July 24, 2023
Kleinfelder Project No. 20234315.001A

Mr. Jake Janicek
Caerus Piceance, LLC
1001 17th Street #1600
Denver, Colorado 80202

SUBJECT: **Site Investigation Report**
Caerus Piceance, LLC
Remediation Project Number: 25510
RA11 Pad
Garfield County, Colorado

Dear Mr. Janicek:

Kleinfelder Inc. (Kleinfelder) performed soil sampling activities at the RA11 Pad in Garfield County, Colorado under contract by Caerus Piceance LLC (Caerus). Enclosed is the report of work complete for this effort.

Please do not hesitate to contact me at (303) 319-2456 or by email at VDeCianne@kleinfelder.com should you have questions or concerns.

Respectfully submitted,
KLEINFELDER, INC.

Vince DeCianne
VP, Senior Principal Professional

KLEINFELDER 707 17th Street, Suite 3000, Denver, CO 80202 p | 303.237.6601 f | 303.237.6602

SITE INVESTIGATION REPORT
CAERUS PICEANCE, LLC
REMEDIATION PROJECT NUMBER: 25510
RA11 PAD
GARFIELD COUNTY, COLORADO

KLEINFELDER PROJECT NO. 20234315.001A

July 24, 2023

A Report Prepared for:

Caerus Piceance, LLC
1001 17th Street #1600
Denver, CO 80202

SITE INVESTIGATION REPORT
CAERUS PICEANCE, LLC
REMEDIATION PROJECT NUMBER: 25510
RA11 PAD
GARFIELD COUNTY, COLORADO

Prepared by:

Tristan Schmalz
Staff Professional I

Reviewed by:

Vince DeCianne
VP, Senior Principal Professional

KLEINFELDER
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July 24, 2023
Kleinfelder Project No. 20234315.001A

Contents

KLEINFELDER 707 17th Street, Suite 3000, Denver, CO 80202 p | 303.237.6601 f | 303.237.6602

SITE INVESTIGATION REPORT

CAERUS PICEANCE, LLC

REMEDIATION PROJECT NUMBER: 25510

RA11 PAD

GARFIELD COUNTY, COLORADO

1 INTRODUCTION

This document was prepared by Kleinfelder Inc. (Kleinfelder) on behalf of Caerus Piceance, LLC (Caerus) to provide documentation of recent sampling support services conducted at the RA11 Pad located in Garfield County, Colorado (**Figure 1**).

Kleinfelder has been contracted by Caerus to perform soil sampling support services to provide necessary information to complete the Colorado Energy and Carbon Management Commission (ECMC) (formerly Colorado Oil and Gas Conservation Commission (COGCC)) Form 27 for their upstream oil and gas production facilities located in the Piceance Basin. According to the ECMC Form 19 Spill / Release Report Approved (document # 403074356) provided to Kleinfelder by Caerus (**Appendix A),** a dumpline failure was identified upon the discovery of surfaced fluids at the RA11 Pad on April 22, 2022. Caerus proposed soil sampling to characterize the approximate release area from the reported spill under ECMC 913.c.(3) Rule 906: Remediation of Spill and Release pursuant to Rule 912 (refer to **Appendix B**, Approved Form 27 Site Investigation and Remediation Workplan). Kleinfelder collected the soil samples. Samples were analyzed by Pace Analytical National (Pace) laboratory and results are reported herein.

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2 SITE LOCATION AND GEOLOGIC SETTING

The RA11 Pad is located within the Piceance Basin in Garfield County, northwestern Colorado (NENE, Section 11, Township 7 South, Range 94 West) (**Figure 1**). The Piceance Basin is a geologic structural basin consisting of sandstones and siltstones, containing reserves of coal, natural gas, and oil shale.

No surface water or groundwater were encountered during Kleinfelder's soil sampling activities. The general soil type within the release area was classified based on Kleinfelder's field observations using the Unified Soil Classification System (USCS) and were observed as silty sands, sand-silt mixture. Topographical information is provided in **Figure 1**.

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3 FIELD ACTIVITIES

As prescribed within the approved ECMC Form 27 Site Investigation and Remediation Workplan, Kleinfelder performed the following field activities at the RA11 Pad on April 24, 2023, and June 15, 2023.

April 24, 2023

- Collected eight (8) background soil samples from locations north and northwest of the RA11 facility from 1 foot below ground surface (bgs).
- Shipped soil samples to Pace to analyze for the contaminants of concern listed within ECMC Table 915-1, minus organics.

June 15, 2023

- Collected three (3) soil samples from one pothole (PH05) from 7, 9, and 11 feet bgs,
- Screened soil with a photoionization detector (PID) at all soil sample locations, and
- Shipped soil samples to Pace to analyze for total petroleum hydrocarbons (TPH) and sodium adsorption ratio (SAR).

Caerus identified the soil sampling locations for the sampling events. On April 24, 2023, Kleinfelder collected eight (8) background soil samples from locations north and northwest of the RA11 facility from 1 foot bgs. The sample locations were chosen to better reflect the varying soil types encountered in the area.

On June 15, 2023, MK Hydrovac (MK) was directed by Caerus to complete hydrovac potholes at the following sample locations: point of release (POR), PH01, PH02, PH03, and PH05. During the site walk, Kleinfelder and MK observed a large amount of water within the POR excavation. Additionally, several of the previously backfilled potholes had begun to sink. The area had received a large amount of precipitation throughout the winter and into the spring. It is believed the ground was saturated from the moisture. Due to safety concerns, MK did not perform hydrovac activities at the POR, PH01, PH02, and PH03 sample locations. PH05, however, was located on the pad surface and was deemed to be safe for hydrovac operations. MK was tasked by Caerus to complete a hydrovac pothole at the previously sampled PH05 location to a depth of 15 feet bgs. MK was to stop every 2 vertical feet (starting at 7 feet bgs) to allow for Kleinfelder to collect soil samples. Kleinfelder collected one soil sample at 7, 9, and 11 feet bgs

for a total of three (3) soil samples. Refusal was met at approximately 12.5 feet bgs, so the pothole was not continued, and no additional soil samples were collected. Kleinfelder used an EOS Arrow 100 Submeter GNSS receiver to record latitude and longitude at each sample location and the sample locations are shown on **Figures 2a and 2b**.

Soil samples were collected from a stainless-steel hand auger or a stainless-steel hand trowel and placed into four laboratory-supplied, 9-ounce jars with Teflon lids per sample. Each sample was collected directly from the hand auger or trowel from the appropriate depth and placed into the glass jars. The samples were immediately placed on ice in a cooler. Standard chain-of-custody (COC) procedures were used during sampling and transportation to Pace in Mount Juliet, Tennessee (via FEDEX). Background soil samples were analyzed for contaminants of concern listed in ECMC Table 915-1 excluding organics. Site soil samples were analyzed for TPH and SAR.

Sampling equipment (i.e., hand auger cutter head, soil sampler, etc.) was washed with a solution of Liquinox® detergent, rinsed with tap water, and then distilled water between samples. During soil sampling activities, Kleinfelder documented staining and/or odor observations, if any, and screened the soil with a PID. Kleinfelder placed the soil into a Ziploc® plastic bag directly from the hand auger for screening with the PID. The PID is a MiniRAE 3000®, which is owned and maintained by Caerus. Prior to use, Kleinfelder calibrated the PID, which passed calibration. Soil sample conditions and locations are provided in **Table 1**.

4 RESULTS

Kleinfelder observed soil conditions within the release area during the soil sampling activities. Hydrocarbon odors and soil staining were not observed at any sample location. PID readings were all below 2 parts per million (PPM). **Table 1** summarizes the samples and associated field observations.

The sample analytical results for the sample location PH05 did not exceed the ECMC Table 915-1 Residential Soil Screening Levels (RSSLs) for the reduced analyte suite of TPH and SAR (**see Table 2**). Site specific and background laboratory reports are provided in **Appendix C**. Sample locations are provided in **Figures 2a and 2b.**

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5 CONCLUSIONS AND RECOMMENDATIONS

Results from the PH05 samples at 7, 9, and 11 feet bgs indicated no exceedances for TPH and SAR, therefore assessment of No further samples will be collected at PH05. Once the ground adjacent to the POR dries and becomes safe to continue hydrovac operations, Kleinfelder will return and collect additional soil samples at the POR, PH01, PH02, and PH03 sample locations. Samples at each location will be collected every two feet until a depth of 15 feet bgs is reached (i.e., collecting samples at 7, 9, 11, 13, and 15 feet bgs).

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6 LIMITATIONS

Kleinfelder offers various levels of investigative and engineering services to suit the varying needs of different clients. It should be recognized that definition and evaluation of geologic and environmental conditions are a difficult and inexact science. Judgments leading to conclusions and recommendations are generally made with incomplete knowledge of the subsurface conditions present due to the limitations of data from field studies. Although risk can never be eliminated, more detailed and extensive studies yield more information, which may help understand and manage the level of risk. Since detailed study and analysis involves greater expense, our clients participate in determining levels of service that provide adequate information for their purposes at acceptable levels of risk. More extensive studies, including subsurface studies or field tests, should be performed to reduce uncertainties. Acceptance of this report will indicate that Caerus has reviewed the document and determined that it does not need or want a greater level of service than provided.

During the course of the performance of Kleinfelder's services, hazardous materials may have been discovered. Kleinfelder assumes no responsibility or liability whatsoever for any claim, loss of property value, damage, or injury that results from pre-existing hazardous materials being encountered or present on the project site, or from the discovery of such hazardous materials. Nothing contained in this report should be construed or interpreted as requiring Kleinfelder to assume the status of an owner, operator, or generator, or person who arranges for disposal, transport, storage, or treatment of hazardous materials within the meaning of any governmental statute, regulation, or order. Caerus is solely responsible for directing notification of all governmental agencies, and the public at large, of the existence, release, treatment, or disposal of any hazardous materials observed at the project site, either before or during performance of Kleinfelder's services. Caerus is responsible for directing all arrangements to lawfully store, treat, recycle, dispose, or otherwise handle hazardous materials, including cuttings and samples resulting from Kleinfelder’s services.

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FIGURES

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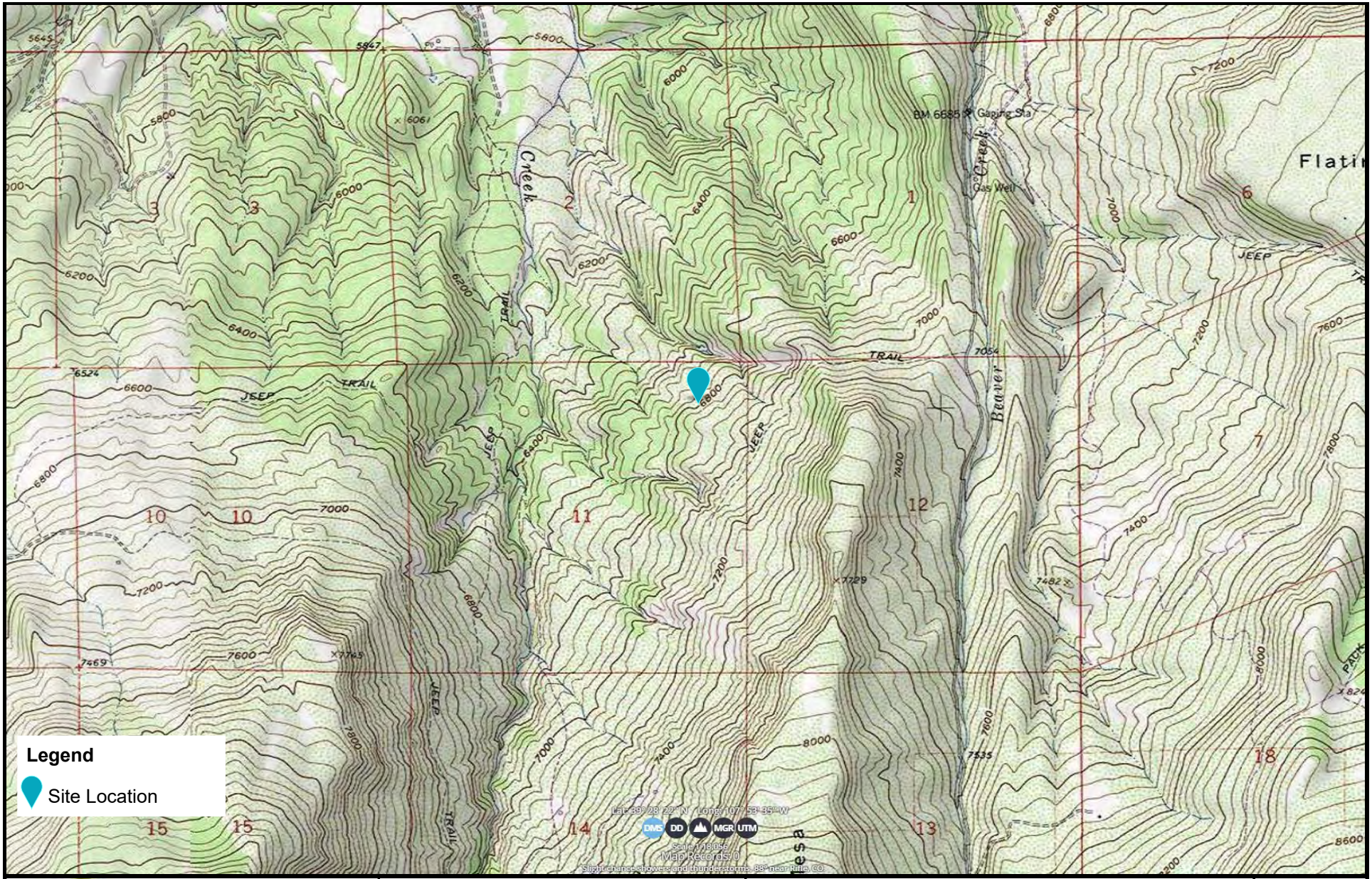

