-cd)pyrene	U		0.00181	0.00600	1	09/09/2022 18:14	<a href="#">WG1922993</a>
1-Methylnaphthalene	0.0416		0.00449	0.0200	1	09/09/2022 18:14	<a href="#">WG1922993</a>
2-Methylnaphthalene	0.0423		0.00427	0.0200	1	09/09/2022 18:14	<a href="#">WG1922993</a>
Naphthalene	0.0159	U	0.00408	0.0200	1	09/09/2022 18:14	<a href="#">WG1922993</a>
Pyrene	U		0.00200	0.00600	1	09/09/2022 18:14	<a href="#">WG1922993</a>
(S) p-Terphenyl-d14	80.0			23.0-120		09/09/2022 18:14	<a href="#">WG1922993</a>
(S) Nitrobenzene-d5	135			14.0-149		09/09/2022 18:14	<a href="#">WG1922993</a>
(S) 2-Fluorobiphenyl	86.6			34.0-125		09/09/2022 18:14	<a href="#">WG1922993</a>

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Method Blank (MB)

(MB) R3837202-1 09/13/22 18:09

	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	mg/kg		mg/kg	mg/kg
Hexavalent Chromium	U		0.255	1.00

L1532232-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1532232-03 09/13/22 19:11 • (DUP) R3837202-11 09/13/22 19:16

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

L1532232-10 Original Sample (OS) • Duplicate (DUP)

(OS) L1532232-10 09/13/22 19:53 • (DUP) R3837202-12 09/13/22 19:58

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

Laboratory Control Sample (LCS)

(LCS) R3837202-2 09/13/22 18:14

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	mg/kg	mg/kg	%	%	
Hexavalent Chromium	10.0	10.3	103	80.0-120	

L1532219-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1532219-01 09/13/22 18:24 • (MS) R3837202-7 09/13/22 18:30 • (MSD) R3837202-8 09/13/22 18:35

	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Analyte	mg/kg	mg/kg	mg/kg	mg/kg	%	%		%			%	%
Hexavalent Chromium	20.0	U	12.7	14.3	63.4	71.6	1	75.0-125	J6	J6	12.1	20

Sample Narrative:

OS: Sample is a reducer.

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

L1532219-01 Original Sample (OS) • Matrix Spike (MS)

(OS) L1532219-01 09/13/22 18:24 • (MS) R3837202-10 09/13/22 18:45

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Hexavalent Chromium	636	U	368	57.9	50	75.0-125	J6

Sample Narrative:

OS: Sample is a reducer.

<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

L1532241-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1532241-02 09/13/22 16:00 • (DUP) R3836727-2 09/13/22 16:00

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	pH	su		%		%
pH	8.08	8.14	1	0.740		1

Sample Narrative:  
OS: 8.08 at 20.8C  
DUP: 8.14 at 20.3C

L1532263-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1532263-02 09/13/22 16:00 • (DUP) R3836727-3 09/13/22 16:00

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	pH	su		%		%
pH	8.14	8.09	1	0.616		1

Sample Narrative:  
OS: 8.14 at 20.7C  
DUP: 8.09 at 20.8C

Laboratory Control Sample (LCS)

(LCS) R3836727-1 09/13/22 16:00

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	su	su	%	%	
pH	10.0	9.92	99.2	99.0-101	

Sample Narrative:  
LCS: 9.92 at 19.4C

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Method Blank (MB)

(MB) R3838102-1 09/16/22 14:10

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

L1532241-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1532241-03 09/16/22 14:10 • (DUP) R3838102-3 09/16/22 14:10

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	490	488	1	0.409		20

Sample Narrative:

OS: at 25C

DUP: at 25C

L1532610-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1532610-01 09/16/22 14:10 • (DUP) R3838102-4 09/16/22 14:10

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	151	152	1	0.662		20

Sample Narrative:

OS: at 25C

DUP: at 25C

Laboratory Control Sample (LCS)

(LCS) R3838102-2 09/16/22 14:10

Analyte	Spike Amount umhos/cm	LCS Result umhos/cm	LCS Rec. %	Rec. Limits %	LCS Qualifier
Specific Conductance	1120	1150	102	85.0-115	

Sample Narrative:

LCS: at 25C



Method Blank (MB)

(MB) R3837336-1 09/14/22 13:57

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Barium	U		0.0852	0.500
Cadmium	U		0.0471	0.500
Copper	U		0.400	2.00
Lead	U		0.208	0.500
Nickel	U		0.132	2.00
Selenium	U		0.764	2.00
Silver	U		0.127	1.00
Zinc	U		0.832	5.00

Laboratory Control Sample (LCS)

(LCS) R3837336-2 09/14/22 14:00

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Barium	100	96.8	96.8	80.0-120	
Cadmium	100	91.7	91.7	80.0-120	
Copper	100	93.4	93.4	80.0-120	
Lead	100	90.2	90.2	80.0-120	
Nickel	100	91.2	91.2	80.0-120	
Selenium	100	90.9	90.9	80.0-120	
Silver	20.0	17.4	86.9	80.0-120	
Zinc	100	89.5	89.5	80.0-120	

L1532615-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1532615-01 09/14/22 14:03 • (MS) R3837336-5 09/14/22 14:14 • (MSD) R3837336-6 09/14/22 14:17

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Barium	100	436	629	505	193	69.2	1	75.0-125	V	J3 V	21.9	20
Cadmium	100	0.305	96.2	94.5	95.9	94.2	1	75.0-125			1.77	20
Copper	100	13.6	114	109	100	95.9	1	75.0-125			4.07	20
Lead	100	14.1	114	109	99.5	94.9	1	75.0-125			4.07	20
Nickel	100	24.9	127	120	102	95.5	1	75.0-125			4.97	20
Selenium	100	U	94.5	89.8	94.5	89.8	1	75.0-125			5.04	20
Silver	20.0	U	18.3	17.9	91.4	89.5	1	75.0-125			2.15	20
Zinc	100	47.8	135	125	87.2	77.2	1	75.0-125			7.68	20

