August 17, 2021

Blair Rollins
Environmental Specialist
Caerus Oil & Gas LLC (Operator #: 10456)
brollins@caerusoilandgas.com

REPORT OF WORK COMPLETED	
COGCC Location Name (ID)	N.PARACHUTE-65S95W 29NENW (335692)
Operator Location Name	C29
COGCC Remediation Project #	19100
Legal Description	NENW Section 29, T5S-R95W
Coordinates (Lat/Long)	39.590200 / -108.079560
County	Garfield County, Colorado

Mr. Rollins,

Confluence Compliance Companies, LLC (Confluence) prepared this Report of Work Completed (ROWC) for Caerus Oil & Gas LLC (Caerus) to document recent investigation activities associated with historical releases of drilling mud and produced water at the C29 Well Pad (Location). The Location is 9.6 miles north of Parachute, Colorado, in Garfield County, as illustrated in the attached Topographic Location Map. Additional information on the Location and associated remediation project is provided in the title block above, the attached Site Diagrams, and laboratory analytical reports. This ROWC provides background on the Location, methods used to complete the remedial investigation, results of the investigation, and recommendations for how to proceed with this information.

Background

On November 27, 2008, 50 barrels (bbls) of drilling mud were released after a valve was left partially open on a horizontal tank during transfer operations. The release was confined to the working surface of the pad, and all released drilling mud was recovered. The release was reported in a Colorado Oil and Gas Conservation Commission (COGCC) Form 19 (document # 1941712). The approved Form 19 stated that no additional remediation was necessary. However, the spill was never closed by the COGCC. No additional activities associated with this release have been documented.

On August 17, 2009, 15 bbls of produced water were released after a valve was left partially open on a flowback line during drilling operations. The release was confined to the working surface of the pad, and 10 bbls of produced water were recovered. The release was reported in a COGCC Form 19 (document # 1944692). No additional activities associated with this release have been documented.

Methodology

On July 28, 2021, Confluence coordinated and oversaw investigation activities associated with the historical releases at the Location. All activities were conducted in accordance with approved COGCC Form 27 Document # 402616382. Using a hydro vacuum truck, four potholes were advanced within the spill areas. Investigation activities were directed by Confluence personnel, who characterized the soil using visual and olfactory observations and field-screened soil samples for volatile organic compounds using a photoionization detector (PID). Field screening was attempted at each pothole location between six and 12 inches below ground surface (bgs) and between 24 and 30 inches bgs. However, refusal was encountered at pothole locations PH01, PH03, and PH04 between 12 and 14 inches bgs. Where refusal was encountered, samples were collected at 12 inches bgs (PH03 and PH04) and 14 inches bgs (PH01). Pothole locaiton PH02 was sampled at 30 inches bgs. Field screening did not indicate impacts to soil, with PID measurements ranging from 0.3 to 1.2 parts per million (ppm). No staining or odor was noted in any of the samples. Soil samples were collected in laboratory provided jars, immediately placed on ice, and shipped for laboratory analysis of constituents listed in COGCC Table 910-1. Background soil samples were also collected from comparable, nearby, non-impacted native soil to establish background soil conditions including arsenic, pH, electrical conductivity (EC), and sodium adsorption ratio (SAR) per Rule 915.e.(2).D. Sample locations are illustrated in the attached Site Diagrams.

Results

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

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

Lithology and Hydrogeology

Lithology at the Location is characterized by sandy clay and gravel with angular and subangular cobbles. Groundwater is expected to flow south towards the East Fork of Parachute Creek and ultimately the Colorado River, located 9.8 miles south of the Location.

Excavation Results

Laboratory results of spill investigation soil samples indicate compliance with COGCC Table 910-1 with the exception of pH and arsenic. Exceedances of pH range from 9.05 at pothole location PH04 to 9.24 at PH02. Arsenic exceedances range from 3.45 milligrams per kilogram (mg/kg) at PH02 to 29.2 mg/kg at PH04. All other analytes are compliant with COGCC Table 910-1.

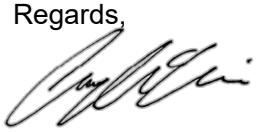
Analysis and Recommendations

Laboratory results of spill investigation soil samples indicate concentrations of pH and arsenic concentrations exceeding COGCC Table 910-1 within the historical spill area. However, background data suggests that these exceedances are within naturally occurring levels at the Location. Background samples indicate pH values up to 9.33 and arsenic concentrations up to 77.3 mg/kg. Although the names of 2012 background samples reference “oil shale,” the samples were collected from a naturally occurring, undisturbed cut slope at the Location. Field notes associated with these

sample locations are attached. Based on these results, no additional investigation or remediation activities appear to be warranted. Confluence recommends that Caerus request closure of COGCC Remediation Project Number 19100 and a no further action (NFA) determination.

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

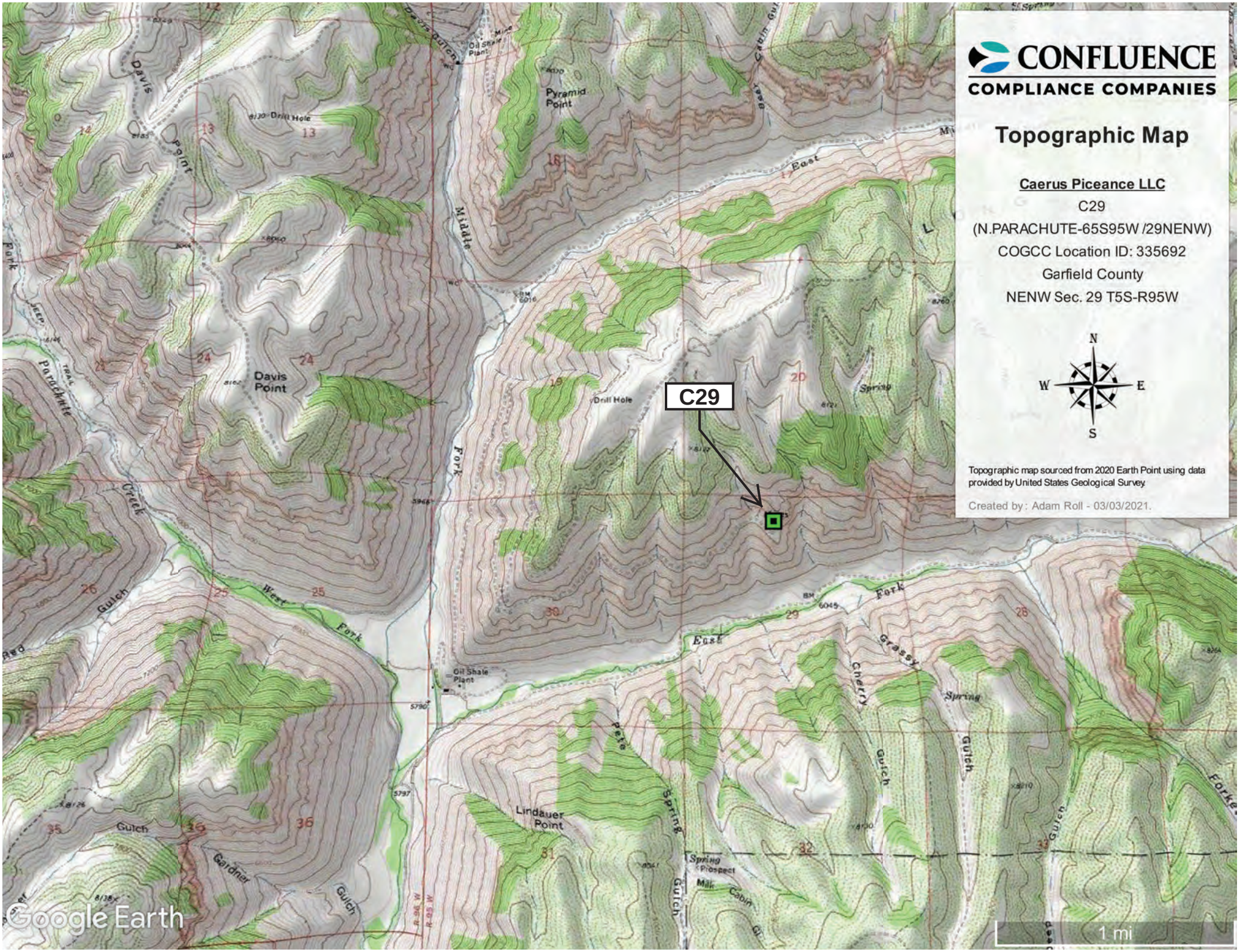
Regards,



Chris McKisson
Senior Project Manager
(720) 490-6758
chris.mckisson@confluence-cc.com

Attachments

- Topographic Map
- Site Diagram – Overview
- Site Diagram – Sample Locations
- Laboratory Results Summary Table
- Field Notes
- Laboratory Analytical Reports



CONFLUENCE
COMPLIANCE COMPANIES

Topographic Map

Caerus Piceance LLC

C29

(N.PARACHUTE-65S95W /29NENW)

COGCC Location ID: 335692

Garfield County

NENW Sec. 29 T5S-R95W

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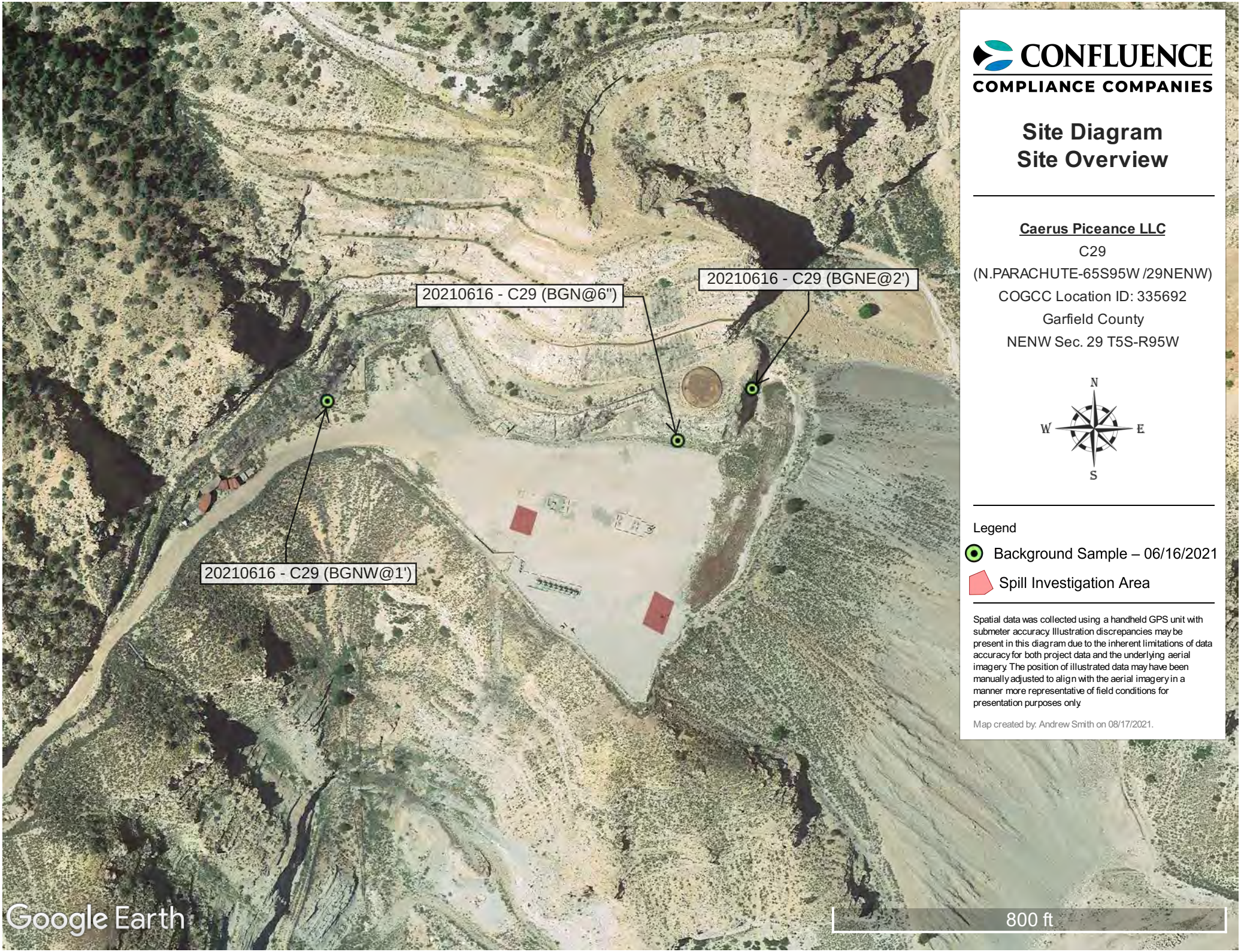
Topographic map sourced from 2020 Earth Point using data provided by United States Geological Survey

Created by: Adam Roll - 03/03/2021.



CONFLUENCE
COMPLIANCE COMPANIES

Site Diagram
Site Overview

Caerus Piceance LLC

C29

(N.PARACHUTE-65S95W /29NENW)

COGCC Location ID: 335692

Garfield County

NENW Sec. 29 T5S-R95W

N
W E
S

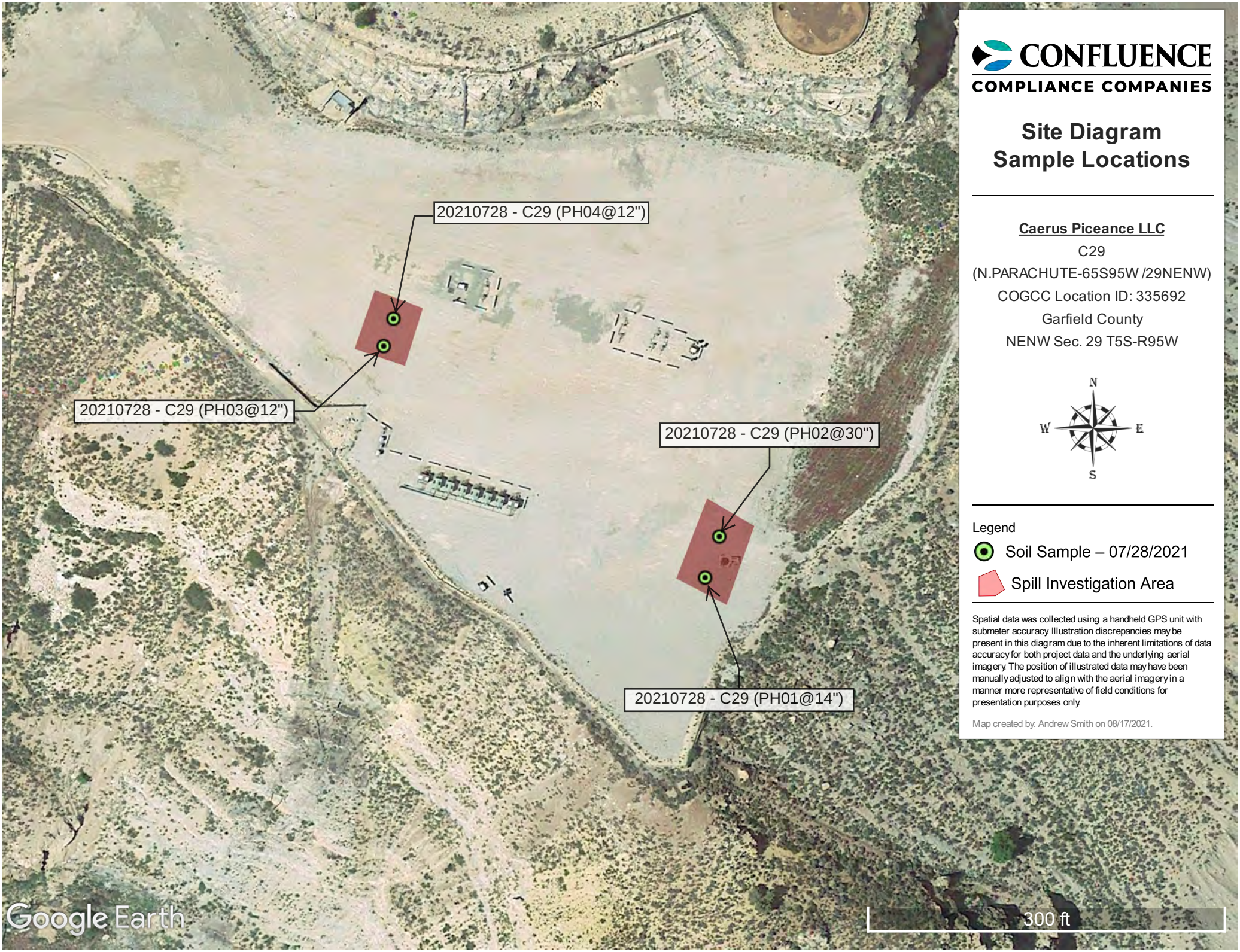
Legend

Background Sample – 06/16/2021

Spill Investigation Area

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

Map created by: Andrew Smith on 08/17/2021.



CONFLUENCE
COMPLIANCE COMPANIES

Site Diagram
Sample Locations

Caerus Piceance LLC

C29

(N.PARACHUTE-65S95W /29NENW)

COGCC Location ID: 335692

Garfield County

NENW Sec. 29 T5S-R95W

N
W E
S

Legend

Soil Sample – 07/28/2021

Spill Investigation Area

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

Map created by: Andrew Smith on 08/17/2021.

CONFLUENCE

Laboratory Results Summary Table - Soil

8/17/2021

Soil Screening and Remediation Limits			Organic Compounds (mg/kg [ppm])																			
COGCC Table 910-1 Allowable Concentration -->			500	NA	NA	0.17	85	100	175	1000	1000	0.22	0.022	0.22	2.2	22	0.022	1000	1000	0.22	23	1000
Location	Solid/Soil Source (Equipment) [Vault/Sump, Separator, Tank Battery, Dump Line, Pit, Cuttings, Background, etc.]	Sample ID	TPH (total volatile and extractable petroleum hydrocarbons) (GRO+DRO+ORO)	TPH-GRO (C6-C10) Low Fraction	TPH-DRO (C10-C28) High Fraction	Benzene	Toluene	Ethylbenzene	Xylenes - total (sum of o-, m-, p- isomers)	Acenaphthene	Anthracene	Benzo(A)anthracene	Benzo(A)pyrene	Benzo(B)fluoranthene	Benzo(K)fluoranthene	Chrysene	Dibenzo(A,H)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3,C,D)pyrene	Naphthalene	Pyrene
C29	Water Tank	**20210728-C29 (PH01@14")**	**390.242**	**0.242**	**390**	**0.00389**	**0.00750**	**0.00279**	**0.00604**	*<0.00600*	*<0.00600*	*<0.00600*	*<0.00600*	**0.00531**	*<0.00600*	**0.00649**	*<0.00600*	**0.00293**	*<0.00600*	*<0.00600*	**0.0410**	**0.00816**
C29	Water Tank	**20210728-C29 (PH02@30")**	**43.304**	**0.104**	**43.2**	**0.00164**	**0.00323**	**0.000773**	**0.00189**	*<0.00600*	*<0.00600*	*<0.00600*	*<0.00600*	*<0.00600*	*<0.00600*	*<0.00600*	*<0.00600*	*<0.00600*	*<0.00600*	*<0.00600*	**0.00454**	*<0.00600*
C29	Water Tank	**20210728-C29 (PH03@12")**	**13.036**	**0.236**	**12.8**	**0.0118**	**0.0117**	**0.00164**	**0.00644**	*<0.00600*	*<0.00600*	*<0.00600*	*<0.00600*	*<0.00600*	*<0.00600*	*<0.00600*	*<0.00600*	*<0.00600*	*<0.00600*	*<0.00600*	*<0.0200*	*<0.00600*
C29	Water Tank	**20210728-C29 (PH04@12")**	**24.517**	**0.217**	**24.3**	**0.00804**	**0.00955**	**0.00238**	**0.00636**	*<0.00600*	*<0.00600*	*<0.00600*	*<0.00600*	**0.00165**	*<0.00600*	*<0.00600*	*<0.00600*	*<0.00600*	*<0.00600*	*<0.00600*	*<0.0200*	*<0.00600*
C29	Background	**LongRidge-oil shale 1 -101112**	**1470.0**	**170**	**1,300**	*<0.030*	**1.6**	**0.56**	**9.12**	**0.130**	*<0.140*	*<0.140*	*<0.140*	*<0.140*	*<0.140*	*<0.140*	*<0.140*	**0.054**	**0.110**	*<0.140*	**0.120**	**0.068**
C29	Background	**LongRidge-oil shale 2 -101112**	**420.0**	**160**	**260**	*<0.030*	**1.5**	**0.54**	**21.29**	**0.180**	**0.020**	*<0.130*	*<0.130*	*<0.130*	*<0.130*	*<0.130*	*<0.130*	**0.052**	**0.100**	*<0.130*	**0.110**	**0.098**
C29	Background	**20210616 - C29 (BGNE@2')**	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
C29	Background	**20210616 - C29 (BGN@6")**	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
C29	Background	**20210616 - C29 (BGNW@1')**	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*

Confluence Compliance Companies, LLC
info@confluence-cc.com

Yellow Fill = Exceedance
Dark Gray Italics = Below Reporting Detection Limit (RDL)
"NA" = Not Analyzed
mg/kg = milligrams per kilogram / parts per million

CONFLUENCE

Laboratory Results Summary Table - Soil

8/17/2021

Soil Screening and Remediation Limits			Soil Suitability for Reclamation			Metals (mg/kg [ppm])										
COGCC Table 910-1 Allowable Concentration -->			4	12	6-9	0.39	70	120000	23	3100	400	23	1600	390	390	23000
Location	Solid/Soil Source (Equipment) [Vault/Sump, Separator, Tank Battery, Dump Line, Pit, Cuttings, Background, etc.]	Sample ID	EC (Specific Conductance) (millimhos/centimeter) (by saturated paste method)	SAR (Sodium Adsorption Ratio) (calculation) (by saturated paste method)	pH (pH Units) (by saturated paste method)	Arsenic	Cadmium (mg/kg)	Chromium (III)	Chromium (VI)	Copper	Lead	Mercury *(Total Mercury by EPA 7471)*	Nickel	Selenium	Silver	Zinc
C29	Water Tank	**20210728-C29 (PH01@14")**	**0.279**	**0.302**	**8.75**	**14.9**	*<2.50*	**17.2**	*<2.00*	**19.6**	**16.6**	**0.0345**	**15.3**	**1.88**	*<1.00*	**50.2**
C29	Water Tank	**20210728-C29 (PH02@30")**	**0.198**	**0.655**	**9.24**	**3.45**	*<0.500*	**7.51**	*<2.00*	**4.38**	**4.57**	*<0.0400*	**7.49**	*<2.00*	*<1.00*	**25.1**
C29	Water Tank	**20210728-C29 (PH03@12")**	**0.671**	**2.81**	**8.94**	**14.2**	**1.02**	**19.1**	*<2.00*	**19.9**	**13.5**	*<0.0400*	**16.7**	**1.07**	*<1.00*	**41.5**
C29	Water Tank	**20210728-C29 (PH04@12")**	**0.648**	**2.28**	**9.05**	**29.2**	**0.262**	**21.6**	*<2.00*	**24.9**	**15.5**	*<0.0400*	**20.1**	**1.52**	*<1.00*	**49.8**
C29	Background	**LongRidge-oil shale 1 -101112**	**1.1**	**1.6**	**9.33**	**57**	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
C29	Background	**LongRidge-oil shale 2 -101112**	**1.1**	**1.5**	**9.19**	**55**	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
C29	Background	**20210616 - C29 (BGNE@2')**	**0.176**	**0.245**	**8.58**	**39.0**	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
C29	Background	**20210616 - C29 (BGN@6")**	**0.824**	**0.544**	**8.25**	**51.9**	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
C29	Background	**20210616 - C29 (BGNW@1')**	**10.200**	**5.96**	**8.10**	**77.3**	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*

Confluence Compliance Companies, LLC
info@confluence-cc.com

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Dark Gray Italics = Below Reporting Detection Limit (RDL)
"NA" = Not Analyzed
mg/kg = milligrams per kilogram / parts per million

encana natural gas

PICEANCE BASIN
ENVIRONMENTAL COMPLIANCE GROUP
FIELD SAMPLING DATA FORM

Document No:	ECG – F001
Revised By - Date:	C. Hines – 07/09/2010
Reviewed By - Date:	B. Kieding – 07/10/10
Approved By - Date:	B.Middleton – 07/10/10

General Information

Document purpose: this form is intended to document multiple samples collected from different media, at one facility location in support of the Site Clearance Program.