KLEINFELDER Bright People. Right Solutions. www.kleinfelder.com	
PROJECT NO.	20234315.001A
DRAWN:	7/18/2023
DRAWN BY:	T. Schmalz
CHECKED BY:	J. Veith
FILE NAME:	RA11 Figure 1.pub

Topographical Map

Caerus Piceance, LLC
RA11 Pad
NENE Sec. 11 T7S R94W
Garfield County, Colorado

FIGURE

1

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PROJECT NO.	20234315.001A
DRAWN:	4/26/2023
DRAWN BY:	T. Schmalz
CHECKED BY:	J. Veith
FILE NAME:	RA11 Sample Map.pub

Sample Locations

Caerus Piceance, LLC
RA11 Pad
NENE Sec. 11 T7S R94W
Garfield County, Colorado

FIGURE

2a

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PROJECT NO.	20234315.001A
DRAWN:	6/19/2023
DRAWN BY:	T. Schmalz
CHECKED BY:	J. Veith
FILE NAME:	RA11 Sample Map.pub

Sample Locations

Caerus Piceance, LLC
RA11 Pad
NENE Sec. 11 T7S R94W
Garfield County, Colorado

FIGURE

2b

TABLES

KLEINFELDER 707 17th Street, Suite 3000, Denver, CO 80202 p | 303.237.6601 f | 303.237.6602

Table 1

COGCC Soil Sampling

by **Tristan Schmalz** on **4/24/2023 & 6/15/2023** for **Caerus RA11**

Caerus - 2023 Sampling Support Services
20234315.001A
Veith, Jordan

Sample Register

Sample ID	Latitude (deg)	Longitude (deg)	Sample Type	Date	Time	Depth	PID (ppmv)	Odor	Staining	Comments
20230424-RFBG-(RA11-N01)@1	39.459413	-107.847991	Background	04/24/2023	11:10 AM	1 to 1	0	N	N	Soil is grey and yellow
20230424-RFBG-(RA11-N02)@1	39.459865	-107.848406	Background	04/24/2023	11:26 AM	1 to 1	0	N	N	
20230424-RFBG-(RA11-N03)@1	39.460052	-107.848598	Background	04/24/2023	11:37 AM	1 to 1	0	N	N	Soil is grey
20230424-RFBG-(RA11-N04)@1	39.460245	-107.848694	Background	04/24/2023	11:52 AM	1 to 1	0	N	N	Soil is grey and purple
20230424-RFBG-(RA11-NW01)@1	39.458996	-107.848670	Background	04/24/2023	12:20 PM	1 to 1	0	N	N	Soil is grey and purple
20230424-RFBG-(RA11-NW02)@1	39.459107	-107.848902	Background	04/24/2023	12:31 PM	1 to 1	0	N	N	
20230424-RFBG-(RA11-NW03)@1	39.459160	-107.849339	Background	04/24/2023	12:46 PM	1 to 1	0	N	N	
20230424-RFBG-(RA11-NW04)@1	39.459133	-107.849521	Background	04/24/2023	12:58 PM	1 to 1	0	N	N	
20230615-RA11-(PH05)@7	39.458850	-107.847378	Other	06/15/2023	08:48 AM	7 to 7	1.5	N	N	
20230615-RA11-(PH05)@9	39.458850	-107.847378	Other	06/15/2023	09:47 AM	9 to 9	0	N	N	
20230615-RA11-(PH05)@11	39.458850	-107.847378	Other	06/15/2023	10:54 AM	11 to 11	0	N	N	Refusal met at approximately 12.5 feet. Soil was purple in color

Table 2 - Soil Analytical Results
Caerus Piceance, LLC
Remediation Project # 25510
RA11Pad
Garfield County, Colorado

Location ID		RFBG-(RA11-N01)	RFBG-(RA11-N02)	RFBG-(RA11-N03)	RFBG-(RA11-N04)	RFBG-(RA11-NW01)	RFBG-(RA11-NW02)	RFBG-(RA11-NW03)	RFBG-(RA11-NW04)	RA 11-(PH05)	RA 11-(PH05)	RA 11-(PH05)
Sample Date		4/24/2023	4/24/2023	4/24/2023	4/24/2023	4/24/2023	4/24/2023	4/24/2023	4/24/2023	6/15/2023	6/15/2023	6/15/2023
Sample ID		20230424-RFBG-(RA11-N01)@1	20230424-RFBG-(RA11-N02)@1	20230424-RFBG-(RA11-N03)@1	20230424-RFBG-(RA11-N04)@1	20230424-RFBG-(RA11-NW01)@1	20230424-RFBG-(RA11-NW02)@1	20230424-RFBG-(RA11-NW03)@1	20230424-RFBG-(RA11-NW04)@1	20230615-RA 11-(PH05)@7	20230615-RA 11-(PH05)@9	20230615-RA 11-(PH05)@11
Sample Depth (ft bgs)		1	1	1	1	1	1	1	1	7	9	11
Contaminant of Concern	**Cleanup Concentration (mg/kg unless otherwise noted)**											
Soil TPH (total volatile [C6-C10] and extractable [C10-C36] hydrocarbons)	500	NM	NM	NM	NM	NM	NM	NM	NM	0.61	0.105	0.0407
TPH Low Fraction GRO (C6-C10)		NM	NM	NM	NM	NM	NM	NM	NM	0.0932 B J	0.105 B	0.0407 B J
DRO (C10-C28)		NM	NM	NM	NM	NM	NM	NM	NM	U	U	U
MRO (C28-C36)		NM	NM	NM	NM	NM	NM	NM	NM	0.519	U	U
Soils and Groundwater - liquid hydrocarbons including condensate and oil	Below Visual Detection Limits	Below Visual Detection Limits	Below Visual Detection Limits	Below Visual Detection Limits	Below Visual Detection Limits	Below Visual Detection Limits	Below Visual Detection Limits	Below Visual Detection Limits	Below Visual Detection Limits	Below Visual Detection Limits	Below Visual Detection Limits	Below Visual Detection Limits
Electrical conductivity (EC) (by saturated paste method)	<4mmhos/cm	0.111	0.174	2.310	0.179	0.176	0.354	1.490	0.135	NM	NM	NM
Sodium adsorption ratio (SAR) (by saturated paste method)	<6 SAR units	0.386	1.88	0.0329	0.111	2.85	2.42	16.2	0.925	4.44	1.80	2.81
pH (by saturated paste method)	6–8.3 pH units	8.80 T8	8.73 T8	6.54 T8	7.23 T8	8.92 T8	9.44 T8	8.31 T8	8.72 T8	NM	NM	NM
Boron (hot water soluble soil extract)	2 mg/L	0.149 B J	0.370	0.137 J	0.170 J	0.220	0.260 J	0.483	0.198 J	NM	NM	NM
Organic Compounds in Soils	**Residential Soil Screening Level Concentrations**											
benzene	1.2	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
toluene	490	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
ethylbenzene	5.8	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
xylenes (sum of o-, m- and p- isomers = total xylenes)	58	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
1,2,4-trimethylbenzene	30	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
1,3,5-trimethylbenzene	27	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
acenaphthene	360	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
anthracene	1800	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
benz(a)anthracene	1.1	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
benzo(b)fluoranthene	1.1	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
benzo(k)fluoranthene	11	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
benzo(a)pyrene	0.11	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
chrysene	110	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
dibenz(a,h)anthracene	0.11	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
fluoranthene	240	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
fluorene	240	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
indeno(1,2,3-cd)pyrene	1.1	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
pyrene	180	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
1-methylnaphthalene	18	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
2-methylnaphthalene	24	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
naphthalene	2	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
Metals in Soils	**Residential Soil Screening Level Concentrations**											
arsenic	0.68	2.48 O1	5.10	17.0	3.61	5.40	5.21	8.43	9.28	NM	NM	NM
barium	15000	1110	178	439	82.0	255	258	74.7	200	NM	NM	NM
cadmium	71	0.275 J	0.835 J	0.836 J	0.153 J	<0.0855 U	1.26	<0.0855 U	1.08	NM	NM	NM
chromium (VI)	0.3	<0.255 U	<0.255 U	<0.255 U	<0.255 U	<0.255 U	<0.255 U	<0.255 U	<0.255 U	NM	NM	NM
copper	3100	16.3	18.1	15.1	16.1	23.3	24.4	23.8	16.8	NM	NM	NM
lead	400	7.85	12.0	14.2	10.7	10.7	15.9	19.4	13.7	NM	NM	NM
nickel	1500	17.8	25.5	16.1	33.2	50.0	29.9	10.2	23.5	NM	NM	NM
selenium	390	0.529 J O1	0.601 J	0.840 J	0.519 J	1.33 J	0.419 J	0.511 J	0.435 J	NM	NM	NM
silver	390	<0.0865 U O1	<0.0865 U	<0.0865 U	<0.0865 U	0.0871 J	<0.0865 U	<0.0865 U	<0.0865 U	NM	NM	NM
zinc	23000	59.8 O1	85.4	60.2	88.6	146	106	46.8	81.2	NM	NM	NM

NOTES:

Greater than Table 915-1 Residential Soil Screening Level (RSSL) Concentrations

Greater than Table 915-1 Standards, but less than adjusted standards (Highest background level is the adjusted standard for inorganics; 1.25X highest background level for metals).

B = The same analyte is found in the associated blank.
BG = background sample
ft bgs = feet below ground surface
J = The identification of the analyte is acceptable: the reported value is an estimate
MCL = maximum contaminant level
mg/kg = milligram per kilogram
mg/L = milligram per liter
mmhos/cm = millimhos per centimeter
NM = Not measured
O1 = The analyte failed the method required serial dilution test and/or subsequent post-spike criteria. These failures indicate matrix interference.
PH = pothole
T8 = Samples received past/too close to holding time expiration.
U = Not detected at the Reporting Limit (or MDL where applicable).

APPENDIX A

ECMC FORM 19 SPILL / RELEASE REPORT

KLEINFELDER 707 17th Street, Suite 3000, Denver, CO 80202 p | 303.237.6601 f | 303.237.6602

FORM 19 Rev 03/21

State of Colorado
Oil and Gas Conservation Commission

1120 Lincoln Street, Suite 801, Denver, Colorado 80203
Phone: (303) 894-2100 Fax: (303) 894-2109

Document Number: 403074356
Date Received: 06/09/2022

Spill report taken by: FISCHER, ALEX

Spill/Release Point ID: 482310

SPILL/RELEASE REPORT (INITIAL)

This form is to be submitted by the party responsible for the oil and gas spill or release. Refer to COGCC Rule 912.b. for reporting requirements of spills or releases of E&P Waste, produced Fluids, or unauthorized Releases of natural gas. Submit a Site Investigation and Remediation Workplan (Form 27) if Rule 913.c. applies.