1  
Cp

2  
Tc

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Ss

4  
Cn

5  
Sr

6  
Qc

7  
Gl

8  
Al

9  
Sc

Method Blank (MB)

(MB) R3836834-1 09/14/22 00:04

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) R3836834-2 09/14/22 00:07 • (LCSD) R3836834-3 09/14/22 00:10

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	1.07	1.04	107	104	80.0-120			2.98	20

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Method Blank (MB)

(MB) R3836787-1 09/13/22 23:35

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

Laboratory Control Sample (LCS)

(LCS) R3836787-2 09/13/22 23:40

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Arsenic	100	84.2	84.2	80.0-120	

L1532615-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1532615-01 09/13/22 23:43 • (MS) R3836787-5 09/13/22 23:53 • (MSD) R3836787-6 09/13/22 23:56

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Arsenic	100	5.77	87.4	87.5	81.7	81.7	5	75.0-125			0.0769	20

1  
Cp

2  
Tc

3  
Ss

4  
Cn

5  
Sr

6  
Qc

7  
Gl

8  
Al

9  
Sc

Method Blank (MB)

(MB) R3836207-2 09/10/22 08:34

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
TPH (GC/FID) Low Fraction	0.0272	⬇	0.0217	0.100
(S) a,a,a-Trifluorotoluene(FID)	102			77.0-120

Laboratory Control Sample (LCS)

(LCS) R3836207-1 09/10/22 07:51

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
TPH (GC/FID) Low Fraction	5.50	4.12	74.9	72.0-127	
(S) a,a,a-Trifluorotoluene(FID)			101	77.0-120	

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc



Method Blank (MB)

(MB) R3835373-3 09/08/22 13:12

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Benzene	U		0.000467	0.00100
Toluene	U		0.00130	0.00500
Ethylbenzene	U		0.000737	0.00250
Xylenes, Total	U		0.000880	0.00650
1,2,4-Trimethylbenzene	U		0.00158	0.00500
1,3,5-Trimethylbenzene	U		0.00200	0.00500
(S) Toluene-d8	95.4			75.0-131
(S) 4-Bromofluorobenzene	107			67.0-138
(S) 1,2-Dichloroethane-d4	113			70.0-130

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

(LCS) R3835373-1 09/08/22 11:01 • (LCSD) R3835373-2 09/08/22 11:20

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Benzene	0.125	0.117	0.123	93.6	98.4	70.0-123			5.00	20
Toluene	0.125	0.107	0.115	85.6	92.0	75.0-121			7.21	20
Ethylbenzene	0.125	0.111	0.124	88.8	99.2	74.0-126			11.1	20
Xylenes, Total	0.375	0.321	0.369	85.6	98.4	72.0-127			13.9	20
1,2,4-Trimethylbenzene	0.125	0.107	0.109	85.6	87.2	70.0-126			1.85	20
1,3,5-Trimethylbenzene	0.125	0.109	0.104	87.2	83.2	73.0-127			4.69	20
(S) Toluene-d8				99.9	94.8	75.0-131				
(S) 4-Bromofluorobenzene				99.0	108	67.0-138				
(S) 1,2-Dichloroethane-d4				115	117	70.0-130				

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Method Blank (MB)

(MB) R3836308-1 09/12/22 20:43

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	0.350	J	0.274	4.00
(S) o-Terphenyl	47.9			18.0-148

Laboratory Control Sample (LCS)

(LCS) R3836308-2 09/12/22 20:56

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
C10-C28 Diesel Range	50.0	27.5	55.0	50.0-150	
(S) o-Terphenyl			58.7	18.0-148	

L1532262-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1532262-02 09/12/22 21:08 • (MS) R3836308-3 09/12/22 21:21 • (MSD) R3836308-4 09/12/22 21:33

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
C10-C28 Diesel Range	47.8	2.70	23.2	24.0	42.9	43.8	1	50.0-150	J6	J6	3.39	20
(S) o-Terphenyl					35.0	36.1		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) R3835873-2 09/09/22 12:41

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Acenaphthene	U		0.00209	0.00600
Anthracene	U		0.00230	0.00600
Benzo(a)anthracene	U		0.00173	0.00600
Benzo(b)fluoranthene	U		0.00153	0.00600
Benzo(k)fluoranthene	U		0.00215	0.00600
Benzo(a)pyrene	U		0.00179	0.00600
Chrysene	U		0.00232	0.00600
Dibenz(a,h)anthracene	U		0.00172	0.00600
Fluoranthene	U		0.00227	0.00600
Fluorene	U		0.00205	0.00600
Indeno(1,2,3-cd)pyrene	U		0.00181	0.00600
1-Methylnaphthalene	U		0.00449	0.0200
2-Methylnaphthalene	U		0.00427	0.0200
Naphthalene	U		0.00408	0.0200
Pyrene	U		0.00200	0.00600
(S) p-Terphenyl-d14	80.2			23.0-120
(S) Nitrobenzene-d5	83.3			14.0-149
(S) 2-Fluorobiphenyl	84.3			34.0-125

<sup>1</sup>Cp

<sup>2</sup>Tc

<sup>3</sup>Ss

<sup>4</sup>Cn

<sup>5</sup>Sr

<sup>6</sup>Qc

<sup>7</sup>Gl

<sup>8</sup>Al

<sup>9</sup>Sc

Laboratory Control Sample (LCS)