Naming convention: is important to support the identification of the location, sampling area and media at the location, and date it was sampled (Location – Cardinal Direction and Media Type – Date). Include cardinal direction if multiple samples are collected from the same sampling media wherever possible (i.e. "N9W – NW Background – 022610" vs. "N9W – SW Background – 022610").

Sampler: JENSEN / HINES | **Location:** C29 T ACCESS | **Date of Sample:** 10-11-12

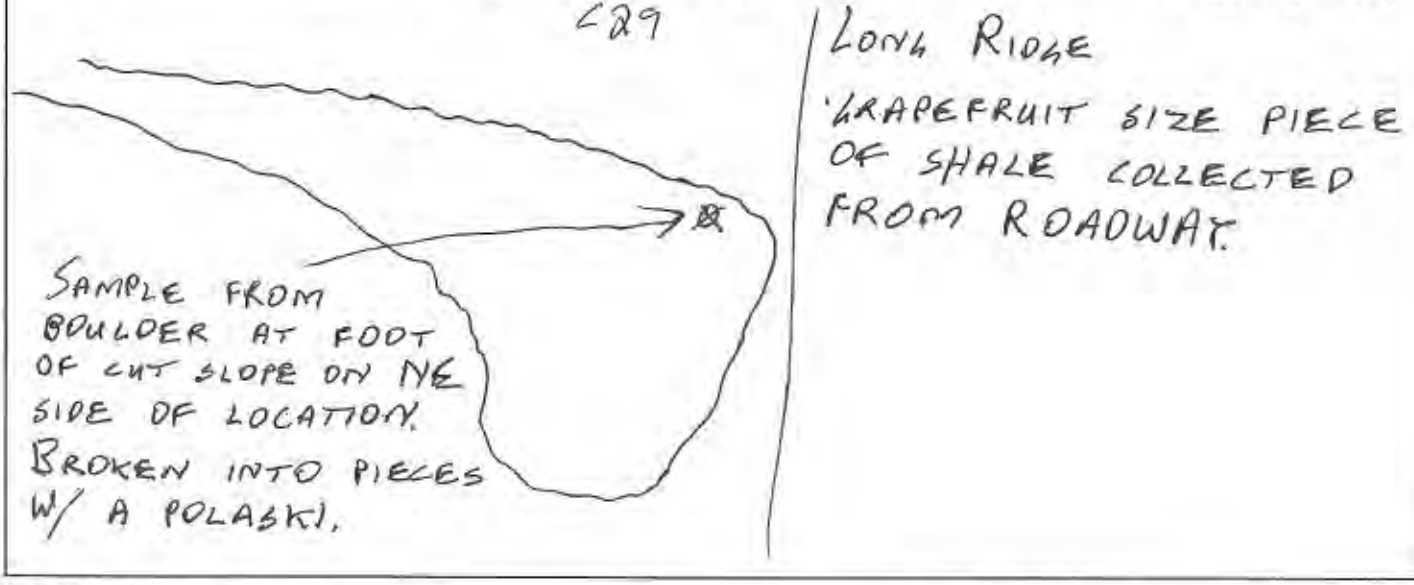
Sample ID:	Time of Sample:	Lat (WGS 84):	Long (WGS 84):	Number of containers:	Composite or Grab:
C29 - OIL SHALE BG (10-11-12)	9:45	39.590668	-108.079152	NA	GRAB
LONG RIDGE - OIL SHALE BG (10-11-12	10:15	39.590728	-108.102063	NA	GRAB

Procedural Directions:

1. Take photos of location and sampled media.
2. Take GPS point(s) of sample locations, including composite points.
3. Prepare site sketch below (Include sample locations, media dimensions, other waste not previously identified, estimated volumes of all waste on location, and color and texture of all waste on location).

Site Sketch:

- OIL SHALE BACKGROUND SAMPLES COLLECTED TO DEMONSTRATE PRESENCE OF ORGANIC CONSTITUENTS, SPECIFICALLY PAH.
- GPS OUT OF BATTERIES – COORDINATES IDENTIFIED REMOTELY USING GIS.



Follow Up Procedures

1. Create "FieldData" folder within the appropriate site folder in the SITE CLEARANCE directory. (If you don't know where this is...**ASK!**)
2. Scan document to PDF and save in sampling field notes folder, using the name convention *Location – Field Notes (Date)* (i.e. "PD30 – Field Notes (06-10-2010)")
3. Create "Photos" folder within "FieldData" folder and insert all photos taken during sampling event. Do not create an additional folder in the "Photos" folder. Use the camera wizard for consistent naming of photos: (i.e. "PD30 – Pit Sampling (07-09-2010)")
4. Provide GPS unit to Chris Hines or Blair Rollins for data download.

ANALYTICAL REPORT

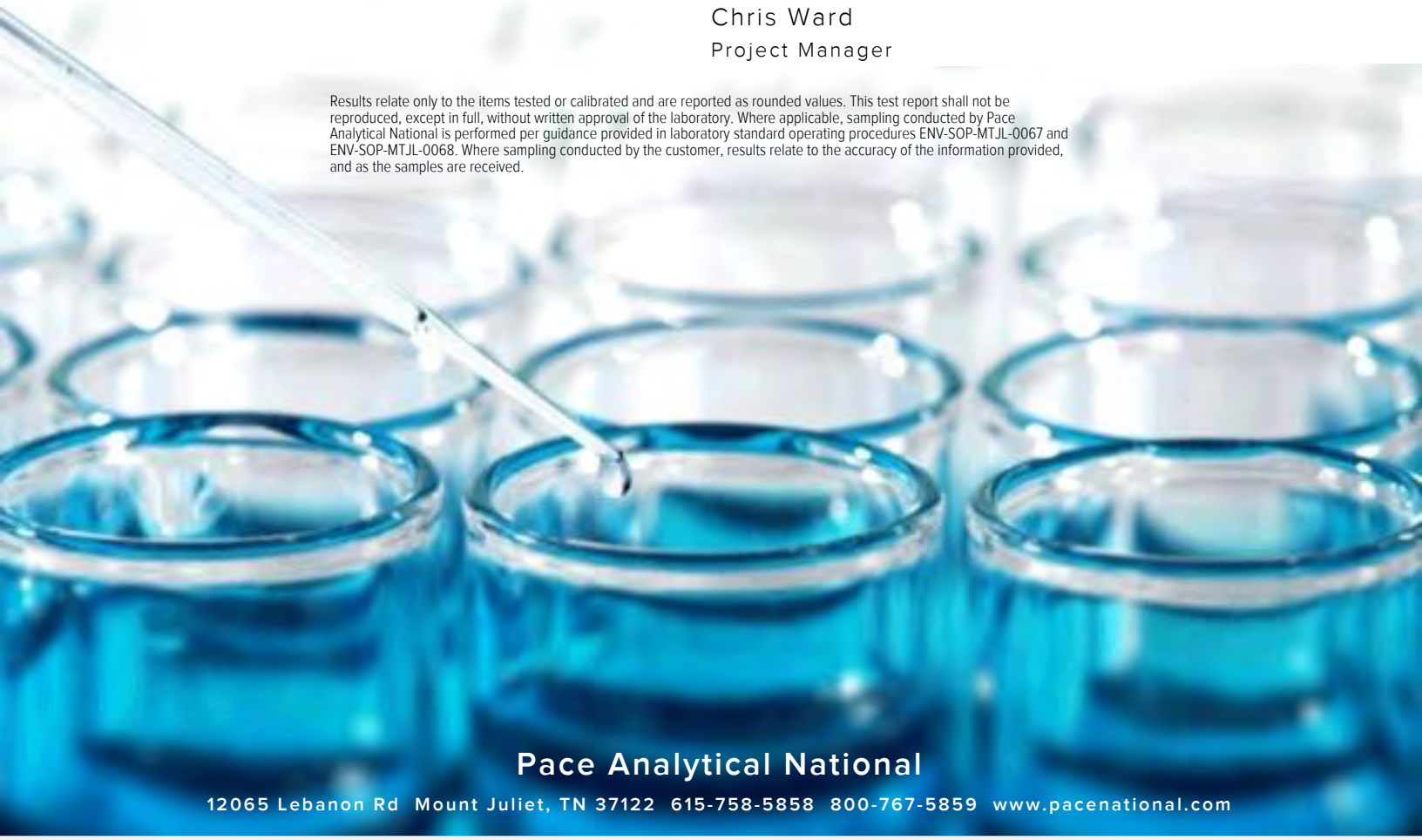
August 09, 2021

Caerus Oil and Gas

Sample Delivery Group:	L1384825
Samples Received:	07/30/2021
Project Number:	
Description:	C29 Historical
Site:	C29
Report To:	Brett Middleton 143 Diamond Avenue Parachute, CO 81635

Entire Report Reviewed By:

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

20210728-C29 (PH01@14") L1384825-01 Solid

Collected by: Andrew Smith | Collected date/time: 07/28/21 08:25 | Received date/time: 07/30/21 09:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1715992	1	08/05/21 14:41	08/05/21 14:41	KMG	Mt. Juliet, TN
Calculated Results	WG1717139	1	08/04/21 17:19	08/06/21 05:50	CCE	Mt. Juliet, TN
Wet Chemistry by Method 3060A/7196A	WG1715152	1	08/03/21 09:00	08/03/21 17:53	RMR	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1715372	1	08/01/21 13:00	08/01/21 15:00	KAB	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1715779	1	08/05/21 12:58	08/05/21 17:17	AMH	Mt. Juliet, TN
Mercury by Method 7471A	WG1717834	1	08/05/21 10:32	08/05/21 15:03	BMF	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1717139	1	08/04/21 17:19	08/06/21 05:50	CCE	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1717139	5	08/04/21 17:19	08/06/21 12:06	CCE	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015/8021	WG1716051	1	08/02/21 13:38	08/03/21 00:24	JAH	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1716897	10	08/04/21 15:41	08/06/21 14:52	WCR	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG1716865	1	08/03/21 23:06	08/04/21 12:17	AAT	Mt. Juliet, TN

20210728-C29 (PH02@30") L1384825-02 Solid

Collected by: Andrew Smith | Collected date/time: 07/28/21 08:40 | Received date/time: 07/30/21 09:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1715992	1	08/05/21 14:44	08/05/21 14:44	KMG	Mt. Juliet, TN
Calculated Results	WG1717139	1	08/04/21 17:19	08/06/21 05:53	CCE	Mt. Juliet, TN
Wet Chemistry by Method 3060A/7196A	WG1715152	1	08/03/21 09:00	08/03/21 17:54	RMR	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1715372	1	08/01/21 13:00	08/01/21 15:00	KAB	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1715779	1	08/05/21 12:58	08/05/21 17:17	AMH	Mt. Juliet, TN
Mercury by Method 7471A	WG1717834	1	08/05/21 10:32	08/05/21 15:09	BMF	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1717139	1	08/04/21 17:19	08/06/21 05:53	CCE	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015/8021	WG1719013	1	08/02/21 13:38	08/06/21 17:35	JAH	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1716897	1	08/04/21 15:41	08/06/21 13:43	WCR	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG1716865	1	08/03/21 23:06	08/04/21 09:41	AAT	Mt. Juliet, TN

20210728-C29 (PH03@12") L1384825-03 Solid

Collected by: Andrew Smith | Collected date/time: 07/28/21 08:50 | Received date/time: 07/30/21 09:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1715992	1	08/05/21 14:46	08/05/21 14:46	KMG	Mt. Juliet, TN
Calculated Results	WG1717139	1	08/04/21 17:19	08/06/21 06:02	CCE	Mt. Juliet, TN
Wet Chemistry by Method 3060A/7196A	WG1715152	1	08/03/21 09:00	08/03/21 17:54	RMR	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1715372	1	08/01/21 13:00	08/01/21 15:00	KAB	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1715779	1	08/05/21 12:58	08/05/21 17:17	AMH	Mt. Juliet, TN
Mercury by Method 7471A	WG1717834	1	08/05/21 10:32	08/05/21 15:12	BMF	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1717139	1	08/04/21 17:19	08/06/21 06:02	CCE	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015/8021	WG1716051	1	08/02/21 13:38	08/03/21 01:12	JAH	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1716897	1	08/04/21 15:41	08/06/21 13:56	WCR	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG1716865	1	08/03/21 23:06	08/04/21 12:35	AAT	Mt. Juliet, TN

20210728-C29 (PH04@12") L1384825-04 Solid

Collected by: Andrew Smith | Collected date/time: 07/28/21 09:00 | Received date/time: 07/30/21 09:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1715992	1	08/05/21 14:49	08/05/21 14:49	KMG	Mt. Juliet, TN
Calculated Results	WG1717139	1	08/04/21 17:19	08/06/21 06:05	CCE	Mt. Juliet, TN
Wet Chemistry by Method 3060A/7196A	WG1715152	1	08/03/21 09:00	08/03/21 17:55	RMR	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1715372	1	08/01/21 13:00	08/01/21 15:00	KAB	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1715779	1	08/05/21 12:58	08/05/21 17:17	AMH	Mt. Juliet, TN
Mercury by Method 7471A	WG1717834	1	08/05/21 10:32	08/05/21 15:14	BMF	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1717139	1	08/04/21 17:19	08/06/21 06:05	CCE	Mt. Juliet, TN

20210728-C29 (PH04@12") L1384825-04 Solid

Collected by: Andrew Smith
Collected date/time: 07/28/21 09:00
Received date/time: 07/30/21 09:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (GC) by Method 8015/8021	WG1716051	1	08/02/21 13:38	08/03/21 01:36	JAH	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1716897	1	08/04/21 15:41	08/06/21 13:29	WCR	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG1716865	1	08/03/21 23:06	08/04/21 09:58	AAT	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	0.302		1	08/05/2021 14:41	WG1715992

Calculated Results

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Chromium,Trivalent	17.2		0.133	1.00	1	08/06/2021 05:50	WG1717139

Wet Chemistry by Method 3060A/7196A

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Chromium,Hexavalent	U		0.640	2.00	1	08/03/2021 17:53	WG1715152

Wet Chemistry by Method 9045D

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	8.75	T8	1	08/01/2021 15:00	WG1715372

Sample Narrative:

L1384825-01 WG1715372: 8.75 at 22.4C

Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	279		10.0	1	08/05/2021 17:17	WG1715779

Mercury by Method 7471A

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Mercury	0.0345	J	0.0180	0.0400	1	08/05/2021 15:03	WG1717834

Metals (ICP) by Method 6010B

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	14.9		0.518	2.00	1	08/06/2021 05:50	WG1717139
Barium	10300		0.426	2.50	5	08/06/2021 12:06	WG1717139
Cadmium	U		0.236	2.50	5	08/06/2021 12:06	WG1717139
Chromium	17.2		0.133	1.00	1	08/06/2021 05:50	WG1717139
Copper	19.6		0.400	2.00	1	08/06/2021 05:50	WG1717139
Lead	16.6		0.208	0.500	1	08/06/2021 05:50	WG1717139
Nickel	15.3		0.132	2.00	1	08/06/2021 05:50	WG1717139
Selenium	1.88	J	0.764	2.00	1	08/06/2021 05:50	WG1717139
Silver	U		0.127	1.00	1	08/06/2021 05:50	WG1717139
Zinc	50.2		0.832	5.00	1	08/06/2021 05:50	WG1717139

Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	0.00389		0.000120	0.000500	1	08/03/2021 00:24	WG1716051
Toluene	0.00750		0.000150	0.00500	1	08/03/2021 00:24	WG1716051
Ethylbenzene	0.00279		0.000110	0.000500	1	08/03/2021 00:24	WG1716051
Total Xylene	0.00604	B	0.000460	0.00150	1	08/03/2021 00:24	WG1716051
TPH (GC/FID) Low Fraction	0.242	B	0.0217	0.100	1	08/03/2021 00:24	WG1716051

Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
(S) a,a,a-Trifluorotoluene(FID)	*89.2*			*77.0-120*		*08/03/2021 00:24*	WG1716051
(S) a,a,a-Trifluorotoluene(PID)	*89.9*			*72.0-128*		*08/03/2021 00:24*	WG1716051

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	390		7.69	40.0	10	08/06/2021 14:52	WG1716897
(S) o-Terphenyl	*128*			*18.0-148*		*08/06/2021 14:52*	WG1716897

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

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Anthracene	U		0.00230	0.00600	1	08/04/2021 12:17	WG1716865
Acenaphthene	U		0.00209	0.00600	1	08/04/2021 12:17	WG1716865
Acenaphthylene	U		0.00216	0.00600	1	08/04/2021 12:17	WG1716865
Benzo(a)anthracene	U		0.00173	0.00600	1	08/04/2021 12:17	WG1716865
Benzo(a)pyrene	U		0.00179	0.00600	1	08/04/2021 12:17	WG1716865
Benzo(b)fluoranthene	0.00531	J	0.00153	0.00600	1	08/04/2021 12:17	WG1716865
Benzo(g,h,i)perylene	0.00398	J	0.00177	0.00600	1	08/04/2021 12:17	WG1716865
Benzo(k)fluoranthene	U		0.00215	0.00600	1	08/04/2021 12:17	WG1716865
Chrysene	0.00649		0.00232	0.00600	1	08/04/2021 12:17	WG1716865
Dibenz(a,h)anthracene	U		0.00172	0.00600	1	08/04/2021 12:17	WG1716865
Fluoranthene	0.00293	J	0.00227	0.00600	1	08/04/2021 12:17	WG1716865
Fluorene	U		0.00205	0.00600	1	08/04/2021 12:17	WG1716865
Indeno(1,2,3-cd)pyrene	U		0.00181	0.00600	1	08/04/2021 12:17	WG1716865
Naphthalene	0.0410		0.00408	0.0200	1	08/04/2021 12:17	WG1716865
Phenanthrene	0.0322		0.00231	0.00600	1	08/04/2021 12:17	WG1716865
Pyrene	0.00816		0.00200	0.00600	1	08/04/2021 12:17	WG1716865
1-Methylnaphthalene	0.0465		0.00449	0.0200	1	08/04/2021 12:17	WG1716865
2-Methylnaphthalene	0.124		0.00427	0.0200	1	08/04/2021 12:17	WG1716865
2-Chloronaphthalene	U		0.00466	0.0200	1	08/04/2021 12:17	WG1716865
(S) p-Terphenyl-d14	*91.0*			*23.0-120*		*08/04/2021 12:17*	WG1716865
(S) Nitrobenzene-d5	*70.7*			*14.0-149*		*08/04/2021 12:17*	WG1716865
(S) 2-Fluorobiphenyl	*67.5*			*34.0-125*		*08/04/2021 12:17*	WG1716865

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	0.655		1	08/05/2021 14:44	WG1715992

Calculated Results

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Chromium,Trivalent	7.51		0.133	1.00	1	08/06/2021 05:53	WG1717139

Wet Chemistry by Method 3060A/7196A

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Chromium,Hexavalent	U		0.640	2.00	1	08/03/2021 17:54	WG1715152

Wet Chemistry by Method 9045D

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	9.24	T8	1	08/01/2021 15:00	WG1715372

Sample Narrative:

L1384825-02 WG1715372: 9.24 at 22.6C

Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	198		10.0	1	08/05/2021 17:17	WG1715779

Mercury by Method 7471A

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Mercury	U		0.0180	0.0400	1	08/05/2021 15:09	WG1717834

Metals (ICP) by Method 6010B

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	3.45		0.518	2.00	1	08/06/2021 05:53	WG1717139
Barium	593		0.0852	0.500	1	08/06/2021 05:53	WG1717139
Cadmium	U		0.0471	0.500	1	08/06/2021 05:53	WG1717139
Chromium	7.51		0.133	1.00	1	08/06/2021 05:53	WG1717139
Copper	4.38		0.400	2.00	1	08/06/2021 05:53	WG1717139
Lead	4.57		0.208	0.500	1	08/06/2021 05:53	WG1717139
Nickel	7.49		0.132	2.00	1	08/06/2021 05:53	WG1717139
Selenium	U		0.764	2.00	1	08/06/2021 05:53	WG1717139
Silver	U		0.127	1.00	1	08/06/2021 05:53	WG1717139
Zinc	25.1		0.832	5.00	1	08/06/2021 05:53	WG1717139

Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	0.00164		0.000120	0.000500	1	08/06/2021 17:35	WG1719013
Toluene	0.00323	J	0.000150	0.00500	1	08/06/2021 17:35	WG1719013
Ethylbenzene	0.000773	B	0.000110	0.000500	1	08/06/2021 17:35	WG1719013
Total Xylene	0.00189		0.000460	0.00150	1	08/06/2021 17:35	WG1719013
TPH (GC/FID) Low Fraction	0.104	B	0.0217	0.100	1	08/06/2021 17:35	WG1719013

Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
(S) a,a,a-Trifluorotoluene(FID)	*98.2*			*77.0-120*		*08/06/2021 17:35*	WG1719013
(S) a,a,a-Trifluorotoluene(PID)	*101*			*72.0-128*		*08/06/2021 17:35*	WG1719013

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	43.2		0.769	4.00	1	08/06/2021 13:43	WG1716897
(S) o-Terphenyl	*71.4*			*18.0-148*		*08/06/2021 13:43*	WG1716897

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

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Anthracene	U		0.00230	0.00600	1	08/04/2021 09:41	WG1716865
Acenaphthene	U		0.00209	0.00600	1	08/04/2021 09:41	WG1716865
Acenaphthylene	U		0.00216	0.00600	1	08/04/2021 09:41	WG1716865
Benzo(a)anthracene	U		0.00173	0.00600	1	08/04/2021 09:41	WG1716865
Benzo(a)pyrene	U		0.00179	0.00600	1	08/04/2021 09:41	WG1716865
Benzo(b)fluoranthene	U		0.00153	0.00600	1	08/04/2021 09:41	WG1716865
Benzo(g,h,i)perylene	U		0.00177	0.00600	1	08/04/2021 09:41	WG1716865
Benzo(k)fluoranthene	U		0.00215	0.00600	1	08/04/2021 09:41	WG1716865
Chrysene	U		0.00232	0.00600	1	08/04/2021 09:41	WG1716865
Dibenz(a,h)anthracene	U		0.00172	0.00600	1	08/04/2021 09:41	WG1716865
Fluoranthene	U		0.00227	0.00600	1	08/04/2021 09:41	WG1716865
Fluorene	U		0.00205	0.00600	1	08/04/2021 09:41	WG1716865
Indeno(1,2,3-cd)pyrene	U		0.00181	0.00600	1	08/04/2021 09:41	WG1716865
Naphthalene	0.00454	J	0.00408	0.0200	1	08/04/2021 09:41	WG1716865
Phenanthrene	0.00316	J	0.00231	0.00600	1	08/04/2021 09:41	WG1716865
Pyrene	U		0.00200	0.00600	1	08/04/2021 09:41	WG1716865
1-Methylnaphthalene	0.00592	J	0.00449	0.0200	1	08/04/2021 09:41	WG1716865
2-Methylnaphthalene	0.0219		0.00427	0.0200	1	08/04/2021 09:41	WG1716865
2-Chloronaphthalene	U		0.00466	0.0200	1	08/04/2021 09:41	WG1716865
(S) p-Terphenyl-d14	*93.0*			*23.0-120*		*08/04/2021 09:41*	WG1716865
(S) Nitrobenzene-d5	*74.3*			*14.0-149*		*08/04/2021 09:41*	WG1716865
(S) 2-Fluorobiphenyl	*69.4*			*34.0-125*		*08/04/2021 09:41*	WG1716865

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	2.81		1	08/05/2021 14:46	WG1715992

Calculated Results

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Chromium,Trivalent	19.1		0.133	1.00	1	08/06/2021 06:02	WG1717139

Wet Chemistry by Method 3060A/7196A

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Chromium,Hexavalent	U		0.640	2.00	1	08/03/2021 17:54	WG1715152

Wet Chemistry by Method 9045D

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	8.94	T8	1	08/01/2021 15:00	WG1715372

Sample Narrative:

L1384825-03 WG1715372: 8.94 at 22.3C

Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	671		10.0	1	08/05/2021 17:17	WG1715779

Mercury by Method 7471A

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Mercury	U		0.0180	0.0400	1	08/05/2021 15:12	WG1717834