OPERATOR INFORMATON

Name of Operator: CAERUS PICEANCE LLC Operator No: 10456

Address: 1001 17TH STREET #1600

City: DENVER State: CO Zip: 80202

Contact Person: Brett Middleton

Phone Numbers

Phone: (970) 285.2739

Mobile: (970) 987.4650

Email: bmiddleton@caerusoilandgas.com

INITIAL SPILL/RELEASE REPORT

Initial Spill/Release Report Doc# 403074356

Initial Report Date: 06/09/2022 Date of Discovery: 06/09/2022 Spill Type: Recent Spill

Spill/Release Point Location:

QTRQTR NENE SEC 11 TWP 7S RNG 94W MERIDIAN 6

Latitude: 39.458841 Longitude: -107.847325

`Municipality (if within municipal boundaries): County: GARFIELD

Enter Lat./long measurement of the actual Spill/Release Point. Lat./Long. Data shall meet standards of Rule 216.

Reference Location:

Facility Type: WELL SITE [X] Facility/Location ID No 334688

Spill/Release Point Name: RA11 Dumpline Release

[ ] Well API No. (Only if the reference facility is well) 05- -

[ ] No Existing Facility or Location ID No.

Estimated Total Spill Volume: use same ranges as others for values

Estimated Oil Spill Volume(bbl): 0 Estimated Condensate Spill Volume(bbl): Unknown

Estimated Flow Back Fluid Spill Volume(bbl): 0 Estimated Produced Water Spill Volume(bbl): Unknown

Estimated Other E&P Waste Spill Volume(bbl): 0 Estimated Drilling Fluid Spill Volume(bbl): 0

Specify:

Has the subject Spill/Release been controlled at the time of reporting? Yes

Land Use:

Current Land Use: NON-CROP LAND Other(Specify):

Weather Condition: clear

Surface Owner: FEDERAL Other(Specify): BLM

Describe what is known about the spill/release event (what happened -- including how it was stopped, contained, and recovered):

Operator identified a dumpline failure which surfaced on location.

List of Agencies and Other Parties Notified Pursuant to Rule 912.b.(7)-(11):

OTHER NOTIFICATIONS

Date	Agency/Party	Contact	Phone	Response
6/9/2022	GARCO	Kirby Wynn	970-987..2557	email
6/9/2022	BLM	Doug Jones	970-309.2188	email
6/9/2022	CPW	Taylor Elm	970-986.9767	email

REPORT CRITERIA

Rule 912.b.(1) Report to the Director (select all criteria that apply):

No — Rule 912.b.(1).A: A Spill or Release of any size that impacts or threatens to impact any Waters of the State, Public Water System, residence or occupied structure, livestock, wildlife, or publicly-maintained road.

Waters of the State: _____ Public Water System: _____

Residence or Occupied Structure: _____ Livestock: _____

Wildlife: _____ Publicly-Maintained Road: _____

Yes — Rule 912.b.(1).B: A Spill or Release in which 1 barrel or more of E&P Waste or produced fluids is spilled or released outside of berms or other secondary containment.

No — Rule 912.b.(1).C: A Spill or Release of 5 barrels or more of E&P Waste or produced Fluids regardless of whether the Spill or Release is completely contained within berms or other secondary containment.

No — Rule 912.b.(1).D: Within 6 hours of discovery, a Grade 1 Gas Leak. For a Grade 1 Gas Leak from a Flowline, the Operator also must submit the Form 19 – Initial, document number on a Form 44, Flowline Report, for the Grade 1 Gas Leak

Enter the approximate time of discovery _____(HH:MM)

Enter the Document Number of the Grade 1 Gas Leak Report, Form 44 _____

Was there a reportable accident associated with either a Grade 1 Gas Leak or an E&P waste spill or release? _____

Enter the Document Number of the Initial Accident Report, Form 22 _____

Was there damage during excavation? _____

Was CO 811 notified prior to excavation? _____

No — Rule 912.b.(1).E: The discovery of 10 cubic yards or more of impacted material resulting from a current or historic Spill or Release. Discovery and reporting will not be contingent upon confirmation samples demonstrating exceedance of Table 915-1 standards.

Estimated Volume of Impacted Solids (cu. yd.): _____

No — Rule 912.b.(1).F: The discovery of impacted Waters of the State, including Groundwater. Discovery and reporting will not be contingent upon confirmation samples demonstrating exceedance of Table 915-1 standards. The presence of free product or hydrocarbon sheen on Groundwater or surface water is reportable. The presence of contaminated soil in contact with Groundwater or surface water is reportable. Check all that apply:

- ☐ The presence of free product or hydrocarbon sheen Surface Water
- ☐ The presence of free product or hydrocarbon sheen on Groundwater
- ☐ The presence of contaminated soil in contact with Groundwater
- ☐ The presence of contaminated soil in contact with Surface water

Yes — Rule 912.b.(1).G: A suspected or actual Spill or Release of any volume where the volume cannot be immediately determined, including a spill or release of any volume that daylights from the subsurface.

No — Rule 912.b.(1).H: Spill or Release resulting in vaporized hydrocarbon mists that leave the Oil and Gas Location or Off-Location Flowline right of way from an Oil and Gas Location and impacts or threatens to impact off-location property.

☐ Areas offsite of Oil & Gas Location ☐ Off-Location Flowline right of way

No — Rule 912.b.(1).I: A Release of natural gas that results in an accumulation of soil gas or gas seeps.

No — Rule 912.b.(1).J: A Release that results in natural gas in Groundwater.

OPERATOR COMMENTS:

I hereby certify all statements made in this form are to the best of my knowledge true, correct, and complete.

Signed: Print Name: Brett Middleton

Title: Environmental Lead Date: 06/09/2022 Email: bmiddleton@caerusoilandgas.com

Condition of Approval

COA Type	Description
	Assess nature and extent of contamination with confirmation soil samples. The operator shall comply with Rule 915.e.(2) for collection of soil samples. The operator shall notify the COGCC and comply with Rule 915.e.(3) if groundwater is encountered during cleanup operations.
	Operator shall collect sample(s) from comparable, nearby non-impacted native soil for purposes of establishing background soil conditions including pH, electrical conductivity (EC) and sodium adsorption ratio (SAR), per Rule 915.e.(2).D.
	Submit photo documentation, as described in Rule 912.b.(4).B, via a Supplemental Form 19.
	Additional information required by Rule 912.b.(4) shall be submitted on a supplemental spill report no later than ten days after discovery (reported Discovery Date: 06/09/2022). Within 90 days of spill discovery date, Operator shall comply with Spill/Release closure requirements outlined in Rule 912.b.(6).
	In the Supplemental eForm 19, identify the root cause of the failure and explain how reoccurrence on this flowline and the other flowlines associated with this pad will be prevented, per Rule 912.d.(3). Operator shall coordinate with COGCC Integrity Unit, Mark Schlagenhauf, regarding dumpline excavation, assessment, and repair.
	Delineate horizontal and vertical extent of impacted area using the Table 915-1 Protection of Groundwater Soil Screening Level Concentrations and remediate impacts to Table 915-1 standards. Provide documentation in either a Supplemental eForm 19 if cleaned up immediately and/or Initial eForm 27 if additional site investigation and remediation is required OR if groundwater is encountered during cleanup operations. Documentation must include a figure showing spill area with sample locations plus laboratory results.
6 COAs	

Attachment List

Att Doc Num	Name
403074356	SPILL/RELEASE REPORT(INITIAL)
403074813	FORM 19 SUBMITTED

Total Attach: 2 Files

General Comments

User Group	Comment	Comment Date
		Stamp Upon Approval

Total: 0 comment(s)

FORM 19 Rev 03/21

State of Colorado
Oil and Gas Conservation Commission

1120 Lincoln Street, Suite 801, Denver, Colorado 80203
Phone: (303) 894-2100 Fax: (303) 894-2109

Document Number: 403082834
Date Received: 06/17/2022

Spill report taken by: FISCHER, ALEX

Spill/Release Point ID: 482310

SPILL/RELEASE REPORT (SUPPLEMENTAL)

This form is to be submitted by the party responsible for the oil and gas spill or release. Refer to COGCC Rule 912.b. for reporting requirements of spills or releases of E&P Waste, produced Fluids, or unauthorized Releases of natural gas. Submit a Site Investigation and Remediation Workplan (Form 27) if Rule 913.c. applies.

OPERATOR INFORMATON

Name of Operator: CAERUS PICEANCE LLC Operator No: 10456
Address: 1001 17TH STREET #1600
City: DENVER State: CO Zip: 80202
Contact Person: Jake Janicek

Phone Numbers
Phone: (970) 778-2314
Mobile: (970) 778-2314
Email: jjanicek@caerusoilandgas.com

☐ Transfer of Operatorship: Pursuant to Rule 912.f, this Supplemental Form 19 is being submitted to designate the Buying Operator as the responsible Operator for this Spill and Release.

INITIAL SPILL/RELEASE REPORT

Initial Spill/Release Report Doc# 403074356

Initial Report Date: 06/09/2022 Date of Discovery: 06/09/2022 Spill Type: Recent Spill

Spill/Release Point Location:

QTRQTR NENE SEC 11 TWP 7S RNG 94W MERIDIAN 6
Latitude: 39.458867 Longitude: -107.847270
`Municipality (if within municipal boundaries): County: GARFIELD

Enter Lat./long measurement of the actual Spill/Release Point. Lat./Long. Data shall meet standards of Rule 216.

Reference Location:

Facility Type: WELL SITE ☒ Facility/Location ID No 334688
Spill/Release Point Name: RA11 Dumpline Release ☐ Well API No. (Only if the reference facility is well) 05- -
☐ No Existing Facility or Location ID No.

Estimated Total Spill Volume: use same ranges as others for values

Estimated Oil Spill Volume(bbl): 0 Estimated Condensate Spill Volume(bbl): Unknown
Estimated Flow Back Fluid Spill Volume(bbl): 0 Estimated Produced Water Spill Volume(bbl): Unknown
Estimated Other E&P Waste Spill Volume(bbl): 0 Estimated Drilling Fluid Spill Volume(bbl): 0
Specify:

Has the subject Spill/Release been controlled at the time of reporting? Yes

Land Use:

Current Land Use: NON-CROP LAND Other(Specify):
Weather Condition: clear
Surface Owner: FEDERAL Other(Specify): BLM

Describe what is known about the spill/release event (what happened -- including how it was stopped, contained, and recovered):

Operator identified a dumpline failure which surfaced on location.

List of Agencies and Other Parties Notified Pursuant to Rule 912.b.(7)-(11):

OTHER NOTIFICATIONS

Date	Agency/Party	Contact	Phone	Response
6/9/2022	GARCO	Kirby Wynn	970-987..2557	email
6/9/2022	BLM	Doug Jones	970-309.2188	email
6/9/2022	CPW	Taylor Elm	970-986.9767	email

REPORT CRITERIA

Rule 912.b.(1) Report to the Director (select all criteria that apply):

No — Rule 912.b.(1).A: A Spill or Release of any size that impacts or threatens to impact any Waters of the State, Public Water System, residence or occupied structure, livestock, wildlife, or publicly-maintained road.

Waters of the State: _____ Public Water System: _____

Residence or Occupied Structure: _____ Livestock: _____

Wildlife: _____ Publicly-Maintained Road: _____

Yes — Rule 912.b.(1).B: A Spill or Release in which 1 barrel or more of E&P Waste or produced fluids is spilled or released outside of berms or other secondary containment.

No — Rule 912.b.(1).C: A Spill or Release of 5 barrels or more of E&P Waste or produced Fluids regardless of whether the Spill or Release is completely contained within berms or other secondary containment.

No — Rule 912.b.(1).D: Within 6 hours of discovery, a Grade 1 Gas Leak. For a Grade 1 Gas Leak from a Flowline, the Operator also must submit the Form 19 – Initial, document number on a Form 44, Flowline Report, for the Grade 1 Gas Leak

Enter the approximate time of discovery _____(HH:MM)

Enter the Document Number of the Grade 1 Gas Leak Report, Form 44 _____

Was there a reportable accident associated with either a Grade 1 Gas Leak or an E&P waste spill or release? _____

Enter the Document Number of the Initial Accident Report, Form 22 _____

Was there damage during excavation? _____

Was CO 811 notified prior to excavation? _____

No — Rule 912.b.(1).E: The discovery of 10 cubic yards or more of impacted material resulting from a current or historic Spill or Release. Discovery and reporting will not be contingent upon confirmation samples demonstrating exceedance of Table 915-1 standards.