(LCS) R3835873-1 09/09/22 12:21

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Acenaphthene	0.0800	0.0601	75.1	50.0-120	
Anthracene	0.0800	0.0620	77.5	50.0-126	
Benzo(a)anthracene	0.0800	0.0620	77.5	45.0-120	
Benzo(b)fluoranthene	0.0800	0.0528	66.0	42.0-121	
Benzo(k)fluoranthene	0.0800	0.0523	65.4	49.0-125	
Benzo(a)pyrene	0.0800	0.0557	69.6	42.0-120	
Chrysene	0.0800	0.0616	77.0	49.0-122	
Dibenz(a,h)anthracene	0.0800	0.0507	63.4	47.0-125	
Fluoranthene	0.0800	0.0665	83.1	49.0-129	
Fluorene	0.0800	0.0623	77.9	49.0-120	
Indeno(1,2,3-cd)pyrene	0.0800	0.0574	71.8	46.0-125	
1-Methylnaphthalene	0.0800	0.0625	78.1	51.0-121	
2-Methylnaphthalene	0.0800	0.0634	79.3	50.0-120	
Naphthalene	0.0800	0.0621	77.6	50.0-120	
Pyrene	0.0800	0.0599	74.9	43.0-123	

Laboratory Control Sample (LCS)

(LCS) R3835873-1 09/09/22 12:21

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	<u>LCS Qualifier</u>
(S) p-Terphenyl-d14			73.1	23.0-120	
(S) Nitrobenzene-d5			80.0	14.0-149	
(S) 2-Fluorobiphenyl			80.6	34.0-125	

L1531665-07 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1531665-07 09/12/22 21:27 • (MS) R3836578-1 09/12/22 21:45 • (MSD) R3836578-2 09/12/22 22:02

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	<u>MS Qualifier</u>	<u>MSD Qualifier</u>	RPD %	RPD Limits %
Acenaphthene	0.0800	0.00615	0.0533	0.0599	58.9	67.2	1	14.0-127			11.7	27
Anthracene	0.0800	0.00266	0.0554	0.0629	65.9	75.3	1	10.0-145			12.7	30
Benzo(a)anthracene	0.0800	U	0.0551	0.0624	68.9	78.0	1	10.0-139			12.4	30
Benzo(b)fluoranthene	0.0800	U	0.0480	0.0542	60.0	67.8	1	10.0-140			12.1	36
Benzo(k)fluoranthene	0.0800	U	0.0462	0.0533	57.8	66.6	1	10.0-137			14.3	31
Benzo(a)pyrene	0.0800	U	0.0544	0.0626	68.0	78.3	1	10.0-141			14.0	31
Chrysene	0.0800	U	0.0528	0.0600	66.0	75.0	1	10.0-145			12.8	30
Dibenz(a,h)anthracene	0.0800	U	0.0410	0.0482	51.3	60.3	1	10.0-132			16.1	31
Fluoranthene	0.0800	0.00228	0.0584	0.0658	70.2	79.4	1	10.0-153			11.9	33
Fluorene	0.0800	0.00531	0.0567	0.0629	64.2	72.0	1	11.0-130			10.4	29
Indeno(1,2,3-cd)pyrene	0.0800	U	0.0438	0.0503	54.8	62.9	1	10.0-137			13.8	32
1-Methylnaphthalene	0.0800	0.0167	0.0577	0.0644	51.3	59.6	1	10.0-142			11.0	28
2-Methylnaphthalene	0.0800	0.0458	0.0629	0.0725	21.4	33.4	1	10.0-137			14.2	28
Naphthalene	0.0800	0.162	0.0539	0.0619	0.000	0.000	1	10.0-135	J6	J6	13.8	27
Pyrene	0.0800	0.00215	0.0499	0.0562	59.7	67.6	1	10.0-148			11.9	35
(S) p-Terphenyl-d14					64.0	74.6		23.0-120				
(S) Nitrobenzene-d5					92.0	102		14.0-149				
(S) 2-Fluorobiphenyl					71.1	80.6		34.0-125				

Cp

Tc

Ss

Cn

Sr

Qc

Gl

Al

Sc

# GLOSSARY OF TERMS

## Guide to Reading and Understanding Your Laboratory Report

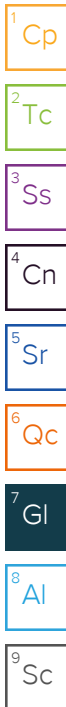
The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

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.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.
T8	Sample(s) received past/too close to holding time expiration.
V	The sample concentration is too high to evaluate accurate spike recoveries.



# 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.



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Fax (615) 758-5859

Tax I.D. 62-0814289

Est. 1970

Chris Hines  
EnCana Oil & Gas Inc. - CO  
2717 County Road 215, Suite 100  
Parachute, CO 81635

## Report Summary

Wednesday August 04, 2010

Report Number: L471053

Samples Received: 07/29/10

Client Project:

Description: A03 Pit Closure

The analytical results in this report are based upon information supplied by you, the client, and are for your exclusive use. If you have any questions regarding this data package, please do not hesitate to call.

Entire Report Reviewed By:

Jarred Willis , ESC Representative

### Laboratory Certification Numbers

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - I-2327, CT - PH-0197, FL - E87487  
GA - 923, IN - C-TN-01, KY - 90010, KYUST - 0016, NC - ENV375/DW21704, ND - R-140  
NJ - TN002, NJ NELAP - TN002, SC - 84004, TN - 2006, VA - 00109, WV - 233  
AZ - 0612, MN - 047-999-395, NY - 11742, WI - 998093910, NV - TN000032008A

Accreditation is only applicable to the test methods specified on each scope of accreditation held by ESC Lab Sciences.

Note: The use of the preparatory EPA Method 3511 is not approved or endorsed by the CA ELAP.