Metals (ICP) by Method 6010B

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	14.2		0.518	2.00	1	08/06/2021 06:02	WG1717139
Barium	457		0.0852	0.500	1	08/06/2021 06:02	WG1717139
Cadmium	1.02		0.0471	0.500	1	08/06/2021 06:02	WG1717139
Chromium	19.1		0.133	1.00	1	08/06/2021 06:02	WG1717139
Copper	19.9		0.400	2.00	1	08/06/2021 06:02	WG1717139
Lead	13.5		0.208	0.500	1	08/06/2021 06:02	WG1717139
Nickel	16.7		0.132	2.00	1	08/06/2021 06:02	WG1717139
Selenium	1.07	J	0.764	2.00	1	08/06/2021 06:02	WG1717139
Silver	U		0.127	1.00	1	08/06/2021 06:02	WG1717139
Zinc	41.5		0.832	5.00	1	08/06/2021 06:02	WG1717139

Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	0.0118		0.000120	0.000500	1	08/03/2021 01:12	WG1716051
Toluene	0.0117		0.000150	0.00500	1	08/03/2021 01:12	WG1716051
Ethylbenzene	0.00164	B	0.000110	0.000500	1	08/03/2021 01:12	WG1716051
Total Xylene	0.00644	B	0.000460	0.00150	1	08/03/2021 01:12	WG1716051
TPH (GC/FID) Low Fraction	0.236	B	0.0217	0.100	1	08/03/2021 01:12	WG1716051

Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
(S) a,a,a-Trifluorotoluene(FID)	*96.3*			*77.0-120*		*08/03/2021 01:12*	WG1716051
(S) a,a,a-Trifluorotoluene(PID)	*95.6*			*72.0-128*		*08/03/2021 01:12*	WG1716051

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	12.8		0.769	4.00	1	08/06/2021 13:56	WG1716897
(S) o-Terphenyl	*51.8*			*18.0-148*		*08/06/2021 13:56*	WG1716897

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

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Anthracene	U		0.00230	0.00600	1	08/04/2021 12:35	WG1716865
Acenaphthene	U		0.00209	0.00600	1	08/04/2021 12:35	WG1716865
Acenaphthylene	U		0.00216	0.00600	1	08/04/2021 12:35	WG1716865
Benzo(a)anthracene	U		0.00173	0.00600	1	08/04/2021 12:35	WG1716865
Benzo(a)pyrene	U		0.00179	0.00600	1	08/04/2021 12:35	WG1716865
Benzo(b)fluoranthene	U		0.00153	0.00600	1	08/04/2021 12:35	WG1716865
Benzo(g,h,i)perylene	0.00275	J	0.00177	0.00600	1	08/04/2021 12:35	WG1716865
Benzo(k)fluoranthene	U		0.00215	0.00600	1	08/04/2021 12:35	WG1716865
Chrysene	U		0.00232	0.00600	1	08/04/2021 12:35	WG1716865
Dibenz(a,h)anthracene	U		0.00172	0.00600	1	08/04/2021 12:35	WG1716865
Fluoranthene	U		0.00227	0.00600	1	08/04/2021 12:35	WG1716865
Fluorene	U		0.00205	0.00600	1	08/04/2021 12:35	WG1716865
Indeno(1,2,3-cd)pyrene	U		0.00181	0.00600	1	08/04/2021 12:35	WG1716865
Naphthalene	U		0.00408	0.0200	1	08/04/2021 12:35	WG1716865
Phenanthrene	U		0.00231	0.00600	1	08/04/2021 12:35	WG1716865
Pyrene	U		0.00200	0.00600	1	08/04/2021 12:35	WG1716865
1-Methylnaphthalene	U		0.00449	0.0200	1	08/04/2021 12:35	WG1716865
2-Methylnaphthalene	U		0.00427	0.0200	1	08/04/2021 12:35	WG1716865
2-Chloronaphthalene	U		0.00466	0.0200	1	08/04/2021 12:35	WG1716865
(S) p-Terphenyl-d14	*83.5*			*23.0-120*		*08/04/2021 12:35*	WG1716865
(S) Nitrobenzene-d5	*73.7*			*14.0-149*		*08/04/2021 12:35*	WG1716865
(S) 2-Fluorobiphenyl	*67.3*			*34.0-125*		*08/04/2021 12:35*	WG1716865

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	2.28		1	08/05/2021 14:49	WG1715992

Calculated Results

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Chromium,Trivalent	21.6		0.133	1.00	1	08/06/2021 06:05	WG1717139

Wet Chemistry by Method 3060A/7196A

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Chromium,Hexavalent	U		0.640	2.00	1	08/03/2021 17:55	WG1715152

Wet Chemistry by Method 9045D

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	9.05	T8	1	08/01/2021 15:00	WG1715372

Sample Narrative:
L1384825-04 WG1715372: 9.05 at 22.4C

Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	648		10.0	1	08/05/2021 17:17	WG1715779

Mercury by Method 7471A

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Mercury	U		0.0180	0.0400	1	08/05/2021 15:14	WG1717834

Metals (ICP) by Method 6010B

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	29.2		0.518	2.00	1	08/06/2021 06:05	WG1717139
Barium	450		0.0852	0.500	1	08/06/2021 06:05	WG1717139
Cadmium	0.262	J	0.0471	0.500	1	08/06/2021 06:05	WG1717139
Chromium	21.6		0.133	1.00	1	08/06/2021 06:05	WG1717139
Copper	24.9		0.400	2.00	1	08/06/2021 06:05	WG1717139
Lead	15.5		0.208	0.500	1	08/06/2021 06:05	WG1717139
Nickel	20.1		0.132	2.00	1	08/06/2021 06:05	WG1717139
Selenium	1.52	J	0.764	2.00	1	08/06/2021 06:05	WG1717139
Silver	U		0.127	1.00	1	08/06/2021 06:05	WG1717139
Zinc	49.8		0.832	5.00	1	08/06/2021 06:05	WG1717139

Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	0.00804		0.000120	0.000500	1	08/03/2021 01:36	WG1716051
Toluene	0.00955		0.000150	0.00500	1	08/03/2021 01:36	WG1716051
Ethylbenzene	0.00238	B	0.000110	0.000500	1	08/03/2021 01:36	WG1716051
Total Xylene	0.00636	B	0.000460	0.00150	1	08/03/2021 01:36	WG1716051
TPH (GC/FID) Low Fraction	0.217	B	0.0217	0.100	1	08/03/2021 01:36	WG1716051

Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
(S) a,a,a-Trifluorotoluene(FID)	*96.8*			*77.0-120*		*08/03/2021 01:36*	WG1716051
(S) a,a,a-Trifluorotoluene(PID)	*95.9*			*72.0-128*		*08/03/2021 01:36*	WG1716051

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	24.3		0.769	4.00	1	08/06/2021 13:29	WG1716897
(S) o-Terphenyl	*49.2*			*18.0-148*		*08/06/2021 13:29*	WG1716897

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

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Anthracene	U		0.00230	0.00600	1	08/04/2021 09:58	WG1716865
Acenaphthene	U		0.00209	0.00600	1	08/04/2021 09:58	WG1716865
Acenaphthylene	U		0.00216	0.00600	1	08/04/2021 09:58	WG1716865
Benzo(a)anthracene	U		0.00173	0.00600	1	08/04/2021 09:58	WG1716865
Benzo(a)pyrene	U		0.00179	0.00600	1	08/04/2021 09:58	WG1716865
Benzo(b)fluoranthene	0.00165	J	0.00153	0.00600	1	08/04/2021 09:58	WG1716865
Benzo(g,h,i)perylene	0.00186	J	0.00177	0.00600	1	08/04/2021 09:58	WG1716865
Benzo(k)fluoranthene	U		0.00215	0.00600	1	08/04/2021 09:58	WG1716865
Chrysene	U		0.00232	0.00600	1	08/04/2021 09:58	WG1716865
Dibenz(a,h)anthracene	U		0.00172	0.00600	1	08/04/2021 09:58	WG1716865
Fluoranthene	U		0.00227	0.00600	1	08/04/2021 09:58	WG1716865
Fluorene	U		0.00205	0.00600	1	08/04/2021 09:58	WG1716865
Indeno(1,2,3-cd)pyrene	U		0.00181	0.00600	1	08/04/2021 09:58	WG1716865
Naphthalene	U		0.00408	0.0200	1	08/04/2021 09:58	WG1716865
Phenanthrene	U		0.00231	0.00600	1	08/04/2021 09:58	WG1716865
Pyrene	U		0.00200	0.00600	1	08/04/2021 09:58	WG1716865
1-Methylnaphthalene	U		0.00449	0.0200	1	08/04/2021 09:58	WG1716865
2-Methylnaphthalene	0.00609	J	0.00427	0.0200	1	08/04/2021 09:58	WG1716865
2-Chloronaphthalene	U		0.00466	0.0200	1	08/04/2021 09:58	WG1716865
(S) p-Terphenyl-d14	*90.3*			*23.0-120*		*08/04/2021 09:58*	WG1716865
(S) Nitrobenzene-d5	*80.1*			*14.0-149*		*08/04/2021 09:58*	WG1716865
(S) 2-Fluorobiphenyl	*70.2*			*34.0-125*		*08/04/2021 09:58*	WG1716865

Method Blank (MB)

(MB) R3687353-1 08/03/21 17:35

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

L1384824-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1384824-02 08/03/21 17:44 • (DUP) R3687353-3 08/03/21 17:46

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

L1384824-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1384824-03 08/03/21 17:47 • (DUP) R3687353-4 08/03/21 17:47

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

Laboratory Control Sample (LCS)

(LCS) R3687353-2 08/03/21 17:35

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Chromium,Hexavalent	24.0	22.1	92.2	80.0-120	

L1384824-04 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1384824-04 08/03/21 17:48 • (MS) R3687353-5 08/03/21 17:49 • (MSD) R3687353-6 08/03/21 17:50

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Chromium,Hexavalent	20.0	U	6.90	7.66	34.5	38.3	1	75.0-125	J6	J6	10.4	20

L1384789-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1384789-02 08/01/21 15:00 • (DUP) R3686380-2 08/01/21 15:00

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	8.11	8.09	1	0.247		1

Sample Narrative:

OS: 8.11 at 23.1C

DUP: 8.09 at 23.1C

Laboratory Control Sample (LCS)

(LCS) R3686380-1 08/01/21 15:00

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

Sample Narrative:

LCS: 10.07 at 22.3C

Method Blank (MB)

(MB) R3688471-1 08/05/21 17:17

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

L1384909-07 Original Sample (OS) • Duplicate (DUP)

(OS) L1384909-07 08/05/21 17:17 • (DUP) R3688471-3 08/05/21 17:17

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	1620	1500	1	7.55		20

L1385755-04 Original Sample (OS) • Duplicate (DUP)

(OS) L1385755-04 08/05/21 17:17 • (DUP) R3688471-4 08/05/21 17:17

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	212	202	1	4.49		20

Laboratory Control Sample (LCS)

(LCS) R3688471-2 08/05/21 17:17

Analyte	Spike Amount umhos/cm	LCS Result umhos/cm	LCS Rec. %	Rec. Limits %	LCS Qualifier
Specific Conductance	899	908	101	85.0-115	

Method Blank (MB)

(MB) R3688500-1 08/05/21 14:05

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

Laboratory Control Sample (LCS)

(LCS) R3688500-2 08/05/21 14:08

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Mercury	0.500	0.505	101	80.0-120	

L1386201-10 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1386201-10 08/05/21 14:10 • (MS) R3688500-3 08/05/21 14:12 • (MSD) R3688500-4 08/05/21 14:14

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 %
Mercury	0.500	0.0485	0.529	0.504	96.0	91.1	1	75.0-125			4.74	20

Method Blank (MB)

(MB) R3688803-1 08/06/21 04:51

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Arsenic	U		0.518	2.00
Barium	U		0.0852	0.500
Cadmium	U		0.0471	0.500
Chromium	U		0.133	1.00
Copper	U		0.400	2.00
Lead	U		0.208	0.500
Nickel	U		0.132	2.00
Selenium	U		0.764	2.00
Silver	U		0.127	1.00
Zinc	U		0.832	5.00

Laboratory Control Sample (LCS)

(LCS) R3688803-2 08/06/21 04:53

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Arsenic	100	95.3	95.3	80.0-120	
Barium	100	99.7	99.7	80.0-120	
Cadmium	100	95.0	95.0	80.0-120	
Chromium	100	98.2	98.2	80.0-120	
Copper	100	98.6	98.6	80.0-120	
Lead	100	98.0	98.0	80.0-120	
Nickel	100	99.5	99.5	80.0-120	
Selenium	100	97.5	97.5	80.0-120	
Silver	20.0	18.3	91.4	80.0-120	
Zinc	100	97.0	97.0	80.0-120	

L1384880-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1384880-03 08/06/21 04:56 • (MS) R3688803-5 08/06/21 05:04 • (MSD) R3688803-6 08/06/21 05:06

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	U	101	101	101	101	1	75.0-125			0.142	20
Barium	100	45.6	164	160	119	114	1	75.0-125			2.68	20
Cadmium	100	0.0653	100	101	100	100	1	75.0-125			0.324	20
Chromium	100	7.45	109	109	101	101	1	75.0-125			0.0258	20
Copper	100	7.71	114	116	107	108	1	75.0-125			1.45	20
Lead	100	5.35	109	109	103	104	1	75.0-125			0.610	20
Nickel	100	5.64	112	112	106	107	1	75.0-125			0.515	20

L1384880-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1384880-03 08/06/21 04:56 • (MS) R3688803-5 08/06/21 05:04 • (MSD) R3688803-6 08/06/21 05:06

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 %
Selenium	100	U	103	102	103	102	1	75.0-125			0.676	20
Silver	20.0	U	19.2	19.3	95.9	96.4	1	75.0-125			0.565	20
Zinc	100	69.7	200	197	131	127	1	75.0-125	J5	J5	1.59	20

Method Blank (MB)

(MB) R3687124-3 08/02/21 18:29

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Benzene	0.000142	J	0.000120	0.000500
Toluene	0.000545	J	0.000150	0.00500
Ethylbenzene	0.000257	J	0.000110	0.000500
Total Xylene	0.000806	J	0.000460	0.00150
TPH (GC/FID) Low Fraction	0.0476	J	0.0217	0.100
(S) a,a,a-Trifluorotoluene(FID)	*99.9*			*77.0-120*
(S) a,a,a-Trifluorotoluene(PID)	*101*			*72.0-128*

Laboratory Control Sample (LCS)

(LCS) R3687124-1 08/02/21 16:13

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Benzene	0.0500	0.0402	80.4	76.0-121	
Toluene	0.0500	0.0421	84.2	80.0-120	
Ethylbenzene	0.0500	0.0448	89.6	80.0-124	
Total Xylene	0.150	0.135	90.0	37.0-160	
(S) a,a,a-Trifluorotoluene(FID)			*100*	*77.0-120*	
(S) a,a,a-Trifluorotoluene(PID)			*97.2*	*72.0-128*	

Laboratory Control Sample (LCS)

(LCS) R3687124-2 08/02/21 16:37

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
TPH (GC/FID) Low Fraction	5.50	6.04	110	72.0-127	
(S) a,a,a-Trifluorotoluene(FID)			*101*	*77.0-120*	
(S) a,a,a-Trifluorotoluene(PID)			*104*	*72.0-128*	

Method Blank (MB)

(MB) R3689280-2 08/06/21 14:55

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Benzene	U		0.000120	0.000500
Toluene	0.000151	J	0.000150	0.00500
Ethylbenzene	0.000115	J	0.000110	0.000500
Total Xylene	U		0.000460	0.00150
TPH (GC/FID) Low Fraction	0.0313	J	0.0217	0.100
(S) a,a,a-Trifluorotoluene(FID)	*103*			*77.0-120*
(S) a,a,a-Trifluorotoluene(PID)	*107*			*72.0-128*

Laboratory Control Sample (LCS)

(LCS) R3689280-1 08/06/21 14:08

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
TPH (GC/FID) Low Fraction	5.50	4.95	90.0	72.0-127	
(S) a,a,a-Trifluorotoluene(FID)			*109*	*77.0-120*	
(S) a,a,a-Trifluorotoluene(PID)			*113*	*72.0-128*	

Laboratory Control Sample (LCS)

(LCS) R3689280-3 08/06/21 16:09

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Benzene	0.0500	0.0430	86.0	76.0-121	
Toluene	0.0500	0.0423	84.6	80.0-120	
Ethylbenzene	0.0500	0.0418	83.6	80.0-124	
Total Xylene	0.150	0.125	83.3	37.0-160	
(S) a,a,a-Trifluorotoluene(FID)			*102*	*77.0-120*	
(S) a,a,a-Trifluorotoluene(PID)			*103*	*72.0-128*	

Method Blank (MB)

(MB) R3688743-1 08/06/21 07:47

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
TPH (GC/FID) High Fraction	U		0.769	4.00
(S) o-Terphenyl	*62.6*			*18.0-148*

Laboratory Control Sample (LCS)

(LCS) R3688743-2 08/06/21 08:00

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
TPH (GC/FID) High Fraction	50.0	26.6	53.2	50.0-150	
(S) o-Terphenyl			*55.6*	*18.0-148*	

L1384823-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1384823-01 08/06/21 13:08 • (MS) R3688915-1 08/06/21 13:22 • (MSD) R3688915-2 08/06/21 13:35

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
TPH (GC/FID) High Fraction	47.7	17.4	56.3	58.9	81.6	86.5	1	50.0-150			4.51	20
(S) o-Terphenyl					*77.7*	*80.3*		*18.0-148*				

Method Blank (MB)

(MB) R3687739-2 08/04/21 07:21

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Anthracene	U		0.00230	0.00600
Acenaphthene	U		0.00209	0.00600
Acenaphthylene	U		0.00216	0.00600
Benzo(a)anthracene	U		0.00173	0.00600
Benzo(a)pyrene	U		0.00179	0.00600
Benzo(b)fluoranthene	U		0.00153	0.00600
Benzo(g,h,i)perylene	U		0.00177	0.00600
Benzo(k)fluoranthene	U		0.00215	0.00600
Chrysene	U		0.00232	0.00600
Dibenz(a,h)anthracene	U		0.00172	0.00600
Fluoranthene	U		0.00227	0.00600
Fluorene	U		0.00205	0.00600
Indeno(1,2,3-cd)pyrene	U		0.00181	0.00600
Naphthalene	U		0.00408	0.0200
Phenanthrene	U		0.00231	0.00600
Pyrene	U		0.00200	0.00600
1-Methylnaphthalene	U		0.00449	0.0200
2-Methylnaphthalene	U		0.00427	0.0200
2-Chloronaphthalene	U		0.00466	0.0200
(S) Nitrobenzene-d5	*87.8*			*14.0-149*
(S) 2-Fluorobiphenyl	*81.5*			*34.0-125*
(S) p-Terphenyl-d14	*106*			*23.0-120*

Laboratory Control Sample (LCS)

(LCS) R3687739-1 08/04/21 07:04

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Anthracene	0.0800	0.0650	81.3	50.0-126	
Acenaphthene	0.0800	0.0639	79.9	50.0-120	
Acenaphthylene	0.0800	0.0696	87.0	50.0-120	
Benzo(a)anthracene	0.0800	0.0659	82.4	45.0-120	
Benzo(a)pyrene	0.0800	0.0585	73.1	42.0-120	
Benzo(b)fluoranthene	0.0800	0.0670	83.8	42.0-121	
Benzo(g,h,i)perylene	0.0800	0.0598	74.8	45.0-125	
Benzo(k)fluoranthene	0.0800	0.0662	82.8	49.0-125	
Chrysene	0.0800	0.0657	82.1	49.0-122	
Dibenz(a,h)anthracene	0.0800	0.0594	74.3	47.0-125	
Fluoranthene	0.0800	0.0630	78.8	49.0-129	

Laboratory Control Sample (LCS)

(LCS) R3687739-1 08/04/21 07:04

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Fluorene	0.0800	0.0650	81.3	49.0-120	
Indeno(1,2,3-cd)pyrene	0.0800	0.0594	74.3	46.0-125	
Naphthalene	0.0800	0.0640	80.0	50.0-120	
Phenanthrene	0.0800	0.0659	82.4	47.0-120	
Pyrene	0.0800	0.0706	88.3	43.0-123	
1-Methylnaphthalene	0.0800	0.0630	78.8	51.0-121	
2-Methylnaphthalene	0.0800	0.0620	77.5	50.0-120	
2-Chloronaphthalene	0.0800	0.0641	80.1	50.0-120	
(S) Nitrobenzene-d5			*91.6*	*14.0-149*	
(S) 2-Fluorobiphenyl			*83.2*	*34.0-125*	
(S) p-Terphenyl-d14			*105*	*23.0-120*	

L1384880-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1384880-01 08/04/21 10:16 • (MS) R3687739-3 08/04/21 10:33 • (MSD) R3687739-4 08/04/21 10:50

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Anthracene	0.0780	U	0.0496	0.0485	63.6	62.2	1	10.0-145			2.24	30
Acenaphthene	0.0780	U	0.0464	0.0451	59.5	57.8	1	14.0-127			2.84	27
Acenaphthylene	0.0780	U	0.0513	0.0499	65.8	64.0	1	21.0-124			2.77	25
Benzo(a)anthracene	0.0780	U	0.0520	0.0514	66.7	65.9	1	10.0-139			1.16	30
Benzo(a)pyrene	0.0780	U	0.0507	0.0501	65.0	64.2	1	10.0-141			1.19	31
Benzo(b)fluoranthene	0.0780	U	0.0486	0.0480	62.3	61.5	1	10.0-140			1.24	36
Benzo(g,h,i)perylene	0.0780	U	0.0478	0.0475	61.3	60.9	1	10.0-140			0.630	33
Benzo(k)fluoranthene	0.0780	U	0.0523	0.0526	67.1	67.4	1	10.0-137			0.572	31
Chrysene	0.0780	U	0.0554	0.0542	71.0	69.5	1	10.0-145			2.19	30
Dibenz(a,h)anthracene	0.0780	U	0.0496	0.0498	63.6	63.8	1	10.0-132			0.402	31
Fluoranthene	0.0780	U	0.0466	0.0457	59.7	58.6	1	10.0-153			1.95	33
Fluorene	0.0780	U	0.0466	0.0458	59.7	58.7	1	11.0-130			1.73	29
Indeno(1,2,3-cd)pyrene	0.0780	U	0.0468	0.0477	60.0	61.2	1	10.0-137			1.90	32
Naphthalene	0.0780	U	0.0500	0.0482	64.1	61.8	1	10.0-135			3.67	27
Phenanthrene	0.0780	U	0.0480	0.0465	61.5	59.6	1	10.0-144			3.17	31
Pyrene	0.0780	U	0.0514	0.0501	65.9	64.2	1	10.0-148			2.56	35
1-Methylnaphthalene	0.0780	U	0.0467	0.0460	59.9	59.0	1	10.0-142			1.51	28
2-Methylnaphthalene	0.0780	U	0.0459	0.0449	58.8	57.6	1	10.0-137			2.20	28
2-Chloronaphthalene	0.0780	U	0.0470	0.0467	60.3	59.9	1	29.0-120			0.640	24
(S) Nitrobenzene-d5					*81.7*	*86.3*		*14.0-149*				
(S) 2-Fluorobiphenyl					*73.2*	*79.0*		*34.0-125*				
(S) p-Terphenyl-d14					*89.7*	*97.7*		*23.0-120*				

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.
J5	The sample matrix interfered with the ability to make any accurate determination; spike value is high.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.
T8	Sample(s) received past/too close to holding time expiration.