Estimated Volume of Impacted Solids (cu. yd.): _____

No — Rule 912.b.(1).F: The discovery of impacted Waters of the State, including Groundwater. Discovery and reporting will not be contingent upon confirmation samples demonstrating exceedance of Table 915-1 standards. The presence of free product or hydrocarbon sheen on Groundwater or surface water is reportable. The presence of contaminated soil in contact with Groundwater or surface water is reportable. Check all that apply:

- ☐ The presence of free product or hydrocarbon sheen Surface Water
- ☐ The presence of free product or hydrocarbon sheen on Groundwater
- ☐ The presence of contaminated soil in contact with Groundwater
- ☐ The presence of contaminated soil in contact with Surface water

Yes — Rule 912.b.(1).G: A suspected or actual Spill or Release of any volume where the volume cannot be immediately determined, including a spill or release of any volume that daylights from the subsurface.

No — Rule 912.b.(1).H: Spill or Release resulting in vaporized hydrocarbon mists that leave the Oil and Gas Location or Off-Location Flowline right of way from an Oil and Gas Location and impacts or threatens to impact off-location property.

☐ Areas offsite of Oil & Gas Location ☐ Off-Location Flowline right of way

No — Rule 912.b.(1).I: A Release of natural gas that results in an accumulation of soil gas or gas seeps.

No — Rule 912.b.(1).J: A Release that results in natural gas in Groundwater.

SPILL/RELEASE DETAIL REPORTS

#1 Supplemental Report Date: 06/17/2022

FLUIDS	BBL's SPILLED	BBL's RECOVERED	Unknown
OIL	0	0	☐
CONDENSATE	0	0	☐
PRODUCED WATER			☒
DRILLING FLUID	0	0	☐
FLOW BACK FLUID	0	0	☐
OTHER E&P WASTE	0	0	☐

specify:

Was spill/release completely contained within berms or secondary containment? NO Was an Emergency Pit constructed? NO

*Secondary containment, **including walls & floor regardless of construction material**, must be sufficiently impervious to contain any discharge from primary containment until cleanup occurs.*

A Form 15 Pit Report shall be submitted within 30 calendar days after the construction of an emergency pit

Impacted Media (Check all that apply) ☒ Soil ☐ Groundwater ☐ Surface Water ☐ Dry Drainage Feature

Surface Area Impacted: Length of Impact (feet): Width of Impact (feet):

Depth of Impact (feet BGS): Depth of Impact (inches BGS):

How was extent determined?

It will be determined via field observations and laboratory analytical data of soil samples.

Soil/Geology Description:

Torriorthents-Rock outcrop complex, steep

Depth to Groundwater (feet BGS) 650 Number Water Wells within 1/2 mile radius: 1

If less than 1 mile, distance in feet to nearest

Water Well	2386	None ☐	Surface Water	2778	None ☐
Wetlands		None ☒	Springs		None ☒
Livestock		None ☒	Occupied Building	2558	None ☐

Additional Spill Details Not Provided Above:

The depth to groundwater value listed above is an estimate based on the nearest water well which is identified as DWR Permit # 177190. Documents associated with that well list that the well was drilled to 600 feet and no water was found.

REQUEST FOR CLOSURE

Spill/Release Reports should be closed when impacts have been remediated or when further investigation and corrective actions will take place under an approved Form 27.

Basis for Closure:

- ☐ Corrective Actions Completed (documentation attached, check all that apply)
  - ☐ Horizontal and Vertical extents of impacts have been delineated.
  - ☐ Documentation of compliance with Table 915-1 is attached.
  - ☐ All E&P Waste has been properly treated or disposed.
- ☐ Work proceeding under an approved Form 27 (Rule 912.c).
  - Form 27 Remediation Project No: _____
- ☐ SUSPECTED Spill/Release did not occur or was below Rule 912.a.(5) reporting thresholds.

OPERATOR COMMENTS:

Please see attached photo documentation for photographs of the failure point. The GPS coordinates were also updated in the "Spill/Release Point Location" section of this form.

I hereby certify all statements made in this form are to the best of my knowledge true, correct, and complete.

Signed: _____ Print Name: Jake Janicek

Title: EHS Specialist Date: 06/17/2022 Email: jjanicek@caerusoilandgas.com

Condition of Approval

COA Type	Description
0 COA	

Attachment List

Att Doc Num	Name
403082834	SPILL/RELEASE REPORT(SUPPLEMENTAL)
403082845	PHOTO DOCUMENTATION
403082848	TOPOGRAPHIC MAP
403089051	FORM 19 SUBMITTED

Total Attach: 4 Files

General Comments

User Group	Comment	Comment Date
Environmental	Comply with outstanding COAs.	06/24/2022

Total: 1 comment(s)

APPENDIX B

ECMC FORM 27 SITE INVESTIGATION AND REMEDIATION WORKPLAN

KLEINFELDER 707 17th Street, Suite 3000, Denver, CO 80202 p | 303.237.6601 f | 303.237.6602

FORM 27 Rev 5/22

State of Colorado
Oil and Gas Conservation Commission

1120 Lincoln Street, Suite 801, Denver, Colorado 80203
Phone: (303) 894-2100 Fax: (303) 894-2109

Document Number: 403284187
Receive Date: 01/19/2023
Report taken by: Steven Arauza

Site Investigation and Remediation Workplan (Supplemental Form)

This form shall be submitted to the Director for approval prior to the initiation of site investigation and remediation activities. However, this shall not preclude the Operator from taking immediate action to protect public health or safety, the environment, wildlife, or livestock.
This Form 27 describes site conditions as currently understood by the Operator; approval of this Form 27 by COGCC is based on the site conditions accurately described herein; any changes in site conditions identified during or subsequent to the performance of the approved workplan may necessitate additional investigation or remediation which shall be described on a supplemental Form 27.
This Form 27 is intended to provide basic information regarding the proposed site investigation and remediation actions, but the workplan may be more fully described in attached documentation.
Closure request is not available for an Initial Site Investigation and Remediation Workplan.

OPERATOR INFORMATON

Name of Operator: CAERUS PICEANCE LLC Operator No: 10456
Address: 1001 17TH STREET #1600
City: DENVER State: CO Zip: 80202
Contact Person: Jake Janicek Email: jjanicek@caerusoilandgas.com

Phone Numbers
Phone: (970) 778-2314
Mobile: (970) 778-2314

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION

Remediation Project #: 25510 Initial Form 27 Document #: 403140056

PURPOSE INFORMATION

- [ ] Rule 913.c.(1): Pit or Cuttings Trench closure.
- [ ] Rule 913.c.(2): Buried or partially buried vessel closure, which will be by removal.
- [X] Rule 913.c.(3): Remediation of Spill and Releases pursuant to Rule 912.
- [ ] Rule 913.c.(4): Land treatment of Oily Waste pursuant to Rule 905.e.
- [ ] Rule 913.c.(5): Closure of Centralized E&P Waste Management Facilities pursuant to Rule 907.h.
- [ ] Rule 913.c.(6): Remediation of impacted Groundwater pursuant to Rule 915.e.(3).D, and the contaminant concentrations in Table 915-1.
- [ ] Rule 913.c.(7): Investigation and remediation of natural gas in soil or Groundwater.
- [ ] Rule 913.c.(8): When requested by the Director due to any potential risk to soil, Groundwater, or surface water.
- [ ] Rule 913.c.(9): Decommissioning of Oil and Gas Facilities.
- [ ] Rule 913.g: Changes of Operator.
- [ ] Rule 915.b: Request to leave elevated inorganics in situ.
- [ ] Other:

SITE INFORMATION

No Multiple Facilities

Facility Type: SPILL OR RELEASE Facility ID: 482310 API #: County Name: GARFIELD
Facility Name: RA11 Dumpline Release Latitude: 39.458841 Longitude: -107.847325
** correct Lat/Long if needed: Latitude: Longitude:
QtrQtr: NENE Sec: 11 Twp: 7S Range: 94W Meridian: 6 Sensitive Area? Yes

SITE CONDITIONS

General soil type - USCS Classifications CL
Most Sensitive Adjacent Land Use Rangeland/grazing
Is domestic water well within 1/4 mile? No
Is surface water within 1/4 mile? Yes
Is groundwater less than 20 feet below ground surface? No

Other Potential Receptors within 1/4 mile

SITE INVESTIGATION PLAN

TYPE OF WASTE:

- [X] **E&P Waste**
  - [X] Produced Water
  - [ ] Oil
  - [ ] Condensate
  - [ ] Drilling Fluids
  - [ ] Drill Cuttings
- [ ] **Other E&P Waste**
  - [ ] Workover Fluids
  - [ ] Tank Bottoms
  - [ ] Pigging Waste
  - [ ] Rig Wash
  - [ ] Spent Filters
  - [ ] Pit Bottoms
  - [ ] Other (as described by EPA)
- [ ] **Non-E&P Waste**

DESCRIPTION OF IMPACT

Impacted?	Impacted Media	Extent of Impact	How Determined
Yes	SOILS	To be determined	Laboratory analysis

INITIAL ACTION SUMMARY

Description of initial action or emergency response measures take to abate, investigate, and/or remediate impacts associated with E&P Waste.

Please see documents previously submitted for COGCC Spill Release Point ID 482310 and COGCC Remediation Project # 25510.

PROPOSED SAMPLING PLAN

Proposed Soil Sampling

[X] Will soil samples be collected as part of this investigation? (Number, type (grab/composite), analyses, and locations of samples):

Approximately eight more background soil samples will be collected north of the RA11 facility from a depth of 1 foot below ground surface (bgs) to further address inorganic exceedances (see attached proposed sample map). These samples will be analyzed for SAR only.

Proposed Groundwater Sampling

[ ] Will groundwater samples be collected as part of this investigation? (Number, analyses, and locations of samples):

Caerus does not anticipate encountering groundwater associated with the release. If groundwater is encountered, Caerus will notify the COGCC and attempt to collect a representative sample for analysis.

Proposed Surface Water Sampling

[ ] Will surface water samples be collected as part of this investigation? (Number, analyses, and locations of samples):

Additional Investigative Actions

[ ] Additional alternative investigative actions described in attached Site Investigation Plan (summary):

SITE INVESTIGATION REPORT

SAMPLE SUMMARY

Soil **NA / ND**

Number of soil samples collected 11 -- Highest concentration of TPH (mg/kg) 684.64

Number of soil samples exceeeding 915-1 11 -- Highest concentration of SAR 21

Was the areal and vertical extent of soil contamination delineated? Yes BTEX > 915-1 Yes

Approximate areal extent (square feet) 1423 Vertical Extent > 915-1 (in feet) 0

Groundwater

Number of groundwater samples collected 0 Highest concentration of Benzene (µg/l)

Was extent of groundwater contaminated delineated? No Highest concentration of Toluene (µg/l)

Depth to groundwater (below ground surface, in feet) Highest concentration of Ethylbenzene (µg/l)

Number of groundwater monitoring wells installed Highest concentration of Xylene (µg/l)

Number of groundwater samples exceeding 915-1 Highest concentration of Methane (mg/l)

Surface Water

0 Number of surface water samples collected

Number of surface water samples exceeding 915-1

If surface water is impacted, other agency notification may be required.

OTHER INVESTIGATION INFORMATION

☐ Were impacts to adjacent property or offsite impacts identified?

☒ Were background samples collected as part of this site investigation?

15 background samples were collected ranging from 1-13 feet bgs north, south, east, and west of the facility.

☐ Was investigation derived waste (IDW) generated as part of this investigation?

Volume of solid waste (cubic yards) Volume of liquid waste (barrels)

☒ Is further site investigation required?

See previous section.

REMEDIAL ACTION PLAN

Does this Supplemental Form 27A include changes to a previously approved Remedial Action Plan? Yes

SOURCE REMOVAL SUMMARY

Describe how source is to be removed.

The failed dumpline will be replaced.

REMEDIATION SUMMARY

Describe how remediation of existing impacts to soil and groundwater is to be accomplished (i.e. summarize remedial action plan). Provide a brief narrative description including: technical justification, schedule for implementation, estimated time to attain NFA status, plus plans and specifications for the selected remedial action technology.

See document #403140056 for this information.