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REPORT OF ANALYSIS

Chris Hines  
EnCana Oil & Gas Inc. - CO  
2717 County Road 215, Suite 100  
Parachute, CO 81635

August 04, 2010

Date Received : July 29, 2010  
Description : A03 Pit Closure  
Sample ID : A03-N. BACK-072810  
Collected By : Blair Rollins  
Collection Date : 07/28/10 10:30

ESC Sample # : L471053-01

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Chromium, Hexavalent	BDL	10.	mg/kg	3060A/7196A	08/03/10	5
Chromium, Trivalent	49.	10.	mg/kg	Calc.	07/31/10	1
ORP	150		mV	2580	08/03/10	1
pH	6.7		su	9045D	07/31/10	1
Sodium Adsorption Ratio	2.6			Calc.	08/04/10	1
Specific Conductance	79.		umhos/cm	9050AMod	08/03/10	1
Mercury	BDL	0.020	mg/kg	7471	08/01/10	1
Arsenic	8.8	1.0	mg/kg	6010B	07/31/10	1
Barium	270	0.25	mg/kg	6010B	07/31/10	1
Cadmium	0.54	0.50	mg/kg	6010B	08/03/10	2
Chromium	49.	0.50	mg/kg	6010B	07/31/10	1
Copper	25.	1.0	mg/kg	6010B	07/31/10	1
Lead	21.	0.25	mg/kg	6010B	07/31/10	1
Nickel	26.	2.0	mg/kg	6010B	08/03/10	2
Selenium	BDL	1.0	mg/kg	6010B	07/31/10	1
Silver	0.54	0.50	mg/kg	6010B	07/31/10	1
Zinc	47.	1.5	mg/kg	6010B	07/31/10	1
Benzene	BDL	0.0025	mg/kg	8021/8015	07/29/10	5
Toluene	BDL	0.025	mg/kg	8021/8015	07/29/10	5
Ethylbenzene	BDL	0.0025	mg/kg	8021/8015	07/29/10	5
Total Xylene	BDL	0.0075	mg/kg	8021/8015	07/29/10	5
TPH (GC/FID) Low Fraction	BDL	0.50	mg/kg	GRO	07/29/10	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	97.3		% Rec.	8021/8015	07/29/10	5
a,a,a-Trifluorotoluene(PID)	102.		% Rec.	8021/8015	07/29/10	5
TPH (GC/FID) High Fraction	5.0	4.0	mg/kg	3546/DRO	07/30/10	1
Surrogate recovery(%)						
o-Terphenyl	84.3		% Rec.	3546/DRO	07/30/10	1
Polynuclear Aromatic Hydrocarbons						
Anthracene	BDL	0.0060	mg/kg	8270C-SIM	08/02/10	1
Acenaphthene	BDL	0.0060	mg/kg	8270C-SIM	08/02/10	1
Acenaphthylene	BDL	0.0060	mg/kg	8270C-SIM	08/02/10	1
Benzo(a)anthracene	BDL	0.0060	mg/kg	8270C-SIM	08/02/10	1
Benzo(a)pyrene	BDL	0.0060	mg/kg	8270C-SIM	08/02/10	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

L471053-01 (PH) - 6.7@21.4c

L471053-01 (CR6) - diluted due to dark sample, used sample blank



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Est. 1970

# REPORT OF ANALYSIS

Chris Hines  
EnCana Oil & Gas Inc. - CO  
2717 County Road 215, Suite 100  
Parachute, CO 81635

August 04, 2010

Date Received : July 29, 2010  
Description : A03 Pit Closure

Sample ID : A03-N. BACK-072810

Collected By : Blair Rollins  
Collection Date : 07/28/10 10:30

ESC Sample # : L471053-01

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzo(b)fluoranthene	BDL	0.0060	mg/kg	8270C-SIM	08/02/10	1
Benzo(g,h,i)perylene	BDL	0.0060	mg/kg	8270C-SIM	08/02/10	1
Benzo(k)fluoranthene	BDL	0.0060	mg/kg	8270C-SIM	08/02/10	1
Chrysene	BDL	0.0060	mg/kg	8270C-SIM	08/02/10	1
Dibenz(a,h)anthracene	BDL	0.0060	mg/kg	8270C-SIM	08/02/10	1
Fluoranthene	BDL	0.0060	mg/kg	8270C-SIM	08/02/10	1
Fluorene	0.0073	0.0060	mg/kg	8270C-SIM	08/02/10	1
Indeno(1,2,3-cd)pyrene	BDL	0.0060	mg/kg	8270C-SIM	08/02/10	1
Naphthalene	BDL	0.0060	mg/kg	8270C-SIM	08/02/10	1
Phenanthrene	BDL	0.0060	mg/kg	8270C-SIM	08/02/10	1
Pyrene	BDL	0.0060	mg/kg	8270C-SIM	08/02/10	1
1-Methylnaphthalene	BDL	0.0060	mg/kg	8270C-SIM	08/02/10	1
2-Methylnaphthalene	BDL	0.0060	mg/kg	8270C-SIM	08/02/10	1
2-Chloronaphthalene	BDL	0.0060	mg/kg	8270C-SIM	08/02/10	1
Surrogate Recovery						
Nitrobenzene-d5	71.2		% Rec.	8270C-SIM	08/02/10	1
2-Fluorobiphenyl	68.2		% Rec.	8270C-SIM	08/02/10	1
p-Terphenyl-d14	113.		% Rec.	8270C-SIM	08/02/10	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

The reported analytical results relate only to the sample submitted.