ACCREDITATIONS & LOCATIONS

Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [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	LAO00356
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 Analytical Request Document

Pace Analytical®

Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: https://info.pacelabs.com/hubfs/pas-standard-terms.pdf

Chain-of-Custody is a LEGAL DOCUMENT - Complete all relevant fields

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

ALL BOLD OUTLINED AREAS are for LAB USE ONLY

Company: Caerus Oil and Gas LLC	Billing Information: Info on file
Address: Info on file	
Report To: Jake Janicek, Brett Middleton, Blair Rollins	Email To: Info on file
Copy To: Chris McKisson, remediation@confluence-cc.com	Site Collection Info/Address:
Customer Project Name/Number: C29 Historical	State: / County/City: Time Zone Collected: [ ]PT [X]MT [ ]CT [ ]ET

Container Preservative Type **

Lab Project Manager:

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

Phone: Email:	Site/Facility ID #: C29	Compliance Monitoring? [ ] Yes [X] No
Collected By (print): Andrew Smith	Purchase Order # : Quote #:	DW PWS ID #: DW Location Code:
Collected By (signature):	Turnaround Date Required: Standard 5-Day	Immediately Packed on Ice: [X] Yes [ ] No
Sample Disposal: [ ] Dispose as appropriate [ ] Return [ ] Archive: _____ [ ] Hold: _____	Rush: (Expedite Charges Apply) [ ] Same Day [ ] Next Day [ ] 2 Day [ ] 3 Day [ ] 4 Day [ ] 5 Day	Field Filtered (if applicable): [ ] Yes [ ] No Analysis: _____

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

Customer Sample ID	Matrix *	Comp / Grab	Collected (or Composite Start) Date	Collected (or Composite Start) Time	Composite End Date	Composite End Time	Res Cl	# of Ctns	Container Type: Plastic (P) or Glass (G)	BTEX	TPH)GRO, DRO)	Table 910-1 Metal's	Table 910-1 PAH's	EC, SAR,pH, Arsenic	Lab Sample # / Comments
20210728 - C29 (PH01@14")	SL	G	7/28/2021	0825				2	G	X	X	X	X	X	L1384825 -01
20210728 - C29 (PH02@30")	SL	G	7/28/2021	0840				2	G	X	X	X	X	X	-02
20210728 - C29 (PH03@12")	SL	G	7/28/2021	0850				2	G	X	X	X	X	X	-03
20210728 - C29 (PH04@12")	SL	G	7/28/2021	0900				2	G	X	X	X	X	X	-04

Analyses

Lab Profile/Line:

Lab Sample Receipt Checklist:

Custody Seals Present/Intact	Y	N	NA
Custody Signatures Present	Y	N	NA
Collector Signature Present	Y	N	NA
Bottles Intact	Y	N	NA
Correct Bottles	Y	N	NA
Sufficient Volume	Y	N	NA
Samples Received on Ice	Y	N	NA
VOA - Headspace Acceptable	Y	N	NA
USDA Regulated Soils	Y	N	NA
Samples in Holding Time	Y	N	NA
Residual Chlorine Present	Y	N	NA
Cl Strips: _____			
Sample pH Acceptable	Y	N	NA
pH Strips: _____			
Sulfide Present	Y	N	NA
Lead Acetate Strips: _____			

LAB USE ONLY:

Customer Remarks / Special Conditions / Possible Hazards:
PLEASE NOTE TABLE 910-1....NOT TABLE 915-1.

Type of Ice Used: Wet Blue Dry None

Packing Material Used: Fed ex Solo 1232 1187/1198

Radchem sample(s) screened (<500 cpm): Y N NA

SHORT HOLDS PRESENT (<72 hours): Y N N/A

Lab Tracking #:

Samples received via: FEDEX UPS Client Courier Pace Courier

LAB Sample Temperature Info:
Temp Blank Received: Y N NA
Therm ID#: IR#2
Cooler 1 Temp Upon Receipt: 2.7 oC
Cooler 1 Therm Corr. Factor: -.2 oC
Cooler 1 Corrected Temp: 2.5 oC
Comments:

Relinquished by/Company: (Signature)	Date/Time: 7-29-21/1300	Received by/Company: (Signature)	Date/Time:
Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time: 7/30/21 9:15
Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:

A018

Acctnum:
Template:
Prelogin:
PM:
PB:

Trip Blank Received: Y N NA
HCL MeOH TSP Other

Non Conformance(s): YES / NO

Page: ____ of: ____

ANALYTICAL REPORT

July 02, 2021

Caerus Oil and Gas

Sample Delivery Group:	L1368713
Samples Received:	06/19/2021
Project Number:	
Description:	C29 10" Gathering Line

Report To:

Brett Middleton
143 Diamond Avenue
Parachute, CO 81635

Entire Report Reviewed By: Chris Ward

Chris Ward
Project Manager

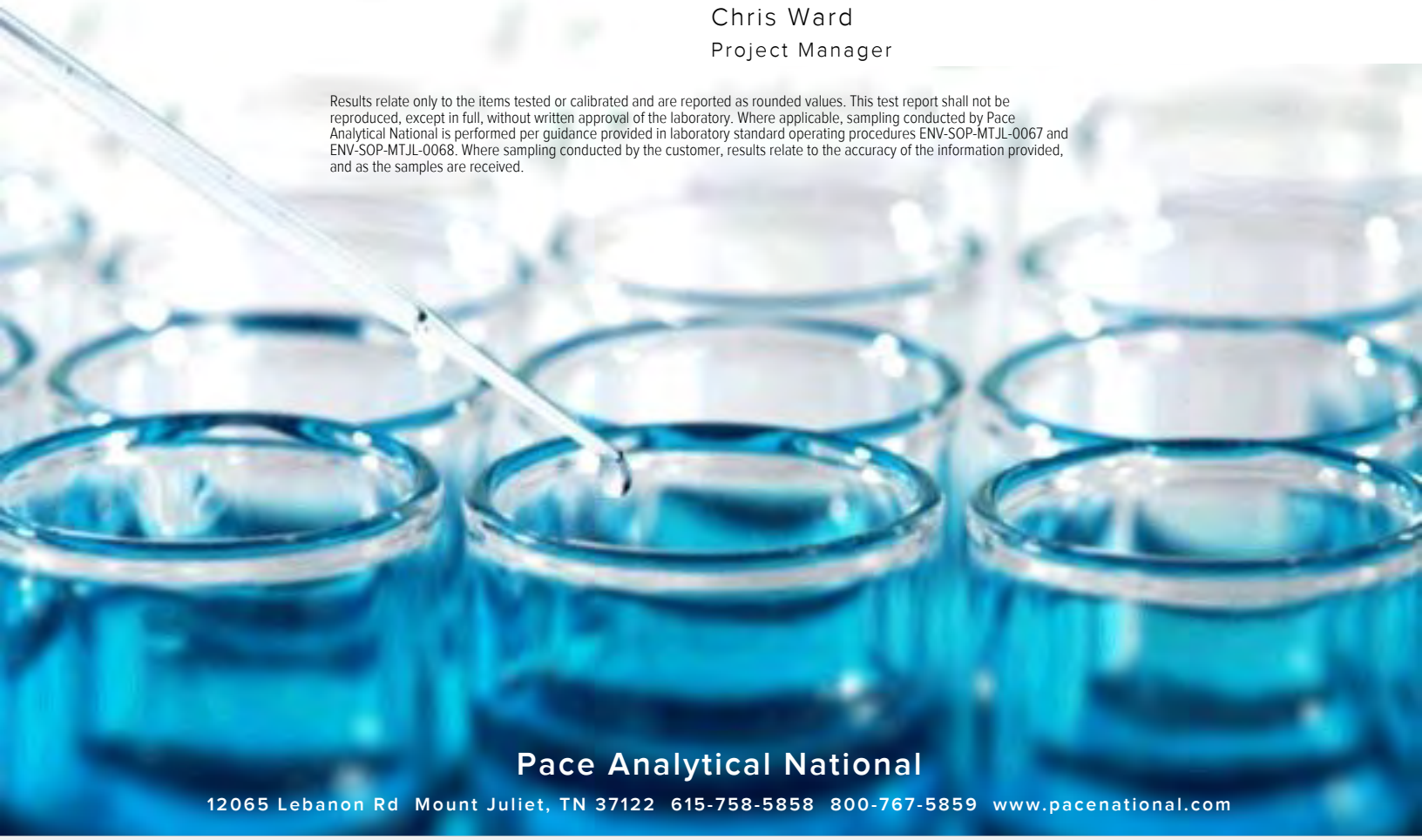


TABLE OF CONTENTS

SAMPLE SUMMARY

20210616-C29 (BGNE@2') L1368713-01 Solid

Collected by: Andrew Smith | Collected date/time: 06/16/21 13:10 | Received date/time: 06/19/21 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1693096	1	07/01/21 06:30	07/01/21 06:30	CCE	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1694384	1	06/24/21 14:06	06/24/21 17:00	GJA	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1693372	1	06/23/21 02:00	06/23/21 07:40	ARD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1693491	5	06/25/21 08:30	06/25/21 18:46	JPD	Mt. Juliet, TN

20210616-C29 (BGN@6") L1368713-02 Solid

Collected by: Andrew Smith | Collected date/time: 06/16/21 13:15 | Received date/time: 06/19/21 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1693096	1	07/01/21 06:33	07/01/21 06:33	CCE	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1694384	1	06/24/21 14:06	06/24/21 17:00	GJA	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1693372	1	06/23/21 02:00	06/23/21 07:40	ARD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1693491	5	06/25/21 08:30	06/25/21 19:10	JPD	Mt. Juliet, TN

20210616-C29 (BGNW@1') L1368713-03 Solid

Collected by: Andrew Smith | Collected date/time: 06/16/21 13:25 | Received date/time: 06/19/21 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1693096	1	07/01/21 06:36	07/01/21 06:36	CCE	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1694384	1	06/24/21 14:06	06/24/21 17:00	GJA	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1693372	1	06/23/21 02:00	06/23/21 07:40	ARD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1693491	5	06/25/21 08:30	06/25/21 19:21	JPD	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	0.245		1	07/01/2021 06:30	WG1693096

Wet Chemistry by Method 9045D

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	8.58	T8	1	06/24/2021 17:00	WG1694384

Sample Narrative:

L1368713-01 WG1694384: 8.58 at 24C

Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	176		10.0	1	06/23/2021 07:40	WG1693372

Metals (ICPMS) by Method 6020

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	39.0		0.100	1.00	5	06/25/2021 18:46	WG1693491

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	0.544		1	07/01/2021 06:33	WG1693096

Wet Chemistry by Method 9045D

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	8.25	T8	1	06/24/2021 17:00	WG1694384

Sample Narrative:

L1368713-02 WG1694384: 8.25 at 24.1C

Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	824		10.0	1	06/23/2021 07:40	WG1693372

Metals (ICPMS) by Method 6020

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	51.9		0.100	1.00	5	06/25/2021 19:10	WG1693491

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	5.96		1	07/01/2021 06:36	WG1693096

Wet Chemistry by Method 9045D

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	8.10	T8	1	06/24/2021 17:00	WG1694384

Sample Narrative:

L1368713-03 WG1694384: 8.1 at 24.1C

Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	10200		10.0	1	06/23/2021 07:40	WG1693372

Metals (ICPMS) by Method 6020

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	77.3		0.100	1.00	5	06/25/2021 19:21	WG1693491

L1368709-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1368709-03 06/24/21 17:00 • (DUP) R3671674-2 06/24/21 17:00

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	8.48	8.49	1	0.118		1

Sample Narrative:

OS: 8.48 at 25C

DUP: 8.49 at 24.8C

L1368716-04 Original Sample (OS) • Duplicate (DUP)

(OS) L1368716-04 06/24/21 17:00 • (DUP) R3671674-3 06/24/21 17:00

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	8.25	8.24	1	0.121		1

Sample Narrative:

OS: 8.25 at 24C

DUP: 8.24 at 24C

Laboratory Control Sample (LCS)

(LCS) R3671674-1 06/24/21 17:00

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: 10.03 at 24.6C

Method Blank (MB)

(MB) R3670661-1 06/23/21 07:40

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

L1368709-04 Original Sample (OS) • Duplicate (DUP)

(OS) L1368709-04 06/23/21 07:40 • (DUP) R3670661-3 06/23/21 07:40

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	2030	2010	1	1.24		20

L1368716-04 Original Sample (OS) • Duplicate (DUP)

(OS) L1368716-04 06/23/21 07:40 • (DUP) R3670661-4 06/23/21 07:40

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	312	317	1	1.59		20

Laboratory Control Sample (LCS)

(LCS) R3670661-2 06/23/21 07:40

Analyte	Spike Amount umhos/cm	LCS Result umhos/cm	LCS Rec. %	Rec. Limits %	LCS Qualifier
Specific Conductance	268	275	102	85.0-115	

Method Blank (MB)

(MB) R3672293-1 06/25/21 18:39

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

Laboratory Control Sample (LCS)

(LCS) R3672293-2 06/25/21 18:43

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Arsenic	100	95.4	95.4	80.0-120	

L1368713-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1368713-01 06/25/21 18:46 • (MS) R3672293-5 06/25/21 18:56 • (MSD) R3672293-6 06/25/21 19:00

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	39.0	147	133	108	93.9	5	75.0-125			9.96	20

GLOSSARY OF TERMS

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Abbreviations and Definitions

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

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

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
Info on file

Billing Information:
Caerus Oil and Gas
Info on file

Pres Chk

Report to:
Blair Rollins; Chris McKisson

Email To: **brollins@caerusoilandgas.com; remediation@confluence-cc.com**

Project Description:
C29 10" Gathering Line

City/State Collected: **Colorado**

Please Circle: (MT) CT ET

Phone: **970-640-6919**

Client Project #

Lab Project #

Collected by (print):
Andrew Smith

Site/Facility ID #

P.O. #

Collected by (signature):

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

No. of Cntrs

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix*	Depth	Date	Time	No. of Cntrs	Table 915-1 VOC's	TPH (ORO,GRO,DRO)	Table 915-1 Metal's	Table 915-1 PAH's	EC, SAR, Ph, Arsenic	Boron (Hot Water Soluble Soil)	Remarks	Sample # (lab only)
20210616 - C29 (BGNE@2')	Grab	SS	2'	6-16-21	1310	2					X			-01
20210616 - C29 (BGN@6")	Grab	SS	0.5'	6-16-21	1315	2					X			-02
20210616 - C29 (BGNW@1')	Grab	SS	1'	6-16-21	1325	2					X			-03

Chain of Custody Page ___of___
12065 Lebanon Rd Mount Juliet, TN 37122 Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

Pace Analytical®
National Center for Testing & Innovation

SDG #

Table # F186

L1368713

Acctnum:
Template:
Prelogin:
PM:
PB:

Shipped Via:

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

Remarks:

pH ____ Temp ____ ____ Other ____

Samples returned via:
UPS FedEx Courier ____

Tracking #

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

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
	6/18/21	1200	
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
	6/16/21	1300	
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Trip Blank Received: Yes / No
HCL / MeoH
TBR

Temp: 4.8 +.3 = 5.1 °C Bottles Received: 6

Date: 6-19-21 Time: 9:10

If preservation required by Login: Date/Time

Hold:

Condition: NCF / OK

12-Nov-2012

Christopher Hines
Encana Oil and Gas (USA) Inc.
2717 County Road 215, Suite 100
Parachute, CO 81635

Re: **C29 Oil Shale 10/11/12** Work Order: **1210454**

Dear Christopher,

ALS Environmental received 4 samples on 12-Oct-2012 10:00 AM for the analyses presented in the following report.

This is a REVISED REPORT. The Case Narrative provides information discussing the reason for issuing a revised report. The total number of pages in this revision is 46.

If you have any questions regarding these test results, please feel free to contact me.

Sincerely,

Ann Preston

Electronically approved by: Ann Preston

Ann Preston
Project Manager

Certificate No: MN331938

ALS Group USA, Corp

Date: 12-Nov-12

Client: Encana Oil and Gas (USA) Inc.
Project: C29 Oil Shale 10/11/12
Work Order: **1210454**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
1210454-01	C29-oil shale 1 - 101112	Solid		10/11/2012 09:45	10/12/2012 10:00	☐
1210454-02	C29-oil shale 2 - 101112	Solid		10/11/2012 09:45	10/12/2012 10:00	☐
1210454-03	LongRidge-oil shale 1 - 101112	Solid		10/11/2012 10:15	10/12/2012 10:00	☐
1210454-04	LongRidge-oil shale 2 - 101112	Solid		10/11/2012 10:15	10/12/2012 10:00	☐

ALS Group USA, Corp

Date: 12-Nov-12

Client: Encana Oil and Gas (USA) Inc.
Project: C29 Oil Shale 10/11/12
Work Order: 1210454

Case Narrative

This revised report includes PAH data with lower reporting limits.

Batch 44252 samples 1210454-01 through 1210454-03 DRO surrogate recoveries are high due to matrix interference. The sample results may be biased high for DRO

Batch R111419 Method Blank GRO surrogate recovery was above control limits. This does not effect any results in the samples in this work order.

Batch R111413 Duplicate data for pH is not related to this project's samples. No data requires qualification.

Two samples were pulverized . Two separate sets of analyses were run on each pulverized sample.

Batch 44306 MS/MSD data for PAHs is not related to this project's samples. No data requires qualification.

ALS Group USA, Corp

Date: 12-Nov-12

Client: Encana Oil and Gas (USA) Inc.
Project: C29 Oil Shale 10/11/12
WorkOrder: **1210454**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL

Acronym	Description
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
SD	Serial Dilution
TDL	Target Detection Limit

Units Reported	Description
% of sample	Percent of Sample
µg/Kg-dry	Micrograms per Kilogram Dry Weight
mg/Kg-dry	Milligrams per Kilogram Dry Weight
µmhos/cm @25°	
none	
s.u.	Standard Units

ALS Group USA, Corp

Date: *12-Nov-12*

Client: Encana Oil and Gas (USA) Inc.
Project: C29 Oil Shale 10/11/12
Sample ID: C29-oil shale 1 - 101112
Collection Date: 10/11/2012 09:45 AM

Work Order: 1210454
Lab ID: 1210454-01
Matrix: SOLID

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID		Method: **SW8015M**			Prep: SW3541 / 10/19/12		Analyst: **CW**
DRO (C10-C28)	**1,900**		**5.5**	**41**	**mg/Kg-dry**	10	10/19/2012 22:20
Surr: 4-Terphenyl-d14	*913*	S		*39-115*	*%REC*	10	10/19/2012 22:20
GASOLINE RANGE ORGANICS BY GC-FID		Method: **SW8015**					Analyst: **CW**
GRO (C6-C10)	**270**		**0.54**	**2.5**	**mg/Kg-dry**	50	10/18/2012 19:35
Surr: Toluene-d8	*113*			*50-150*	*%REC*	50	10/18/2012 19:35
METALS BY ICP-MS		Method: **SW6020A**			Prep: SW3050B / 10/23/12		Analyst: **CES**
Arsenic	**66**		**0.092**	**0.77**	**mg/Kg-dry**	2	10/23/2012 15:23
SOLUBLE CATIONS FOR SAR		Method: **SW6020A**			Prep: USDA Method 20B / 10/22/12		Analyst: **CES**
Calcium	**760**		**0.074**	**5.0**	**mg/L-dry**	10	10/22/2012 16:33
Magnesium	**140**		**0.024**	**2.0**	**mg/L-dry**	10	10/22/2012 16:33
Sodium	**240**		**0.070**	**2.0**	**mg/L-dry**	10	10/22/2012 16:33
SODIUM ADSORPTION RATIO		Method: **USDA H60 METHOD 2**			Prep: USDA Method 20B / 10/22/12		Analyst: **CES**
Sodium Adsorption Ratio	**2.1**		**0.010**	**0.010**	**none**	1	10/22/2012
POLYNUCLEAR AROMATIC HYDROCARBONS (PAHS)		Method: **SW8270M**			Prep: SW3540 / 10/18/12		Analyst: **HL**
1-Methylnaphthalene	**250**		**13**	**13**	**µg/Kg-dry**	20	11/2/2012 15:53
2-Methylnaphthalene	**960**		**13**	**13**	**µg/Kg-dry**	20	11/2/2012 15:53
Acenaphthene	**66**		**13**	**13**	**µg/Kg-dry**	20	11/2/2012 15:53
Acenaphthylene	**140**		**13**	**13**	**µg/Kg-dry**	20	11/2/2012 15:53
Anthracene	U		13	13	µg/Kg-dry	20	11/2/2012 15:53
Benzo(a)anthracene	U		13	13	µg/Kg-dry	20	11/2/2012 15:53
Benzo(a)pyrene	U		13	13	µg/Kg-dry	20	11/2/2012 15:53
Benzo(b)fluoranthene	U		13	13	µg/Kg-dry	20	11/2/2012 15:53
Benzo(b-k)fluoranthene	U		13	13	µg/Kg-dry	20	11/2/2012 15:53
Benzo(e)pyrene	U		13	13	µg/Kg-dry	20	11/2/2012 15:53
Benzo(g,h,i)perylene	U		13	13	µg/Kg-dry	20	11/2/2012 15:53
Benzo(k)fluoranthene	U		13	13	µg/Kg-dry	20	11/2/2012 15:53
Chrysene	U		13	13	µg/Kg-dry	20	11/2/2012 15:53
Dibenzo(a,h)anthracene	U		13	13	µg/Kg-dry	20	11/2/2012 15:53
Fluoranthene	**46**		**13**	**13**	**µg/Kg-dry**	20	11/2/2012 15:53
Fluorene	**150**		**13**	**13**	**µg/Kg-dry**	20	11/2/2012 15:53
Indeno(1,2,3-cd)pyrene	U		13	13	µg/Kg-dry	20	11/2/2012 15:53
Naphthalene	**210**		**13**	**13**	**µg/Kg-dry**	20	11/2/2012 15:53
Perylene	U		13	13	µg/Kg-dry	20	11/2/2012 15:53
Phenanthrene	**60**		**13**	**13**	**µg/Kg-dry**	20	11/2/2012 15:53

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *12-Nov-12*

Client: Encana Oil and Gas (USA) Inc.
Project: C29 Oil Shale 10/11/12
Sample ID: C29-oil shale 1 - 101112
Collection Date: 10/11/2012 09:45 AM

Work Order: 1210454
Lab ID: 1210454-01
Matrix: SOLID

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
Phenol	U		13	13	µg/Kg-dry	20	11/2/2012 15:53
Pyrene	**110**		**13**	**13**	**µg/Kg-dry**	20	11/2/2012 15:53
Surr: 2-Fluorobiphenyl	*81.2*			*12-100*	*%REC*	20	11/2/2012 15:53
Surr: 4-Terphenyl-d14	*66.0*			*25-137*	*%REC*	20	11/2/2012 15:53
Surr: Nitrobenzene-d5	*56.0*			*37-107*	*%REC*	20	11/2/2012 15:53
VOLATILE ORGANIC COMPOUNDS		Method: **SW8260**			Prep: SW5035 / 10/18/12		Analyst: **BG**
Benzene	U		0.012	0.030	mg/Kg-dry	1	10/23/2012 06:50
Ethylbenzene	**0.18**		**0.011**	**0.030**	**mg/Kg-dry**	1	10/23/2012 06:50
m,p-Xylene	**9.5**		**0.023**	**0.060**	**mg/Kg-dry**	1	10/23/2012 06:50
o-Xylene	**0.40**		**0.013**	**0.030**	**mg/Kg-dry**	1	10/23/2012 06:50
Toluene	**0.070**		**0.011**	**0.030**	**mg/Kg-dry**	1	10/23/2012 06:50
Xylenes, Total	**9.9**		**0.036**	**0.090**	**mg/Kg-dry**	1	10/23/2012 06:50
Surr: 1,2-Dichloroethane-d4	*95.4*			*70-130*	*%REC*	1	10/23/2012 06:50
Surr: 4-Bromofluorobenzene	*105*			*70-130*	*%REC*	1	10/23/2012 06:50
Surr: Dibromofluoromethane	*102*			*70-130*	*%REC*	1	10/23/2012 06:50
Surr: Toluene-d8	*101*			*70-130*	*%REC*	1	10/23/2012 06:50
ELECTRICAL CONDUCTIVITY (SAR)		Method: **USDA H60 METHOD 2**			Prep: USDA Method 20B / 10/22/12		Analyst: **JB**
Electrical Conductivity @ Saturation	**4.8**		**0.0013**	**0.012**	**mmhos/cm @25°**	2.5	10/22/2012 14:00
MOISTURE		Method: **A2540 G**					Analyst: **LR**
Moisture	**0.34**		**0.025**	**0.050**	**% of sample**	1	10/18/2012 12:30
PH		Method: **SW9045D**					Analyst: **JB**
pH	**8.55**		**0**		**s.u.**	1	10/18/2012 09:00

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *12-Nov-12*

Client: Encana Oil and Gas (USA) Inc.
Project: C29 Oil Shale 10/11/12
Sample ID: C29-oil shale 2 - 101112
Collection Date: 10/11/2012 09:45 AM