Soil Remediation Summary

☐ **In Situ**

Bioremediation (or enhanced bioremediation)

Chemical oxidation

Air sparge / Soil vapor extraction

☒ **Ex Situ**

Yes Excavate and offsite disposal

If Yes: Estimated Volume (Cubic Yards) 475

Name of Licensed Disposal Facility or COGCC Facility ID #

Natural Attenuation

Other

Excavate and onsite remediation

Land Treatment

Bioremediation (or enhanced bioremediation)

Chemical oxidation

Other

Groundwater Remediation Summary

No Bioremediation (or enhanced bioremediation)

Chemical oxidation

Air sparge / Soil vapor extraction

Natural Attenuation

Other

GROUNDWATER MONITORING

If groundwater has been impacted, describe proposed monitoring plan, including # of wells or sample points, monitoring schedule, analytical methods, points of compliance. Attach a groundwater monitoring location diagram.

REMEDIATION PROGRESS UPDATE

PERIODIC REPORTING

Approved Reporting Schedule:

[X] Quarterly [ ] Semi-Annually [ ] Annually [ ] Other

[ ] **Request Alternative Reporting Schedule:**

[ ] Semi-Annually [ ] Annually [ ] Other

Rule 913.e:
After initial approval of a Form 27, the Operator will provide quarterly update reports in a Supplemental Form 27 to document progress of site investigation and remediation, unless an alternative reporting schedule has been requested by the Operator and approved by the Director. The Director may request a more frequent reporting schedule based on site-specific conditions.

Report Type: [ ] Groundwater Monitoring [ ] Land Treatment Progress Report [ ] O&M Report

[ ] Other

Adequacy of Operator's General Liability Insurance and Financial Assurance

Describe the adequacy of the Operator's general liability insurance and Financial Assurance to fully address the anticipated costs of Remediation, including the estimated remaining cost for this project (below).
If this information has been provided on a Form 27 within the last 12 months, provide the Document Number of that form.

Per Rule 705.b, and in line with guidance laid out in the SBAP, Caerus has general liability insurance in the amount of $1M, and Caerus has umbrella insurance, which sits over the general liability insurance in the amount of $75M. The umbrella and general liability insurance covers property damage, bodily injury to third parties, and sudden or accidental pollution under a combined $76M.

Operator anticipates the remaining cost for this project to be: $ 20000

WASTE DISPOSAL INFORMATION

Was E&P waste generated as part of this remediation? Yes

Describe beneficial use, if any, of E&P Waste derived from this remediation project:

None

Volume of E&P Waste (solid) in cubic yards 0

E&P waste (solid) description

COGCC Disposal Facility ID #, if applicable:

Non-COGCC Disposal Facility:

Volume of E&P Waste (liquid) in barrels 51

E&P waste (liquid) description hydrocarbon impacted soil mixed with hydrovac water

COGCC Disposal Facility ID #, if applicable:

Non-COGCC Disposal Facility: Greenleaf Environmental Services

REMEDIATION COMPLETION REPORT

REMEDIATION COMPLETION SUMMARY

Is this a Final Closure Request for this Remediation Project? No

If YES:

[ ] Compliant with Rule 913.h.(1).

[ ] Compliant with Rule 913.h.(2).

[ ] Compliant with Rule 913.h.(3).

Do all soils meet Table 915-1 standards?

Does the previous reply indicate consideration of background concentrations?

Does Groundwater meet Table 915-1 standards?

Is additional groundwater monitoring to be conducted?

Operator shall comply with the COGCC 1000-Series Reclamation Requirements for all impacted and disturbed areas.

RECLAMATION PLAN

RECLAMATION PLANNING

Describe reclamation plan. Discuss existing and new grade recontouring; method and testing of compaction alleviation; and reseeding program, including location of new seed, seed mix and noxious weed prevention. Attach diagram or drawing.

Caerus plans to return the disturbed area to the active working surface of the well pad for continued operation.

Is the described reclamation complete? No

Does the reclamation described herein constitute interim or final reclamation of the Oil and Gas Location?

☐ Interim ☐ Final

Did the Surface Owner provide the seed mix? Yes

If YES, does the seed mix comply with local soil conservation district recommendations? Yes

Did the local soil conservation district provide the seed mix?

SITE RECLAMATION DATES

Proposed date of commencement of Reclamation.

Proposed date of completion of Reclamation.

IMPLEMENTATION SCHEDULE

Per Rule 913.d.(2): Any change from the approved implementation schedule will be requested at least 14 days in advance, and the Operator may not make the change without the Director's approval.

PRIOR DATES

Date of Surface Owner notification/consultation, if required.

Actual Spill or Release date, or date of discovery. 06/09/2022

SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 06/10/2022

Proposed site investigation commencement. 06/10/2022

Proposed completion of site investigation.

REMEDIAL ACTION DATES

Proposed start date of Remediation. 06/01/2023

Proposed date of completion of Remediation.

Per Rule 913.d.(2): Any change from the approved implementation schedule will be requested at least 14 days in advance, and the Operator may not make the change without the Director's approval.

☐ Change from approved implementation schedule per Rule 913.d.(2).

Basis for change in implementation schedule:

OPERATOR COMMENT

I hereby certify all statements made in this form are to the best of my knowledge true, correct, and complete.

Signed: Tristan Schmalz Title: Environmental Scientist

Submit Date: 01/19/2023 Email: tschmalz@kleinfelder.com

Based on the information provided herein, this Application for Site Investigation and Remediation Workplan complies with COGCC Rules and applicable orders and is hereby approved.

COGCC Approved: Steven Arauza Date: 02/23/2023

Remediation Project Number: 25510

COA Type	Description
0 COA	

Attachment Check List

Upon approval, the approved Form 27 and all listed attachments will be indexed to the Remediation Project file. Only the approved Form 27 will also be indexed to the related Facilities.

Att Doc Num	Name
403284187	FORM 27-SUPPLEMENTAL-SUBMITTED
403293022	SOIL SAMPLE LOCATION MAP

Total Attach: 2 Files

General Comments

User Group	Comment	Comment Date
Environmental	Comply with outstanding COAs.	02/23/2023

Total: 1 comment(s)

APPENDIX C

LABORATORY ANALYTICAL REPORTS

KLEINFELDER 707 17th Street, Suite 3000, Denver, CO 80202 p | 303.237.6601 f | 303.237.6602

ANALYTICAL REPORT

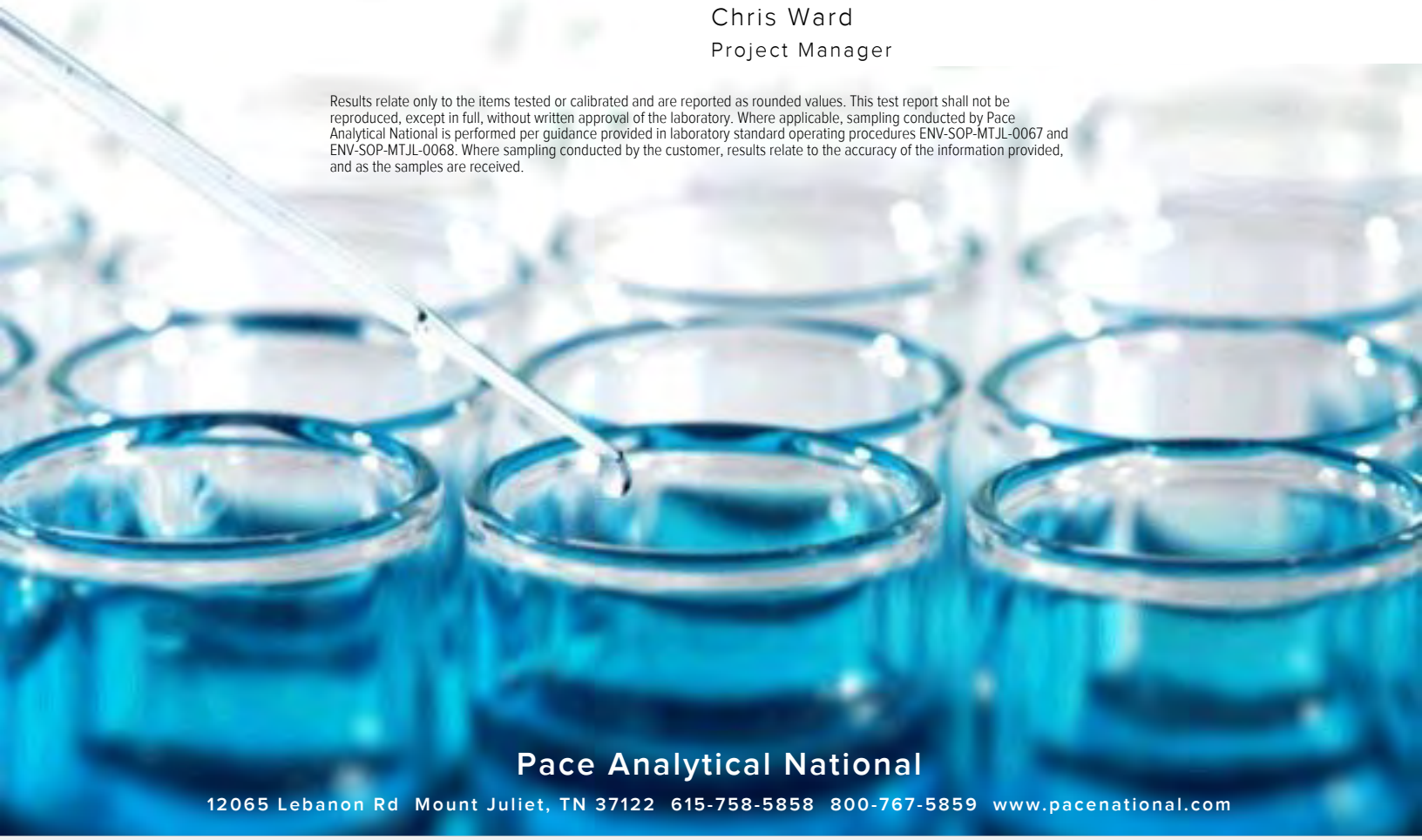
May 03, 2023

Caerus Oil and Gas

Sample Delivery Group:	L1608806
Samples Received:	04/25/2023
Project Number:	
Description:	RA11 Flowline Investigation
Site:	RA11
Report To:	Brett M. , Jake J. , Blair R. 143 Diamond Avenue Parachute, CO 81635

Entire Report Reviewed By: Chris Ward

Chris Ward
Project Manager



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

TABLE OF CONTENTS

20230424-RFBG-(RA11-NO1)@1 L1608806-01 Solid

Collected by: Tristan Schmalz | Collected date/time: 04/24/23 11:10 | Received date/time: 04/25/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG2050589	1	05/02/23 13:56	05/02/23 13:56	ABL	Mt. Juliet, TN
Wet Chemistry by Method 7199	WG2049530	1	05/02/23 01:09	05/02/23 14:05	SET	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG2052208	1	05/02/23 14:19	05/02/23 16:45	KAD	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG2049317	1	05/02/23 12:20	05/02/23 14:06	NTG	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG2050590	1	04/28/23 10:08	05/01/23 19:54	ZSA	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2051994	10	05/01/23 15:52	05/02/23 10:42	SJM	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2051994	5	05/01/23 15:52	05/02/23 09:44	SJM	Mt. Juliet, TN

20230424-RFBG-(RA11-NO2)@1 L1608806-02 Solid

Collected by: Tristan Schmalz | Collected date/time: 04/24/23 11:26 | Received date/time: 04/25/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG2050589	1	05/02/23 13:59	05/02/23 13:59	ABL	Mt. Juliet, TN
Wet Chemistry by Method 7199	WG2049530	1	05/02/23 01:09	05/02/23 14:42	SET	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG2052208	1	05/02/23 14:19	05/02/23 16:45	KAD	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG2049317	1	05/02/23 12:20	05/02/23 14:06	NTG	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG2051787	1	05/02/23 07:49	05/02/23 11:26	ABL	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2051994	5	05/01/23 15:52	05/02/23 10:00	SJM	Mt. Juliet, TN

20230424-RFBG-(RA11-NO3)@1 L1608806-03 Solid

Collected by: Tristan Schmalz | Collected date/time: 04/24/23 11:37 | Received date/time: 04/25/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG2050589	1	05/02/23 14:02	05/02/23 14:02	ABL	Mt. Juliet, TN
Wet Chemistry by Method 7199	WG2049530	1	05/02/23 01:09	05/02/23 14:47	SET	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG2052208	1	05/02/23 14:19	05/02/23 16:45	KAD	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG2049317	1	05/02/23 12:20	05/02/23 14:06	NTG	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG2051787	1	05/02/23 07:49	05/02/23 11:29	ABL	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2051994	5	05/01/23 15:52	05/02/23 10:04	SJM	Mt. Juliet, TN