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Reported: 08/04/10 16:00 Printed: 08/04/10 16:00

L471053-01 (PH) - 6.7@21.4c

L471053-01 (CR6) - diluted due to dark sample, used sample blank

Attachment A  
List of Analytes with QC Qualifiers

Sample Number	Work Group	Sample Type	Analyte	Run ID	Qualifier
L471053-01	WG491136	SAMP	Chromium, Hexavalent	R1311089	0

Attachment B  
Explanation of QC Qualifier Codes

Qualifier	Meaning
O	(ESC) Sample diluted due to matrix interferences that impaired the ability to make an accurate analytical determination. The detection limit is elevated in order to reflect the necessary dilution.

Qualifier Report Information

ESC utilizes sample and result qualifiers as set forth by the EPA Contract Laboratory Program and as required by most certifying bodies including NELAC. In addition to the EPA qualifiers adopted by ESC, we have implemented ESC qualifiers to provide more information pertaining to our analytical results. Each qualifier is designated in the qualifier explanation as either EPA or ESC. Data qualifiers are intended to provide the ESC client with more detailed information concerning the potential bias of reported data. Because of the wide range of constituents and variety of matrices incorporated by most EPA methods, it is common for some compounds to fall outside of established ranges. These exceptions are evaluated and all reported data is valid and useable "unless qualified as 'R' (Rejected)."

Definitions

- Accuracy - The relationship of the observed value of a known sample to the true value of a known sample. Represented by percent recovery and relevant to samples such as: control samples, matrix spike recoveries, surrogate recoveries, etc.
- Precision - The agreement between a set of samples or between duplicate samples. Relates to how close together the results are and is represented by Relative Percent Difference.
- Surrogate - Organic compounds that are similar in chemical composition, extraction, and chromatography to analytes of interest. The surrogates are used to determine the probable response of the group of analytes that are chemically related to the surrogate compound. Surrogates are added to the sample and carried through all stages of preparation and analyses.
- TIC - Tentatively Identified Compound: Compounds detected in samples that are not target compounds, internal standards, system monitoring compounds, or surrogates.

Summary of Remarks For Samples Printed  
08/04/10 at 16:00:43

TSR Signing Reports: 358  
R4 - Rush: Three Day

Log all samples to separate L#s. Log all PAHs as SV8270PAHSIM. Log all BTEX samples by 8021.

Sample: L471053-01 Account: ENCANACO Received: 07/29/10 09:00 Due Date: 08/03/10 00:00 RPT Date: 08/04/10 16:00



YOUR LAB OF CHOICE

EnCana Oil & Gas Inc. - CO  
Chris Hines  
2717 County Road 215, Suite 100  
Parachute, CO 81635

Quality Assurance Report  
Level II

L471053

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1-800-767-5859  
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Est. 1970

August 04, 2010

Analyte	Result	Laboratory Blank		Limit	Batch	Date Analyzed
		Units	% Rec			
Benzene	< .0005	mg/kg			WG490720	07/29/10 14:01
Ethylbenzene	< .0005	mg/kg			WG490720	07/29/10 14:01
Toluene	< .005	mg/kg			WG490720	07/29/10 14:01
TPH (GC/FID) Low Fraction	< .1	mg/kg			WG490720	07/29/10 14:01
Total Xylene	< .0015	mg/kg			WG490720	07/29/10 14:01
a,a,a-Trifluorotoluene(FID)		% Rec.	98.08	59-128	WG490720	07/29/10 14:01
a,a,a-Trifluorotoluene(PID)		% Rec.	103.0	54-144	WG490720	07/29/10 14:01
TPH (GC/FID) High Fraction	< 4	ppm			WG490981	07/30/10 13:18
o-Terphenyl		% Rec.	89.17	50-150	WG490981	07/30/10 13:18
Arsenic	< 1	mg/kg			WG490955	07/30/10 23:42
Barium	< .25	mg/kg			WG490955	07/30/10 23:42
Cadmium	< .25	mg/kg			WG490955	07/30/10 23:42
Chromium	< .5	mg/kg			WG490955	07/30/10 23:42
Copper	< 1	mg/kg			WG490955	07/30/10 23:42
Lead	< .25	mg/kg			WG490955	07/30/10 23:42
Selenium	< 1	mg/kg			WG490955	07/30/10 23:42
Silver	< .5	mg/kg			WG490955	07/30/10 23:42
Zinc	< 1.5	mg/kg			WG490955	07/30/10 23:42
Mercury	< .02	mg/kg			WG490972	08/01/10 10:25
pH	5.30	su			WG491011	07/31/10 10:45
1-Methylnaphthalene	< .006	mg/kg			WG490985	08/02/10 08:57
2-Chloronaphthalene	< .006	mg/kg			WG490985	08/02/10 08:57
2-Methylnaphthalene	< .006	mg/kg			WG490985	08/02/10 08:57
Acenaphthene	< .006	mg/kg			WG490985	08/02/10 08:57
Acenaphthylene	< .006	mg/kg			WG490985	08/02/10 08:57
Anthracene	< .006	mg/kg			WG490985	08/02/10 08:57
Benzo(a)anthracene	< .006	mg/kg			WG490985	08/02/10 08:57
Benzo(a)pyrene	< .006	mg/kg			WG490985	08/02/10 08:57
Benzo(b)fluoranthene	< .006	mg/kg			WG490985	08/02/10 08:57
Benzo(g,h,i)perylene	< .006	mg/kg			WG490985	08/02/10 08:57
Benzo(k)fluoranthene	< .006	mg/kg			WG490985	08/02/10 08:57
Chrysene	< .006	mg/kg			WG490985	08/02/10 08:57
Dibenz(a,h)anthracene	< .006	mg/kg			WG490985	08/02/10 08:57
Fluoranthene	< .006	mg/kg			WG490985	08/02/10 08:57
Fluorene	< .006	mg/kg			WG490985	08/02/10 08:57
Indeno(1,2,3-cd)pyrene	< .006	mg/kg			WG490985	08/02/10 08:57
Naphthalene	< .006	mg/kg			WG490985	08/02/10 08:57
Phenanthrene	< .006	mg/kg			WG490985	08/02/10 08:57
Pyrene	< .006	mg/kg			WG490985	08/02/10 08:57
2-Fluorobiphenyl		% Rec.	81.22	21-120	WG490985	08/02/10 08:57
Nitrobenzene-d5		% Rec.	75.07	33-114	WG490985	08/02/10 08:57
p-Terphenyl-d14		% Rec.	98.87	18-142	WG490985	08/02/10 08:57
Chromium,Hexavalent	< 2	mg/kg			WG491136	08/03/10 16:21
Nickel	< 1	mg/kg			WG490955	08/03/10 16:53
* Performance of this Analyte is outside of established criteria. For additional information, please see Attachment A 'List of Analytes with QC Qualifiers.'						