Work Order: 1210454
Lab ID: 1210454-02
Matrix: SOLID

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID		Method: **SW8015M**			Prep: SW3541 / 10/19/12		Analyst: **CW**
DRO (C10-C28)	**1,900**		**5.7**	**42**	**mg/Kg-dry**	10	10/19/2012 22:46
Surr: 4-Terphenyl-d14	*953*	S		*39-115*	*%REC*	10	10/19/2012 22:46
GASOLINE RANGE ORGANICS BY GC-FID		Method: **SW8015**					Analyst: **CW**
GRO (C6-C10)	**180**		**0.54**	**2.5**	**mg/Kg-dry**	50	10/18/2012 19:59
Surr: Toluene-d8	*112*			*50-150*	*%REC*	50	10/18/2012 19:59
METALS BY ICP-MS		Method: **SW6020A**			Prep: SW3050B / 10/23/12		Analyst: **CES**
Arsenic	**75**		**0.086**	**0.71**	**mg/Kg-dry**	2	10/23/2012 15:28
SOLUBLE CATIONS FOR SAR		Method: **SW6020A**			Prep: USDA Method 20B / 10/22/12		Analyst: **CES**
Calcium	**780**		**0.074**	**5.0**	**mg/L-dry**	10	10/22/2012 16:39
Magnesium	**130**		**0.024**	**2.0**	**mg/L-dry**	10	10/22/2012 16:39
Sodium	**230**		**0.070**	**2.0**	**mg/L-dry**	10	10/22/2012 16:39
SODIUM ADSORPTION RATIO		Method: **USDA H60 METHOD 2**			Prep: USDA Method 20B / 10/22/12		Analyst: **CES**
Sodium Adsorption Ratio	**2.0**		**0.010**	**0.010**	**none**	1	10/22/2012
POLYNUCLEAR AROMATIC HYDROCARBONS (PAHS)		Method: **SW8270M**			Prep: SW3540 / 10/18/12		Analyst: **HL**
1-Methylnaphthalene	**240**		**14**	**14**	**µg/Kg-dry**	20	11/2/2012 16:32
2-Methylnaphthalene	**920**		**14**	**14**	**µg/Kg-dry**	20	11/2/2012 16:32
Acenaphthene	**120**		**14**	**14**	**µg/Kg-dry**	20	11/2/2012 16:32
Acenaphthylene	**140**		**14**	**14**	**µg/Kg-dry**	20	11/2/2012 16:32
Anthracene	U		14	14	µg/Kg-dry	20	11/2/2012 16:32
Benzo(a)anthracene	U		14	14	µg/Kg-dry	20	11/2/2012 16:32
Benzo(a)pyrene	U		14	14	µg/Kg-dry	20	11/2/2012 16:32
Benzo(b)fluoranthene	U		14	14	µg/Kg-dry	20	11/2/2012 16:32
Benzo(b-k)fluoranthene	U		14	14	µg/Kg-dry	20	11/2/2012 16:32
Benzo(e)pyrene	U		14	14	µg/Kg-dry	20	11/2/2012 16:32
Benzo(g,h,i)perylene	U		14	14	µg/Kg-dry	20	11/2/2012 16:32
Benzo(k)fluoranthene	U		14	14	µg/Kg-dry	20	11/2/2012 16:32
Chrysene	U		14	14	µg/Kg-dry	20	11/2/2012 16:32
Dibenzo(a,h)anthracene	U		14	14	µg/Kg-dry	20	11/2/2012 16:32
Fluoranthene	U		14	14	µg/Kg-dry	20	11/2/2012 16:32
Fluorene	**160**		**14**	**14**	**µg/Kg-dry**	20	11/2/2012 16:32
Indeno(1,2,3-cd)pyrene	U		14	14	µg/Kg-dry	20	11/2/2012 16:32
Naphthalene	**200**		**14**	**14**	**µg/Kg-dry**	20	11/2/2012 16:32
Perylene	U		14	14	µg/Kg-dry	20	11/2/2012 16:32
Phenanthrene	**140**		**14**	**14**	**µg/Kg-dry**	20	11/2/2012 16:32

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *12-Nov-12*

Client: Encana Oil and Gas (USA) Inc.
Project: C29 Oil Shale 10/11/12
Sample ID: C29-oil shale 2 - 101112
Collection Date: 10/11/2012 09:45 AM

Work Order: 1210454
Lab ID: 1210454-02
Matrix: SOLID

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
Phenol	U		14	14	µg/Kg-dry	20	11/2/2012 16:32
Pyrene	**100**		**14**	**14**	**µg/Kg-dry**	20	11/2/2012 16:32
Surr: 2-Fluorobiphenyl	*77.2*			*12-100*	*%REC*	20	11/2/2012 16:32
Surr: 4-Terphenyl-d14	*58.0*			*25-137*	*%REC*	20	11/2/2012 16:32
Surr: Nitrobenzene-d5	*52.4*			*37-107*	*%REC*	20	11/2/2012 16:32
VOLATILE ORGANIC COMPOUNDS		Method: **SW8260**			Prep: SW5035 / 10/18/12		Analyst: **BG**
Benzene	U		0.012	0.030	mg/Kg-dry	1	10/23/2012 07:14
Ethylbenzene	**0.14**		**0.011**	**0.030**	**mg/Kg-dry**	1	10/23/2012 07:14
m,p-Xylene	**6.9**		**0.023**	**0.060**	**mg/Kg-dry**	1	10/23/2012 07:14
o-Xylene	**0.29**		**0.013**	**0.030**	**mg/Kg-dry**	1	10/23/2012 07:14
Toluene	**0.055**		**0.011**	**0.030**	**mg/Kg-dry**	1	10/23/2012 07:14
Xylenes, Total	**7.2**		**0.036**	**0.090**	**mg/Kg-dry**	1	10/23/2012 07:14
Surr: 1,2-Dichloroethane-d4	*96.4*			*70-130*	*%REC*	1	10/23/2012 07:14
Surr: 4-Bromofluorobenzene	*104*			*70-130*	*%REC*	1	10/23/2012 07:14
Surr: Dibromofluoromethane	*100*			*70-130*	*%REC*	1	10/23/2012 07:14
Surr: Toluene-d8	*100*			*70-130*	*%REC*	1	10/23/2012 07:14
ELECTRICAL CONDUCTIVITY (SAR)		Method: **USDA H60 METHOD 2**			Prep: USDA Method 20B / 10/22/12		Analyst: **JB**
Electrical Conductivity @ Saturation	**4.9**		**0.0013**	**0.012**	**mmhos/cm @25°**	2.5	10/22/2012 14:00
MOISTURE		Method: **A2540 G**					Analyst: **LR**
Moisture	**0.36**		**0.025**	**0.050**	**% of sample**	1	10/18/2012 12:30
PH		Method: **SW9045D**					Analyst: **JB**
pH	**8.39**		**0**		**s.u.**	1	10/18/2012 09:00

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *12-Nov-12*

Client: Encana Oil and Gas (USA) Inc.
Project: C29 Oil Shale 10/11/12
Sample ID: LongRidge-oil shale 1 - 101112
Collection Date: 10/11/2012 10:15 AM

Work Order: 1210454
Lab ID: 1210454-03
Matrix: SOLID

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID		Method: **SW8015M**			Prep: SW3541 / 10/19/12		Analyst: **CW**
DRO (C10-C28)	**1,300**		**11**	**85**	**mg/Kg-dry**	20	10/19/2012 23:13
Surr: 4-Terphenyl-d14	*134*	S		*39-115*	*%REC*	20	10/19/2012 23:13
GASOLINE RANGE ORGANICS BY GC-FID		Method: **SW8015**					Analyst: **CW**
GRO (C6-C10)	**170**		**0.54**	**2.5**	**mg/Kg-dry**	50	10/18/2012 20:24
Surr: Toluene-d8	*112*			*50-150*	*%REC*	50	10/18/2012 20:24
METALS BY ICP-MS		Method: **SW6020A**			Prep: SW3050B / 10/23/12		Analyst: **CES**
Arsenic	**57**		**0.081**	**0.68**	**mg/Kg-dry**	2	10/23/2012 15:34
SOLUBLE CATIONS FOR SAR		Method: **SW6020A**			Prep: USDA Method 20B / 10/22/12		Analyst: **CES**
Calcium	**99**		**0.074**	**5.0**	**mg/L-dry**	10	10/22/2012 16:44
Magnesium	**55**		**0.024**	**2.0**	**mg/L-dry**	10	10/22/2012 16:44
Sodium	**78**		**0.070**	**2.0**	**mg/L-dry**	10	10/22/2012 16:44
SODIUM ADSORPTION RATIO		Method: **USDA H60 METHOD 2**			Prep: USDA Method 20B / 10/22/12		Analyst: **CES**
Sodium Adsorption Ratio	**1.6**		**0.010**	**0.010**	**none**	1	10/22/2012
POLYNUCLEAR AROMATIC HYDROCARBONS (PAHS)		Method: **SW8270M**			Prep: SW3540 / 10/18/12		Analyst: **HL**
1-Methylnaphthalene	**120**		**14**	**14**	**µg/Kg-dry**	20	11/2/2012 17:11
2-Methylnaphthalene	**680**		**14**	**14**	**µg/Kg-dry**	20	11/2/2012 17:11
Acenaphthene	**130**		**14**	**14**	**µg/Kg-dry**	20	11/2/2012 17:11
Acenaphthylene	**100**		**14**	**14**	**µg/Kg-dry**	20	11/2/2012 17:11
Anthracene	U		14	14	µg/Kg-dry	20	11/2/2012 17:11
Benzo(a)anthracene	U		14	14	µg/Kg-dry	20	11/2/2012 17:11
Benzo(a)pyrene	U		14	14	µg/Kg-dry	20	11/2/2012 17:11
Benzo(b)fluoranthene	U		14	14	µg/Kg-dry	20	11/2/2012 17:11
Benzo(b-k)fluoranthene	U		14	14	µg/Kg-dry	20	11/2/2012 17:11
Benzo(e)pyrene	U		14	14	µg/Kg-dry	20	11/2/2012 17:11
Benzo(g,h,i)perylene	U		14	14	µg/Kg-dry	20	11/2/2012 17:11
Benzo(k)fluoranthene	U		14	14	µg/Kg-dry	20	11/2/2012 17:11
Chrysene	U		14	14	µg/Kg-dry	20	11/2/2012 17:11
Dibenzo(a,h)anthracene	U		14	14	µg/Kg-dry	20	11/2/2012 17:11
Fluoranthene	**54**		**14**	**14**	**µg/Kg-dry**	20	11/2/2012 17:11
Fluorene	**110**		**14**	**14**	**µg/Kg-dry**	20	11/2/2012 17:11
Indeno(1,2,3-cd)pyrene	U		14	14	µg/Kg-dry	20	11/2/2012 17:11
Naphthalene	**120**		**14**	**14**	**µg/Kg-dry**	20	11/2/2012 17:11
Perylene	U		14	14	µg/Kg-dry	20	11/2/2012 17:11
Phenanthrene	**54**		**14**	**14**	**µg/Kg-dry**	20	11/2/2012 17:11

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *12-Nov-12*

Client: Encana Oil and Gas (USA) Inc.
Project: C29 Oil Shale 10/11/12
Sample ID: LongRidge-oil shale 1 - 101112
Collection Date: 10/11/2012 10:15 AM

Work Order: 1210454
Lab ID: 1210454-03
Matrix: SOLID

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
Phenol	U		14	14	µg/Kg-dry	20	11/2/2012 17:11
Pyrene	**68**		**14**	**14**	**µg/Kg-dry**	20	11/2/2012 17:11
Surr: 2-Fluorobiphenyl	*82.8*			*12-100*	*%REC*	20	11/2/2012 17:11
Surr: 4-Terphenyl-d14	*62.4*			*25-137*	*%REC*	20	11/2/2012 17:11
Surr: Nitrobenzene-d5	*50.0*			*37-107*	*%REC*	20	11/2/2012 17:11
VOLATILE ORGANIC COMPOUNDS		Method: **SW8260**			Prep: SW5035 / 10/18/12		Analyst: **BG**
Benzene	U		0.012	0.030	mg/Kg-dry	1	10/23/2012 07:38
Ethylbenzene	**0.56**		**0.011**	**0.030**	**mg/Kg-dry**	1	10/23/2012 07:38
m,p-Xylene	**8.8**		**0.091**	**0.24**	**mg/Kg-dry**	4	10/23/2012 20:50
o-Xylene	**0.32**		**0.013**	**0.030**	**mg/Kg-dry**	1	10/23/2012 07:38
Toluene	**1.6**		**0.011**	**0.030**	**mg/Kg-dry**	1	10/23/2012 07:38
Xylenes, Total	**9.3**		**0.14**	**0.36**	**mg/Kg-dry**	4	10/23/2012 20:50
Surr: 1,2-Dichloroethane-d4	*102*			*70-130*	*%REC*	1	10/23/2012 07:38
Surr: 1,2-Dichloroethane-d4	*108*			*70-130*	*%REC*	4	10/23/2012 20:50
Surr: 4-Bromofluorobenzene	*104*			*70-130*	*%REC*	1	10/23/2012 07:38
Surr: 4-Bromofluorobenzene	*100*			*70-130*	*%REC*	4	10/23/2012 20:50
Surr: Dibromofluoromethane	*99.2*			*70-130*	*%REC*	1	10/23/2012 07:38
Surr: Dibromofluoromethane	*101*			*70-130*	*%REC*	4	10/23/2012 20:50
Surr: Toluene-d8	*97.5*			*70-130*	*%REC*	1	10/23/2012 07:38
Surr: Toluene-d8	*96.8*			*70-130*	*%REC*	4	10/23/2012 20:50
ELECTRICAL CONDUCTIVITY (SAR)		Method: **USDA H60 METHOD 2**			Prep: USDA Method 20B / 10/22/12		Analyst: **JB**
Electrical Conductivity @ Saturation	**1.1**		**0.0013**	**0.012**	**mmhos/cm @25°**	2.5	10/22/2012 14:00
MOISTURE		Method: **A2540 G**					Analyst: **LR**
Moisture	**0.36**		**0.025**	**0.050**	**% of sample**	1	10/18/2012 12:30
PH		Method: **SW9045D**					Analyst: **JB**
pH	**9.33**		**0**		**s.u.**	1	10/18/2012 09:00

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *12-Nov-12*

Client: Encana Oil and Gas (USA) Inc.
Project: C29 Oil Shale 10/11/12
Sample ID: LongRidge-oil shale 2 - 101112
Collection Date: 10/11/2012 10:15 AM

Work Order: 1210454
Lab ID: 1210454-04
Matrix: SOLID

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID		Method: **SW8015M**			Prep: SW3541 / 10/19/12		Analyst: **CW**
DRO (C10-C28)	**260**		**0.54**	**4.1**	**mg/Kg-dry**	1	10/19/2012 23:40
Surr: 4-Terphenyl-d14	*57.4*			*39-115*	*%REC*	1	10/19/2012 23:40
GASOLINE RANGE ORGANICS BY GC-FID		Method: **SW8015**					Analyst: **CW**
GRO (C6-C10)	**160**		**0.54**	**2.5**	**mg/Kg-dry**	50	10/18/2012 20:48
Surr: Toluene-d8	*114*			*50-150*	*%REC*	50	10/18/2012 20:48
METALS BY ICP-MS		Method: **SW6020A**			Prep: SW3050B / 10/24/12		Analyst: **CES**
Arsenic	**55**		**0.085**	**0.71**	**mg/Kg-dry**	2	10/24/2012 16:14
SOLUBLE CATIONS FOR SAR		Method: **SW6020A**			Prep: USDA Method 20B / 10/22/12		Analyst: **CES**
Calcium	**89**		**0.074**	**5.0**	**mg/L-dry**	10	10/22/2012 16:50
Magnesium	**57**		**0.024**	**2.0**	**mg/L-dry**	10	10/22/2012 16:50
Sodium	**75**		**0.070**	**2.0**	**mg/L-dry**	10	10/22/2012 16:50
SODIUM ADSORPTION RATIO		Method: **USDA H60 METHOD 2**			Prep: USDA Method 20B / 10/22/12		Analyst: **CES**
Sodium Adsorption Ratio	**1.5**		**0.010**	**0.010**	**none**	1	10/22/2012
POLYNUCLEAR AROMATIC HYDROCARBONS (PAHS)		Method: **SW8270M**			Prep: SW3540 / 10/18/12		Analyst: **HL**
1-Methylnaphthalene	**85**		**13**	**13**	**µg/Kg-dry**	20	11/2/2012 17:49
2-Methylnaphthalene	**570**		**13**	**13**	**µg/Kg-dry**	20	11/2/2012 17:49
Acenaphthene	**180**		**13**	**13**	**µg/Kg-dry**	20	11/2/2012 17:49
Acenaphthylene	**91**		**13**	**13**	**µg/Kg-dry**	20	11/2/2012 17:49
Anthracene	**20**		**13**	**13**	**µg/Kg-dry**	20	11/2/2012 17:49
Benzo(a)anthracene	U		13	13	µg/Kg-dry	20	11/2/2012 17:49
Benzo(a)pyrene	U		13	13	µg/Kg-dry	20	11/2/2012 17:49
Benzo(b)fluoranthene	U		13	13	µg/Kg-dry	20	11/2/2012 17:49
Benzo(b-k)fluoranthene	U		13	13	µg/Kg-dry	20	11/2/2012 17:49
Benzo(e)pyrene	U		13	13	µg/Kg-dry	20	11/2/2012 17:49
Benzo(g,h,i)perylene	U		13	13	µg/Kg-dry	20	11/2/2012 17:49
Benzo(k)fluoranthene	U		13	13	µg/Kg-dry	20	11/2/2012 17:49
Chrysene	U		13	13	µg/Kg-dry	20	11/2/2012 17:49
Dibenzo(a,h)anthracene	U		13	13	µg/Kg-dry	20	11/2/2012 17:49
Fluoranthene	**52**		**13**	**13**	**µg/Kg-dry**	20	11/2/2012 17:49
Fluorene	**100**		**13**	**13**	**µg/Kg-dry**	20	11/2/2012 17:49
Indeno(1,2,3-cd)pyrene	U		13	13	µg/Kg-dry	20	11/2/2012 17:49
Naphthalene	**110**		**13**	**13**	**µg/Kg-dry**	20	11/2/2012 17:49
Perylene	U		13	13	µg/Kg-dry	20	11/2/2012 17:49
Phenanthrene	**39**		**13**	**13**	**µg/Kg-dry**	20	11/2/2012 17:49

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *12-Nov-12*

Client: Encana Oil and Gas (USA) Inc.
Project: C29 Oil Shale 10/11/12
Sample ID: LongRidge-oil shale 2 - 101112
Collection Date: 10/11/2012 10:15 AM

Work Order: 1210454
Lab ID: 1210454-04
Matrix: SOLID

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
Phenol	U		13	13	µg/Kg-dry	20	11/2/2012 17:49
Pyrene	**98**		**13**	**13**	**µg/Kg-dry**	20	11/2/2012 17:49
Surr: 2-Fluorobiphenyl	*88.8*			*12-100*	*%REC*	20	11/2/2012 17:49
Surr: 4-Terphenyl-d14	*76.8*			*25-137*	*%REC*	20	11/2/2012 17:49
Surr: Nitrobenzene-d5	*51.6*			*37-107*	*%REC*	20	11/2/2012 17:49
VOLATILE ORGANIC COMPOUNDS		Method:	**SW8260**		Prep: SW5035 / 10/18/12		Analyst: **AK**
Benzene	U		0.012	0.030	mg/Kg-dry	1	10/23/2012 04:58
Ethylbenzene	**0.54**		**0.011**	**0.030**	**mg/Kg-dry**	1	10/23/2012 04:58
m,p-Xylene	**21**		**0.091**	**0.24**	**mg/Kg-dry**	4	10/24/2012 15:02
o-Xylene	**0.29**		**0.013**	**0.030**	**mg/Kg-dry**	1	10/23/2012 04:58
Toluene	**1.5**		**0.011**	**0.030**	**mg/Kg-dry**	1	10/23/2012 04:58
Xylenes, Total	**21**		**0.14**	**0.36**	**mg/Kg-dry**	4	10/24/2012 15:02
Surr: 1,2-Dichloroethane-d4	*101*			*70-130*	*%REC*	1	10/23/2012 04:58
Surr: 1,2-Dichloroethane-d4	*94.4*			*70-130*	*%REC*	4	10/24/2012 15:02
Surr: 4-Bromofluorobenzene	*105*			*70-130*	*%REC*	1	10/23/2012 04:58
Surr: 4-Bromofluorobenzene	*99.9*			*70-130*	*%REC*	4	10/24/2012 15:02
Surr: Dibromofluoromethane	*123*			*70-130*	*%REC*	1	10/23/2012 04:58
Surr: Dibromofluoromethane	*90.8*			*70-130*	*%REC*	4	10/24/2012 15:02
Surr: Toluene-d8	*97.7*			*70-130*	*%REC*	1	10/23/2012 04:58
Surr: Toluene-d8	*99.2*			*70-130*	*%REC*	4	10/24/2012 15:02
ELECTRICAL CONDUCTIVITY (SAR)		Method:	**USDA H60 METHOD 2**		Prep: USDA Method 20B / 10/22/12		Analyst: **JB**
Electrical Conductivity @ Saturation	**1.1**		**0.0010**	**0.010**	**mmhos/cm @25°**	2	10/22/2012 14:00
MOISTURE		Method:	**A2540 G**				Analyst: **LR**
Moisture	**0.36**		**0.025**	**0.050**	**% of sample**	1	10/18/2012 12:30
PH		Method:	**SW9045D**				Analyst: **JB**
pH	**9.19**		**0**		**s.u.**	1	10/18/2012 09:00

Note: See Qualifiers page for a list of qualifiers and their definitions.

Batch ID: **44252** Instrument ID **GC8** Method: **SW8015M**

MBLK Sample ID: **DBLKS1-44252-44252** Units: **mg/Kg** Analysis Date: **10/19/2012 05:51 PM**

Client ID: Run ID: **GC8_121019A** SeqNo: **2118888** Prep Date: **10/19/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C28)	U	4.2								
Surr: 4-Terphenyl-d14	*1.103*	0	*1.667*	0	*66.2*	*39-115*	0			

MBLK Sample ID: **DBLKS1-44252-44252** Units: **mg/Kg** Analysis Date: **10/19/2012 05:51 PM**

Client ID: Run ID: **GC8_121019A** SeqNo: **2118936** Prep Date: **10/19/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C28)	U	4.2								
Surr: 4-Terphenyl-d14	*0.992*	0	*1.667*	0	*59.5*	*39-115*	0			

LCS Sample ID: **DLCSS1-44252-44252** Units: **mg/Kg** Analysis Date: **10/19/2012 06:18 PM**

Client ID: Run ID: **GC8_121019A** SeqNo: **2118889** Prep Date: **10/19/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C28)	115.5	4.2	166.7	0	69.3	49-124	0			
Surr: 4-Terphenyl-d14	*1.159*	0	*1.667*	0	*69.5*	*39-115*	0			

LCS Sample ID: **DLCSS1-44252-44252** Units: **mg/Kg** Analysis Date: **10/19/2012 06:18 PM**

Client ID: Run ID: **GC8_121019A** SeqNo: **2118940** Prep Date: **10/19/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C28)	115.1	4.2	166.7	0	69.1	49-124	0			
Surr: 4-Terphenyl-d14	*1.037*	0	*1.667*	0	*62.2*	*39-115*	0			

MS Sample ID: **1210676-08B MS** Units: **mg/Kg** Analysis Date: **10/19/2012 06:45 PM**

Client ID: Run ID: **GC8_121019A** SeqNo: **2118890** Prep Date: **10/19/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C28)	206.7	8.1	323.9	0	63.8	49-130	0			
Surr: 4-Terphenyl-d14	*2.182*	0	*3.239*	0	*67.4*	*39-115*	0			

MS Sample ID: **1210676-08B MS** Units: **mg/Kg** Analysis Date: **10/19/2012 06:45 PM**

Client ID: Run ID: **GC8_121019A** SeqNo: **2118941** Prep Date: **10/19/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C28)	207.6	8.1	323.9	0	64.1	60-130	0			
Surr: 4-Terphenyl-d14	*1.967*	0	*3.239*	0	*60.7*	*39-115*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Encana Oil and Gas (USA) Inc.
Work Order: 1210454
Project: C29 Oil Shale 10/11/12

QC BATCH REPORT

Batch ID: **44252** Instrument ID **GC8** Method: **SW8015M**

MSD Sample ID: **1210676-08B MSD** Units: **mg/Kg** Analysis Date: **10/19/2012 07:12 PM**
Client ID: Run ID: **GC8_121019A** SeqNo: **2118891** Prep Date: **10/19/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C28)	190.2	7.8	311.1	0	61.1	49-130	206.7	8.33	30	
Surr: 4-Terphenyl-d14	*1.936*	0	*3.111*	0	*62.2*	*39-115*	2.182	*12*	*30*	

MSD Sample ID: **1210676-08B MSD** Units: **mg/Kg** Analysis Date: **10/19/2012 07:12 PM**
Client ID: Run ID: **GC8_121019A** SeqNo: **2118942** Prep Date: **10/19/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C28)	189.4	7.8	311.1	0	60.9	60-130	207.6	9.19	30	
Surr: 4-Terphenyl-d14	*1.744*	0	*3.111*	0	*56.1*	*39-115*	1.967	*12*	*30*	