20230424-RFBG-(RA11-NO4)@1 L1608806-04 Solid

Collected by: Tristan Schmalz | Collected date/time: 04/24/23 11:52 | Received date/time: 04/25/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG2050589	1	05/02/23 14:05	05/02/23 14:05	ABL	Mt. Juliet, TN
Wet Chemistry by Method 7199	WG2049530	1	05/02/23 01:09	05/02/23 14:52	SET	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG2052208	1	05/02/23 14:19	05/02/23 16:45	KAD	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG2049317	1	05/02/23 12:20	05/02/23 14:06	NTG	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG2051787	1	05/02/23 07:49	05/02/23 11:32	ABL	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2051994	5	05/01/23 15:52	05/02/23 10:07	SJM	Mt. Juliet, TN

20230424-RFBG-(RA11-NWO1)@1 L1608806-05 Solid

Collected by: Tristan Schmalz | Collected date/time: 04/24/23 12:20 | Received date/time: 04/25/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG2050589	1	05/02/23 14:08	05/02/23 14:08	ABL	Mt. Juliet, TN
Wet Chemistry by Method 7199	WG2049530	1	05/02/23 01:09	05/02/23 14:57	SET	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG2052208	1	05/02/23 14:19	05/02/23 16:45	KAD	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG2049317	1	05/02/23 12:20	05/02/23 14:06	NTG	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG2051787	1	05/02/23 07:49	05/02/23 11:35	ABL	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2051994	5	05/01/23 15:52	05/02/23 10:19	SJM	Mt. Juliet, TN

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

SAMPLE SUMMARY

20230424-RFBG-(RA11-NWO2)@1 L1608806-06 Solid

Collected by: Tristan Schmalz
Collected date/time: 04/24/23 12:32
Received date/time: 04/25/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG2050589	1	05/02/23 14:11	05/02/23 14:11	ABL	Mt. Juliet, TN
Wet Chemistry by Method 7199	WG2049530	1	05/02/23 01:09	05/02/23 15:02	SET	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG2052208	1	05/02/23 14:19	05/02/23 16:45	KAD	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG2049317	1	05/02/23 12:20	05/02/23 14:06	NTG	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG2051787	5	05/02/23 07:49	05/02/23 11:37	ABL	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2051994	5	05/01/23 15:52	05/02/23 10:22	SJM	Mt. Juliet, TN

20230424-RFBG-(RA11-NWO3)@1 L1608806-07 Solid

Collected by: Tristan Schmalz
Collected date/time: 04/24/23 12:46
Received date/time: 04/25/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG2050589	1	05/02/23 14:14	05/02/23 14:14	ABL	Mt. Juliet, TN
Wet Chemistry by Method 7199	WG2049530	1	05/02/23 01:09	05/02/23 15:08	SET	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG2052208	1	05/02/23 14:19	05/02/23 16:45	KAD	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG2049317	1	05/02/23 12:20	05/02/23 14:06	NTG	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG2051787	1	05/02/23 07:49	05/02/23 11:40	ABL	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2051994	5	05/01/23 15:52	05/02/23 10:26	SJM	Mt. Juliet, TN

20230424-RFBG-(RA11-NWO4)@1 L1608806-08 Solid

Collected by: Tristan Schmalz
Collected date/time: 04/24/23 12:58
Received date/time: 04/25/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG2050589	1	05/02/23 14:17	05/02/23 14:17	ABL	Mt. Juliet, TN
Wet Chemistry by Method 7199	WG2049530	1	05/02/23 01:09	05/02/23 15:13	SET	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG2052208	1	05/02/23 14:19	05/02/23 16:45	KAD	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG2049317	1	05/02/23 12:20	05/02/23 14:06	NTG	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG2051787	1	05/02/23 07:49	05/02/23 11:43	ABL	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2051994	5	05/01/23 15:52	05/02/23 10:29	SJM	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	0.386		1	05/02/2023 13:56	WG2050589

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	05/02/2023 14:05	WG2049530

Wet Chemistry by Method 9045D

Analyte	Result pH	Qualifier	Dilution	Analysis date / time	Batch
pH	8.80	T8	1	05/02/2023 16:45	WG2052208

Sample Narrative:

L1608806-01 WG2052208: 8.8 at 20.5C

Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	111		10.0	1	05/02/2023 14:06	WG2049317

Sample Narrative:

L1608806-01 WG2049317: at 25C

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

Analyte	Result mg/l	Qualifier	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
Hot Water Sol. Boron	0.149	B J	0.0167	0.200	1	05/01/2023 19:54	WG2050590

Metals (ICPMS) by Method 6020

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	2.48	O1	0.100	1.00	5	05/02/2023 09:44	WG2051994
Barium	1110		0.304	5.00	10	05/02/2023 10:42	WG2051994
Cadmium	0.275	J	0.0855	1.00	5	05/02/2023 09:44	WG2051994
Copper	16.3		0.132	5.00	5	05/02/2023 09:44	WG2051994
Lead	7.85		0.0990	2.00	5	05/02/2023 09:44	WG2051994
Nickel	17.8		0.197	2.50	5	05/02/2023 09:44	WG2051994
Selenium	0.529	J O1	0.180	2.50	5	05/02/2023 09:44	WG2051994
Silver	U	O1	0.0865	0.500	5	05/02/2023 09:44	WG2051994
Zinc	59.8	O1	0.740	25.0	5	05/02/2023 09:44	WG2051994

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	1.88		1	05/02/2023 13:59	WG2050589

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	05/02/2023 14:42	WG2049530

Wet Chemistry by Method 9045D

Analyte	Result pH	Qualifier	Dilution	Analysis date / time	Batch
pH	8.73	T8	1	05/02/2023 16:45	WG2052208

Sample Narrative:

L1608806-02 WG2052208: 8.73 at 20.3C

Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	174		10.0	1	05/02/2023 14:06	WG2049317

Sample Narrative:

L1608806-02 WG2049317: at 25C

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

Analyte	Result mg/l	Qualifier	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
Hot Water Sol. Boron	0.370		0.0167	0.200	1	05/02/2023 11:26	WG2051787

Metals (ICPMS) by Method 6020

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	5.10		0.100	1.00	5	05/02/2023 10:00	WG2051994
Barium	178		0.152	2.50	5	05/02/2023 10:00	WG2051994
Cadmium	0.835	J	0.0855	1.00	5	05/02/2023 10:00	WG2051994
Copper	18.1		0.132	5.00	5	05/02/2023 10:00	WG2051994
Lead	12.0		0.0990	2.00	5	05/02/2023 10:00	WG2051994
Nickel	25.5		0.197	2.50	5	05/02/2023 10:00	WG2051994
Selenium	0.601	J	0.180	2.50	5	05/02/2023 10:00	WG2051994
Silver	U		0.0865	0.500	5	05/02/2023 10:00	WG2051994
Zinc	85.4		0.740	25.0	5	05/02/2023 10:00	WG2051994

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
	SAR				
Sodium Adsorption Ratio	0.0329		1	05/02/2023 14:02	WG2050589

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	05/02/2023 14:47	WG2049530

Wet Chemistry by Method 9045D

Analyte	Result pH	Qualifier	Dilution	Analysis date / time	Batch
pH	6.54	T8	1	05/02/2023 16:45	WG2052208

Sample Narrative:

L1608806-03 WG2052208: 6.54 at 20.4C

Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	2310		10.0	1	05/02/2023 14:06	WG2049317

Sample Narrative:

L1608806-03 WG2049317: at 25C

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

Analyte	Result mg/l	Qualifier	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
Hot Water Sol. Boron	0.137	J	0.0167	0.200	1	05/02/2023 11:29	WG2051787

Metals (ICPMS) by Method 6020

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	17.0		0.100	1.00	5	05/02/2023 10:04	WG2051994
Barium	439		0.152	2.50	5	05/02/2023 10:04	WG2051994
Cadmium	0.836	J	0.0855	1.00	5	05/02/2023 10:04	WG2051994
Copper	15.1		0.132	5.00	5	05/02/2023 10:04	WG2051994
Lead	14.2		0.0990	2.00	5	05/02/2023 10:04	WG2051994
Nickel	16.1		0.197	2.50	5	05/02/2023 10:04	WG2051994
Selenium	0.840	J	0.180	2.50	5	05/02/2023 10:04	WG2051994
Silver	U		0.0865	0.500	5	05/02/2023 10:04	WG2051994
Zinc	60.2		0.740	25.0	5	05/02/2023 10:04	WG2051994

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	0.111		1	05/02/2023 14:05	WG2050589

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	05/02/2023 14:52	WG2049530

Wet Chemistry by Method 9045D

Analyte	Result pH	Qualifier	Dilution	Analysis date / time	Batch
pH	7.23	T8	1	05/02/2023 16:45	WG2052208

Sample Narrative:

L1608806-04 WG2052208: 7.23 at 20.2C

Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	179		10.0	1	05/02/2023 14:06	WG2049317

Sample Narrative:

L1608806-04 WG2049317: at 25C

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

Analyte	Result mg/l	Qualifier	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
Hot Water Sol. Boron	0.170	J	0.0167	0.200	1	05/02/2023 11:32	WG2051787

Metals (ICPMS) by Method 6020

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	3.61		0.100	1.00	5	05/02/2023 10:07	WG2051994
Barium	82.0		0.152	2.50	5	05/02/2023 10:07	WG2051994
Cadmium	0.153	J	0.0855	1.00	5	05/02/2023 10:07	WG2051994
Copper	16.1		0.132	5.00	5	05/02/2023 10:07	WG2051994
Lead	10.7		0.0990	2.00	5	05/02/2023 10:07	WG2051994
Nickel	33.2		0.197	2.50	5	05/02/2023 10:07	WG2051994
Selenium	0.519	J	0.180	2.50	5	05/02/2023 10:07	WG2051994
Silver	U		0.0865	0.500	5	05/02/2023 10:07	WG2051994
Zinc	88.6		0.740	25.0	5	05/02/2023 10:07	WG2051994

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
	SAR				
Sodium Adsorption Ratio	2.85		1	05/02/2023 14:08	WG2050589

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	05/02/2023 14:57	WG2049530

Wet Chemistry by Method 9045D

Analyte	Result pH	Qualifier	Dilution	Analysis date / time	Batch
pH	8.92	T8	1	05/02/2023 16:45	WG2052208

Sample Narrative:

L1608806-05 WG2052208: 8.92 at 20C

Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	176		10.0	1	05/02/2023 14:06	WG2049317

Sample Narrative:

L1608806-05 WG2049317: at 25C

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

Analyte	Result mg/l	Qualifier	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
Hot Water Sol. Boron	0.220		0.0167	0.200	1	05/02/2023 11:35	WG2051787

Metals (ICPMS) by Method 6020

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	5.40		0.100	1.00	5	05/02/2023 10:19	WG2051994
Barium	255		0.152	2.50	5	05/02/2023 10:19	WG2051994
Cadmium	U		0.0855	1.00	5	05/02/2023 10:19	WG2051994
Copper	23.3		0.132	5.00	5	05/02/2023 10:19	WG2051994
Lead	10.7		0.0990	2.00	5	05/02/2023 10:19	WG2051994
Nickel	50.0		0.197	2.50	5	05/02/2023 10:19	WG2051994
Selenium	1.33	J	0.180	2.50	5	05/02/2023 10:19	WG2051994
Silver	0.0871	J	0.0865	0.500	5	05/02/2023 10:19	WG2051994
Zinc	146		0.740	25.0	5	05/02/2023 10:19	WG2051994

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
	SAR				
Sodium Adsorption Ratio	2.42		1	05/02/2023 14:11	WG2050589

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	05/02/2023 15:02	WG2049530

Wet Chemistry by Method 9045D

Analyte	Result pH	Qualifier	Dilution	Analysis date / time	Batch
pH	9.44	T8	1	05/02/2023 16:45	WG2052208

Sample Narrative:

L1608806-06 WG2052208: 9.44 at 19.9C

Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	354		10.0	1	05/02/2023 14:06	WG2049317

Sample Narrative:

L1608806-06 WG2049317: at 25C

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

Analyte	Result mg/l	Qualifier	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
Hot Water Sol. Boron	0.260	J	0.0835	1.00	5	05/02/2023 11:37	WG2051787

Metals (ICPMS) by Method 6020

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	5.21		0.100	1.00	5	05/02/2023 10:22	WG2051994
Barium	258		0.152	2.50	5	05/02/2023 10:22	WG2051994
Cadmium	1.26		0.0855	1.00	5	05/02/2023 10:22	WG2051994
Copper	24.4		0.132	5.00	5	05/02/2023 10:22	WG2051994
Lead	15.9		0.0990	2.00	5	05/02/2023 10:22	WG2051994
Nickel	29.9		0.197	2.50	5	05/02/2023 10:22	WG2051994
Selenium	0.419	J	0.180	2.50	5	05/02/2023 10:22	WG2051994
Silver	U		0.0865	0.500	5	05/02/2023 10:22	WG2051994
Zinc	106		0.740	25.0	5	05/02/2023 10:22	WG2051994

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	16.2		1	05/02/2023 14:14	WG2050589

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	05/02/2023 15:08	WG2049530

Wet Chemistry by Method 9045D

Analyte	Result pH	Qualifier	Dilution	Analysis date / time	Batch
pH	8.31	T8	1	05/02/2023 16:45	WG2052208

Sample Narrative:

L1608806-07 WG2052208: 8.31 at 19.8C

Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	1490		10.0	1	05/02/2023 14:06	WG2049317

Sample Narrative:

L1608806-07 WG2049317: at 25C

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

Analyte	Result mg/l	Qualifier	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
Hot Water Sol. Boron	0.483		0.0167	0.200	1	05/02/2023 11:40	WG2051787

Metals (ICPMS) by Method 6020

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	8.43		0.100	1.00	5	05/02/2023 10:26	WG2051994
Barium	74.7		0.152	2.50	5	05/02/2023 10:26	WG2051994
Cadmium	U		0.0855	1.00	5	05/02/2023 10:26	WG2051994
Copper	23.8		0.132	5.00	5	05/02/2023 10:26	WG2051994
Lead	19.4		0.0990	2.00	5	05/02/2023 10:26	WG2051994
Nickel	10.2		0.197	2.50	5	05/02/2023 10:26	WG2051994
Selenium	0.511	J	0.180	2.50	5	05/02/2023 10:26	WG2051994
Silver	U		0.0865	0.500	5	05/02/2023 10:26	WG2051994
Zinc	46.8		0.740	25.0	5	05/02/2023 10:26	WG2051994

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
	SAR				
Sodium Adsorption Ratio	0.925		1	05/02/2023 14:17	WG2050589

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	05/02/2023 15:13	WG2049530

Wet Chemistry by Method 9045D

Analyte	Result pH	Qualifier	Dilution	Analysis date / time	Batch
pH	8.72	T8	1	05/02/2023 16:45	WG2052208

Sample Narrative:

L1608806-08 WG2052208: 8.72 at 19.5C

Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	135		10.0	1	05/02/2023 14:06	WG2049317

Sample Narrative:

L1608806-08 WG2049317: at 25C

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

Analyte	Result mg/l	Qualifier	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
Hot Water Sol. Boron	0.198	J	0.0167	0.200	1	05/02/2023 11:43	WG2051787

Metals (ICPMS) by Method 6020

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	9.28		0.100	1.00	5	05/02/2023 10:29	WG2051994
Barium	200		0.152	2.50	5	05/02/2023 10:29	WG2051994
Cadmium	1.08		0.0855	1.00	5	05/02/2023 10:29	WG2051994
Copper	16.8		0.132	5.00	5	05/02/2023 10:29	WG2051994
Lead	13.7		0.0990	2.00	5	05/02/2023 10:29	WG2051994
Nickel	23.5		0.197	2.50	5	05/02/2023 10:29	WG2051994
Selenium	0.435	J	0.180	2.50	5	05/02/2023 10:29	WG2051994
Silver	U		0.0865	0.500	5	05/02/2023 10:29	WG2051994
Zinc	81.2		0.740	25.0	5	05/02/2023 10:29	WG2051994

Method Blank (MB)

(MB) R3920066-1 05/02/23 13:37

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

L1610618-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1610618-02 05/02/23 15:44 • (DUP) R3920066-7 05/02/23 15:49

Analyte	Original Result mg/kg	DUP Result mg/kg	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Hexavalent Chromium	0.859	0.757	1	12.6	J	20

L1610618-04 Original Sample (OS) • Duplicate (DUP)

(OS) L1610618-04 05/02/23 15:59 • (DUP) R3920066-8 05/02/23 16:05

Analyte	Original Result mg/kg	DUP Result mg/kg	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Hexavalent Chromium	0.588	0.607	1	3.09	J	20

Laboratory Control Sample (LCS)

(LCS) R3920066-2 05/02/23 13:45

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Hexavalent Chromium	10.0	9.77	97.7	80.0-120	

L1608806-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1608806-01 05/02/23 14:05 • (MS) R3920066-3 05/02/23 14:10 • (MSD) R3920066-4 05/02/23 14:16

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 %
Hexavalent Chromium	20.0	U	20.7	19.6	103	97.9	1	75.0-125			5.35	20

L1608806-01 Original Sample (OS) • Matrix Spike (MS)

(OS) L1608806-01 05/02/23 14:05 • (MS) R3920066-5 05/02/23 14:21

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Hexavalent Chromium	648	U	765	118	50	75.0-125	

L1608272-98 Original Sample (OS) • Duplicate (DUP)

(OS) L1608272-98 05/02/23 16:45 • (DUP) R3920032-2 05/02/23 16:45

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	9.30	9.29	1	0.108		1

Sample Narrative:

OS: 9.3 at 20.9C

DUP: 9.29 at 20.8C

L1608806-04 Original Sample (OS) • Duplicate (DUP)

(OS) L1608806-04 05/02/23 16:45 • (DUP) R3920032-3 05/02/23 16:45

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	pH	su		%		%
pH	7.23	7.25	1	0.276		1

Sample Narrative:

OS: 7.23 at 20.2C

DUP: 7.25 at 20.1C

Laboratory Control Sample (LCS)

(LCS) R3920032-1 05/02/23 16:45

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

Sample Narrative:

LCS: 10.02 at 19.1C

Method Blank (MB)

(MB) R3919941-1 05/02/23 14:06

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

L1608806-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1608806-01 05/02/23 14:06 • (DUP) R3919941-3 05/02/23 14:06

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	111	114	1	2.13		20

Sample Narrative:

OS: at 25C

DUP: at 25C

Laboratory Control Sample (LCS)

(LCS) R3919941-2 05/02/23 14:06

Analyte	Spike Amount umhos/cm	LCS Result umhos/cm	LCS Rec. %	Rec. Limits %	LCS Qualifier
Specific Conductance	1120	1140	102	85.0-115	

Sample Narrative:

LCS: at 25C

Method Blank (MB)

(MB) R3919644-1 05/01/23 18:43

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Hot Water Sol. Boron	0.0373	J	0.0167	0.200

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

(LCS) R3919644-2 05/01/23 18:45 • (LCSD) R3919644-3 05/01/23 18:48

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	1.13	1.07	113	107	80.0-120			4.95	20

Method Blank (MB)

(MB) R3919944-1 05/02/23 11:18

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) R3919944-2 05/02/23 11:20 • (LCSD) R3919944-3 05/02/23 11:23

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	1.09	1.07	109	107	80.0-120			1.38	20

QUALITY CONTROL SUMMARY

L1608806-01,02,03,04,05,06,07,08

Method Blank (MB)

(MB) R3919806-1 05/02/23 09:37

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Arsenic	U		0.100	1.00
Barium	U		0.152	2.50
Cadmium	U		0.0855	1.00
Copper	U		0.133	5.00
Lead	U		0.0990	2.00
Nickel	U		0.197	2.50
Selenium	U		0.180	2.50
Silver	U		0.0865	0.500
Zinc	U		0.740	25.0

Laboratory Control Sample (LCS)

(LCS) R3919806-2 05/02/23 09:41

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Arsenic	100	104	104	80.0-120	
Barium	100	101	101	80.0-120	
Cadmium	100	112	112	80.0-120	
Copper	100	107	107	80.0-120	
Lead	100	106	106	80.0-120	
Nickel	100	109	109	80.0-120	
Selenium	100	117	117	80.0-120	
Silver	20.0	21.4	107	80.0-120	
Zinc	100	104	104	80.0-120	

L1608806-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1608806-01 05/02/23 09:44 • (MS) R3919806-5 05/02/23 09:54 • (MSD) R3919806-6 05/02/23 09:57

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Arsenic	100	2.48	104	97.1	102	94.6	5	75.0-125			7.30	20
Barium	100	1130	1350	1200	213	69.5	5	75.0-125	E V	E V	11.3	20
Cadmium	100	0.275	113	109	113	108	5	75.0-125			4.23	20
Copper	100	16.3	118	112	102	96.2	5	75.0-125			5.01	20
Lead	100	7.85	113	107	105	99.1	5	75.0-125			5.73	20
Nickel	100	17.8	121	115	103	97.7	5	75.0-125			4.85	20
Selenium	100	0.529	116	111	115	111	5	75.0-125			4.19	20
Silver	20.0	U	21.1	20.6	105	103	5	75.0-125			1.99	20
Zinc	100	59.8	162	160	102	100	5	75.0-125			1.16	20

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

Qualifier	Description
B	The same analyte is found in the associated blank.
E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL).
J	The identification of the analyte is acceptable; the reported value is an estimate.
O1	The analyte failed the method required serial dilution test and/or subsequent post-spike criteria. These failures indicate matrix interference.
T8	Sample(s) received past/too close to holding time expiration.
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 [1]	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LA000356
Kentucky [1 6]	KY90010	South Carolina	84004002
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas [5]	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 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

* 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.

Chain of Custody

Page ___ of ___

Caerus Oil and Gas
143 Diamond Avenue
Parachute, CO 81635

Billing Information: SAME AS LEFT

Pres Chk

Report to: Jake Janicek

Email To: jjanicek@caerusoilandgas.com

Project Description: RAII Flowline Investigation

City/State Collected: Piceance Crk, CO

Please Circle: PT (MT) CT ET

Phone: (970) 778-2314

Client Project #

Lab Project #

Collected by (print): Tristan Schmalz

Site/Facility ID #: RAII

P.O. #

Collected by (signature): Tristan Schmalz

Immediately Packed on Ice N ___ Y X

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

Quote #

Date Results Needed: Standard TAT

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix*	Depth	Date	Time	No. of Cntrs	COGCC Table 915-1	EC, pH, SAR	Arsenic, Boron	COGCC Table 910-1	SAR	Remarks	Sample # (lab only)
20230424-RFBG-(RAII-N01)@1	Grab	SS	1ft	4/24/23	11:10	2					X		-01
20230424-RFBG-(RAII-N02)@1	Grab	SS	1ft	4/24/23	11:26	2					X		-02
20230424-RFBG-(RAII-N03)@1	Grab	SS	1ft	4/24/23	11:37	2					X		-03
20230424-RFBG-(RAII-N04)@1	Grab	SS	1ft	4/24/23	11:52	2					X		-04
20230424-RFBG-(RAII-NW01)@1	Grab	SS	1ft	4/24/23	12:20	2					X		-05
20230424-RFBG-(RAII-NW02)@1	Grab	SS	1ft	4/24/23	12:32	2					X		-06
20230424-RFBG-(RAII-NW03)@1	Grab	SS	1ft	4/24/23	12:46	2					X		-07
20230424-RFBG-(RAII-NW04)@1	Grab	SS	1ft	4/24/23	12:58	2					X		-08

Tristan Schmalz

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

Remarks:

pH _____ Temp _____

Flow _____ Other _____

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

Tracking # 6136 6537 5946

Sample Receipt Checklist

COC Seal Present/Intact:	NP	N
COC Signed/Accurate:	Y	N
Bottles arrive intact:	Y	N
Correct bottles used:	Y	N
Sufficient volume sent:	Y	N
If Applicable		
VOA Zero Headspace:	Y	N
Preservation Correct/Checked:	Y	N
RAD Screen <0.5 mR/hr:	Y	N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes (No) HCL / MeoH TBR
Tristan Schmalz	4/24/2023	15:00		
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: NSAC °C Bottles Received:
	4/24/23	1700		1.1+0=1.1 16
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: Time:
				4-25-23 9:00

If preservation required by Login: Date/Time

Hold:

Condition: NCF / OK

Pace Analytical®
National Center for Testing & Innovation

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

SDG # L1608806

Table # B133

Acctn

Template:

Prelogin:

PM:

PB:

Shipped Via:

ANALYTICAL REPORT

June 27, 2023

Caerus Oil and Gas

Sample Delivery Group:	L1626905
Samples Received:	06/16/2023
Project Number:	
Description:	RA11 Flowline Investigation
Site:	RA11 PAD
Report To:	Jake J. , Brett M. , Blair R. 143 Diamond Avenue Parachute, CO 81635

Entire Report Reviewed By:

Jason Romer
Project Manager

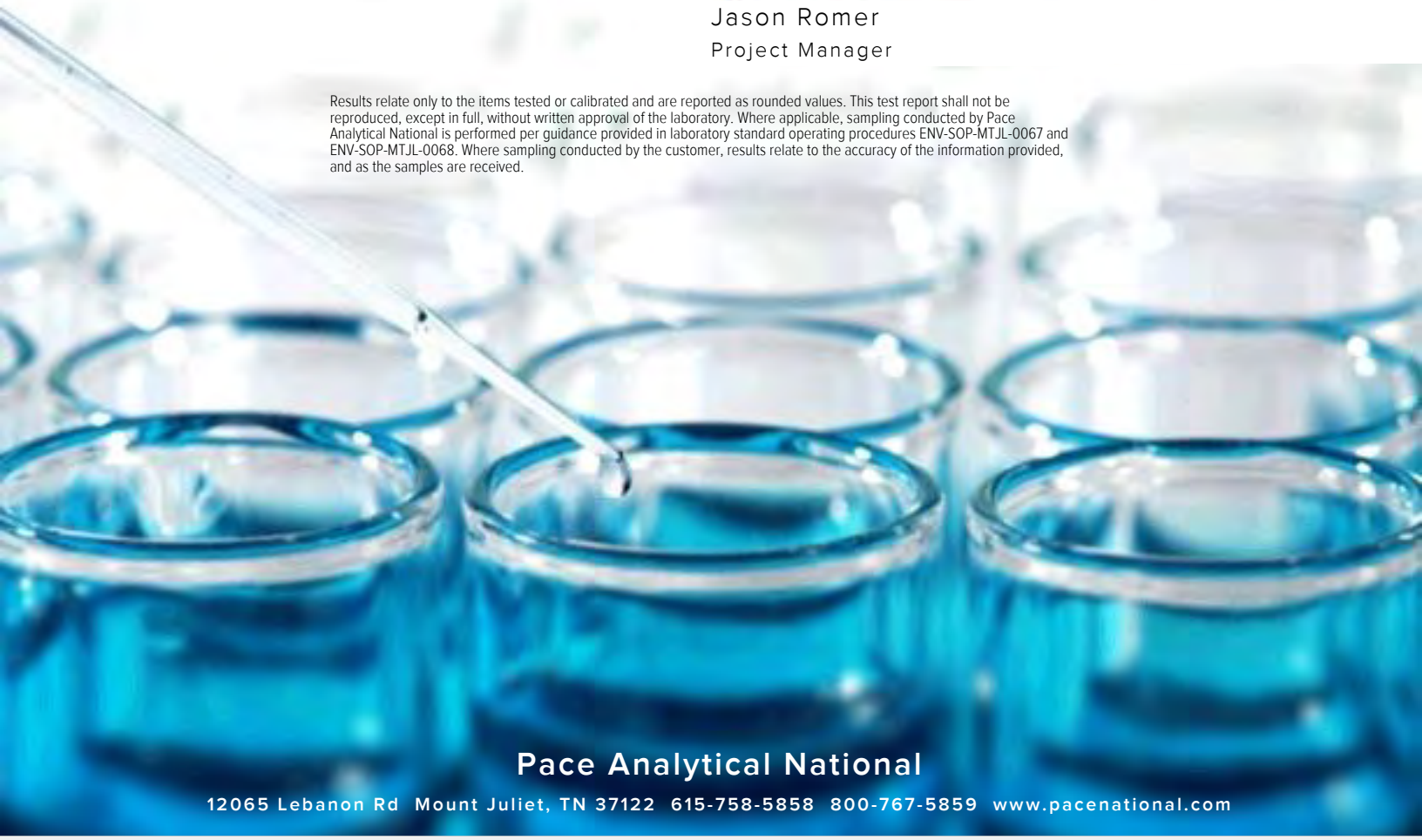


TABLE OF CONTENTS

SAMPLE SUMMARY

20230615-RA11-(PH05)@7 L1626905-01 Solid

Collected by: Tristan Schmalz
Collected date/time: 06/15/23 08:48
Received date/time: 06/16/23 09:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG2080661	1	06/27/23 15:30	06/27/23 15:30	ZSA	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG2081447	1	06/20/23 13:30	06/22/23 01:52	BAM	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015M	WG2082311	1	06/23/23 05:39	06/23/23 15:57	TJD	Mt. Juliet, TN

20230615-RA11-(PH05)@9 L1626905-02 Solid

Collected by: Tristan Schmalz
Collected date/time: 06/15/23 09:47
Received date/time: 06/16/23 09:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG2080661	1	06/27/23 15:32	06/27/23 15:32	ZSA	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG2081447	1	06/20/23 13:30	06/22/23 02:13	BAM	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015M	WG2082311	1	06/23/23 05:39	06/23/23 15:44	TJD	Mt. Juliet, TN

20230615-RA11-(PH05)@11 L1626905-03 Solid

Collected by: Tristan Schmalz
Collected date/time: 06/15/23 10:54
Received date/time: 06/16/23 09:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG2080661	1	06/27/23 14:04	06/27/23 14:04	ZSA	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG2081447	1	06/20/23 13:30	06/22/23 02:33	BAM	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015M	WG2082311	1	06/23/23 05:39	06/23/23 15:31	TJD	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.

Jason Romer
Project Manager

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	SAR			date / time	
Sodium Adsorption Ratio	4.44		1	06/27/2023 15:30	WG2080661

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

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
TPH (GC/FID) Low Fraction	0.0932	B J	0.0217	0.100	1	06/22/2023 01:52	WG2081447
(S) a,a,a-Trifluorotoluene(FID)	*101*			*77.0-120*		*06/22/2023 01:52*	WG2081447

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

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
C10-C28 Diesel Range	U		1.61	4.00	1	06/23/2023 15:57	WG2082311
C28-C36 Motor Oil Range	0.519	J	0.274	4.00	1	06/23/2023 15:57	WG2082311
(S) o-Terphenyl	*58.6*			*18.0-148*		*06/23/2023 15:57*	WG2082311

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	SAR			date / time	
Sodium Adsorption Ratio	1.80		1	06/27/2023 15:32	WG2080661

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

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
TPH (GC/FID) Low Fraction	0.105	B	0.0217	0.100	1	06/22/2023 02:13	WG2081447
(S) a,a,a-Trifluorotoluene(FID)	*101*			*77.0-120*		*06/22/2023 02:13*	WG2081447

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

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
C10-C28 Diesel Range	U		1.61	4.00	1	06/23/2023 15:44	WG2082311
C28-C36 Motor Oil Range	U		0.274	4.00	1	06/23/2023 15:44	WG2082311
(S) o-Terphenyl	*60.6*			*18.0-148*		*06/23/2023 15:44*	WG2082311

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	SAR			date / time	
Sodium Adsorption Ratio	2.81		1	06/27/2023 14:04	WG2080661

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

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
TPH (GC/FID) Low Fraction	0.0407	B J	0.0217	0.100	1	06/22/2023 02:33	WG2081447
(S) a,a,a-Trifluorotoluene(FID)	*103*			*77.0-120*		*06/22/2023 02:33*	WG2081447

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

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
C10-C28 Diesel Range	U		1.61	4.00	1	06/23/2023 15:31	WG2082311
C28-C36 Motor Oil Range	U		0.274	4.00	1	06/23/2023 15:31	WG2082311
(S) o-Terphenyl	*57.9*			*18.0-148*		*06/23/2023 15:31*	WG2082311

Method Blank (MB)

(MB) R3940018-2 06/21/23 21:45

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
TPH (GC/FID) Low Fraction	0.0304	J	0.0217	0.100
(S) a,a,a-Trifluorotoluene(FID)	*103*			*77.0-120*

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

(LCS) R3940018-1 06/21/23 21:04 • (LCSD) R3940018-3 06/21/23 22:05

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
TPH (GC/FID) Low Fraction	5.50	4.53	4.89	82.4	88.9	72.0-127			7.64	20
(S) a,a,a-Trifluorotoluene(FID)				*112*	*114*	*77.0-120*				

Method Blank (MB)

(MB) R3940859-1 06/23/23 15:04

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	*53.8*			*18.0-148*

Laboratory Control Sample (LCS)

(LCS) R3940859-2 06/23/23 15:17

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
C10-C28 Diesel Range	50.0	32.1	64.2	50.0-150	
(S) o-Terphenyl			*76.3*	*18.0-148*	

L1626902-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1626902-01 06/23/23 16:10 • (MS) R3940859-3 06/23/23 16:23 • (MSD) R3940859-4 06/23/23 16:36

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	49.8	1.66	34.1	31.6	65.1	59.9	1	50.0-150			7.61	20
(S) o-Terphenyl					*59.0*	*52.6*		*18.0-148*				

GLOSSARY OF TERMS

Guide to Reading and Understanding Your Laboratory Report

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

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

Abbreviations and Definitions

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

Qualifier	Description
B	The same analyte is found in the associated blank.
J	The identification of the analyte is acceptable; the reported value is an estimate.

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 [1]	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LA000356
Kentucky [1 6]	KY90010	South Carolina	84004002
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas [5]	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 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

* 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
143 Diamond Avenue
Parachute, CO 81635

Billing Information: SAME AS LEFT

Pres Chk

Analysis / Container / Preservative

Chain of Custody Page ___ of ___

Pace Analytical®
National Center for Testing & Innovation

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

Report to: Jake Janicek

Email To: jjanicek@caerusoilandgas.com

Project Description: RAil Flowline Investigation

City/State Collected: Piceance Crk, CO

Please Circle: PT (MT) CT ET

Phone: (970) 778-2314

Client Project #

Lab Project #

SDG # 162905
G163

Collected by (print): Tristan Schmalz

Site/Facility ID #: RAil Pad

P.O. #

Collected by (signature): Tristan Schmalz

Immediately Packed on Ice N ___ Y X

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

Quote #

Date Results Needed: Standard TAT

Acctnum:
Template:
Prelogin:
PM:
PB:
Shipped Via:

Sample ID	Comp/Grab	Matrix*	Depth	Date	Time	No. of Cntrs	COGCC Table 915-1	EC, pH, SAR	Arsenic, Boron	COGCC Table 910-1	TPH + SAR	Remarks	Sample # (lab only)
20230615-RAil-(PHOS)@7	Grab	SS	7ft	6/15/2023	8:48	4					x		-01
20230615-RAil-(PHOS)@9	Grab	SS	9ft	6/15/2023	9:47	4					x		-02
20230615-RAil-(PHOS)@11	Grab	SS	11ft	6/15/2023	10:54	4					x		-03

Tristan Schmalz
6/15/2023

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

Remarks:

pH _____ Temp _____

Flow _____ Other _____

Samples returned via:
__ UPS __ FedEx __ Courier _____

Tracking # 6126 6537 3648

Sample Receipt Checklist

COC Seal Present/Intact:	NP	Y N
COC Signed/Accurate:		Y N
Bottles arrive intact:		Y N
Correct bottles used:		Y N
Sufficient volume sent:		Y N
If Applicable		
VOA Zero Headspace:		Y N
Preservation Correct/Checked:		Y N
RAD Screen <0.5 mR/hr:		Y N

	Date:	Time:		
Relinquished by: (Signature) Tristan Schmalz	6/15/2023	12:45	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR
Relinquished by: (Signature)	6/15/23	1500	Received by: (Signature)	Temp: °C Bottles Received: 4.5+0=4.5 12 — If preservation required by Login: Date/Time
Relinquished by: (Signature)	Date:	Time:	Received for lab by: (Signature) Caleb Tapp	Date: 6/16/23 Time: 09:15 — Hold: — Condition: NCF / OK