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Chris Hines  
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Quality Assurance Report  
Level II

L471053

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August 04, 2010

Analyte	Result	Laboratory Blank Units % Rec	Limit	Batch	Date Analyzed
Specific Conductance	0.890	umhos/cm		WG491172	08/03/10 15:10

Analyte	Units	Result	Duplicate	RPD	Limit	Ref Samp	Batch
Arsenic	mg/kg	26.0	28.0	7.02	20	L471124-05	WG490955
Barium	mg/kg	100.	85.9	18.1	20	L471124-05	WG490955
Cadmium	mg/kg	0	0	0	20	L471124-05	WG490955
Chromium	mg/kg	13.0	14.8	10.7	20	L471124-05	WG490955
Copper	mg/kg	26.0	30.7	17.3	20	L471124-05	WG490955
Lead	mg/kg	72.0	55.6	25.6*	20	L471124-05	WG490955
Selenium	mg/kg	0	0	0	20	L471124-05	WG490955
Silver	mg/kg	0	0	0	20	L471124-05	WG490955
Zinc	mg/kg	90.0	71.0	23.4*	20	L471124-05	WG490955
Mercury	mg/kg	0.0230	0.0250	8.77	20	L471045-01	WG490972
pH	su	7.60	7.50	1.32*	1	L470825-01	WG491011
Specific Conductance	umhos/cm	120.	120.	1.90	20	L471045-01	WG491172
Chromium,Hexavalent	mg/kg	0	0	0	20	L471047-01	WG491136
Chromium,Hexavalent	mg/kg	0	0	0	20	L471362-04	WG491136
ORP	mV	220.	220.	0	20	L471045-01	WG491167
ORP	mV	200.	200.	1.49	20	L471333-01	WG491167
Nickel	mg/kg	21.0	0	NA	20	L471124-05	WG490955

Analyte	Units	Laboratory Control Sample Known Val Result	% Rec	Limit	Batch
Benzene	mg/kg	.05	0.0535	107.	76-113 WG490720
Ethylbenzene	mg/kg	.05	0.0544	109.	78-115 WG490720
Toluene	mg/kg	.05	0.0541	108.	76-114 WG490720
Total Xylene	mg/kg	.15	0.165	110.	81-118 WG490720
a,a,a-Trifluorotoluene(PID)			101.6	54-144	WG490720
TPH (GC/FID) Low Fraction	mg/kg	5.5	6.09	111.	67-135 WG490720
a,a,a-Trifluorotoluene(FID)			90.80	59-128	WG490720
TPH (GC/FID) High Fraction	ppm	60	51.1	85.1	50-150 WG490981
o-Terphenyl				95.53	50-150 WG490981
Arsenic	mg/kg	192	190.	99.0	78.6-120.8 WG490955
Barium	mg/kg	420	397.	94.5	78.8-121.4 WG490955
Cadmium	mg/kg	70.1	58.0	82.7	78.5-121.5 WG490955
Chromium	mg/kg	168	160.	95.2	80.4-120.2 WG490955
Copper	mg/kg	122	123.	101.	81.6-119.7 WG490955
Lead	mg/kg	113	111.	98.2	77.3-122.1 WG490955
Selenium	mg/kg	176	163.	92.6	75.6-125.0 WG490955

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Analyte	Units	Laboratory Control	Sample	% Rec	Limit	Batch
		Known Val	Result			
Silver	mg/kg	115	106.	92.2	66-133.9	WG490955
Zinc	mg/kg	437	391.	89.5	78.5-121.7	WG490955
Mercury	mg/kg	8.77	9.44	108.	71.6-127.7	WG490972
pH	su	9.36	9.30	99.4	98.9-102.0	WG491011
1-Methylnaphthalene	mg/kg	.033	0.0251	76.1	41-110	WG490985
2-Chloronaphthalene	mg/kg	.033	0.0249	75.5	43-109	WG490985
2-Methylnaphthalene	mg/kg	.033	0.0237	71.8	38-104	WG490985
Acenaphthene	mg/kg	.033	0.0243	73.6	48-103	WG490985
Acenaphthylene	mg/kg	.033	0.0227	68.8	43-106	WG490985
Anthracene	mg/kg	.033	0.0237	72.0	51-110	WG490985
Benzo(a)anthracene	mg/kg	.033	0.0222	67.2	38-126	WG490985
Benzo(a)pyrene	mg/kg	.033	0.0222	67.3	47-118	WG490985
Benzo(b)fluoranthene	mg/kg	.033	0.0198	60.1	47-118	WG490985
Benzo(g,h,i)perylene	mg/kg	.033	0.0224	67.7	40-125	WG490985
Benzo(k)fluoranthene	mg/kg	.033	0.0245	74.2	45-121	WG490985
Chrysene	mg/kg	.033	0.0266	80.5	35-135	WG490985
Dibenz(a,h)anthracene	mg/kg	.033	0.0226	68.5	41-124	WG490985
Fluoranthene	mg/kg	.033	0.0244	73.9	50-114	WG490985
Fluorene	mg/kg	.033	0.0239	72.4	49-109	WG490985
Indeno(1,2,3-cd)pyrene	mg/kg	.033	0.0222	67.2	40-126	WG490985
Naphthalene	mg/kg	.033	0.0244	73.9	36-100	WG490985
Phenanthrene	mg/kg	.033	0.0239	72.3	46-108	WG490985
Pyrene	mg/kg	.033	0.0229	69.5	30-136	WG490985
2-Fluorobiphenyl				93.93	21-120	WG490985
Nitrobenzene-d5				81.37	33-114	WG490985
p-Terphenyl-d14				102.0	18-142	WG490985
Specific Conductance	umhos/cm	406	430.	106.	85-115	WG491172
Chromium, Hexavalent	mg/kg	100	95.5	95.5	50-143	WG491136
ORP	mV	229	220.	96.1	95.6-104.37	WG491167
Nickel	mg/kg	74.1	73.4	99.1	78.8-121.2	WG490955