The following samples were analyzed in this batch: 1210454-01A 1210454-02A 1210454-03A 1210454-04A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Encana Oil and Gas (USA) Inc.
Work Order: 1210454
Project: C29 Oil Shale 10/11/12

QC BATCH REPORT

Batch ID: **R111419** Instrument ID **GC10** Method: **SW8015**

MBLK Sample ID: **GBLK1-121018-R111419** Units: **µg/L** Analysis Date: **10/18/2012 04:44 PM**
Client ID: Run ID: **GC10_121018A** SeqNo: **2116921** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
GRO (C6-C10)	U	200								
Surr: Toluene-d8	*165.6*	0	*100*	0	*166*	*70-130*	0			*S*

LCS Sample ID: **GLCS1-121018-R111419** Units: **µg/L** Analysis Date: **10/18/2012 04:19 PM**
Client ID: Run ID: **GC10_121018A** SeqNo: **2116920** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
GRO (C6-C10)	11290	200	10000	0	113	70-130	0			
Surr: Toluene-d8	*124.2*	0	*100*	0	*124*	*70-130*	0			

MS Sample ID: **1210594-10A MS** Units: **µg/L** Analysis Date: **10/19/2012 01:16 AM**
Client ID: Run ID: **GC10_121018A** SeqNo: **2116928** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
GRO (C6-C10)	9102	200	10000	0	91	70-130	0			
Surr: Toluene-d8	*112.8*	0	*100*	0	*113*	*70-130*	0			

MSD Sample ID: **1210594-10A MSD** Units: **µg/L** Analysis Date: **10/19/2012 01:40 AM**
Client ID: Run ID: **GC10_121018A** SeqNo: **2116929** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
GRO (C6-C10)	8762	200	10000	0	87.6	70-130	9102	3.81	30	
Surr: Toluene-d8	*111.8*	0	*100*	0	*112*	*70-130*	112.8	*0.89*	*30*	

The following samples were analyzed in this batch: 1210454-01A 1210454-02A 1210454-03A 1210454-04A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Encana Oil and Gas (USA) Inc.
Work Order: 1210454
Project: C29 Oil Shale 10/11/12

QC BATCH REPORT

Batch ID: **44271** Instrument ID **ICPMS1** Method: **SW6020A** **(Dissolve)**

DUP Sample ID: **1210583-01C DUP** Units: **mg/L** Analysis Date: **10/22/2012 04:10 PM**
Client ID: Run ID: **ICPMS1_121022A** SeqNo: **2119313** Prep Date: **10/22/2012** DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	138.4	5.0	0	0	0	0-0	151.4	8.97		
Magnesium	23.35	2.0	0	0	0	0-0	25.27	7.9		
Sodium	180.4	2.0	0	0	0	0-0	190.4	5.39		

DUP Sample ID: **1210583-01C DUP** Units: **none** Analysis Date: **10/22/2012**
Client ID: Run ID: **SAR_121022A** SeqNo: **2119324** Prep Date: **10/22/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sodium Adsorption Ratio	3.735	0.010	0	0	0		3.773	1.02	50	

The following samples were analyzed in this batch: 1210454-01A 1210454-02A 1210454-03A 1210454-04A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Encana Oil and Gas (USA) Inc.
Work Order: 1210454
Project: C29 Oil Shale 10/11/12

QC BATCH REPORT

Batch ID: **44315** Instrument ID **ICPMS1** Method: **SW6020A**

MBLK Sample ID: **MBLK-44315-44315** Units: **mg/Kg** Analysis Date: **10/23/2012 12:41 PM**
Client ID: Run ID: **ICPMS1_121023A** SeqNo: **2120495** Prep Date: **10/23/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	U	0.25								

LCS Sample ID: **LCS-44315-44315** Units: **mg/Kg** Analysis Date: **10/23/2012 12:46 PM**
Client ID: Run ID: **ICPMS1_121023A** SeqNo: **2120496** Prep Date: **10/23/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	4.302	0.25	5	0	86	80-120	0			

MS Sample ID: **1210644-01BMS** Units: **mg/Kg** Analysis Date: **10/23/2012 01:17 PM**
Client ID: Run ID: **ICPMS1_121023A** SeqNo: **2120501** Prep Date: **10/23/2012** DF: **2**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	9.709	0.78	7.752	2.763	89.6	75-125	0			

MSD Sample ID: **1210644-01BMSD** Units: **mg/Kg** Analysis Date: **10/23/2012 01:23 PM**
Client ID: Run ID: **ICPMS1_121023A** SeqNo: **2120502** Prep Date: **10/23/2012** DF: **2**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	9.686	0.75	7.519	2.763	92.1	75-125	9.709	0.235	25	

The following samples were analyzed in this batch: 1210454-01A 1210454-02A 1210454-03A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Encana Oil and Gas (USA) Inc.
Work Order: 1210454
Project: C29 Oil Shale 10/11/12

QC BATCH REPORT

Batch ID: **44344** Instrument ID **ICPMS1** Method: **SW6020A**

MBLK Sample ID: **MBLK-44344-44344** Units: **mg/Kg** Analysis Date: **10/24/2012 02:49 PM**
Client ID: Run ID: **ICPMS1_121024A** SeqNo: **2121966** Prep Date: **10/24/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	U	0.25								

LCS Sample ID: **LCS-44344-44344** Units: **mg/Kg** Analysis Date: **10/24/2012 02:55 PM**
Client ID: Run ID: **ICPMS1_121024A** SeqNo: **2121967** Prep Date: **10/24/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	4.27	0.25	5	0	85.4	80-120	0			

MS Sample ID: **1210726-04BMS** Units: **mg/Kg** Analysis Date: **10/24/2012 03:18 PM**
Client ID: Run ID: **ICPMS1_121024A** SeqNo: **2121971** Prep Date: **10/24/2012** DF: **4**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	8.855	1.3	6.702	2.459	95.4	75-125	0			

MSD Sample ID: **1210726-04BMSD** Units: **mg/Kg** Analysis Date: **10/24/2012 03:23 PM**
Client ID: Run ID: **ICPMS1_121024A** SeqNo: **2121972** Prep Date: **10/24/2012** DF: **4**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	9.765	1.3	6.394	2.459	114	75-125	8.855	9.77	25	

The following samples were analyzed in this batch: 1210454-04A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Encana Oil and Gas (USA) Inc.
Work Order: 1210454
Project: C29 Oil Shale 10/11/12

QC BATCH REPORT

Batch ID: **44226** Instrument ID **SVMS7** Method: **SW8270**

MBLK Sample ID: **SBLKS1-44226-44226** Units: **µg/Kg** Analysis Date: **10/18/2012 06:21 PM**
Client ID: Run ID: **SVMS7_121018A** SeqNo: **2117424** Prep Date: **10/18/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1`-Biphenyl	U	330								
1,2,3,4-Tetrachlorobenzene	U	330								
1,2,4,5-Tetrachlorobenzene	U	330								
1,2,4-Trichlorobenzene	U	160								
1,2-Dichlorobenzene	U	160								
1,2-Dinitrobenzene	U	0								
1,2-Diphenylhydrazine	U	160								
1,3,4,5-Tetrachlorobenzene	U	0								
1,3,5-Trinitrobenzene	U	660								
1,3-Dichlorobenzene	U	160								
1,3-Dinitrobenzene	U	0								
1,4-Dichlorobenzene	U	160								
1,4-Dinitrobenzene	U	0								
1,4-Napthoquinone	U	160								
1-Methylnaphthalene	U	160								
1-Naphthylamine	U	660								
2,3,4,6-Tetrachlorophenol	U	660								
2,4,5-Trichlorophenol	U	160								
2,4,6-Trichlorophenol	U	160								
2,4-Dichlorophenol	U	160								
2,4-Dimethylphenol	U	330								
2,4-Dinitrophenol	U	660								
2,4-Dinitrotoluene	U	160								
2,6-Dichlorophenol	U	160								
2,6-Dinitrotoluene	U	160								
2-Acetylaminofluorene	U	160								
2-Chloronaphthalene	U	80								
2-Chlorophenol	U	160								
2-Methylnaphthalene	U	80								
2-Methylphenol	U	160								
2-Naphthylamine	U	660								
2-Nitroaniline	U	660								
2-Nitrophenol	U	160								
2-Picoline	U	330								
3,3´-Dichlorobenzidine	U	660								
3,3´-Dimethylbenzidine	U	660								
3-Methylcholanthrene	U	160								
3-Methylphenol	U	160								
3-Nitroaniline	U	660								
4,6-Dinitro-2-methylphenol	U	330								
4-Aminobiphenyl	U	660								
4-Bromophenyl phenyl ether	U	160								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44226** Instrument ID **SVMS7** Method: **SW8270**

4-Chloro-3-methylphenol	U	160	
4-Chloroaniline	U	660	
4-Chlorophenyl phenyl ether	U	160	
4-Methylphenol	U	160	
4-Nitroaniline	U	660	
4-Nitrophenol	U	660	
4-Nitroquinoline 1-oxide	U	330	
5,5-Diphenylhydantoin	U	660	
5-Nitro-o-toluidine	U	160	
6-Methyl chrysene	U	330	
7,12-Dimethylbenz(a)anthracene	U	160	
a,a-Dimethylphenethylamine	U	160	
Acenaphthene	U	30	
Acenaphthylene	U	30	
Acetophenone	U	330	
Aniline	U	660	
Anthracene	U	30	
Aramite	U	160	
Atrazine	U	330	
Benzaldehyde	U	330	
Benzenethiol	U	330	
Benzidine	U	660	
Benzo(a)anthracene	U	30	
Benzo(a)pyrene	U	30	
Benzo(b)fluoranthene	U	30	
Benzo(g,h,i)perylene	U	30	
Benzo(k)fluoranthene	U	30	
Benzoic acid	U	100	
Benzophenone	U	660	
Benzyl alcohol	U	660	
Bis(2-chloroethoxy)methane	U	160	
Bis(2-chloroethyl)ether	U	160	
Bis(2-chloroisopropyl)ether	U	160	
Bis(2-ethylhexyl)phthalate	U	330	
Bis(methoxyethyethyl)phthalate	U	330	
Butyl benzyl phthalate	21	160	J
Caprolactam	44.33	330	J
Carbazole	U	160	
Chlorobenzilate	U	160	
Chrysene	U	30	
Diallate	U	160	
Dibenzo(a,h)acridine	U	330	
Dibenzo(a,h)anthracene	U	30	
Dibenzofuran	U	160	
Diethyl phthalate	U	330	
Diisobutyl phthalate	U	330	
Diisodecyl phthalate	U	160	
Diisononyl phthalate	U	160	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **44226** Instrument ID **SVMS7** Method: **SW8270**

Dimethoate	U	330
Dimethyl phthalate	U	330
Di-n-butyl phthalate	U	330
Di-n-octyl phthalate	U	160
Dinoseb	U	0
Di-n-pentyl phthalate	U	330
Diphenyl oxide	U	160
Diphenylamine	U	0
Disulfoton	U	130
Ethyl methanesulfonate	U	160
Famphur	U	160
Fluoranthene	U	30
Fluorene	U	30
Hexachloro-1,3-butadiene	U	160
Hexachlorobenzene	U	160
Hexachlorobutadiene	U	160
Hexachlorocyclopentadiene	U	330
Hexachloroethane	U	160
Hexachlorophene	U	0
Hexachloropropene	U	660
Indene	U	330
Indeno(1,2,3-cd)pyrene	U	30
Isodrin	U	160
Isophorone	U	160
Isosafrole	U	330
Kepone	U	660
m-Cresol	U	160
Methapyrilene	U	660
Methyl methanesulfonate	U	330
Methyl parathion	U	160
Naphthalene	U	30
Nicotine	U	330
Nitrobenzene	U	160
N-Nitrosodiethylamine	U	330
N-Nitrosodimethylamine	U	160
N-Nitroso-di-n-butylamine	U	330
N-Nitrosodi-n-propylamine	U	160
N-Nitrosodiphenylamine	U	160
N-Nitrosomethylethylamine	U	160
N-Nitrosomorpholine	U	330
N-Nitrosopiperidine	U	0
N-Nitrosopyrrolidine	U	330
O,O,O-Triethylphosphorothioate	U	330
o-Cresol	U	160
o-Toluidine	U	330
Parathion	U	160
p-Cresol	U	160
p-Dimethylaminoazobenzene	U	160

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **44226** Instrument ID **SVMS7** Method: **SW8270**

Pentachlorobenzene	U	660					
Pentachloronitrobenzene	U	660					
Pentachlorophenol	U	330					
Phenacetin	U	130					
Phenanthrene	U	30					
Phenol	U	160					
Phorate	U	330					
p-Phenylenediamine	U	160					
Pronamide	U	160					
Pyrene	U	30					
Pyridine	U	160					
Quinoline	U	330					
Safrole	U	330					
Sulfotepp	U	160					
Surfynol 104E	U	330					
sym-Trinitrobenzene	U	0					
Tetraethyldithiopyrophosphate	U	0					
Thionazin	U	160					
Cresols	U	0					
Phthalates, Total	21	0					
Surr: 2,4,6-Tribromophenol	*1424*	0	*1667*	0	*85.4*	*34-140*	0
Surr: 2-Fluorobiphenyl	*1150*	0	*1667*	0	*69*	*12-100*	0
Surr: 2-Fluorophenol	*1408*	0	*1667*	0	*84.5*	*33-117*	0
Surr: 4-Terphenyl-d14	*1499*	0	*1667*	0	*90*	*25-137*	0
Surr: Nitrobenzene-d5	*1311*	0	*1667*	0	*78.7*	*37-107*	0
Surr: Phenol-d6	*1436*	0	*1667*	0	*86.2*	*40-106*	0

Client: Encana Oil and Gas (USA) Inc.
Work Order: 1210454
Project: C29 Oil Shale 10/11/12

QC BATCH REPORT

Batch ID: **44226** Instrument ID **SVMS7** Method: **SW8270**

LCS Sample ID: **SLCSS1-44226-44226** Units: **µg/Kg** Analysis Date: **10/18/2012 06:49 PM**

Client ID: Run ID: **SVMS7_121018A** SeqNo: **2117425** Prep Date: **10/18/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2,4-Trichlorobenzene	541	160	666.7	0	81.1	45-110	0			
1,2-Dichlorobenzene	530.7	160	666.7	0	79.6	45-95	0			
1,3-Dichlorobenzene	532	160	666.7	0	79.8	40-100	0			
1,4-Dichlorobenzene	542.3	160	666.7	0	81.3	35-105	0			
2,4,5-Trichlorophenol	594	160	666.7	0	89.1	50-110	0			
2,4,6-Trichlorophenol	590.3	160	666.7	0	88.5	45-110	0			
2,4-Dichlorophenol	626	160	666.7	0	93.9	45-110	0			
2,4-Dimethylphenol	552.3	330	666.7	0	82.8	30-105	0			
2,4-Dinitrophenol	565	660	666.7	0	84.7	15-130	0			J
2,4-Dinitrotoluene	675.3	160	666.7	0	101	50-115	0			
2,6-Dinitrotoluene	623	160	666.7	0	93.4	50-110	0			
2-Chloronaphthalene	553	80	666.7	0	82.9	45-105	0			
2-Chlorophenol	561	160	666.7	0	84.1	45-105	0			
2-Methylnaphthalene	558.3	80	666.7	0	83.7	45-105	0			
2-Methylphenol	573	160	666.7	0	85.9	40-105	0			
2-Nitroaniline	609.7	660	666.7	0	91.4	45-120	0			J
2-Nitrophenol	560.3	160	666.7	0	84	40-110	0			
3-Methylphenol	606	160	666.7	0	90.9	40-105	0			
3-Nitroaniline	451.3	660	666.7	0	67.7	25-150	0			J
4-Bromophenyl phenyl ether	600	160	666.7	0	90	45-115	0			
4-Chloro-3-methylphenol	626.3	160	666.7	0	93.9	45-115	0			
4-Chloroaniline	454.3	660	666.7	0	68.1	15-110	0			J
4-Chlorophenyl phenyl ether	587.7	160	666.7	0	88.1	45-110	0			
4-Methylphenol	606	160	666.7	0	90.9	40-105	0			
4-Nitroaniline	481.3	660	666.7	0	72.2	35-150	0			J
4-Nitrophenol	651.7	660	666.7	0	97.7	15-140	0			J
Acenaphthene	571	30	666.7	0	85.6	45-110	0			
Acenaphthylene	598.3	30	666.7	0	89.7	45-105	0			
Aniline	564	660	666.7	0	84.6	45-135	0			J
Anthracene	628	30	666.7	0	94.2	55-105	0			
Benzo(a)anthracene	635.7	30	666.7	0	95.3	50-110	0			
Benzo(a)pyrene	683	30	666.7	0	102	50-110	0			
Benzo(b)fluoranthene	635.3	30	666.7	0	95.3	45-115	0			
Benzo(g,h,i)perylene	690.7	30	666.7	0	104	40-125	0			
Benzo(k)fluoranthene	674.3	30	666.7	0	101	45-115	0			
Bis(2-chloroethoxy)methane	563.3	160	666.7	0	84.5	45-110	0			
Bis(2-chloroethyl)ether	533	160	666.7	0	79.9	40-105	0			
Bis(2-chloroisopropyl)ether	573.7	160	666.7	0	86	20-115	0			
Bis(2-ethylhexyl)phthalate	695	330	666.7	0	104	45-125	0			
Butyl benzyl phthalate	681	160	666.7	0	102	50-125	0			
Carbazole	823	160	666.7	0	123	50-150	0			
Chrysene	643.7	30	666.7	0	96.5	55-110	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **44226** Instrument ID **SVMS7** Method: **SW8270**

Dibenzo(a,h)anthracene	700.3	30	666.7	0	105	40-125	0
Dibenzofuran	587.7	160	666.7	0	88.1	50-105	0
Diethyl phthalate	631.3	330	666.7	0	94.7	50-115	0
Dimethyl phthalate	579	330	666.7	0	86.8	50-110	0
Di-n-butyl phthalate	665.3	330	666.7	0	99.8	55-110	0
Di-n-octyl phthalate	666	160	666.7	0	99.9	40-130	0
Fluoranthene	671.7	30	666.7	0	101	55-115	0
Fluorene	610.3	30	666.7	0	91.5	50-110	0
Hexachlorobenzene	617.3	160	666.7	0	92.6	45-120	0
Hexachlorobutadiene	551.3	160	666.7	0	82.7	40-115	0
Hexachlorocyclopentadiene	490	330	666.7	0	73.5	40-115	0
Hexachloroethane	555.3	160	666.7	0	83.3	35-110	0
Indeno(1,2,3-cd)pyrene	698.3	30	666.7	0	105	40-120	0
Isophorone	550	160	666.7	0	82.5	45-110	0
Naphthalene	552	30	666.7	0	82.8	40-105	0
Nitrobenzene	556.3	160	666.7	0	83.4	40-115	0
N-Nitrosodimethylamine	560.7	160	666.7	0	84.1	20-115	0
N-Nitrosodi-n-propylamine	559	160	666.7	0	83.8	40-115	0
N-Nitrosodiphenylamine	716.3	160	666.7	0	107	50-115	0
Pentachlorophenol	615.3	330	666.7	0	92.3	25-120	0
Phenanthrene	629.7	30	666.7	0	94.4	50-110	0
Phenol	510.3	160	666.7	0	76.5	40-100	0
Pyrene	640.7	30	666.7	0	96.1	45-125	0
Surr: 2,4,6-Tribromophenol	*1550*	0	*1667*	0	*93*	*34-140*	0
Surr: 2-Fluorobiphenyl	*1121*	0	*1667*	0	*67.2*	*12-100*	0
Surr: 2-Fluorophenol	*1320*	0	*1667*	0	*79.2*	*33-117*	0
Surr: 4-Terphenyl-d14	*1561*	0	*1667*	0	*93.7*	*25-137*	0
Surr: Nitrobenzene-d5	*1263*	0	*1667*	0	*75.8*	*37-107*	0
Surr: Phenol-d6	*1324*	0	*1667*	0	*79.4*	*40-106*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Encana Oil and Gas (USA) Inc.
Work Order: 1210454
Project: C29 Oil Shale 10/11/12

QC BATCH REPORT

Batch ID: **44226** Instrument ID **SVMS7** Method: **SW8270**

MS Sample ID: **1210593-01B MS** Units: **µg/Kg** Analysis Date: **10/18/2012 09:19 PM**
Client ID: Run ID: **SVMS7_121018A** SeqNo: **2117426** Prep Date: **10/18/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2,4-Trichlorobenzene	1147	320	1318	0	87	45-110	0			
1,2-Dichlorobenzene	1150	320	1318	0	87.3	45-95	0			
1,3-Dichlorobenzene	1145	320	1318	0	86.9	40-100	0			
1,4-Dichlorobenzene	1157	320	1318	0	87.8	35-105	0			
2,4,5-Trichlorophenol	1200	320	1318	0	91.1	50-110	0			
2,4,6-Trichlorophenol	1240	320	1318	0	94.1	45-110	0			
2,4-Dichlorophenol	1332	320	1318	0	101	45-110	0			
2,4-Dimethylphenol	1054	650	1318	0	80	30-105	0			
2,4-Dinitrophenol	1265	1,300	1318	0	96	15-130	0			J
2,4-Dinitrotoluene	1350	320	1318	0	102	50-115	0			
2,6-Dinitrotoluene	1257	320	1318	0	95.4	50-110	0			
2-Chloronaphthalene	1161	160	1318	0	88.1	45-105	0			
2-Chlorophenol	1213	320	1318	0	92.1	45-105	0			
2-Methylnaphthalene	1186	160	1318	0	90	45-105	0			
2-Methylphenol	1215	320	1318	0	92.2	40-105	0			
2-Nitroaniline	1244	1,300	1318	0	94.4	45-120	0			J
2-Nitrophenol	1224	320	1318	0	92.9	40-110	0			
3-Methylphenol	1272	320	1318	0	96.5	40-105	0			
3-Nitroaniline	1138	1,300	1318	0	86.3	25-110	0			J
4-Bromophenyl phenyl ether	1217	320	1318	0	92.4	45-115	0			
4-Chloro-3-methylphenol	1295	320	1318	0	98.3	45-115	0			
4-Chloroaniline	637.7	1,300	1318	0	48.4	15-110	0			J
4-Chlorophenyl phenyl ether	1194	320	1318	0	90.6	45-110	0			
4-Methylphenol	1272	320	1318	0	96.5	40-105	0			
4-Nitroaniline	1226	1,300	1318	0	93	35-150	0			J
4-Nitrophenol	1342	1,300	1318	50.57	98	15-140	0			
Acenaphthene	1184	59	1318	0	89.9	45-110	0			
Acenaphthylene	1237	59	1318	0	93.9	45-105	0			
Aniline	951.9	1,300	1318	0	72.2	45-135	0			J
Anthracene	1254	59	1318	0	95.1	55-105	0			
Benzo(a)anthracene	1272	59	1318	0	96.5	50-110	0			
Benzo(a)pyrene	1346	59	1318	0	102	50-110	0			
Benzo(b)fluoranthene	1289	59	1318	0	97.8	45-115	0			
Benzo(g,h,i)perylene	1369	59	1318	0	104	40-125	0			
Benzo(k)fluoranthene	1289	59	1318	0	97.8	45-115	0			
Bis(2-chloroethoxy)methane	1196	320	1318	0	90.8	45-110	0			
Bis(2-chloroethyl)ether	1148	320	1318	0	87.1	40-105	0			
Bis(2-chloroisopropyl)ether	1238	320	1318	0	93.9	20-115	0			
Bis(2-ethylhexyl)phthalate	1339	650	1318	0	102	45-125	0			
Butyl benzyl phthalate	1356	320	1318	23.13	101	50-125	0			
Carbazole	1658	320	1318	0	126	50-150	0			
Chrysene	1267	59	1318	0	96.2	55-110	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **44226** Instrument ID **SVMS7** Method: **SW8270**