Analyte	Units	Laboratory Control		Sample Duplicate	Limit	RPD	Limit	Batch
		Result	Ref	%Rec				
Benzene	mg/kg	0.0526	0.0535	105.	76-113	1.59	20	WG490720
Ethylbenzene	mg/kg	0.0535	0.0544	107.	78-115	1.62	20	WG490720
Toluene	mg/kg	0.0531	0.0541	106.	76-114	1.90	20	WG490720
Total Xylene	mg/kg	0.162	0.165	108.	81-118	1.86	20	WG490720
a,a,a-Trifluorotoluene(PID)				101.1	54-144			WG490720
TPH (GC/FID) Low Fraction	mg/kg	5.98	6.09	109.	67-135	1.84	20	WG490720
a,a,a-Trifluorotoluene(FID)				90.29	59-128			WG490720
TPH (GC/FID) High Fraction	ppm	48.3	51.1	80.0	50-150	5.68	25	WG490981
o-Terphenyl				93.98	50-150			WG490981

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Analyte	Units	Laboratory Control		Sample Duplicate		Limit	RPD	Limit	Batch
		Result	Ref	%Rec					
pH	su	9.30	9.30	99.0		98.9-102.0	0	20	WG491011
1-Methylnaphthalene	mg/kg	0.0237	0.0251	72.0		41-110	5.77	24	WG490985
2-Chloronaphthalene	mg/kg	0.0240	0.0249	73.0		43-109	3.88	21	WG490985
2-Methylnaphthalene	mg/kg	0.0232	0.0237	70.0		38-104	2.06	24	WG490985
Acenaphthene	mg/kg	0.0217	0.0243	66.0		48-103	11.4	20	WG490985
Acenaphthylene	mg/kg	0.0205	0.0227	62.0		43-106	10.4	20	WG490985
Anthracene	mg/kg	0.0222	0.0237	67.0		51-110	6.60	22	WG490985
Benzo(a)anthracene	mg/kg	0.0215	0.0222	65.0		38-126	2.92	20	WG490985
Benzo(a)pyrene	mg/kg	0.0205	0.0222	62.0		47-118	8.09	20	WG490985
Benzo(b)fluoranthene	mg/kg	0.0209	0.0198	63.0		47-118	5.05	29	WG490985
Benzo(g,h,i)perylene	mg/kg	0.0213	0.0224	64.0		40-125	4.81	20	WG490985
Benzo(k)fluoranthene	mg/kg	0.0219	0.0245	66.0		45-121	11.0	31	WG490985
Chrysene	mg/kg	0.0232	0.0266	70.0		35-135	13.7	20	WG490985
Dibenz(a,h)anthracene	mg/kg	0.0212	0.0226	64.0		41-124	6.62	20	WG490985
Fluoranthene	mg/kg	0.0211	0.0244	64.0		50-114	14.3	20	WG490985
Fluorene	mg/kg	0.0221	0.0239	67.0		49-109	7.56	19	WG490985
Indeno(1,2,3-cd)pyrene	mg/kg	0.0209	0.0222	63.0		40-126	6.15	20	WG490985
Naphthalene	mg/kg	0.0228	0.0244	69.0		36-100	6.93	24	WG490985
Phenanthrene	mg/kg	0.0223	0.0239	67.0		46-108	6.97	21	WG490985
Pyrene	mg/kg	0.0234	0.0229	71.0		30-136	2.04	20	WG490985
2-Fluorobiphenyl				83.22		21-120			WG490985
Nitrobenzene-d5				75.22		33-114			WG490985
p-Terphenyl-d14				100.0		18-142			WG490985
Specific Conductance	umhos/	430.	430.	106.		85-115	0	20	WG491172
Chromium, Hexavalent	mg/kg	95.0	95.5	95.0		50-143	0.525	20	WG491136
ORP	mV	220.	220.	96.0		95.6-104.37	0	20	WG491167

Analyte	Units	Matrix Spike		TV	% Rec	Limit	Ref Samp	Batch
		MS Res	Ref Res					
Benzene	mg/kg	0.254	0	.05	102.	32-137	L470868-01	WG490720
Ethylbenzene	mg/kg	0.246	0	.05	98.3	10-150	L470868-01	WG490720
Toluene	mg/kg	0.256	0	.05	102.	20-142	L470868-01	WG490720
Total Xylene	mg/kg	0.757	0	.15	101.	16-141	L470868-01	WG490720
a,a,a-Trifluorotoluene(PID)					101.6	54-144		WG490720
TPH (GC/FID) Low Fraction	mg/kg	23.0	0	5.5	83.8	55-109	L470868-01	WG490720
a,a,a-Trifluorotoluene(FID)					92.75	59-128		WG490720
Arsenic	mg/kg	71.1	28.0	50	86.2	75-125	L471124-05	WG490955
Barium	mg/kg	146.	85.9	50	120.	75-125	L471124-05	WG490955
Cadmium	mg/kg	43.6	0	50	87.2	75-125	L471124-05	WG490955
Chromium	mg/kg	60.8	14.8	50	92.0	75-125	L471124-05	WG490955
Copper	mg/kg	81.0	30.7	50	101.	75-125	L471124-05	WG490955
Lead	mg/kg	122.	55.6	50	133.*	75-125	L471124-05	WG490955
Selenium	mg/kg	43.1	0	50	86.2	75-125	L471124-05	WG490955
Silver	mg/kg	48.4	0	50	96.8	75-125	L471124-05	WG490955
Zinc	mg/kg	140.	71.0	50	138.*	75-125	L471124-05	WG490955
Mercury	mg/kg	0.246	0.0250	.25	88.4	70-130	L471045-01	WG490972

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Analyte	Units	MS Res	Matrix Spike		% Rec	Limit	Ref Samp	Batch	
			Ref Res	TV					
Chromium,Hexavalent	mg/kg	19.5	0	20	97.5	50-150	L471045-01	WG491136	
Nickel	mg/kg	62.5	0	50	125.	75-125	L471124-05	WG490955	
Analyte	Units	MSD	Matrix Spike Duplicate		Limit	RPD	Limit	Ref Samp	Batch
			Ref	%Rec					
Benzene	mg/kg	0.241	0.254	96.5	32-137	5.14	39	L470868-01	WG490720
Ethylbenzene	mg/kg	0.220	0.246	88.0	10-150	11.1	44	L470868-01	WG490720
Toluene	mg/kg	0.235	0.256	94.1	20-142	8.46	42	L470868-01	WG490720
Total Xylene	mg/kg	0.672	0.757	89.5	16-141	12.0	46	L470868-01	WG490720
a,a,a-Trifluorotoluene(PID)				100.9	54-144				WG490720
TPH (GC/FID) Low Fraction	mg/kg	18.6	23.0	67.8	55-109	21.1*	20	L470868-01	WG490720
a,a,a-Trifluorotoluene(FID)				93.60	59-128				WG490720
Arsenic	mg/kg	66.9	71.1	77.8	75-125	6.09	20	L471124-05	WG490955
Barium	mg/kg	140.	146.	108.	75-125	4.20	20	L471124-05	WG490955
Cadmium	mg/kg	41.9	43.6	83.8	75-125	3.98	20	L471124-05	WG490955
Chromium	mg/kg	59.0	60.8	88.4	75-125	3.01	20	L471124-05	WG490955
Copper	mg/kg	77.0	81.0	92.6	75-125	5.06	20	L471124-05	WG490955
Lead	mg/kg	121.	122.	131.*	75-125	0.823	20	L471124-05	WG490955
Selenium	mg/kg	41.9	43.1	83.8	75-125	2.82	20	L471124-05	WG490955
Silver	mg/kg	46.5	48.4	93.0	75-125	4.00	20	L471124-05	WG490955
Zinc	mg/kg	136.	140.	130.*	75-125	2.90	20	L471124-05	WG490955
Mercury	mg/kg	0.246	0.246	88.4	70-130	0	20	L471045-01	WG490972
Chromium,Hexavalent	mg/kg	18.3	19.5	91.5	50-150	6.35	20	L471045-01	WG491136
Nickel	mg/kg	64.5	62.5	129.*	75-125	3.15	20	L471124-05	WG490955

Batch number /Run number / Sample number cross reference

WG490720: R1304610: L471053-01  
WG490981: R1306211: L471053-01  
WG490955: R1306675: L471053-01  
WG490972: R1307072: L471053-01  
WG491011: R1307150: L471053-01  
WG490985: R1307689: L471053-01  
WG491167: R1310928: L471053-01  
WG491172: R1310969: L471053-01  
WG491136: R1311089: L471053-01  
WG491239: R1312128: L471053-01

\* \* Calculations are performed prior to rounding of reported values .  
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The data package includes a summary of the analytic results of the quality control samples required by the SW-846 or CWA methods. The quality control samples include a method blank, a laboratory control sample, and the matrix spike/matrix spike duplicate analysis. If a target parameter is outside the method limits, every sample that is effected is flagged with the appropriate qualifier in Appendix B of the analytic report.

Method Blank - an aliquot of reagent water carried through the entire analytic process. The method blank results indicate if any possible contamination exposure during the sample handling, digestion or extraction process, and analysis. Concentrations of target analytes above the reporting limit in the method blank are qualified with the "B" qualifier.

Laboratory Control Sample - is a sample of known concentration that is carried through the digestion/extraction and analysis process. The percent recovery, expressed as a percentage of the theoretical concentration, has statistical control limits indicating that the analytic process is "in control". If a target analyte is outside the control limits for the laboratory control sample or any other control sample, the parameter is flagged with a "J4" qualifier for all effected samples.

Matrix Spike and Matrix Spike Duplicate - is two aliquots of an environmental sample that is spiked with known concentrations of target analytes. The percent recovery of the target analytes also has statistical control limits. If any recoveries that are outside the method control limits, the sample that was selected for matrix spike/matrix spike duplicate analysis is flagged with either a "J5" or a "J6". The relative percent difference (%RPD) between the matrix spike and the matrix spike duplicate recoveries is all calculated. If the RPD is above the method limit, the effected samples are flagged with a "J3" qualifier.