Dibenzo(a,h)anthracene	1390	59	1318	0	105	40-125	0
Dibenzofuran	1210	320	1318	0	91.8	50-105	0
Diethyl phthalate	1260	650	1318	0	95.6	50-115	0
Dimethyl phthalate	1179	650	1318	0	89.4	50-110	0
Di-n-butyl phthalate	1329	650	1318	0	101	55-110	0
Di-n-octyl phthalate	1330	320	1318	0	101	40-130	0
Fluoranthene	1329	59	1318	0	101	55-115	0
Fluorene	1234	59	1318	0	93.6	50-110	0
Hexachlorobenzene	1223	320	1318	0	92.8	45-120	0
Hexachlorobutadiene	1169	320	1318	0	88.7	40-115	0
Hexachlorocyclopentadiene	1018	650	1318	0	77.2	40-115	0
Hexachloroethane	1182	320	1318	0	89.7	35-110	0
Indeno(1,2,3-cd)pyrene	1394	59	1318	0	106	40-120	0
Isophorone	1158	320	1318	0	87.9	45-110	0
Naphthalene	1175	59	1318	0	89.1	40-105	0
Nitrobenzene	1180	320	1318	0	89.5	40-115	0
N-Nitrosodimethylamine	1188	320	1318	0	90.2	20-115	0
N-Nitrosodi-n-propylamine	1198	320	1318	0	90.9	40-115	0
N-Nitrosodiphenylamine	1406	320	1318	0	107	50-115	0
Pentachlorophenol	1306	650	1318	199.9	83.9	25-120	0
Phenanthrene	1265	59	1318	0	96	50-110	0
Phenol	1130	320	1318	0	85.7	40-100	0
Pyrene	1277	59	1318	0	96.9	45-125	0
Surr: 2,4,6-Tribromophenol	*3294*	0	*3294*	0	*100*	*34-140*	0
Surr: 2-Fluorobiphenyl	*2305*	0	*3294*	0	*70*	*12-100*	0
Surr: 2-Fluorophenol	*2816*	0	*3294*	0	*85.5*	*33-117*	0
Surr: 4-Terphenyl-d14	*3131*	0	*3294*	0	*95.1*	*25-137*	0
Surr: Nitrobenzene-d5	*2680*	0	*3294*	0	*81.4*	*37-107*	0
Surr: Phenol-d6	*2819*	0	*3294*	0	*85.6*	*40-106*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Encana Oil and Gas (USA) Inc.
Work Order: 1210454
Project: C29 Oil Shale 10/11/12

QC BATCH REPORT

Batch ID: **44226** Instrument ID **SVMS7** Method: **SW8270**

MSD Sample ID: **1210593-01B MSD** Units: **µg/Kg** Analysis Date: **10/18/2012 09:46 PM**

Client ID: Run ID: **SVMS7_121018A** SeqNo: **2117427** Prep Date: **10/18/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2,4-Trichlorobenzene	1140	320	1329	0	85.8	45-110	1147	0.566	30	
1,2-Dichlorobenzene	1137	320	1329	0	85.5	45-95	1150	1.14	30	
1,3-Dichlorobenzene	1134	320	1329	0	85.3	40-100	1145	0.92	30	
1,4-Dichlorobenzene	1150	320	1329	0	86.5	35-105	1157	0.611	30	
2,4,5-Trichlorophenol	1250	320	1329	0	94	50-110	1200	4.07	30	
2,4,6-Trichlorophenol	1317	320	1329	0	99.1	45-110	1240	6	30	
2,4-Dichlorophenol	1362	320	1329	0	102	45-110	1332	2.26	30	
2,4-Dimethylphenol	1067	660	1329	0	80.3	30-105	1054	1.25	30	
2,4-Dinitrophenol	1229	1,300	1329	0	92.5	15-130	1265	0	30	J
2,4-Dinitrotoluene	1421	320	1329	0	107	50-115	1350	5.13	30	
2,6-Dinitrotoluene	1320	320	1329	0	99.3	50-110	1257	4.89	30	
2-Chloronaphthalene	1179	160	1329	0	88.7	45-105	1161	1.56	30	
2-Chlorophenol	1223	320	1329	0	92	45-105	1213	0.826	30	
2-Methylnaphthalene	1192	160	1329	0	89.7	45-105	1186	0.546	30	
2-Methylphenol	1225	320	1329	0	92.2	40-105	1215	0.88	30	
2-Nitroaniline	1322	1,300	1329	0	99.4	45-120	1244	6.04	30	
2-Nitrophenol	1225	320	1329	0	92.1	40-110	1224	0.0694	30	
3-Methylphenol	1300	320	1329	0	97.8	40-105	1272	2.17	30	
3-Nitroaniline	1266	1,300	1329	0	95.2	25-110	1138	0	30	J
4-Bromophenyl phenyl ether	1265	320	1329	0	95.1	45-115	1217	3.81	30	
4-Chloro-3-methylphenol	1371	320	1329	0	103	45-115	1295	5.69	30	
4-Chloroaniline	697.8	1,300	1329	0	52.5	15-110	637.7	0	30	J
4-Chlorophenyl phenyl ether	1257	320	1329	0	94.5	45-110	1194	5.09	30	
4-Methylphenol	1300	320	1329	0	97.8	40-105	1272	2.17	30	
4-Nitroaniline	1368	1,300	1329	0	103	35-150	1226	11	30	
4-Nitrophenol	1453	1,300	1329	50.57	106	15-140	1342	7.98	30	
Acenaphthene	1211	60	1329	0	91.1	45-110	1184	2.21	30	
Acenaphthylene	1258	60	1329	0	94.6	45-105	1237	1.68	30	
Aniline	935.1	1,300	1329	0	70.3	45-135	951.9	0	30	J
Anthracene	1306	60	1329	0	98.2	55-105	1254	4.09	30	
Benzo(a)anthracene	1319	60	1329	0	99.2	50-110	1272	3.59	30	
Benzo(a)pyrene	1402	60	1329	0	105	50-110	1346	4.06	30	
Benzo(b)fluoranthene	1348	60	1329	0	101	45-115	1289	4.49	30	
Benzo(g,h,i)perylene	1422	60	1329	0	107	40-125	1369	3.82	30	
Benzo(k)fluoranthene	1339	60	1329	0	101	45-115	1289	3.8	30	
Bis(2-chloroethoxy)methane	1204	320	1329	0	90.6	45-110	1196	0.66	30	
Bis(2-chloroethyl)ether	1146	320	1329	0	86.2	40-105	1148	0.159	30	
Bis(2-chloroisopropyl)ether	1223	320	1329	0	92	20-115	1238	1.22	30	
Bis(2-ethylhexyl)phthalate	1443	660	1329	0	109	45-125	1339	7.54	30	
Butyl benzyl phthalate	1418	320	1329	23.13	105	50-125	1356	4.51	30	
Carbazole	1736	320	1329	0	131	50-150	1658	4.58	30	
Chrysene	1339	60	1329	0	101	55-110	1267	5.5	30	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44226** Instrument ID **SVMS7** Method: **SW8270**

Dibenzo(a,h)anthracene	1461	60	1329	0	110	40-125	1390	4.96	30
Dibenzofuran	1257	320	1329	0	94.5	50-105	1210	3.78	30
Diethyl phthalate	1323	660	1329	0	99.5	50-115	1260	4.88	30
Dimethyl phthalate	1239	660	1329	0	93.2	50-110	1179	5.04	30
Di-n-butyl phthalate	1393	660	1329	0	105	55-110	1329	4.72	30
Di-n-octyl phthalate	1385	320	1329	0	104	40-130	1330	4.05	30
Fluoranthene	1376	60	1329	0	104	55-115	1329	3.47	30
Fluorene	1304	60	1329	0	98.1	50-110	1234	5.52	30
Hexachlorobenzene	1286	320	1329	0	96.7	45-120	1223	4.99	30
Hexachlorobutadiene	1170	320	1329	0	88	40-115	1169	0.145	30
Hexachlorocyclopentadiene	1021	660	1329	0	76.8	40-115	1018	0.361	30
Hexachloroethane	1179	320	1329	0	88.7	35-110	1182	0.297	30
Indeno(1,2,3-cd)pyrene	1453	60	1329	0	109	40-120	1394	4.18	30
Isophorone	1164	320	1329	0	87.6	45-110	1158	0.538	30
Naphthalene	1186	60	1329	0	89.2	40-105	1175	0.992	30
Nitrobenzene	1182	320	1329	0	88.9	40-115	1180	0.208	30
N-Nitrosodimethylamine	1172	320	1329	0	88.1	20-115	1188	1.42	30
N-Nitrosodi-n-propylamine	1203	320	1329	0	90.5	40-115	1198	0.384	30
N-Nitrosodiphenylamine	1480	320	1329	0	111	50-115	1406	5.14	30
Pentachlorophenol	1394	660	1329	199.9	89.8	25-120	1306	6.52	30
Phenanthrene	1325	60	1329	0	99.6	50-110	1265	4.61	30
Phenol	1095	320	1329	0	82.4	40-100	1130	3.1	30
Pyrene	1327	60	1329	0	99.8	45-125	1277	3.83	30
Surr: 2,4,6-Tribromophenol	*3460*	0	*3323*	0	*104*	*34-140*	3294	*4.94*	*40*
Surr: 2-Fluorobiphenyl	*2338*	0	*3323*	0	*70.4*	*12-100*	2305	*1.42*	*40*
Surr: 2-Fluorophenol	*2825*	0	*3323*	0	*85*	*33-117*	2816	*0.317*	*40*
Surr: 4-Terphenyl-d14	*3240*	0	*3323*	0	*97.5*	*25-137*	3131	*3.41*	*40*
Surr: Nitrobenzene-d5	*2684*	0	*3323*	0	*80.8*	*37-107*	2680	*0.14*	*40*
Surr: Phenol-d6	*2848*	0	*3323*	0	*85.7*	*40-106*	2819	*1.02*	*40*

The following samples were analyzed in this batch: 1210454-01A 1210454-02A 1210454-03A 1210454-04A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Encana Oil and Gas (USA) Inc.
Work Order: 1210454
Project: C29 Oil Shale 10/11/12

QC BATCH REPORT

Batch ID: **44306** Instrument ID **SVMS6** Method: **SW8270**

MBLK Sample ID: **SBLKS1-44306-44306** Units: **µg/Kg** Analysis Date: **10/24/2012 02:04 PM**
Client ID: Run ID: **SVMS6_121024A** SeqNo: **2122464** Prep Date: **10/23/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Chloronaphthalene	U	80								
2-Methylnaphthalene	U	80								
Acenaphthene	U	30								
Acenaphthylene	U	30								
Anthracene	U	30								
Benzo(a)anthracene	U	30								
Benzo(a)pyrene	U	30								
Benzo(b)fluoranthene	U	30								
Benzo(g,h,i)perylene	U	30								
Benzo(k)fluoranthene	U	30								
Chrysene	U	30								
Dibenzo(a,h)anthracene	U	30								
Fluoranthene	U	30								
Fluorene	U	30								
Indeno(1,2,3-cd)pyrene	U	30								
Naphthalene	U	30								
Pentachlorophenol	U	330								
Phenanthrene	U	30								
Pyrene	U	30								
Surr: 2,4,6-Tribromophenol	*1375*	0	*1667*	0	*82.5*	*34-140*	0			
Surr: 2-Fluorobiphenyl	*1205*	0	*1667*	0	*72.3*	*12-100*	0			
Surr: 2-Fluorophenol	*1444*	0	*1667*	0	*86.6*	*33-117*	0			
Surr: 4-Terphenyl-d14	*1995*	0	*1667*	0	*120*	*25-137*	0			
Surr: Nitrobenzene-d5	*1351*	0	*1667*	0	*81.1*	*37-107*	0			
Surr: Phenol-d6	*1363*	0	*1667*	0	*81.8*	*40-106*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Encana Oil and Gas (USA) Inc.
Work Order: 1210454
Project: C29 Oil Shale 10/11/12

QC BATCH REPORT

Batch ID: **44306** Instrument ID **SVMS6** Method: **SW8270**

LCS Sample ID: **SLCSS1-44306-44306** Units: **µg/Kg** Analysis Date: **10/24/2012 12:23 PM**
Client ID: Run ID: **SVMS6_121024A** SeqNo: **2122460** Prep Date: **10/23/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Chloronaphthalene	493.3	80	666.7	0	74	45-105	0			
2-Methylnaphthalene	498	80	666.7	0	74.7	45-105	0			
Acenaphthene	503.3	30	666.7	0	75.5	45-110	0			
Acenaphthylene	533	30	666.7	0	79.9	45-105	0			
Anthracene	579.3	30	666.7	0	86.9	55-105	0			
Benzo(a)anthracene	595.3	30	666.7	0	89.3	50-110	0			
Benzo(a)pyrene	656	30	666.7	0	98.4	50-110	0			
Benzo(b)fluoranthene	603.3	30	666.7	0	90.5	45-115	0			
Benzo(g,h,i)perylene	552.7	30	666.7	0	82.9	40-125	0			
Benzo(k)fluoranthene	675	30	666.7	0	101	45-115	0			
Chrysene	623	30	666.7	0	93.4	55-110	0			
Dibenzo(a,h)anthracene	581.7	30	666.7	0	87.2	40-125	0			
Fluoranthene	614	30	666.7	0	92.1	55-115	0			
Fluorene	535.7	30	666.7	0	80.3	50-110	0			
Indeno(1,2,3-cd)pyrene	552.7	30	666.7	0	82.9	40-120	0			
Naphthalene	492.3	30	666.7	0	73.8	40-105	0			
Pentachlorophenol	563	330	666.7	0	84.4	25-120	0			
Phenanthrene	575.7	30	666.7	0	86.3	50-110	0			
Pyrene	659.3	30	666.7	0	98.9	45-125	0			
Surr: 2,4,6-Tribromophenol	*1586*	0	*1667*	0	*95.2*	*34-140*	0			
Surr: 2-Fluorobiphenyl	*1130*	0	*1667*	0	*67.8*	*12-100*	0			
Surr: 2-Fluorophenol	*1271*	0	*1667*	0	*76.2*	*33-117*	0			
Surr: 4-Terphenyl-d14	*1825*	0	*1667*	0	*109*	*25-137*	0			
Surr: Nitrobenzene-d5	*1233*	0	*1667*	0	*74*	*37-107*	0			
Surr: Phenol-d6	*1184*	0	*1667*	0	*71*	*40-106*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Encana Oil and Gas (USA) Inc.
Work Order: 1210454
Project: C29 Oil Shale 10/11/12

QC BATCH REPORT

Batch ID: **44306** Instrument ID **SVMS6** Method: **SW8270**

MS Sample ID: **1210687-13C MS** Units: **µg/Kg** Analysis Date: **10/24/2012 12:48 PM**
Client ID: Run ID: **SVMS6_121024A** SeqNo: **2122461** Prep Date: **10/23/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Chloronaphthalene	1003	150	1288	0	77.8	45-105	0			
2-Methylnaphthalene	3579	150	1288	1920	129	45-105	0			S
Acenaphthene	1089	58	1288	41.86	81.2	45-110	0			
Acenaphthylene	1015	58	1288	44.47	75.3	45-105	0			
Anthracene	1074	58	1288	0	83.3	55-105	0			
Benzo(a)anthracene	1119	58	1288	0	86.8	50-110	0			
Benzo(a)pyrene	1175	58	1288	0	91.2	50-110	0			
Benzo(b)fluoranthene	1072	58	1288	0	83.2	45-115	0			
Benzo(g,h,i)perylene	1128	58	1288	0	87.5	40-125	0			
Benzo(k)fluoranthene	1262	58	1288	0	97.9	45-115	0			
Chrysene	1134	58	1288	0	88	55-110	0			
Dibenzo(a,h)anthracene	1192	58	1288	0	92.5	40-125	0			
Fluoranthene	1136	58	1288	0	88.2	55-115	0			
Fluorene	1145	58	1288	141.3	77.9	50-110	0			
Indeno(1,2,3-cd)pyrene	1128	58	1288	0	87.5	40-120	0			
Naphthalene	2036	58	1288	690	104	40-105	0			
Pentachlorophenol	1090	640	1288	0	84.6	25-120	0			
Phenanthrene	1193	58	1288	62.79	87.7	50-110	0			
Pyrene	1281	58	1288	0	99.4	45-125	0			
Surr: 2,4,6-Tribromophenol	*3451*	0	*3221*	0	*107*	*34-140*	0			
Surr: 2-Fluorobiphenyl	*2740*	0	*3221*	0	*85.1*	*12-100*	0			
Surr: 2-Fluorophenol	*2427*	0	*3221*	0	*75.4*	*33-117*	0			
Surr: 4-Terphenyl-d14	*3579*	0	*3221*	0	*111*	*25-137*	0			
Surr: Nitrobenzene-d5	*2571*	0	*3221*	0	*79.8*	*37-107*	0			
Surr: Phenol-d6	*2289*	0	*3221*	0	*71.1*	*40-106*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Encana Oil and Gas (USA) Inc.
Work Order: 1210454
Project: C29 Oil Shale 10/11/12

QC BATCH REPORT

Batch ID: **44306** Instrument ID **SVMS6** Method: **SW8270**

MSD Sample ID: **1210687-13C MSD** Units: **µg/Kg** Analysis Date: **10/24/2012 01:13 PM**
Client ID: Run ID: **SVMS6_121024A** SeqNo: **2122462** Prep Date: **10/23/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Chloronaphthalene	1031	160	1293	0	79.7	45-105	1003	2.74	30	
2-Methylnaphthalene	3740	160	1293	1920	141	45-105	3579	4.4	30	S
Acenaphthene	1022	58	1293	41.86	75.8	45-110	1089	6.33	30	
Acenaphthylene	1013	58	1293	44.47	74.9	45-105	1015	0.116	30	
Anthracene	1120	58	1293	0	86.6	55-105	1074	4.22	30	
Benzo(a)anthracene	1125	58	1293	0	87	50-110	1119	0.566	30	
Benzo(a)pyrene	1162	58	1293	0	89.8	50-110	1175	1.1	30	
Benzo(b)fluoranthene	1081	58	1293	0	83.5	45-115	1072	0.814	30	
Benzo(g,h,i)perylene	1134	58	1293	0	87.6	40-125	1128	0.508	30	
Benzo(k)fluoranthene	1274	58	1293	0	98.5	45-115	1262	0.954	30	
Chrysene	1134	58	1293	0	87.7	55-110	1134	0.00458	30	
Dibenzo(a,h)anthracene	1205	58	1293	0	93.2	40-125	1192	1.15	30	
Fluoranthene	1267	58	1293	0	97.9	55-115	1136	10.9	30	
Fluorene	1146	58	1293	141.3	77.7	50-110	1145	0.112	30	
Indeno(1,2,3-cd)pyrene	1134	58	1293	0	87.6	40-120	1128	0.508	30	
Naphthalene	1964	58	1293	690	98.5	40-105	2036	3.61	30	
Pentachlorophenol	1085	640	1293	0	83.9	25-120	1090	0.437	30	
Phenanthrene	1202	58	1293	62.79	88	50-110	1193	0.717	30	
Pyrene	1376	58	1293	0	106	45-125	1281	7.1	30	
Surr: 2,4,6-Tribromophenol	*3326*	0	*3234*	0	*103*	*34-140*	3451	*3.68*	*40*	
Surr: 2-Fluorobiphenyl	*2687*	0	*3234*	0	*83.1*	*12-100*	2740	*1.94*	*40*	
Surr: 2-Fluorophenol	*2580*	0	*3234*	0	*79.8*	*33-117*	2427	*6.12*	*40*	
Surr: 4-Terphenyl-d14	*3902*	0	*3234*	0	*121*	*25-137*	3579	*8.64*	*40*	
Surr: Nitrobenzene-d5	*2600*	0	*3234*	0	*80.4*	*37-107*	2571	*1.12*	*40*	
Surr: Phenol-d6	*2421*	0	*3234*	0	*74.9*	*40-106*	2289	*5.63*	*40*	

The following samples were analyzed in this batch: 1210454-04A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Encana Oil and Gas (USA) Inc.
Work Order: 1210454
Project: C29 Oil Shale 10/11/12

QC BATCH REPORT

Batch ID: **44243** Instrument ID **VMS7** Method: **SW8260**

MBLK Sample ID: **MBLK-44243-44243** Units: **µg/Kg** Analysis Date: **10/18/2012 03:38 PM**
Client ID: Run ID: **VMS7_121018A** SeqNo: **2117463** Prep Date: **10/18/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	U	30								
Ethylbenzene	U	30								
m,p-Xylene	U	60								
o-Xylene	U	30								
Toluene	U	30								
Xylenes, Total	U	90								
Surr: 1,2-Dichloroethane-d4	*941.5*	0	*1000*	0	*94.2*	*70-130*	0			
Surr: 4-Bromofluorobenzene	*991*	0	*1000*	0	*99.1*	*70-130*	0			
Surr: Dibromofluoromethane	*800.5*	0	*1000*	0	*80*	*70-130*	0			
Surr: Toluene-d8	*978.5*	0	*1000*	0	*97.8*	*70-130*	0			

MBLK Sample ID: **MBLK-44243-44243** Units: **µg/Kg** Analysis Date: **10/18/2012 05:54 PM**
Client ID: Run ID: **VMS5_121018A** SeqNo: **2117547** Prep Date: **10/18/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	U	30								
Ethylbenzene	U	30								
m,p-Xylene	U	60								
o-Xylene	U	30								
Toluene	U	30								
Xylenes, Total	U	90								
Surr: 1,2-Dichloroethane-d4	*1013*	0	*1000*	0	*101*	*70-130*	0			
Surr: 4-Bromofluorobenzene	*1014*	0	*1000*	0	*101*	*70-130*	0			
Surr: Dibromofluoromethane	*982.5*	0	*1000*	0	*98.2*	*70-130*	0			
Surr: Toluene-d8	*985*	0	*1000*	0	*98.5*	*70-130*	0			

MBLK Sample ID: **MBLK-44243-44243** Units: **µg/Kg** Analysis Date: **10/18/2012 10:51 PM**
Client ID: Run ID: **VMS8_121018B** SeqNo: **2117862** Prep Date: **10/18/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	U	30								
Ethylbenzene	U	30								
m,p-Xylene	U	60								
o-Xylene	U	30								
Toluene	U	30								
Xylenes, Total	U	90								
Surr: 1,2-Dichloroethane-d4	*1051*	0	*1000*	0	*105*	*70-130*	0			
Surr: 4-Bromofluorobenzene	*1022*	0	*1000*	0	*102*	*70-130*	0			
Surr: Dibromofluoromethane	*961.5*	0	*1000*	0	*96.2*	*70-130*	0			
Surr: Toluene-d8	*978*	0	*1000*	0	*97.8*	*70-130*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Encana Oil and Gas (USA) Inc.
Work Order: 1210454
Project: C29 Oil Shale 10/11/12

QC BATCH REPORT

Batch ID: **44243** Instrument ID **VMS7** Method: **SW8260**

MBLK Sample ID: **MBLK-44243-44243** Units: **µg/Kg** Analysis Date: **10/20/2012 12:13 PM**
Client ID: Run ID: **VMS6_121019B** SeqNo: **2119186** Prep Date: **10/18/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	U	30								
Ethylbenzene	U	30								
m,p-Xylene	U	60								
o-Xylene	U	30								
Toluene	U	30								
Xylenes, Total	U	90								
Surr: 1,2-Dichloroethane-d4	*960.5*	0	*1000*	0	*96*	*70-130*	0			
Surr: 4-Bromofluorobenzene	*994.5*	0	*1000*	0	*99.4*	*70-130*	0			
Surr: Dibromofluoromethane	*924*	0	*1000*	0	*92.4*	*70-130*	0			
Surr: Toluene-d8	*981*	0	*1000*	0	*98.1*	*70-130*	0			

MBLK Sample ID: **MBLK-44243-44243** Units: **µg/Kg** Analysis Date: **10/22/2012 03:27 PM**
Client ID: Run ID: **VMS7_121022A** SeqNo: **2119861** Prep Date: **10/18/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	U	30								
Ethylbenzene	U	30								
m,p-Xylene	U	60								
o-Xylene	U	30								
Toluene	U	30								
Xylenes, Total	U	90								
Surr: 1,2-Dichloroethane-d4	*1029*	0	*1000*	0	*103*	*70-130*	0			
Surr: 4-Bromofluorobenzene	*1021*	0	*1000*	0	*102*	*70-130*	0			
Surr: Dibromofluoromethane	*967*	0	*1000*	0	*96.7*	*70-130*	0			
Surr: Toluene-d8	*974.5*	0	*1000*	0	*97.4*	*70-130*	0			

MBLK Sample ID: **MBLK-44243-44243** Units: **µg/Kg** Analysis Date: **10/23/2012 12:24 PM**
Client ID: Run ID: **VMS5_121022B** SeqNo: **2120603** Prep Date: **10/18/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	U	30								
Ethylbenzene	U	30								
m,p-Xylene	U	60								
o-Xylene	U	30								
Toluene	U	30								
Xylenes, Total	U	90								
Surr: 1,2-Dichloroethane-d4	*1002*	0	*1000*	0	*100*	*70-130*	0			
Surr: 4-Bromofluorobenzene	*1005*	0	*1000*	0	*100*	*70-130*	0			
Surr: Dibromofluoromethane	*1020*	0	*1000*	0	*102*	*70-130*	0			
Surr: Toluene-d8	*980.5*	0	*1000*	0	*98*	*70-130*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Encana Oil and Gas (USA) Inc.
Work Order: 1210454
Project: C29 Oil Shale 10/11/12

QC BATCH REPORT

Batch ID: **44243** Instrument ID **VMS7** Method: **SW8260**

MBLK Sample ID: **MBLK-44243-44243** Units: **µg/Kg** Analysis Date: **10/22/2012 08:27 PM**
Client ID: Run ID: **VMS9_121022A** SeqNo: **2120891** Prep Date: **10/18/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	U	30								
Ethylbenzene	U	30								
m,p-Xylene	U	60								
o-Xylene	U	30								
Toluene	U	30								
Xylenes, Total	U	90								
Surr: 1,2-Dichloroethane-d4	*1168*	0	*1000*	0	*117*	*70-130*	0			
Surr: 4-Bromofluorobenzene	*1025*	0	*1000*	0	*102*	*70-130*	0			
Surr: Dibromofluoromethane	*1140*	0	*1000*	0	*114*	*70-130*	0			
Surr: Toluene-d8	*965*	0	*1000*	0	*96.5*	*70-130*	0			

MBLK Sample ID: **MBLK-44243-44243** Units: **µg/Kg** Analysis Date: **10/23/2012 02:51 PM**
Client ID: Run ID: **VMS5_121023A** SeqNo: **2121185** Prep Date: **10/18/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	U	30								
Ethylbenzene	U	30								
m,p-Xylene	U	60								
o-Xylene	U	30								
Toluene	U	30								
Xylenes, Total	U	90								
Surr: 1,2-Dichloroethane-d4	*974*	0	*1000*	0	*97.4*	*70-130*	0			
Surr: 4-Bromofluorobenzene	*995.5*	0	*1000*	0	*99.6*	*70-130*	0			
Surr: Dibromofluoromethane	*980*	0	*1000*	0	*98*	*70-130*	0			
Surr: Toluene-d8	*964.5*	0	*1000*	0	*96.4*	*70-130*	0			

MBLK Sample ID: **MBLK-44243-44243** Units: **µg/Kg** Analysis Date: **10/24/2012 01:47 PM**
Client ID: Run ID: **VMS6_121024A** SeqNo: **2122125** Prep Date: **10/18/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	U	30								
Ethylbenzene	U	30								
m,p-Xylene	U	60								
o-Xylene	U	30								
Toluene	U	30								
Xylenes, Total	U	90								
Surr: 1,2-Dichloroethane-d4	*962*	0	*1000*	0	*96.2*	*70-130*	0			
Surr: 4-Bromofluorobenzene	*997*	0	*1000*	0	*99.7*	*70-130*	0			
Surr: Dibromofluoromethane	*933.5*	0	*1000*	0	*93.4*	*70-130*	0			
Surr: Toluene-d8	*990.5*	0	*1000*	0	*99*	*70-130*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44243** Instrument ID **VMS7** Method: **SW8260**

LCS Sample ID: **LCS-44243-44243** Units: **µg/Kg** Analysis Date: **10/18/2012 02:23 PM**
Client ID: Run ID: **VMS7_121018A** SeqNo: **2117462** Prep Date: **10/18/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	965	30	1000	0	96.5	75-125	0			
Ethylbenzene	1006	30	1000	0	101	75-125	0			
m,p-Xylene	1970	60	2000	0	98.5	80-125	0			
o-Xylene	989	30	1000	0	98.9	75-125	0			
Toluene	995.5	30	1000	0	99.6	70-125	0			
Xylenes, Total	2958	90	3000	0	98.6	75-125	0			
Surr: 1,2-Dichloroethane-d4	*968.5*	0	*1000*	0	*96.8*	*70-130*	0			
Surr: 4-Bromofluorobenzene	*989*	0	*1000*	0	*98.9*	*70-130*	0			
Surr: Dibromofluoromethane	*958*	0	*1000*	0	*95.8*	*70-130*	0			
Surr: Toluene-d8	*1002*	0	*1000*	0	*100*	*70-130*	0			

LCS Sample ID: **LCS-44243-44243** Units: **µg/Kg** Analysis Date: **10/18/2012 04:42 PM**
Client ID: Run ID: **VMS5_121018A** SeqNo: **2117543** Prep Date: **10/18/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	984.5	30	1000	0	98.4	75-125	0			
Ethylbenzene	1042	30	1000	0	104	75-125	0			
m,p-Xylene	2072	60	2000	0	104	80-125	0			
o-Xylene	1059	30	1000	0	106	75-125	0			
Toluene	1016	30	1000	0	102	70-125	0			
Xylenes, Total	3130	90	3000	0	104	75-125	0			
Surr: 1,2-Dichloroethane-d4	*959.5*	0	*1000*	0	*96*	*70-130*	0			
Surr: 4-Bromofluorobenzene	*1034*	0	*1000*	0	*103*	*70-130*	0			
Surr: Dibromofluoromethane	*972.5*	0	*1000*	0	*97.2*	*70-130*	0			
Surr: Toluene-d8	*1006*	0	*1000*	0	*101*	*70-130*	0			

LCS Sample ID: **LCS-44243-44243** Units: **µg/Kg** Analysis Date: **10/18/2012 09:39 PM**
Client ID: Run ID: **VMS8_121018B** SeqNo: **2117851** Prep Date: **10/18/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	966	30	1000	0	96.6	75-125	0			
Ethylbenzene	987.5	30	1000	0	98.8	75-125	0			
m,p-Xylene	2031	60	2000	0	102	80-125	0			
o-Xylene	1014	30	1000	0	101	75-125	0			
Toluene	996.5	30	1000	0	99.6	70-125	0			
Xylenes, Total	3046	90	3000	0	102	75-125	0			
Surr: 1,2-Dichloroethane-d4	*1047*	0	*1000*	0	*105*	*70-130*	0			
Surr: 4-Bromofluorobenzene	*995.5*	0	*1000*	0	*99.6*	*70-130*	0			
Surr: Dibromofluoromethane	*1036*	0	*1000*	0	*104*	*70-130*	0			
Surr: Toluene-d8	*1001*	0	*1000*	0	*100*	*70-130*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **44243** Instrument ID **VMS7** Method: **SW8260**

LCS Sample ID: **LCS-44243-44243** Units: **µg/Kg** Analysis Date: **10/19/2012 11:00 PM**
Client ID: Run ID: **VMS6_121019B** SeqNo: **2119181** Prep Date: **10/18/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	888	30	1000	0	88.8	75-125	0			
Ethylbenzene	911.5	30	1000	0	91.2	75-125	0			
m,p-Xylene	1844	60	2000	0	92.2	80-125	0			
o-Xylene	920.5	30	1000	0	92	75-125	0			
Toluene	898	30	1000	0	89.8	70-125	0			
Xylenes, Total	2764	90	3000	0	92.2	75-125	0			
Surr: 1,2-Dichloroethane-d4	*934.5*	0	*1000*	0	*93.4*	*70-130*	0			
Surr: 4-Bromofluorobenzene	*1006*	0	*1000*	0	*101*	*70-130*	0			
Surr: Dibromofluoromethane	*969.5*	0	*1000*	0	*97*	*70-130*	0			
Surr: Toluene-d8	*984.5*	0	*1000*	0	*98.4*	*70-130*	0			

LCS Sample ID: **LCS-44243-44243** Units: **µg/Kg** Analysis Date: **10/22/2012 02:11 PM**
Client ID: Run ID: **VMS7_121022A** SeqNo: **2119860** Prep Date: **10/18/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	1008	30	1000	0	101	75-125	0			
Ethylbenzene	1024	30	1000	0	102	75-125	0			
m,p-Xylene	1976	60	2000	0	98.8	80-125	0			
o-Xylene	1008	30	1000	0	101	75-125	0			
Toluene	969	30	1000	0	96.9	70-125	0			
Xylenes, Total	2984	90	3000	0	99.5	75-125	0			
Surr: 1,2-Dichloroethane-d4	*949.5*	0	*1000*	0	*95*	*70-130*	0			
Surr: 4-Bromofluorobenzene	*1018*	0	*1000*	0	*102*	*70-130*	0			
Surr: Dibromofluoromethane	*1083*	0	*1000*	0	*108*	*70-130*	0			
Surr: Toluene-d8	*977.5*	0	*1000*	0	*97.8*	*70-130*	0			

LCS Sample ID: **LCS-44243-44243** Units: **µg/Kg** Analysis Date: **10/22/2012 11:11 PM**
Client ID: Run ID: **VMS5_121022B** SeqNo: **2120599** Prep Date: **10/18/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	1054	30	1000	0	105	75-125	0			
Ethylbenzene	1034	30	1000	0	103	75-125	0			
m,p-Xylene	2058	60	2000	0	103	80-125	0			
o-Xylene	1054	30	1000	0	105	75-125	0			
Toluene	1046	30	1000	0	105	70-125	0			
Xylenes, Total	3112	90	3000	0	104	75-125	0			
Surr: 1,2-Dichloroethane-d4	*969*	0	*1000*	0	*96.9*	*70-130*	0			
Surr: 4-Bromofluorobenzene	*1002*	0	*1000*	0	*100*	*70-130*	0			
Surr: Dibromofluoromethane	*965.5*	0	*1000*	0	*96.6*	*70-130*	0			
Surr: Toluene-d8	*979*	0	*1000*	0	*97.9*	*70-130*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **44243** Instrument ID **VMS7** Method: **SW8260**

LCS Sample ID: **LCS-44243-44243** Units: **µg/Kg** Analysis Date: **10/22/2012 07:11 PM**
Client ID: Run ID: **VMS9_121022A** SeqNo: **2120890** Prep Date: **10/18/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	1044	30	1000	0	104	75-125	0			
Ethylbenzene	1030	30	1000	0	103	75-125	0			
m,p-Xylene	2023	60	2000	0	101	80-125	0			
o-Xylene	1005	30	1000	0	100	75-125	0			
Toluene	1014	30	1000	0	101	70-125	0			
Xylenes, Total	3028	90	3000	0	101	75-125	0			
Surr: 1,2-Dichloroethane-d4	*1008*	0	*1000*	0	*101*	*70-130*	0			
Surr: 4-Bromofluorobenzene	*988.5*	0	*1000*	0	*98.8*	*70-130*	0			
Surr: Dibromofluoromethane	*1095*	0	*1000*	0	*110*	*70-130*	0			
Surr: Toluene-d8	*998.5*	0	*1000*	0	*99.8*	*70-130*	0			

LCS Sample ID: **LCS-44243-44243** Units: **µg/Kg** Analysis Date: **10/23/2012 01:39 PM**
Client ID: Run ID: **VMS5_121023A** SeqNo: **2121184** Prep Date: **10/18/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	1064	30	1000	0	106	75-125	0			
Ethylbenzene	1022	30	1000	0	102	75-125	0			
m,p-Xylene	2044	60	2000	0	102	80-125	0			
o-Xylene	1027	30	1000	0	103	75-125	0			
Toluene	1046	30	1000	0	105	70-125	0			
Xylenes, Total	3071	90	3000	0	102	75-125	0			
Surr: 1,2-Dichloroethane-d4	*971*	0	*1000*	0	*97.1*	*70-130*	0			
Surr: 4-Bromofluorobenzene	*1000*	0	*1000*	0	*100*	*70-130*	0			
Surr: Dibromofluoromethane	*995.5*	0	*1000*	0	*99.6*	*70-130*	0			
Surr: Toluene-d8	*965.5*	0	*1000*	0	*96.6*	*70-130*	0			

LCS Sample ID: **LCS-44243-44243** Units: **µg/Kg** Analysis Date: **10/24/2012 12:32 PM**
Client ID: Run ID: **VMS6_121024A** SeqNo: **2122119** Prep Date: **10/18/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	885	30	1000	0	88.5	75-125	0			
Ethylbenzene	869.5	30	1000	0	87	75-125	0			
m,p-Xylene	1751	60	2000	0	87.6	80-125	0			
o-Xylene	859	30	1000	0	85.9	75-125	0			
Toluene	877	30	1000	0	87.7	70-125	0			
Xylenes, Total	2610	90	3000	0	87	75-125	0			
Surr: 1,2-Dichloroethane-d4	*936.5*	0	*1000*	0	*93.6*	*70-130*	0			
Surr: 4-Bromofluorobenzene	*995.5*	0	*1000*	0	*99.6*	*70-130*	0			
Surr: Dibromofluoromethane	*947*	0	*1000*	0	*94.7*	*70-130*	0			
Surr: Toluene-d8	*968.5*	0	*1000*	0	*96.8*	*70-130*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Encana Oil and Gas (USA) Inc.
Work Order: 1210454
Project: C29 Oil Shale 10/11/12

QC BATCH REPORT

Batch ID: **44243** Instrument ID **VMS7** Method: **SW8260**

MS Sample ID: **1210609-09A MS** Units: **µg/Kg** Analysis Date: **10/18/2012 11:12 PM**
Client ID: Run ID: **VMS7_121018A** SeqNo: **2117476** Prep Date: **10/18/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	906	30	1000	0	90.6	75-125	0			
Ethylbenzene	890.5	30	1000	0	89	75-125	0			
m,p-Xylene	1776	60	2000	0	88.8	80-125	0			
o-Xylene	866.5	30	1000	0	86.6	75-125	0			
Toluene	908.5	30	1000	0	90.8	70-125	0			
Xylenes, Total	2643	90	3000	0	88.1	75-125	0			
Surr: 1,2-Dichloroethane-d4	*962*	0	*1000*	0	*96.2*	*70-130*	0			
Surr: 4-Bromofluorobenzene	*973.5*	0	*1000*	0	*97.4*	*70-130*	0			
Surr: Dibromofluoromethane	*893.5*	0	*1000*	0	*89.4*	*70-130*	0			
Surr: Toluene-d8	*969*	0	*1000*	0	*96.9*	*70-130*	0			

MSD Sample ID: **1210609-09A MSD** Units: **µg/Kg** Analysis Date: **10/18/2012 11:37 PM**
Client ID: Run ID: **VMS7_121018A** SeqNo: **2117477** Prep Date: **10/18/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	899.5	30	1000	0	90	75-125	906	0.72	30	
Ethylbenzene	885.5	30	1000	0	88.6	75-125	890.5	0.563	30	
m,p-Xylene	1772	60	2000	0	88.6	80-125	1776	0.254	30	
o-Xylene	888	30	1000	0	88.8	75-125	866.5	2.45	30	
Toluene	880	30	1000	0	88	70-125	908.5	3.19	30	
Xylenes, Total	2660	90	3000	0	88.7	75-125	2643	0.641	30	
Surr: 1,2-Dichloroethane-d4	*974.5*	0	*1000*	0	*97.4*	*70-130*	962	*1.29*	*30*	
Surr: 4-Bromofluorobenzene	*977*	0	*1000*	0	*97.7*	*70-130*	973.5	*0.359*	*30*	
Surr: Dibromofluoromethane	*939.5*	0	*1000*	0	*94*	*70-130*	893.5	*5.02*	*30*	
Surr: Toluene-d8	*993*	0	*1000*	0	*99.3*	*70-130*	969	*2.45*	*30*	

The following samples were analyzed in this batch: 1210454-01A 1210454-02A 1210454-03A 1210454-04A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Encana Oil and Gas (USA) Inc.
Work Order: 1210454
Project: C29 Oil Shale 10/11/12

QC BATCH REPORT

Batch ID: **44271** Instrument ID **WETCHEM** Method: **USDA H60 Method**

DUP Sample ID: **1210583-01C DUP** Units: **mmhos/cm @25°F** Analysis Date: **10/22/2012 02:00 PM**
Client ID: Run ID: **WETCHEM_121022L** SeqNo: **2119061** Prep Date: **10/22/2012** DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Electrical Conductivity @ Saturation	1.755	0.050	0	0	0		1.937	9.86	50	

The following samples were analyzed in this batch:

1210454-01A 1210454-02A 1210454-03A
1210454-04A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Encana Oil and Gas (USA) Inc.
Work Order: 1210454
Project: C29 Oil Shale 10/11/12

QC BATCH REPORT

Batch ID: **R111413** Instrument ID **WETCHEM** Method: **A4500-H B**

LCS	Sample ID: **WLCSW1-121018-R111413**				Units: **s.u.**			Analysis Date: **10/18/2012 09:00 AM**			
Client ID:		Run ID: **WETCHEM_121018T**			SeqNo: **2116869**		Prep Date:		DF: **1**		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
pH	4.26	0	4.4	0	96.8	90-110	0				

LCS	Sample ID: **WLCSS1-121018-R111413**				Units: **s.u.**			Analysis Date: **10/18/2012 09:00 AM**			
Client ID:		Run ID: **WETCHEM_121018T**			SeqNo: **2116873**		Prep Date:		DF: **1**		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
pH	4.26	0	4.4	0	96.8	90-110	0				

DUP	Sample ID: **1210649-01A DUP**				Units: **s.u.**			Analysis Date: **10/18/2012 09:00 AM**			
Client ID:		Run ID: **WETCHEM_121018T**			SeqNo: **2116871**		Prep Date:		DF: **1**		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
pH	5.92	0	0	0	0	0-0	5.92	0	20	H	

DUP	Sample ID: **1210633-01B DUP**				Units: **s.u.**			Analysis Date: **10/18/2012 09:00 AM**			
Client ID:		Run ID: **WETCHEM_121018T**			SeqNo: **2116879**		Prep Date:		DF: **1**		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
pH	11.64	0	0	0	0	0-0	11.64	0	20		

The following samples were analyzed in this batch:

1210454-01A 1210454-02A 1210454-03A
1210454-04A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Encana Oil and Gas (USA) Inc.
Work Order: 1210454
Project: C29 Oil Shale 10/11/12

QC BATCH REPORT

Batch ID: **R111442** Instrument ID **MOIST** Method: **A2540 G**

MBLK Sample ID: **WBLKS1-R111442** Units: **% of sample** Analysis Date: **10/18/2012 12:30 PM**
Client ID: Run ID: **MOIST_121018A** SeqNo: **2117620** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	U	0.050								

LCS Sample ID: **LCS-R111442** Units: **% of sample** Analysis Date: **10/18/2012 12:30 PM**
Client ID: Run ID: **MOIST_121018A** SeqNo: **2117612** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	99.98	0.050	100	0	100	99.5-100.5	0			

DUP Sample ID: **1210617-05B DUP** Units: **% of sample** Analysis Date: **10/18/2012 12:30 PM**
Client ID: Run ID: **MOIST_121018A** SeqNo: **2117592** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	17.61	0.050	0	0	0	0-0	18.11	2.8	20	

DUP Sample ID: **1210624-09A DUP** Units: **% of sample** Analysis Date: **10/18/2012 12:30 PM**
Client ID: Run ID: **MOIST_121018A** SeqNo: **2117608** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	19.28	0.050	0	0	0	0-0	21.04	8.73	20	

The following samples were analyzed in this batch:

1210454-01A 1210454-02A 1210454-03A
1210454-04A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Chain of Custody Form

ALS Environmental

Page 1 of 1

COC ID: 00573

☐ Cincinnati, OH +1 513 733 5336 ☑ Holland, MI +1 616 399 6070 ☐ Salt Lake City, UT +1 801 266 7700
☐ Everett, WA +1 425 356 2600 ☐ Houston, TX +1 281 530 5656 ☐ Spring City, PA +1 610 948 4903
☐ Fort Collins, CO +1 970 490 1511 ☐ Middletown, PA +1 717 944 5541 ☐ York, PA +1 717 505 5280

ALS Project Manager: | Work Order #: 1210454

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order		Project Name		A	BTEX
Work Order		Project Number		B	TPH (GRO + DRO)
Company Name	ENCANA O+G	Bill To Company		C	EC
Send Report To	Chris Hines	Invoice Attn.		D	PH
Address	2717 County Rd 100 suite 201	Address		E	SAR
				F	Arsenic
City/State/Zip	PARACHUTE, CO	City/State/Zip		G	PAH
Phone	970 [illegible]	Phone		H	
Fax		Fax	(also)	I	
e-Mail Address	Christopher.Hines@encana.com	e-Mail Address	KCservices1@gmail.com		

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	C29-OILSHALE BG-101112	10/11/12	945	Other		1 bag	X	X	X	X	X	X	X				
2	C29-OILSHALE BG2-101112	↓	945	↓			X	X	X	X	X	X	X				
3	Long Ridge-OilshaleBG-101112		1015			1 bag	X	X	X	X	X	X	X				
4	Long Ridge-OilshaleBG2-101112		1015	↓			X	X	X	X	X	X	X				
5				Rock/oil shale													
6																	
7																	
8																	
9																	
10																	

Sampler(s): Please Print & Sign: MATT CASTRO

Shipment Method:

Required Turnaround Time: ☐ STD 10 Wk Days ☐ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☐ Other _____ (Standard)

Results Due Date:

Relinquished by:	Date: 10/11/12	Time: 1800	Received by: Lab Hub, LLC Parachute, CO		Notes: *2 sample analysis per bag (Crushed to make)
Relinquished by: Lab Hub, LLC Parachute, CO	Date: 10/11/12	Time: ~~1800~~ 1305	Received by (Laboratory):	10/12/12 1000	Cooler Temp.
Logged by (Laboratory):	Date: 10/12/12	Time: 1400	Checked by (Laboratory):		

QC Package: (Check Box Below)
- ☐ Level II: Standard QC
- ☐ Level III: Std QC + Raw Data
- ☐ Level IV: SW846 CLP-Like
- ☐ Other: _____

Preservative Key: 1-HCL 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 7-Other 8-4 degrees C 9-5035

Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.

1.0

ALS Environmental

Subcontractor:
Driesenga & Associates, Inc
455 8th Street
Suite 100
Holland, MI 49423

TEL: (616) 396-0255
FAX:
Acct #:

Salesperson **Bruce Schlatter**

CHAIN-OF-CUSTODY RECORD

Date: 15-Oct-12
COC ID: 3864
Due D 18-Oct-12

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order		Project Name	1210454	A	Administrative (ADMIN) Pulverize
Work Order		Project Number		B	
Company Name	ALS Group USA, Corp	Bill To Company	ALS Group USA, Corp	C	
Send Report To	Ann Preston	Inv Attn	Accounts Payable	D	
Address	3352 128th Avenue	Address	3352 128th Avenue	E	
				F	
City/State/Zip	Holland, Michigan 49424-9263	City/State/Zip	Holland, Michigan 49424-9263	G	
Phone	(616) 399-6070	Phone	(616) 399-6070	H	
Fax	(616) 399-6185	Fax	(616) 399-6185	I	
eMail Address	ann.preston@alsglobal.com	eMail CC		J	

ALS Sample ID	Client Sample ID	Matrix	Collection Date 24hr	Bottle	A	B	C	D	E	F	G	H	I	J
1210454-01A	C29-oil shale 1 - 101112	Solid	11/Oct/2012 9:45	(1) MISC	X									
1210454-03A	LongRidge-oil shale 1 - 101112	Solid	11/Oct/2012 10:15	(1) MISC	X									

Comments:

Please pulverized each bag.

Relinquished by:	Date/Time	Received by:	Date/Time	Cooler IDs	Report/QC Level
[signature]	10/12/12				Std
Relinquished by:	Date/Time	Received by:	Date/Time		

ALS Group USA, Corp

Sample Receipt Checklist

Client Name: **ENCANA2** Date/Time Received: **12-Oct-12 10:00**

Work Order: **1210454** Received by: **WJC**

Checklist completed by Bill Carey (eSignature) 12-Oct-12 (Date) Reviewed by: Ann Preston (eSignature) 26-Oct-12 (Date)

Matrices: Solid
Carrier name:

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	1.0 C		
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	10/12/2012 2:16:17 PM		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:	-		

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction:

From: (970) 424-4749
Lab Hub, LLC

127 E First Street

PARACHUTE, CO 81635

Origin ID: RILA

FedEx Express

J12201207160325

Ship Date: 11OCT12
ActWgt: 43.0 LB
CAD: 103923490/INET3300

Dims: 21 X 14 X 16 IN

Delivery Address Bar Code

Ref # 1001-101112-1
Invoice #
PO #
Dept #

SHIP TO: (616) 399-6070 BILL RECIPIENT

Sample Receiving
ALS Environmental - Holland
3352 128TH AVE

HOLLAND, MI 49424

FRI - 12 OCT A4
STANDARD OVERNIGHT

TRK# 0201 7991 7467 0241

XX GRRA

49424
MI-US
GRR

515G1/9CCB/AA44

After printing this label:
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2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

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Lab Hub LLC
Date: 10/11/12
Signature: