

State of Colorado
Oil and Gas Conservation Commission

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



FOR OGCC USE ONLY

REM 9493
Document 2144980
Date 02/10/2016

SITE INVESTIGATION AND REMEDIATION WORKPLAN

This form shall be submitted to the Director for approval prior to the initiation of site investigation and remediation activities. Form 27 is intended to be used whenever possible. Additional documentation will be required when large volumes of soil and groundwater have been impacted or involve large facilities with multiple source areas. See Rule 910. Attach as many pages as needed to fully describe the proposed work.

CAUSE OF CONDITION BEING INVESTIGATED AND REMEDIATED

☒ Spill or Release ☐ Plug & Abandon ☐ Central Facility Closure ☐ Site/Facility Closure ☐ Other (describe): _____

OGCC Operator Number: 100185

Name of Operator: Encana Oil & Gas (USA)

Address: 143 Diamond Avenue

City: Parachute State: CO Zip: 81635

Contact Name and Telephone:

Matt Kasten

No: 970.285.2925

Fax: 970.285.2705

API Number: NA

County: Garfield

Facility Name: Orchard 12"

Facility Number: NA [Facility ID]

Well Name: Orchard 12" Pipeline Vault [Location Name/No]

Well Number: 443844 [Spill/Location ID]

Location: (QtrQtr, Sec, Twp, Rng, Meridian): NESW, Sec. 36, T7S, R96W, 6th PM Latitude: 39.390552 Longitude: -108.061925

TECHNICAL CONDITIONS

Type of Waste Causing Impact (crude oil, condensate, produced water, etc): Produced water

Site Conditions: Is location within a sensitive area (according to Rule 901e)? ☒ Y ☐ N If yes, attach evaluation.

Adjacent land use (cultivated, irrigated, dry land farming, industrial, residential, etc.): Non-Crop Land

Soil type, if not previously identified on Form 2A or Federal Surface Use Plan: Pott-Ildesonso Complex, 12 to 25 percent slopes

Potential receptors (water wells within 1/4 mi, surface waters, etc.): According to the COGCC GIS OnLine mapping service there is

1 surface water receptor and 0 water wells within 1/4 mile of the pad.

Description of Impact (if previously provided, refer to that form or document):

Impacted Media (check):

☐

Soils

☐

Vegetation

☐

Groundwater

☐

Surface Water

Extent of Impact:

Future progress to Remediation will be detailed in the

Form 4 ROWC/NOC

How Determined:

Future progress to Remediation will be detailed in the

Form 4 ROWC/NOC

REMEDIATION WORKPLAN

Describe initial action taken (if previously provided, refer to that form or document):

See attached.

Describe how source is to be removed:

See attached.

Describe how remediation of existing impacts is to be accomplished, including removal and disposal at an injection well or licensed facility, land treatment on site, removal of impacted groundwater, insitu bioremediation, burning of oily vegetation, etc.:

See attached.



Tracking Number: _____
Name of Operator: _____
OGCC Operator No: _____
Received Date: _____
Well Name & No: _____
Facility Name & No: _____

OGCC Employee: _____

If groundwater has been impacted, describe proposed monitoring plan (# of wells or sample points, sampling schedule, analytical methods, etc.):

See attached.

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

See attached.

Attach samples and analytical results taken to verify remediation of impacts. Show locations of samples on an onsite schematic or drawing.

Is further site investigation required? ☒ Y ☐ N If yes, describe:

See attached.

Final disposition of E&P waste (landtreated and disposed onsite, name of licensed disposal facility, recycling, reuse, etc.):

See attached.

*TBD - To Be Determined

IMPLEMENTATION SCHEDULE

Date Site Investigation Began: *TBD	Date Site Investigation Completed: *TBD	Date Remediation Plan Submitted: 02/09/2016
Remediation Start Date: *TBD	Anticipated Completion Date: *TBD	Actual Completion Date: *TBD

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

Print Name: Matt Kasten

Signed: matt.kasten@encana.com

Digitally signed by matt.kasten@encana.com
DN: cn=matt.kasten@encana.com,
Date: 2016.02.09 12:56:49 -0700

Title: Environmental Field Contractor

Date: 02/09/2016

OGCC Approved: _____ Title: _____ Date: _____

Form 27
PK36 (Orchard 12")
Pipeline Release [Spill ID – 443844]

This Form 27 (Site Investigation and Remediation Workplan) was prepared for the purpose of generating a remediation project number in support of pipeline release (Orchard 12") near the PK36 well pad (Spill ID - 443844) in Encana Oil & Gas (USA) Inc. (Encana's) South Parachute area of operation in Garfield County.

REMEDIATION WORKPLAN

Describe initial action taken (if previously provided, refer to that form or document):

* Please see initial and supplemental Form 19

Spill ID: 443844

Document Number(s): 400928465, 400933604, and 400934414 (Form 4/Aerial).

Describe how source is to be removed:

The release was sampled along the historical dry drainage and constituents of concern were identified. Sodium Absorption Ratio and Arsenic were identified to be above the allowable concentration levels noted in the COGCC Table 910-1. Encana requests leaving the noted material in place due to being in a dry drainage and allowing natural attenuation for this release.

Describe how remediation of existing impact is to be accomplished, including removal and disposal at an injection well or licensed facility, land treatment on site, removal of impacted groundwater, insitu bioremediation, burning of oily vegetation, etc.:

Residual impacts will be treated in place via natural attenuation.

Periodic soil sampling will be conducted to evaluate the impacted area. Project data will be provided to the COGCC in the Form 4 (Report of Work Completed/Progress Report).

If groundwater has been impacted, described proposed monitoring plan (# of wells or sample points, sampling schedule, analytical methods, etc.):

Ground water was not impacted during initial release.

*Please see previous sampling events.

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

Reclamation will not take place within dry drainage. After winter weather, the site will be evaluated and any subsidence will be backfilled. If reclaim/seeding is necessary; a Form 4 will be submitted to demonstrate Encana's efforts.

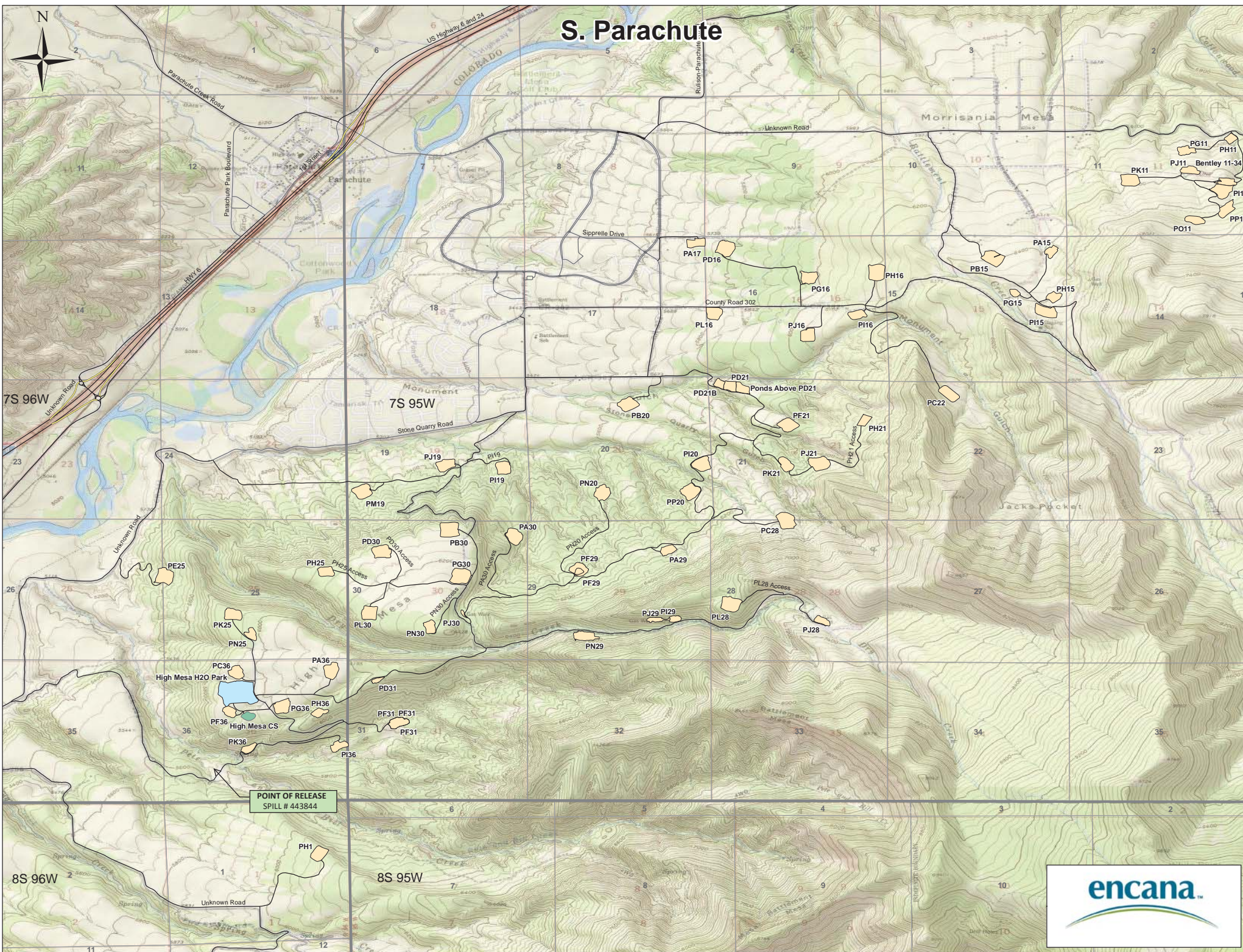
Attach samples and analytical results taken to verify remediation of impacts. Show locations of samples on an onsite schematic or drawing. Is further site investigation required? If yes, describe:

The site investigation for this project will be carried out as described above. All future analytical data collected in support of this remediation project will be provided to the COGCC in the Form 4 (Report of Work Completed and Notification of Completion). Previous sampling data along with a site diagram are attached to this Form 27.

Final disposition of E&P waste (land treated and disposed onsite, name of licensed disposal facility, recycling, reuse, etc.):

Final disposition of E&P waste would be detailed in the Form 4 (Report of Work Completed and Notification of Completion) submitted following successful completion of activities.







LEGEND

- SOIL SAMPLE
- SPRING SAMPLE
- SURFACE WATER SAMPLE
- PETE AND BILL CREEK

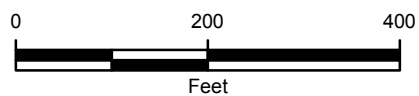


IMAGE COURTESY OF ESRI



SITE DIAGRAM
PK36
NESW SEC 36-T7S-R96W
GARFIELD COUNTY, COLORADO

ENCANA OIL & GAS (USA) INC.

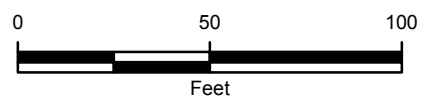




IMAGE COURTESY OF ESRI

LEGEND

- SOIL SAMPLE
- SPRING SAMPLE
- ▲ SURFACE WATER SAMPLE
- PETE AND BILL CREEK



SITE DIAGRAM
PK36
NESW SEC 36-T7S-R96W
GARFIELD COUNTY, COLORADO

ENCANA OIL & GAS (USA) INC.





Laboratory Results Summary Table

02/09/2016

**11/01/14 < is new Data that will need to be uploaded to ACTS

Record Count 3899

Allowable Concentration -->				Organic Compounds in Soil (mg/kg [ppm])																			Inorganics in Soil			Metals in Soil (mg/kg [ppm])												
				500			0.17	85	100	175	1000	1000	0.22	0.22	2.2	0.022	22	0.022	1000	1000	0.22	23	1000		<12	(6-9)	0.39	15000	70	120000	23	3100	400	23	1600	390	390	23000
Location	Sample Date:	Sample Matrix	Matrix Notes	TPH (total volatile and extractable petroleum hydrocarbons) (TPH-GRO + TPH-DRO)	TPH-GRO (C6-C10) Low Fraction	TPH-DRO (C10-C36) High Fraction	Benzene	Toluene	Ethylbenzene	Xylenes - total	Acenaphthene	Anthracene	Benzo(A)anthracene	Benzo(B)fluoranthene	Benzo(K)fluoranthene	Benzo(A)pyrene	Chrysene	Dibenz(A,H)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-C,D)pyrene	Naphthalene	Pyrene	EC (<4 mmhos/cm or 2x background)	SAR (calculation)	pH	Arsenic	Barium - EPA Total Barium	Cadmium	Chromium (III)	Chromium (VI)	Copper	Lead (inorganic)	Mercury	Nickel (soluble salts)	Selenium	Silver	Zinc
Orchard 12"	11/03/15	Spill	EXT-S03 (6")	ND	<0.500	<4.00	<0.0025	<0.0250	<0.0025	<0.0075	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	1.98	2.14	7.61	12.1	291	<0.500	17.4	<2.00	16.3	13.4	<0.0200	17.1	<2.00	<1.00	52.2
Orchard 12"	10/31/15	Spill	POR	11.89	3.9	7.99	0.0259	0.144	0.0134	0.469	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	0.00951	<0.0060	0.0369	<0.0060	3.26	36.1	7.71	9.79	236	<0.500	14.2	<2.00	13.9	10.5	<0.0200	13.9	<2.00	<1.00	41
Orchard 12"	10/31/15	Spill	POR (1')	0.684	0.684	<4.00	0.0045	<0.0250	0.00269	0.0644	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	2.89	30.3	8.22	14.4	275	<0.500	17.3	<2.00	15.8	12.6	0.0219	16	<2.00	<1.00	42.6
Orchard 12"	10/31/15	Spill	EXT-S01	16	<0.500	16	<0.0025	<0.0250	<0.0025	<0.0075	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	0.965	2.57	7.9	12.7	245	0.519	21.4	<2.00	15.9	12.5	<0.0200	17.5	<2.00	<1.00	43.5
Orchard 12"	10/31/15	Spill	EXT-S01 (6")	14.8	<0.500	14.8	<0.0025	<0.0250	<0.0025	<0.0075	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	2.15	4.36	7.88	13.1	250	0.52	19.1	<2.00	17.2	12.8	<0.0200	16.1	<2.00	<1.00	43.7
Orchard 12"	10/31/15	Spill	EXT-S02	ND	<0.500	<4.00	<0.0025	<0.0250	<0.0025	<0.0075	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	2.75	32.7	8.38	8.61	289	<0.5000	17.3	<2.00	15.7	11.9	<0.0200	15	<2.00	<1.00	46.4
Orchard 12"	10/31/15	Spill	EXT-N01	14.9	<0.500	14.9	<0.0025	<0.0250	<0.0025	<0.0075	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	2.97	31.7	7.9	7.34	327	<0.5000	11	2.16	15	11	<0.0200	13.4	<2.00	<1.00	45.2
Orchard 12"	10/31/15	Spill	EXT-N01 (8")	10.4	<0.500	10.4	<0.0025	<0.0250	<0.0025	<0.0075	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	1.84	8.31	7.74	6.03	223	<0.5000	15.7	<2.00	15.4	11.4	<0.0200	12.3	<2.00	<1.00	40.2
Orchard 12"	10/31/15	Spill	EXT-N02	17.3	<0.500	17.3	<0.0025	<0.0250	<0.0025	<0.0075	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	0.397	0.374	7.48	4.84	217	<0.5000	12.4	<2.00	11.8	9.98	<0.0200	12.8	<2.00	<1.00	39.1

EnCana Oil & Gas - Parachute, CO

Sample Delivery Group: L798515
Samples Received: 11/04/2015
Project Number: PK36
Description: PK36
Site: PK36
Report To: Brett Middleton
143 Diamond Avenue
Parachute, CO 81635

Entire Report Reviewed By:



Jarred Willis

Technical Service Representative

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by ESC is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.



¹ Cp: Cover Page	1	¹ Cp
² Tc: Table of Contents	2	² Tc
³ Ss: Sample Summary	3	
⁴ Cn: Case Narrative	4	³ Ss
⁵ Sr: Sample Results	5	⁴ Cn
20151103 - PK36 (EXT - S03) 0.5FT L798515-01	5	
⁶ Gl: Glossary of Terms	7	⁵ Sr
⁷ Al: Accreditations & Locations	8	
⁸ Sc: Chain of Custody	9	⁶ Gl
		⁷ Al
		⁸ Sc

SAMPLE SUMMARY

ONE LAB. NATIONWIDE.



20151103 - PK36 (EXT - S03) 0.5FT L798515-01 Solid

Collected by
Chris McKisson

Collected date/time
11/03/15 10:50

Received date/time
11/04/15 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analysis Analyst
Calculated Results	WG827066	1	11/06/15 07:02	11/09/15 17:36	LTB
Calculated Results	WG827081	1	11/06/15 09:00	11/08/15 12:10	WBD
Mercury by Method 7471A	WG826386	1	11/04/15 15:46	11/05/15 12:58	TRB
Metals (ICP) by Method 6010B	WG827066	1	11/06/15 07:02	11/09/15 00:23	LTB
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG826779	1	11/04/15 19:47	11/05/15 15:42	KMP
Semi-Volatile Organic Compounds (GC) by Method 8015D/DRO	WG826768	1	11/04/15 16:31	11/04/15 19:51	DMG
Volatile Organic Compounds (GC) by Method 8015/8021	WG826726	5	11/04/15 13:30	11/04/15 19:21	LRL
Wet Chemistry by Method 2580 B-2011	WG826809	1	11/05/15 10:04	11/05/15 10:41	JER
Wet Chemistry by Method 3060A/7196A	WG827006	1	11/06/15 08:45	11/07/15 16:05	SJM
Wet Chemistry by Method 9045D	WG826925	1	11/06/15 09:49	11/06/15 09:49	AMC
Wet Chemistry by Method 9050AMod	WG827046	1	11/05/15 19:58	11/05/15 19:58	SAM

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Gl

⁷Al

⁸Sc

ACCOUNT:

EnCana Oil & Gas - Parachute, CO

PROJECT:

PK36

SDG:

L798515

DATE/TIME:

11/09/15 20:38

PAGE:

3 of 9



All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times. 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.

Jarred Willis
Technical Service Representative

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Gl

⁷ Al

⁸ Sc



Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	2.14		1	11/08/2015 12:10	WG827081

¹ Cp² Tc

Calculated Results

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Chromium, Trivalent	17.4		2.00	1	11/09/2015 17:36	WG827066

³ Ss⁴ Cn

Wet Chemistry by Method 2580 B-2011

Analyte	Result mV	Qualifier	Dilution	Analysis date / time	Batch
ORP	109		1	11/05/2015 10:41	WG826809

⁵ Sr⁶ Gl

Wet Chemistry by Method 3060A/7196A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Chromium, Hexavalent	ND		2.00	1	11/07/2015 16:05	WG827006

⁷ Al⁸ Sc

Wet Chemistry by Method 9045D

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	7.61		1	11/06/2015 09:49	WG826925

Sample Narrative:

9045D L798515-01 WG826925: 7.61 at 23.7c

Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	Dilution	Analysis date / time	Batch
Specific Conductance	1980		1	11/05/2015 19:58	WG827046

Mercury by Method 7471A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Mercury	ND		0.0200	1	11/05/2015 12:58	WG826386

Metals (ICP) by Method 6010B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	12.1		2.00	1	11/09/2015 00:23	WG827066
Barium	291		0.500	1	11/09/2015 00:23	WG827066
Cadmium	ND		0.500	1	11/09/2015 00:23	WG827066
Chromium	17.4		1.00	1	11/09/2015 00:23	WG827066
Copper	16.3		2.00	1	11/09/2015 00:23	WG827066
Lead	13.4		0.500	1	11/09/2015 00:23	WG827066
Nickel	17.1		2.00	1	11/09/2015 00:23	WG827066
Selenium	ND		2.00	1	11/09/2015 00:23	WG827066
Silver	ND		1.00	1	11/09/2015 00:23	WG827066
Zinc	52.2		5.00	1	11/09/2015 00:23	WG827066



Collected date/time: 11/03/15 10:50

L798515

Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00250	5	11/04/2015 19:21	WG826726
Toluene	ND		0.0250	5	11/04/2015 19:21	WG826726
Ethylbenzene	ND		0.00250	5	11/04/2015 19:21	WG826726
Total Xylene	ND		0.00750	5	11/04/2015 19:21	WG826726
TPH (GC/FID) Low Fraction	ND		0.500	5	11/04/2015 19:21	WG826726
(S) <i>a,a,a</i> -Trifluorotoluene(FID)	98.9		59.0-128		11/04/2015 19:21	WG826726
(S) <i>a,a,a</i> -Trifluorotoluene(PID)	92.2		54.0-144		11/04/2015 19:21	WG826726

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Gl

7 Al

8 Sc

Semi-Volatile Organic Compounds (GC) by Method 8015D/DRO

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	ND	J3	4.00	1	11/04/2015 19:51	WG826768
(S) <i>o</i> -Terphenyl	66.1		50.0-150		11/04/2015 19:51	WG826768

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Anthracene	ND		0.00600	1	11/05/2015 15:42	WG826779
Acenaphthene	ND		0.00600	1	11/05/2015 15:42	WG826779
Acenaphthylene	ND		0.00600	1	11/05/2015 15:42	WG826779
Benzo(a)anthracene	ND		0.00600	1	11/05/2015 15:42	WG826779
Benzo(a)pyrene	ND		0.00600	1	11/05/2015 15:42	WG826779
Benzo(b)fluoranthene	ND		0.00600	1	11/05/2015 15:42	WG826779
Benzo(g,h,i)perylene	ND		0.00600	1	11/05/2015 15:42	WG826779
Benzo(k)fluoranthene	ND		0.00600	1	11/05/2015 15:42	WG826779
Chrysene	ND		0.00600	1	11/05/2015 15:42	WG826779
Dibenz(a,h)anthracene	ND		0.00600	1	11/05/2015 15:42	WG826779
Fluoranthene	ND		0.00600	1	11/05/2015 15:42	WG826779
Fluorene	ND		0.00600	1	11/05/2015 15:42	WG826779
Indeno(1,2,3-cd)pyrene	ND		0.00600	1	11/05/2015 15:42	WG826779
Naphthalene	ND		0.0200	1	11/05/2015 15:42	WG826779
Phenanthrene	ND		0.00600	1	11/05/2015 15:42	WG826779
Pyrene	ND		0.00600	1	11/05/2015 15:42	WG826779
1-Methylnaphthalene	ND		0.0200	1	11/05/2015 15:42	WG826779
2-Methylnaphthalene	ND		0.0200	1	11/05/2015 15:42	WG826779
2-Chloronaphthalene	ND		0.0200	1	11/05/2015 15:42	WG826779
(S) <i>p</i> -Terphenyl-d14	64.2		32.2-131		11/05/2015 15:42	WG826779
(S) Nitrobenzene-d5	101		22.1-146		11/05/2015 15:42	WG826779
(S) 2-Fluorobiphenyl	82.9		40.6-122		11/05/2015 15:42	WG826779



Abbreviations and Definitions

SDG	Sample Delivery Group.
MDL	Method Detection Limit.
RDL	Reported Detection Limit.
ND,U	Not detected at the Reporting Limit (or MDL where applicable).
RPD	Relative Percent Difference.
(dry)	Results are reported based on the dry weight of the sample. [this will only be present on a dry report basis for soils].
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.
(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.
Rec.	Recovery.
SDL	Sample Detection Limit.
MQL	Method Quantitation Limit.
Unadj. MQL	Unadjusted Method Quantitation Limit.

Qualifier	Description
J3	The associated batch QC was outside the established quality control range for precision.

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Gl

⁷ Al

⁸ Sc



ESC Lab Sciences is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our "one location" design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be **YOUR LAB OF CHOICE**.

State Accreditations

Alabama	40660	Nevada	TN-03-2002-34
Alaska	UST-080	New Hampshire	2975
Arizona	AZ0612	New Jersey–NELAP	TN002
Arkansas	88-0469	New Mexico	TN00003
California	01157CA	New York	11742
Colorado	TN00003	North Carolina	Env375
Connecticut	PH-0197	North Carolina ¹	DW21704
Florida	E87487	North Carolina ²	41
Georgia	NELAP	North Dakota	R-140
Georgia ¹	923	Ohio–VAP	CL0069
Idaho	TN00003	Oklahoma	9915
Illinois	200008	Oregon	TN200002
Indiana	C-TN-01	Pennsylvania	68-02979
Iowa	364	Rhode Island	221
Kansas	E-10277	South Carolina	84004
Kentucky ¹	90010	South Dakota	n/a
Kentucky ²	16	Tennessee ¹⁴	2006
Louisiana	AI30792	Texas	T 104704245-07-TX
Maine	TN0002	Texas ⁵	LAB0152
Maryland	324	Utah	6157585858
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	109
Minnesota	047-999-395	Washington	C1915
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA
Nebraska	NE-OS-15-05		

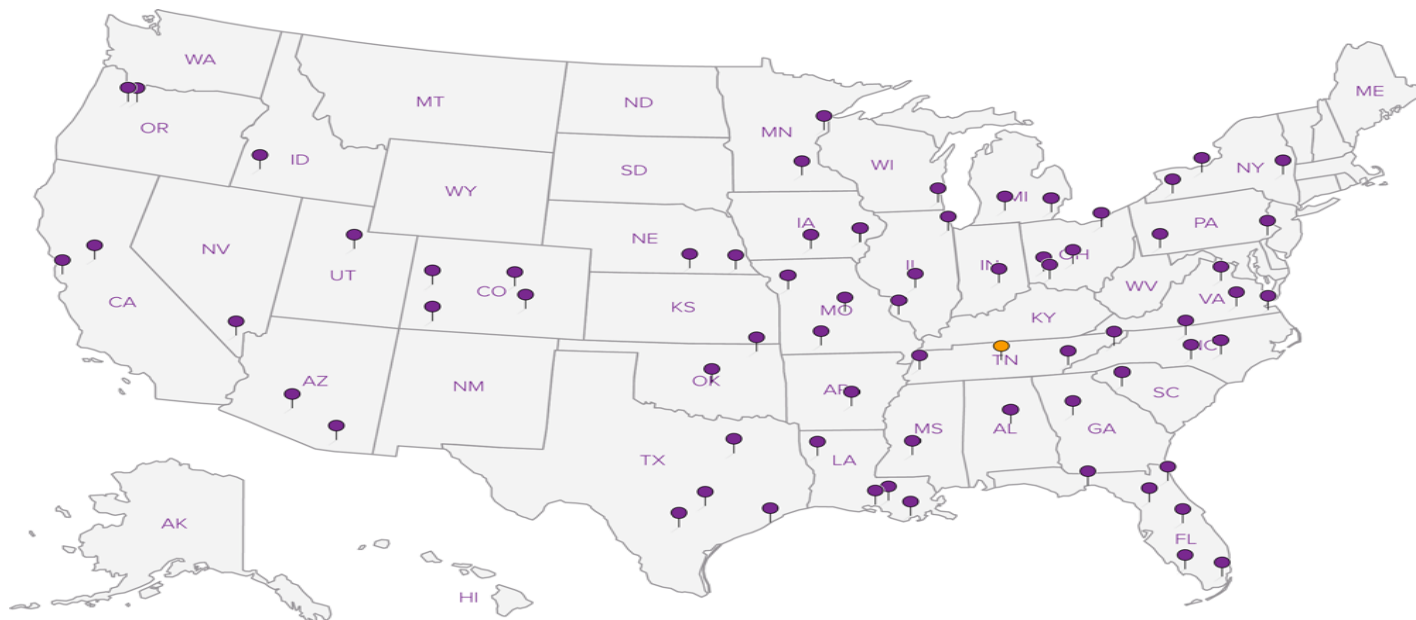
¹ Drinking Water ² Underground Storage Tanks ³ Aquatic Toxicity ⁴ Chemical/Microbiological ⁵ Mold ^{n/a} Accreditation not applicable

Third Party & Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA	100789
Canada	1461.01	DOD	1461.01
EPA–Crypto	TN00003	USDA	S-67674

Our Locations

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Relinquished by: (Signature)	Date: 11/3/15	Time: 1500	Received by: (Signature)	Samples returned via: <input type="checkbox"/> UPS <input type="checkbox"/> FedEx <input type="checkbox"/> Courier <input type="checkbox"/> _____	Condition: (lab use only) G010
Relinquished by: (Signature)	Date: 11/3/15	Time: 1800	Received by: (Signature)	Temp: 3.22 Bottles Received: 3-402	CoC Seals Intact: ___ Y ___ N ___ NA
Relinquished by: (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 11-4-15 Time: 900	pH Checked: NCF:

EnCana Oil & Gas - Parachute, CO

Sample Delivery Group: L798259
Samples Received: 11/03/2015
Project Number: PK36
Description: PK36 Spill Response
Site: PK36
Report To: Brett Middleton
143 Diamond Avenue
Parachute, CO 81635

Entire Report Reviewed By:



Chris McCord
Technical Service Representative

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by ESC is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.



¹ Cp: Cover Page	1	¹ Cp
² Tc: Table of Contents	2	² Tc
³ Ss: Sample Summary	3	
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20151031-PK36 (SPRG-S01) L798259-01	5	
20151031-PK36 (SW-S01) L798259-02	6	⁵ Sr
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⁶ Gl: Glossary of Terms	10	⁷ Al
⁷ Al: Accreditations & Locations	11	
⁸ Sc: Chain of Custody	12	⁸ Sc



20151031-PK36 (SPRG-S01) L798259-01 GW

			Collected by CM and WT	Collected date/time 10/31/15 12:00	Received date/time 11/03/15 09:00
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analysis Analyst
Gravimetric Analysis by Method 2540 C-2011	WG826430	1	11/03/15 15:27	11/04/15 12:14	JER
Volatile Organic Compounds (GC) by Method 8021B	WG826420	1	11/03/15 18:14	11/03/15 18:14	LRL
Wet Chemistry by Method 9056MOD	WG826407	1	11/04/15 09:47	11/04/15 09:47	DJD
Wet Chemistry by Method 9056MOD	WG826407	10	11/04/15 11:04	11/04/15 11:04	DJD

1
Cp2
Tc3
Ss4
Cn5
Sr6
Gl7
Al8
Sc

20151031-PK36 (SW-S01) L798259-02 GW

			Collected by CM and WT	Collected date/time 10/31/15 12:30	Received date/time 11/03/15 09:00
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analysis Analyst
Gravimetric Analysis by Method 2540 C-2011	WG826430	1	11/03/15 15:27	11/04/15 12:14	JER
Volatile Organic Compounds (GC) by Method 8021B	WG826420	1	11/03/15 18:35	11/03/15 18:35	LRL
Wet Chemistry by Method 9056MOD	WG826407	1	11/04/15 10:02	11/04/15 10:02	DJD
Wet Chemistry by Method 9056MOD	WG826407	20	11/04/15 11:19	11/04/15 11:19	DJD

20151031-PK36 (SPRG-N01) L798259-03 GW

			Collected by CM and WT	Collected date/time 10/31/15 12:55	Received date/time 11/03/15 09:00
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analysis Analyst
Gravimetric Analysis by Method 2540 C-2011	WG826430	1	11/03/15 15:27	11/04/15 12:14	JER
Volatile Organic Compounds (GC) by Method 8021B	WG826420	1	11/03/15 18:56	11/03/15 18:56	LRL
Wet Chemistry by Method 9056MOD	WG826407	1	11/04/15 10:18	11/04/15 10:18	DJD
Wet Chemistry by Method 9056MOD	WG826407	5	11/04/15 11:35	11/04/15 11:35	DJD

20151031-PK36 (SW-N01) L798259-04 GW

			Collected by CM and WT	Collected date/time 10/31/15 13:10	Received date/time 11/03/15 09:00
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analysis Analyst
Gravimetric Analysis by Method 2540 C-2011	WG826430	1	11/03/15 15:27	11/04/15 12:14	JER
Volatile Organic Compounds (GC) by Method 8021B	WG826420	1	11/03/15 19:17	11/03/15 19:17	LRL
Wet Chemistry by Method 9056MOD	WG826407	1	11/04/15 10:33	11/04/15 10:33	DJD
Wet Chemistry by Method 9056MOD	WG826407	10	11/04/15 11:50	11/04/15 11:50	DJD

20151031-PK36 (SW-N02) L798259-05 GW

			Collected by CM and WT	Collected date/time 10/31/15 13:25	Received date/time 11/03/15 09:00
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analysis Analyst
Gravimetric Analysis by Method 2540 C-2011	WG826430	1	11/03/15 15:27	11/04/15 12:14	JER
Volatile Organic Compounds (GC) by Method 8021B	WG826420	1	11/03/15 19:38	11/03/15 19:38	LRL
Wet Chemistry by Method 9056MOD	WG826407	1	11/04/15 10:49	11/04/15 10:49	DJD
Wet Chemistry by Method 9056MOD	WG826407	10	11/04/15 12:06	11/04/15 12:06	DJD



All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times. 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 McCord
Technical Service Representative

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Gl

⁷ Al

⁸ Sc



Gravimetric Analysis by Method 2540 C-2011

Analyte	Result mg/l	<u>Qualifier</u>	RDL mg/l	Dilution	Analysis date / time	Batch
Dissolved Solids	1040		10.0	1	11/04/2015 12:14	WG826430

1 Cp

2 Tc

Wet Chemistry by Method 9056MOD

Analyte	Result mg/l	<u>Qualifier</u>	RDL mg/l	Dilution	Analysis date / time	Batch
Chloride	26.5		1.00	1	11/04/2015 09:47	WG826407
Sulfate	430		50.0	10	11/04/2015 11:04	WG826407

3 Ss

4 Cn

5 Sr

Volatile Organic Compounds (GC) by Method 8021B

Analyte	Result mg/l	<u>Qualifier</u>	RDL mg/l	Dilution	Analysis date / time	Batch
Benzene	ND		0.000500	1	11/03/2015 18:14	WG826420
Toluene	ND		0.00500	1	11/03/2015 18:14	WG826420
Ethylbenzene	ND		0.000500	1	11/03/2015 18:14	WG826420
Total Xylene	ND		0.00150	1	11/03/2015 18:14	WG826420
(S) o,o,a-Trifluorotoluene(PID)	100		55.0-122		11/03/2015 18:14	WG826420

6 Gl

7 Al

8 Sc



Gravimetric Analysis by Method 2540 C-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Dissolved Solids	1660		10.0	1	11/04/2015 12:14	WG826430

1 Cp

2 Tc

Wet Chemistry by Method 9056MOD

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chloride	52.7		1.00	1	11/04/2015 10:02	WG826407
Sulfate	808		100	20	11/04/2015 11:19	WG826407

3 Ss

4 Cn

5 Sr

Volatile Organic Compounds (GC) by Method 8021B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Benzene	ND		0.000500	1	11/03/2015 18:35	WG826420
Toluene	ND		0.00500	1	11/03/2015 18:35	WG826420
Ethylbenzene	ND		0.000500	1	11/03/2015 18:35	WG826420
Total Xylene	ND		0.00150	1	11/03/2015 18:35	WG826420
(S) o,o,a-Trifluorotoluene(PID)	101		55.0-122		11/03/2015 18:35	WG826420

6 Gl

7 Al

8 Sc



Gravimetric Analysis by Method 2540 C-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Dissolved Solids	858		10.0	1	11/04/2015 12:14	WG826430

1 Cp

2 Tc

Wet Chemistry by Method 9056MOD

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chloride	58.6		1.00	1	11/04/2015 10:18	WG826407
Sulfate	267		25.0	5	11/04/2015 11:35	WG826407

3 Ss

4 Cn

5 Sr

Volatile Organic Compounds (GC) by Method 8021B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Benzene	ND		0.000500	1	11/03/2015 18:56	WG826420
Toluene	ND		0.00500	1	11/03/2015 18:56	WG826420
Ethylbenzene	ND		0.000500	1	11/03/2015 18:56	WG826420
Total Xylene	ND		0.00150	1	11/03/2015 18:56	WG826420
(S) o,o,a-Trifluorotoluene(PID)	101		55.0-122		11/03/2015 18:56	WG826420

6 Gl

7 Al

8 Sc



Gravimetric Analysis by Method 2540 C-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Dissolved Solids	1260		10.0	1	11/04/2015 12:14	WG826430

1
Cp2
Tc

Wet Chemistry by Method 9056MOD

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chloride	38.8		1.00	1	11/04/2015 10:33	WG826407
Sulfate	529		50.0	10	11/04/2015 11:50	WG826407

3
Ss4
Cn5
Sr

Volatile Organic Compounds (GC) by Method 8021B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Benzene	ND		0.000500	1	11/03/2015 19:17	WG826420
Toluene	ND		0.00500	1	11/03/2015 19:17	WG826420
Ethylbenzene	ND		0.000500	1	11/03/2015 19:17	WG826420
Total Xylene	ND		0.00150	1	11/03/2015 19:17	WG826420
(S) o,o,a-Trifluorotoluene(PID)	101		55.0-122		11/03/2015 19:17	WG826420

6
Gl7
Al8
Sc



Gravimetric Analysis by Method 2540 C-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Dissolved Solids	1170		10.0	1	11/04/2015 12:14	WG826430

1 Cp

2 Tc

Wet Chemistry by Method 9056MOD

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chloride	38.2		1.00	1	11/04/2015 10:49	WG826407
Sulfate	485		50.0	10	11/04/2015 12:06	WG826407

3 Ss

4 Cn

5 Sr

Volatile Organic Compounds (GC) by Method 8021B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Benzene	ND		0.000500	1	11/03/2015 19:38	WG826420
Toluene	ND		0.00500	1	11/03/2015 19:38	WG826420
Ethylbenzene	ND		0.000500	1	11/03/2015 19:38	WG826420
Total Xylene	ND		0.00150	1	11/03/2015 19:38	WG826420
(S) o,o,a-Trifluorotoluene(PID)	101		55.0-122		11/03/2015 19:38	WG826420

6 Gl

7 Al

8 Sc



Abbreviations and Definitions

SDG	Sample Delivery Group.
MDL	Method Detection Limit.
RDL	Reported Detection Limit.
ND,U	Not detected at the Reporting Limit (or MDL where applicable).
RPD	Relative Percent Difference.
(dry)	Results are reported based on the dry weight of the sample. [this will only be present on a dry report basis for soils].
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.
(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.
Rec.	Recovery.
SDL	Sample Detection Limit.
MQL	Method Quantitation Limit.
Unadj. MQL	Unadjusted Method Quantitation Limit.

Qualifier	Description
-----------	-------------

The remainder of this page intentionally left blank, there are no qualifiers applied to this SDG.

¹ Cp² Tc³ Ss⁴ Cn⁵ Sr⁶ Gl⁷ Al⁸ Sc



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Minnesota	047-999-395	Washington	C1915
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA
Nebraska	NE-OS-15-05		

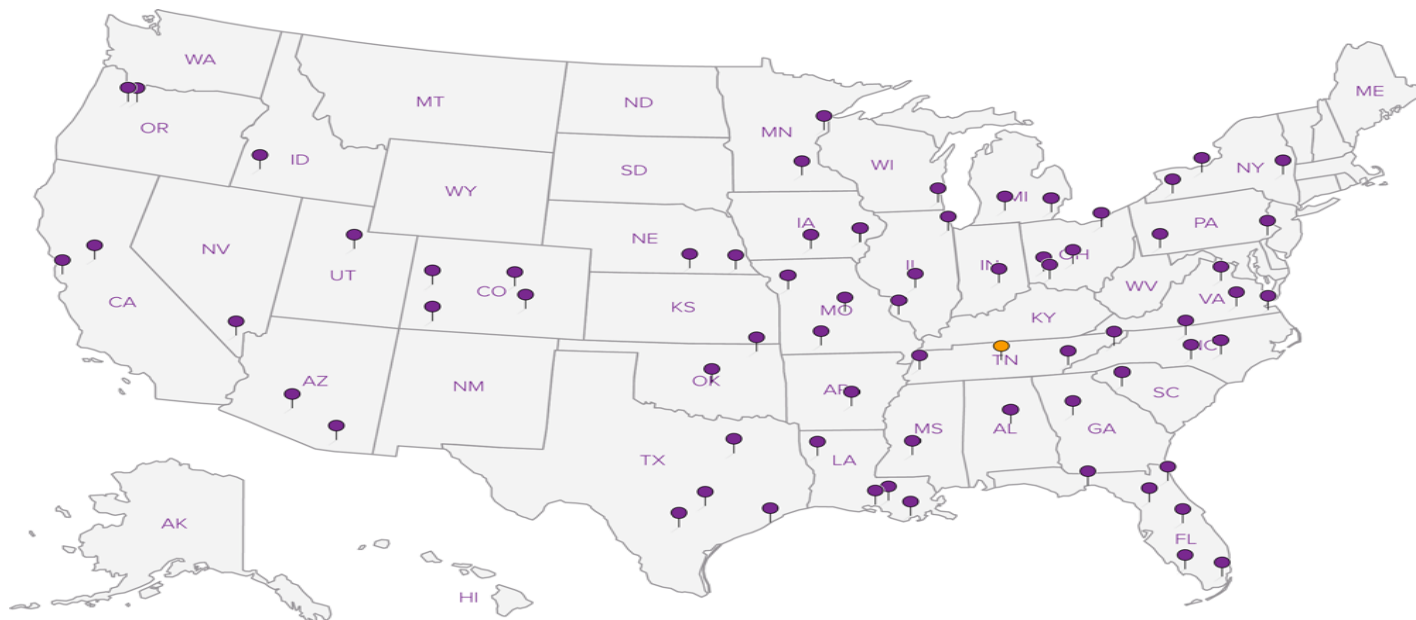
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Encana Oil & Gas (USA)
143 Diamond Avenue
Parachute, CO 81635
ENCANACO-LTENV

Billing Information:

Brett Middleton
143 Diamond Avenue
Parachute, CO 81635
970-285-2653

Report to:

Brett Middleton

Email to:

brett.middleton@encana.com

Analysis/Container/Preservative

Chain of Custody
Page 1 of 1



12065 Lebanon Road
Mt. Juliet, TN 37122

Phone: (800) 767-5859
Phone: (615) 758-5858
Fax: (615) 758-5859

Project Description: PK36 Spill Response

City/State
Collected

Parachute, CO

Phone: 970-285-2653
FAX:

Client Project #:
PK36

ESC Key: ENCANACO-LTENV

Collected by: CM and WT

Site/Facility ID#: PK36

P.O.#: Middleton

Collected by (signature):

Rush? (Lab MUST Be Notified)

Same Day.....200%
☒ Next Day.....100%
Two Day.....50%
Three Day.....25%

Date Results Needed:

Email? ☐ No ☒ Yes

FAX? ☒ No ☐ Yes

No.
of
Cntrs

Immediately Packed on Ice: N ☒ Y

CoCode ENCANACO (lab use only)

Template/Prelogin

Shipped Via:

Remarks/Contaminant

Sample # (lab only)

Sample ID	Comp/Grab	Matrix*	Depth	Date	Time	No. of Cntrs	BTEX	TDS	Chloride, Sulfate	Remarks/Contaminant	Sample # (lab only)
20151031 - PK36 (SPRG-S01)	Grab	GW		10-31-15	1200	5	X	X	X	798259-01	798259-01
20151031 - PK36 (SW-S01)	Grab	GW		10-31-15	1230	5	X	X	X	02	10
20151031 - PK36 (SPRG-N01)	Grab	GW		10-31-15	1255	5	X	X	X	07	11
20151031 - PK36 (SW-N01)	Grab	GW		10-31-15	1310	5	X	X	X	07	12
20151031 - PK36 (SW-N02)	Grab	GW		10-31-15	1325	4	X	X	X	08	13

*Matrix: SS - Soil/Solid GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other

Remarks:

pH _____ Temp _____

Flow _____ Other _____

Relinquished by: (Signature)	Date: 11-2-15	Time: 1530	Received by: (Signature)	Samples returned via: <input type="checkbox"/> UPS <input checked="" type="checkbox"/> FedEx <input type="checkbox"/> Courier <input type="checkbox"/>	Condition: (lab use only)
Relinquished by: (Signature)	Date: 11/2/15	Time: 1700	Received by: (Signature)	Temp: 2.4°	Bottles Received: 45
Relinquished by: (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 11/03/15	Time: 0900
				CoC Seals Intact: <input type="checkbox"/> Y <input type="checkbox"/> N <input checked="" type="checkbox"/> NA	pH Checked: NCF:

EnCana Oil & Gas - Parachute, CO

Sample Delivery Group: L798254
Samples Received: 11/03/2015
Project Number: PK36
Description: PK36 spill Response
Site: PK36
Report To: Brett Middleton
143 Diamond Avenue
Parachute, CO 81635

Entire Report Reviewed By:



Chris McCord
Technical Service Representative

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20151031-PK36 (EXT-S01) L798254-03	11
20151031-PK36 (EXT-S01) 6IN L798254-04	13
20151031-PK36 (EXT-S02) L798254-05	15
20151031-PK36 (EXT-N01) L798254-06	17
20151031-PK36 (EXT-N01) 8IN L798254-07	19
20151031-PK36 (EXT-N02) L798254-08	21
⁶Gl: Glossary of Terms	23
⁷Al: Accreditations & Locations	24
⁸Sc: Chain of Custody	25



SAMPLE SUMMARY

ONE LAB. NATIONWIDE.



20151031-PK36 (POR) L798254-01 Solid

			Collected by WT and CM	Collected date/time 10/31/15 09:35	Received date/time 11/03/15 09:00
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analysis Analyst
Calculated Results	WG826370	1	11/03/15 16:51	11/04/15 14:41	LTB
Calculated Results	WG826375	1	11/03/15 15:45	11/04/15 10:44	CCE
Mercury by Method 7471A	WG826383	1	11/03/15 16:19	11/04/15 08:40	CHM
Metals (ICP) by Method 6010B	WG826370	1	11/03/15 16:51	11/04/15 00:46	LTB
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG826462	1	11/03/15 20:06	11/04/15 09:54	KMP
Semi-Volatile Organic Compounds (GC) by Method 8015D/DRO	WG826450	1	11/03/15 16:51	11/03/15 22:07	DMG
Volatile Organic Compounds (GC) by Method 8015/8021	WG826419	5	11/03/15 14:13	11/03/15 22:30	LRL
Wet Chemistry by Method 2580 B-2011	WG826485	1	11/04/15 01:41	11/04/15 01:42	MZ
Wet Chemistry by Method 3060A/7196A	WG826402	1	11/03/15 14:30	11/04/15 10:35	JEH
Wet Chemistry by Method 9045D	WG826401	1	11/04/15 10:41	11/04/15 10:41	SJM
Wet Chemistry by Method 9050AMod	WG826495	1	11/04/15 13:22	11/04/15 13:22	AMC

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

20151031-PK36 (POR) 1FT L798254-02 Solid

			Collected by WT and CM	Collected date/time 10/31/15 09:45	Received date/time 11/03/15 09:00
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analysis Analyst
Calculated Results	WG826370	1	11/03/15 16:51	11/04/15 14:41	LTB
Calculated Results	WG826375	1	11/03/15 15:45	11/04/15 10:44	CCE
Mercury by Method 7471A	WG826383	1	11/03/15 16:19	11/04/15 08:42	CHM
Metals (ICP) by Method 6010B	WG826370	1	11/03/15 16:51	11/04/15 00:58	LTB
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG826462	1	11/03/15 20:06	11/04/15 08:27	KMP
Semi-Volatile Organic Compounds (GC) by Method 8015D/DRO	WG826450	1	11/03/15 16:51	11/03/15 22:18	DMG
Volatile Organic Compounds (GC) by Method 8015/8021	WG826419	5	11/03/15 14:13	11/03/15 22:51	LRL
Wet Chemistry by Method 2580 B-2011	WG826485	1	11/04/15 01:41	11/04/15 01:42	MZ
Wet Chemistry by Method 3060A/7196A	WG826402	1	11/03/15 14:30	11/04/15 10:35	JEH
Wet Chemistry by Method 9045D	WG826401	1	11/04/15 10:41	11/04/15 10:41	SJM
Wet Chemistry by Method 9050AMod	WG826495	1	11/04/15 13:22	11/04/15 13:22	AMC

20151031-PK36 (EXT-S01) L798254-03 Solid

			Collected by WT and CM	Collected date/time 10/31/15 10:10	Received date/time 11/03/15 09:00
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analysis Analyst
Calculated Results	WG826370	1	11/03/15 16:51	11/04/15 14:41	LTB
Calculated Results	WG826375	1	11/03/15 15:45	11/04/15 10:44	CCE
Mercury by Method 7471A	WG826383	1	11/03/15 16:19	11/04/15 08:45	CHM
Metals (ICP) by Method 6010B	WG826370	1	11/03/15 16:51	11/04/15 01:01	LTB
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG826462	1	11/03/15 20:06	11/04/15 08:48	KMP
Semi-Volatile Organic Compounds (GC) by Method 8015D/DRO	WG826450	1	11/03/15 16:51	11/03/15 22:29	DMG
Volatile Organic Compounds (GC) by Method 8015/8021	WG826419	5	11/03/15 14:13	11/03/15 23:12	LRL
Wet Chemistry by Method 2580 B-2011	WG826485	1	11/04/15 01:41	11/04/15 01:42	MZ
Wet Chemistry by Method 3060A/7196A	WG826402	1	11/03/15 14:30	11/04/15 10:36	JEH
Wet Chemistry by Method 9045D	WG826401	1	11/04/15 10:41	11/04/15 10:41	SJM
Wet Chemistry by Method 9050AMod	WG826495	1	11/04/15 13:22	11/04/15 13:22	AMC

20151031-PK36 (EXT-S01) 6IN L798254-04 Solid

			Collected by WT and CM	Collected date/time 10/31/15 10:20	Received date/time 11/03/15 09:00
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analysis Analyst
Calculated Results	WG826370	1	11/03/15 16:51	11/04/15 14:41	LTB
Calculated Results	WG826375	1	11/03/15 15:45	11/04/15 10:44	CCE
Mercury by Method 7471A	WG826383	1	11/03/15 16:19	11/04/15 08:48	CHM
Metals (ICP) by Method 6010B	WG826370	1	11/03/15 16:51	11/04/15 01:04	LTB

SAMPLE SUMMARY

ONE LAB. NATIONWIDE.



20151031-PK36 (EXT-S01) 6IN L798254-04 Solid

Collected by
WT and CM

Collected date/time
10/31/15 10:20

Received date/time
11/03/15 09:00

¹ Cp

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analysis Analyst
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG826462	1	11/03/15 20:06	11/04/15 09:53	KMP
Semi-Volatile Organic Compounds (GC) by Method 8015D/DRO	WG826450	1	11/03/15 16:51	11/03/15 22:40	DMG
Volatile Organic Compounds (GC) by Method 8015/8021	WG826419	5	11/03/15 14:13	11/03/15 23:34	LRL
Wet Chemistry by Method 2580 B-2011	WG826485	1	11/04/15 01:41	11/04/15 01:42	MZ
Wet Chemistry by Method 3060A/7196A	WG826402	1	11/03/15 14:30	11/04/15 10:39	JEH
Wet Chemistry by Method 9045D	WG826401	1	11/04/15 10:41	11/04/15 10:41	SJM
Wet Chemistry by Method 9050AMod	WG826495	1	11/04/15 13:22	11/04/15 13:22	AMC

² Tc

³ Ss

⁴ Cn

⁵ Sr

20151031-PK36 (EXT-S02) L798254-05 Solid

Collected by
WT and CM

Collected date/time
10/31/15 10:45

Received date/time
11/03/15 09:00

⁶ Gl

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analysis Analyst
Calculated Results	WG826370	1	11/03/15 16:51	11/04/15 14:41	LTB
Calculated Results	WG826375	1	11/03/15 15:45	11/04/15 10:44	CCE
Mercury by Method 7471A	WG826383	1	11/03/15 16:19	11/04/15 08:50	CHM
Metals (ICP) by Method 6010B	WG826370	1	11/03/15 16:51	11/04/15 01:07	LTB
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG826462	1	11/03/15 20:06	11/04/15 10:14	KMP
Semi-Volatile Organic Compounds (GC) by Method 8015D/DRO	WG826450	1	11/03/15 16:51	11/04/15 09:49	DMG
Volatile Organic Compounds (GC) by Method 8015/8021	WG826419	5	11/03/15 14:13	11/03/15 23:55	LRL
Wet Chemistry by Method 2580 B-2011	WG826485	1	11/04/15 01:41	11/04/15 01:42	MZ
Wet Chemistry by Method 3060A/7196A	WG826402	1	11/03/15 14:30	11/04/15 10:39	JEH
Wet Chemistry by Method 9045D	WG826401	1	11/04/15 10:41	11/04/15 10:41	SJM
Wet Chemistry by Method 9050AMod	WG826495	1	11/04/15 13:22	11/04/15 13:22	AMC

⁷ Al

⁸ Sc

20151031-PK36 (EXT-N01) L798254-06 Solid

Collected by
WT and CM

Collected date/time
10/31/15 10:55

Received date/time
11/03/15 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analysis Analyst
Calculated Results	WG826370	1	11/03/15 16:51	11/04/15 14:41	LTB
Calculated Results	WG826375	1	11/03/15 15:45	11/04/15 10:44	CCE
Mercury by Method 7471A	WG826383	1	11/03/15 16:19	11/04/15 08:53	CHM
Metals (ICP) by Method 6010B	WG826370	1	11/03/15 16:51	11/04/15 01:10	LTB
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG826462	1	11/03/15 20:06	11/04/15 10:15	KMP
Semi-Volatile Organic Compounds (GC) by Method 8015D/DRO	WG826450	1	11/03/15 16:51	11/03/15 23:02	DMG
Volatile Organic Compounds (GC) by Method 8015/8021	WG826419	5	11/03/15 14:13	11/04/15 00:17	LRL
Wet Chemistry by Method 2580 B-2011	WG826485	1	11/04/15 01:41	11/04/15 01:42	MZ
Wet Chemistry by Method 3060A/7196A	WG826402	1	11/03/15 14:30	11/04/15 10:43	JEH
Wet Chemistry by Method 9045D	WG826401	1	11/04/15 10:41	11/04/15 10:41	SJM
Wet Chemistry by Method 9050AMod	WG826495	1	11/04/15 13:22	11/04/15 13:22	AMC

20151031-PK36 (EXT-N01) 8IN L798254-07 Solid

Collected by
WT and CM

Collected date/time
10/31/15 11:05

Received date/time
11/03/15 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analysis Analyst
Calculated Results	WG826370	1	11/03/15 16:51	11/04/15 14:41	LTB
Calculated Results	WG826375	1	11/03/15 15:45	11/04/15 10:44	CCE
Mercury by Method 7471A	WG826383	1	11/03/15 16:19	11/04/15 08:55	CHM
Metals (ICP) by Method 6010B	WG826370	1	11/03/15 16:51	11/04/15 01:13	LTB
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG826462	1	11/03/15 20:06	11/04/15 09:11	KMP
Semi-Volatile Organic Compounds (GC) by Method 8015D/DRO	WG826450	1	11/03/15 16:51	11/03/15 23:14	DMG
Volatile Organic Compounds (GC) by Method 8015/8021	WG826419	5	11/03/15 14:13	11/04/15 00:38	LRL
Wet Chemistry by Method 2580 B-2011	WG826485	1	11/04/15 01:41	11/04/15 01:42	MZ

ACCOUNT:

EnCana Oil & Gas - Parachute, CO

PROJECT:

PK36

SDG:

L798254

DATE/TIME:

11/04/15 17:36

PAGE:

4 of 26



20151031-PK36 (EXT-N01) 8IN L798254-07 Solid

Collected by
WT and CMCollected date/time
10/31/15 11:05Received date/time
11/03/15 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analysis Analyst
Wet Chemistry by Method 3060A/7196A	WG826402	1	11/03/15 14:30	11/04/15 10:46	JEH
Wet Chemistry by Method 9045D	WG826401	1	11/04/15 10:41	11/04/15 10:41	SJM
Wet Chemistry by Method 9050AMod	WG826495	1	11/04/15 13:22	11/04/15 13:22	AMC

¹Cp²Tc³Ss⁴Cn⁵Sr⁶Gl⁷Al⁸Sc

20151031-PK36 (EXT-N02) L798254-08 Solid

Collected by
WT and CMCollected date/time
10/31/15 11:15Received date/time
11/03/15 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analysis Analyst
Calculated Results	WG826370	1	11/03/15 16:51	11/04/15 14:41	LTB
Calculated Results	WG826375	1	11/03/15 15:45	11/04/15 10:44	CCE
Mercury by Method 7471A	WG826383	1	11/03/15 16:19	11/04/15 08:58	CHM
Metals (ICP) by Method 6010B	WG826370	1	11/03/15 16:51	11/04/15 01:16	LTB
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG826462	1	11/03/15 20:06	11/04/15 09:32	KMP
Semi-Volatile Organic Compounds (GC) by Method 8015D/DRO	WG826450	1	11/03/15 16:51	11/03/15 23:25	DMG
Volatile Organic Compounds (GC) by Method 8015/8021	WG826419	5	11/03/15 14:13	11/04/15 00:59	LRL
Wet Chemistry by Method 2580 B-2011	WG826485	1	11/04/15 01:41	11/04/15 01:42	MZ
Wet Chemistry by Method 3060A/7196A	WG826402	1	11/03/15 14:30	11/04/15 10:49	JEH
Wet Chemistry by Method 9045D	WG826401	1	11/04/15 10:41	11/04/15 10:41	SJM
Wet Chemistry by Method 9050AMod	WG826495	1	11/04/15 13:22	11/04/15 13:22	AMC



All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times. 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 McCord
Technical Service Representative

¹ Cp² Tc³ Ss⁴ Cn⁵ Sr⁶ Gl⁷ Al⁸ Sc



Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	36.1		1	11/04/2015 10:44	WG826375

¹ Cp² Tc

Calculated Results

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Chromium, Trivalent	14.2		2.00	1	11/04/2015 14:41	WG826370

³ Ss⁴ Cn

Wet Chemistry by Method 2580 B-2011

Analyte	Result mV	Qualifier	Dilution	Analysis date / time	Batch
ORP	86		1	11/04/2015 01:42	WG826485

⁵ Sr⁶ Gl

Wet Chemistry by Method 3060A/7196A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Chromium, Hexavalent	ND		2.00	1	11/04/2015 10:35	WG826402

⁷ Al⁸ Sc

Wet Chemistry by Method 9045D

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	7.71		1	11/04/2015 10:41	WG826401

Sample Narrative:

9045D L798254-01 WG826401: 7.71 at 23.5c

Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	Dilution	Analysis date / time	Batch
Specific Conductance	3260		1	11/04/2015 13:22	WG826495

Mercury by Method 7471A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Mercury	ND		0.0200	1	11/04/2015 08:40	WG826383

Metals (ICP) by Method 6010B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	9.79		2.00	1	11/04/2015 00:46	WG826370
Barium	236		0.500	1	11/04/2015 00:46	WG826370
Cadmium	ND		0.500	1	11/04/2015 00:46	WG826370
Chromium	14.2		1.00	1	11/04/2015 00:46	WG826370
Copper	13.9		2.00	1	11/04/2015 00:46	WG826370
Lead	10.5		0.500	1	11/04/2015 00:46	WG826370
Nickel	13.9		2.00	1	11/04/2015 00:46	WG826370
Selenium	ND		2.00	1	11/04/2015 00:46	WG826370
Silver	ND		1.00	1	11/04/2015 00:46	WG826370
Zinc	41.0		5.00	1	11/04/2015 00:46	WG826370



Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	0.0259		0.00250	5	11/03/2015 22:30	WG826419
Toluene	0.144	<u>J6</u>	0.0250	5	11/03/2015 22:30	WG826419
Ethylbenzene	0.0134		0.00250	5	11/03/2015 22:30	WG826419
Total Xylene	0.469		0.00750	5	11/03/2015 22:30	WG826419
TPH (GC/FID) Low Fraction	3.90		0.500	5	11/03/2015 22:30	WG826419
(S) a,a,a-Trifluorotoluene(FID)	97.2		59.0-128		11/03/2015 22:30	WG826419
(S) a,a,a-Trifluorotoluene(PID)	91.1		54.0-144		11/03/2015 22:30	WG826419

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Gl

7 Al

8 Sc

Semi-Volatile Organic Compounds (GC) by Method 8015D/DRO

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	7.99		4.00	1	11/03/2015 22:07	WG826450
(S) o-Terphenyl	73.7		50.0-150		11/03/2015 22:07	WG826450

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Anthracene	ND		0.00600	1	11/04/2015 09:54	WG826462
Acenaphthene	ND		0.00600	1	11/04/2015 09:54	WG826462
Acenaphthylene	ND		0.00600	1	11/04/2015 09:54	WG826462
Benzo(a)anthracene	ND		0.00600	1	11/04/2015 09:54	WG826462
Benzo(a)pyrene	ND		0.00600	1	11/04/2015 09:54	WG826462
Benzo(b)fluoranthene	ND		0.00600	1	11/04/2015 09:54	WG826462
Benzo(g,h,i)perylene	ND		0.00600	1	11/04/2015 09:54	WG826462
Benzo(k)fluoranthene	ND		0.00600	1	11/04/2015 09:54	WG826462
Chrysene	ND		0.00600	1	11/04/2015 09:54	WG826462
Dibenz(a,h)anthracene	ND		0.00600	1	11/04/2015 09:54	WG826462
Fluoranthene	ND		0.00600	1	11/04/2015 09:54	WG826462
Fluorene	0.00951		0.00600	1	11/04/2015 09:54	WG826462
Indeno(1,2,3-cd)pyrene	ND		0.00600	1	11/04/2015 09:54	WG826462
Naphthalene	0.0369		0.0200	1	11/04/2015 09:54	WG826462
Phenanthrene	0.0146		0.00600	1	11/04/2015 09:54	WG826462
Pyrene	ND		0.00600	1	11/04/2015 09:54	WG826462
1-Methylnaphthalene	0.0504		0.0200	1	11/04/2015 09:54	WG826462
2-Methylnaphthalene	0.104		0.0200	1	11/04/2015 09:54	WG826462
2-Chloronaphthalene	ND		0.0200	1	11/04/2015 09:54	WG826462
(S) p-Terphenyl-d14	47.9		32.2-131		11/04/2015 09:54	WG826462
(S) Nitrobenzene-d5	96.4		22.1-146		11/04/2015 09:54	WG826462
(S) 2-Fluorobiphenyl	66.6		40.6-122		11/04/2015 09:54	WG826462



Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	30.3		1	11/04/2015 10:44	WG826375

1
Cp2
Tc3
Ss4
Cn5
Sr6
Gl7
Al8
Sc

Calculated Results

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Chromium, Trivalent	17.3		2.00	1	11/04/2015 14:41	WG826370

Wet Chemistry by Method 2580 B-2011

Analyte	Result mV	Qualifier	Dilution	Analysis date / time	Batch
ORP	66		1	11/04/2015 01:42	WG826485

Wet Chemistry by Method 3060A/7196A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Chromium, Hexavalent	ND		2.00	1	11/04/2015 10:35	WG826402

Wet Chemistry by Method 9045D

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	8.22		1	11/04/2015 10:41	WG826401

Sample Narrative:

9045D L798254-02 WG826401: 8.22 at 24.0c

Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	Dilution	Analysis date / time	Batch
Specific Conductance	2890		1	11/04/2015 13:22	WG826495

Mercury by Method 7471A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Mercury	0.0219		0.0200	1	11/04/2015 08:42	WG826383

Metals (ICP) by Method 6010B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	14.4		2.00	1	11/04/2015 00:58	WG826370
Barium	275		0.500	1	11/04/2015 00:58	WG826370
Cadmium	ND		0.500	1	11/04/2015 00:58	WG826370
Chromium	17.3		1.00	1	11/04/2015 00:58	WG826370
Copper	15.8		2.00	1	11/04/2015 00:58	WG826370
Lead	12.6		0.500	1	11/04/2015 00:58	WG826370
Nickel	16.0		2.00	1	11/04/2015 00:58	WG826370
Selenium	ND		2.00	1	11/04/2015 00:58	WG826370
Silver	ND		1.00	1	11/04/2015 00:58	WG826370
Zinc	42.6		5.00	1	11/04/2015 00:58	WG826370



Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	0.00450		0.00250	5	11/03/2015 22:51	WG826419
Toluene	ND		0.0250	5	11/03/2015 22:51	WG826419
Ethylbenzene	0.00269		0.00250	5	11/03/2015 22:51	WG826419
Total Xylene	0.0644		0.00750	5	11/03/2015 22:51	WG826419
TPH (GC/FID) Low Fraction	0.684		0.500	5	11/03/2015 22:51	WG826419
(S) <i>a,a,a</i> -Trifluorotoluene(FID)	95.6		59.0-128		11/03/2015 22:51	WG826419
(S) <i>a,a,a</i> -Trifluorotoluene(PID)	89.3		54.0-144		11/03/2015 22:51	WG826419

1
Cp2
Tc3
Ss4
Cn5
Sr6
Gl7
Al8
Sc

Semi-Volatile Organic Compounds (GC) by Method 8015D/DRO

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	ND		4.00	1	11/03/2015 22:18	WG826450
(S) <i>o</i> -Terphenyl	65.3		50.0-150		11/03/2015 22:18	WG826450

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Anthracene	ND		0.00600	1	11/04/2015 08:27	WG826462
Acenaphthene	ND		0.00600	1	11/04/2015 08:27	WG826462
Acenaphthylene	ND		0.00600	1	11/04/2015 08:27	WG826462
Benzo(a)anthracene	ND		0.00600	1	11/04/2015 08:27	WG826462
Benzo(a)pyrene	ND		0.00600	1	11/04/2015 08:27	WG826462
Benzo(b)fluoranthene	ND		0.00600	1	11/04/2015 08:27	WG826462
Benzo(g,h,i)perylene	ND		0.00600	1	11/04/2015 08:27	WG826462
Benzo(k)fluoranthene	ND		0.00600	1	11/04/2015 08:27	WG826462
Chrysene	ND		0.00600	1	11/04/2015 08:27	WG826462
Dibenz(a,h)anthracene	ND		0.00600	1	11/04/2015 08:27	WG826462
Fluoranthene	ND		0.00600	1	11/04/2015 08:27	WG826462
Fluorene	ND		0.00600	1	11/04/2015 08:27	WG826462
Indeno(1,2,3-cd)pyrene	ND		0.00600	1	11/04/2015 08:27	WG826462
Naphthalene	ND		0.0200	1	11/04/2015 08:27	WG826462
Phenanthrene	ND		0.00600	1	11/04/2015 08:27	WG826462
Pyrene	ND		0.00600	1	11/04/2015 08:27	WG826462
1-Methylnaphthalene	ND		0.0200	1	11/04/2015 08:27	WG826462
2-Methylnaphthalene	ND		0.0200	1	11/04/2015 08:27	WG826462
2-Chloronaphthalene	ND		0.0200	1	11/04/2015 08:27	WG826462
(S) <i>p</i> -Terphenyl-d14	53.8		32.2-131		11/04/2015 08:27	WG826462
(S) Nitrobenzene-d5	95.6		22.1-146		11/04/2015 08:27	WG826462
(S) 2-Fluorobiphenyl	76.5		40.6-122		11/04/2015 08:27	WG826462



Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	2.57		1	11/04/2015 10:44	WG826375

¹ Cp² Tc

Calculated Results

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Chromium, Trivalent	21.4		2.00	1	11/04/2015 14:41	WG826370

³ Ss⁴ Cn

Wet Chemistry by Method 2580 B-2011

Analyte	Result mV	Qualifier	Dilution	Analysis date / time	Batch
ORP	81		1	11/04/2015 01:42	WG826485

⁵ Sr⁶ Gl

Wet Chemistry by Method 3060A/7196A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Chromium, Hexavalent	ND		2.00	1	11/04/2015 10:36	WG826402

⁷ Al⁸ Sc

Wet Chemistry by Method 9045D

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	7.90		1	11/04/2015 10:41	WG826401

Sample Narrative:

9045D L798254-03 WG826401: 7.90 at 24.0c

Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	Dilution	Analysis date / time	Batch
Specific Conductance	965		1	11/04/2015 13:22	WG826495

Mercury by Method 7471A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Mercury	ND		0.0200	1	11/04/2015 08:45	WG826383

Metals (ICP) by Method 6010B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	12.7		2.00	1	11/04/2015 01:01	WG826370
Barium	245		0.500	1	11/04/2015 01:01	WG826370
Cadmium	0.519		0.500	1	11/04/2015 01:01	WG826370
Chromium	21.4		1.00	1	11/04/2015 01:01	WG826370
Copper	15.9		2.00	1	11/04/2015 01:01	WG826370
Lead	12.5		0.500	1	11/04/2015 01:01	WG826370
Nickel	17.5		2.00	1	11/04/2015 01:01	WG826370
Selenium	ND		2.00	1	11/04/2015 01:01	WG826370
Silver	ND		1.00	1	11/04/2015 01:01	WG826370
Zinc	43.5		5.00	1	11/04/2015 01:01	WG826370



Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00250	5	11/03/2015 23:12	WG826419
Toluene	ND		0.0250	5	11/03/2015 23:12	WG826419
Ethylbenzene	ND		0.00250	5	11/03/2015 23:12	WG826419
Total Xylene	ND		0.00750	5	11/03/2015 23:12	WG826419
TPH (GC/FID) Low Fraction	ND		0.500	5	11/03/2015 23:12	WG826419
(S) <i>a,a,a</i> -Trifluorotoluene(FID)	98.1		59.0-128		11/03/2015 23:12	WG826419
(S) <i>a,a,a</i> -Trifluorotoluene(PID)	90.7		54.0-144		11/03/2015 23:12	WG826419

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Gl

7 Al

8 Sc

Semi-Volatile Organic Compounds (GC) by Method 8015D/DRO

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	16.0		4.00	1	11/03/2015 22:29	WG826450
(S) <i>o</i> -Terphenyl	98.6		50.0-150		11/03/2015 22:29	WG826450

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Anthracene	ND		0.00600	1	11/04/2015 08:48	WG826462
Acenaphthene	ND		0.00600	1	11/04/2015 08:48	WG826462
Acenaphthylene	ND		0.00600	1	11/04/2015 08:48	WG826462
Benzo(a)anthracene	ND		0.00600	1	11/04/2015 08:48	WG826462
Benzo(a)pyrene	ND		0.00600	1	11/04/2015 08:48	WG826462
Benzo(b)fluoranthene	ND		0.00600	1	11/04/2015 08:48	WG826462
Benzo(g,h,i)perylene	ND		0.00600	1	11/04/2015 08:48	WG826462
Benzo(k)fluoranthene	ND		0.00600	1	11/04/2015 08:48	WG826462
Chrysene	ND		0.00600	1	11/04/2015 08:48	WG826462
Dibenz(a,h)anthracene	ND		0.00600	1	11/04/2015 08:48	WG826462
Fluoranthene	ND		0.00600	1	11/04/2015 08:48	WG826462
Fluorene	ND		0.00600	1	11/04/2015 08:48	WG826462
Indeno(1,2,3-cd)pyrene	ND		0.00600	1	11/04/2015 08:48	WG826462
Naphthalene	ND		0.0200	1	11/04/2015 08:48	WG826462
Phenanthrene	ND		0.00600	1	11/04/2015 08:48	WG826462
Pyrene	ND		0.00600	1	11/04/2015 08:48	WG826462
1-Methylnaphthalene	ND		0.0200	1	11/04/2015 08:48	WG826462
2-Methylnaphthalene	ND		0.0200	1	11/04/2015 08:48	WG826462
2-Chloronaphthalene	ND		0.0200	1	11/04/2015 08:48	WG826462
(S) <i>p</i> -Terphenyl-d14	59.6		32.2-131		11/04/2015 08:48	WG826462
(S) Nitrobenzene-d5	98.2		22.1-146		11/04/2015 08:48	WG826462
(S) 2-Fluorobiphenyl	79.5		40.6-122		11/04/2015 08:48	WG826462



Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	4.36		1	11/04/2015 10:44	WG826375

¹ Cp² Tc

Calculated Results

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Chromium, Trivalent	19.1		2.00	1	11/04/2015 14:41	WG826370

³ Ss⁴ Cn

Wet Chemistry by Method 2580 B-2011

Analyte	Result mV	Qualifier	Dilution	Analysis date / time	Batch
ORP	83		1	11/04/2015 01:42	WG826485

⁵ Sr⁶ Gl

Wet Chemistry by Method 3060A/7196A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Chromium, Hexavalent	ND		2.00	1	11/04/2015 10:39	WG826402

⁷ Al⁸ Sc

Wet Chemistry by Method 9045D

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	7.88		1	11/04/2015 10:41	WG826401

Sample Narrative:

9045D L798254-04 WG826401: 7.88 at 24.1c

Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	Dilution	Analysis date / time	Batch
Specific Conductance	2150		1	11/04/2015 13:22	WG826495

Mercury by Method 7471A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Mercury	ND		0.0200	1	11/04/2015 08:48	WG826383

Metals (ICP) by Method 6010B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	13.1		2.00	1	11/04/2015 01:04	WG826370
Barium	250		0.500	1	11/04/2015 01:04	WG826370
Cadmium	0.520		0.500	1	11/04/2015 01:04	WG826370
Chromium	19.1		1.00	1	11/04/2015 01:04	WG826370
Copper	17.2		2.00	1	11/04/2015 01:04	WG826370
Lead	12.8		0.500	1	11/04/2015 01:04	WG826370
Nickel	16.1		2.00	1	11/04/2015 01:04	WG826370
Selenium	ND		2.00	1	11/04/2015 01:04	WG826370
Silver	ND		1.00	1	11/04/2015 01:04	WG826370
Zinc	43.7		5.00	1	11/04/2015 01:04	WG826370



Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00250	5	11/03/2015 23:34	WG826419
Toluene	ND		0.0250	5	11/03/2015 23:34	WG826419
Ethylbenzene	ND		0.00250	5	11/03/2015 23:34	WG826419
Total Xylene	ND		0.00750	5	11/03/2015 23:34	WG826419
TPH (GC/FID) Low Fraction	ND		0.500	5	11/03/2015 23:34	WG826419
(S) a,a,a-Trifluorotoluene(FID)	97.9		59.0-128		11/03/2015 23:34	WG826419
(S) a,a,a-Trifluorotoluene(PID)	91.3		54.0-144		11/03/2015 23:34	WG826419

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Gl

7 Al

8 Sc

Semi-Volatile Organic Compounds (GC) by Method 8015D/DRO

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	14.8		4.00	1	11/03/2015 22:40	WG826450
(S) o-Terphenyl	93.1		50.0-150		11/03/2015 22:40	WG826450

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Anthracene	ND		0.00600	1	11/04/2015 09:53	WG826462
Acenaphthene	ND		0.00600	1	11/04/2015 09:53	WG826462
Acenaphthylene	ND		0.00600	1	11/04/2015 09:53	WG826462
Benzo(a)anthracene	ND		0.00600	1	11/04/2015 09:53	WG826462
Benzo(a)pyrene	ND		0.00600	1	11/04/2015 09:53	WG826462
Benzo(b)fluoranthene	ND		0.00600	1	11/04/2015 09:53	WG826462
Benzo(g,h,i)perylene	ND		0.00600	1	11/04/2015 09:53	WG826462
Benzo(k)fluoranthene	ND		0.00600	1	11/04/2015 09:53	WG826462
Chrysene	ND		0.00600	1	11/04/2015 09:53	WG826462
Dibenz(a,h)anthracene	ND		0.00600	1	11/04/2015 09:53	WG826462
Fluoranthene	ND		0.00600	1	11/04/2015 09:53	WG826462
Fluorene	ND		0.00600	1	11/04/2015 09:53	WG826462
Indeno(1,2,3-cd)pyrene	ND		0.00600	1	11/04/2015 09:53	WG826462
Naphthalene	ND		0.0200	1	11/04/2015 09:53	WG826462
Phenanthrene	ND		0.00600	1	11/04/2015 09:53	WG826462
Pyrene	ND		0.00600	1	11/04/2015 09:53	WG826462
1-Methylnaphthalene	ND		0.0200	1	11/04/2015 09:53	WG826462
2-Methylnaphthalene	ND		0.0200	1	11/04/2015 09:53	WG826462
2-Chloronaphthalene	ND		0.0200	1	11/04/2015 09:53	WG826462
(S) p-Terphenyl-d14	69.6		32.2-131		11/04/2015 09:53	WG826462
(S) Nitrobenzene-d5	95.2		22.1-146		11/04/2015 09:53	WG826462
(S) 2-Fluorobiphenyl	84.0		40.6-122		11/04/2015 09:53	WG826462



Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	32.7		1	11/04/2015 10:44	WG826375

1
Cp2
Tc3
Ss4
Cn5
Sr6
Gl7
Al8
Sc

Calculated Results

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Chromium,Trivalent	17.3		2.00	1	11/04/2015 14:41	WG826370

Wet Chemistry by Method 2580 B-2011

Analyte	Result mV	Qualifier	Dilution	Analysis date / time	Batch
ORP	53		1	11/04/2015 01:42	WG826485

Wet Chemistry by Method 3060A/7196A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Chromium,Hexavalent	ND		2.00	1	11/04/2015 10:39	WG826402

Wet Chemistry by Method 9045D

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	8.38		1	11/04/2015 10:41	WG826401

Sample Narrative:

9045D L798254-05 WG826401: 8.38 at 24.0c

Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	Dilution	Analysis date / time	Batch
Specific Conductance	2750		1	11/04/2015 13:22	WG826495

Mercury by Method 7471A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Mercury	ND		0.0200	1	11/04/2015 08:50	WG826383

Metals (ICP) by Method 6010B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	8.61		2.00	1	11/04/2015 01:07	WG826370
Barium	289		0.500	1	11/04/2015 01:07	WG826370
Cadmium	ND		0.500	1	11/04/2015 01:07	WG826370
Chromium	17.3		1.00	1	11/04/2015 01:07	WG826370
Copper	15.7		2.00	1	11/04/2015 01:07	WG826370
Lead	11.9		0.500	1	11/04/2015 01:07	WG826370
Nickel	15.0		2.00	1	11/04/2015 01:07	WG826370
Selenium	ND		2.00	1	11/04/2015 01:07	WG826370
Silver	ND		1.00	1	11/04/2015 01:07	WG826370
Zinc	46.4		5.00	1	11/04/2015 01:07	WG826370



Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00250	5	11/03/2015 23:55	WG826419
Toluene	ND		0.0250	5	11/03/2015 23:55	WG826419
Ethylbenzene	ND		0.00250	5	11/03/2015 23:55	WG826419
Total Xylene	ND		0.00750	5	11/03/2015 23:55	WG826419
TPH (GC/FID) Low Fraction	ND		0.500	5	11/03/2015 23:55	WG826419
(S) <i>a,a,a</i> -Trifluorotoluene(FID)	97.3		59.0-128		11/03/2015 23:55	WG826419
(S) <i>a,a,a</i> -Trifluorotoluene(PID)	88.8		54.0-144		11/03/2015 23:55	WG826419

1
Cp2
Tc3
Ss4
Cn5
Sr6
Gl7
Al8
Sc

Semi-Volatile Organic Compounds (GC) by Method 8015D/DRO

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	ND		4.00	1	11/04/2015 09:49	WG826450
(S) <i>o</i> -Terphenyl	74.1		50.0-150		11/04/2015 09:49	WG826450

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Anthracene	ND		0.00600	1	11/04/2015 10:14	WG826462
Acenaphthene	ND		0.00600	1	11/04/2015 10:14	WG826462
Acenaphthylene	ND		0.00600	1	11/04/2015 10:14	WG826462
Benzo(a)anthracene	ND		0.00600	1	11/04/2015 10:14	WG826462
Benzo(a)pyrene	ND		0.00600	1	11/04/2015 10:14	WG826462
Benzo(b)fluoranthene	ND		0.00600	1	11/04/2015 10:14	WG826462
Benzo(g,h,i)perylene	ND		0.00600	1	11/04/2015 10:14	WG826462
Benzo(k)fluoranthene	ND		0.00600	1	11/04/2015 10:14	WG826462
Chrysene	ND		0.00600	1	11/04/2015 10:14	WG826462
Dibenz(a,h)anthracene	ND		0.00600	1	11/04/2015 10:14	WG826462
Fluoranthene	ND		0.00600	1	11/04/2015 10:14	WG826462
Fluorene	ND		0.00600	1	11/04/2015 10:14	WG826462
Indeno(1,2,3-cd)pyrene	ND		0.00600	1	11/04/2015 10:14	WG826462
Naphthalene	ND		0.0200	1	11/04/2015 10:14	WG826462
Phenanthrene	ND		0.00600	1	11/04/2015 10:14	WG826462
Pyrene	ND		0.00600	1	11/04/2015 10:14	WG826462
1-Methylnaphthalene	ND		0.0200	1	11/04/2015 10:14	WG826462
2-Methylnaphthalene	ND		0.0200	1	11/04/2015 10:14	WG826462
2-Chloronaphthalene	ND		0.0200	1	11/04/2015 10:14	WG826462
(S) <i>p</i> -Terphenyl-d14	60.9		32.2-131		11/04/2015 10:14	WG826462
(S) Nitrobenzene-d5	99.7		22.1-146		11/04/2015 10:14	WG826462
(S) 2-Fluorobiphenyl	76.8		40.6-122		11/04/2015 10:14	WG826462



Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	31.7		1	11/04/2015 10:44	WG826375

1 Cp

2 Tc

Calculated Results

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Chromium, Trivalent	11.0		2.00	1	11/04/2015 14:41	WG826370

3 Ss

4 Cn

Wet Chemistry by Method 2580 B-2011

Analyte	Result mV	Qualifier	Dilution	Analysis date / time	Batch
ORP	58		1	11/04/2015 01:42	WG826485

5 Sr

6 Gl

Wet Chemistry by Method 3060A/7196A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Chromium, Hexavalent	2.16		2.00	1	11/04/2015 10:43	WG826402

7 Al

8 Sc

Wet Chemistry by Method 9045D

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	7.90		1	11/04/2015 10:41	WG826401

Sample Narrative:

9045D L798254-06 WG826401: 7.90 at 24.0c

Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	Dilution	Analysis date / time	Batch
Specific Conductance	2970		1	11/04/2015 13:22	WG826495

Mercury by Method 7471A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Mercury	ND		0.0200	1	11/04/2015 08:53	WG826383

Metals (ICP) by Method 6010B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	7.34		2.00	1	11/04/2015 01:10	WG826370
Barium	327		0.500	1	11/04/2015 01:10	WG826370
Cadmium	ND		0.500	1	11/04/2015 01:10	WG826370
Chromium	13.1		1.00	1	11/04/2015 01:10	WG826370
Copper	15.0		2.00	1	11/04/2015 01:10	WG826370
Lead	11.0		0.500	1	11/04/2015 01:10	WG826370
Nickel	13.4		2.00	1	11/04/2015 01:10	WG826370
Selenium	ND		2.00	1	11/04/2015 01:10	WG826370
Silver	ND		1.00	1	11/04/2015 01:10	WG826370
Zinc	45.2		5.00	1	11/04/2015 01:10	WG826370



Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00250	5	11/04/2015 00:17	WG826419
Toluene	ND		0.0250	5	11/04/2015 00:17	WG826419
Ethylbenzene	ND		0.00250	5	11/04/2015 00:17	WG826419
Total Xylene	ND		0.00750	5	11/04/2015 00:17	WG826419
TPH (GC/FID) Low Fraction	ND		0.500	5	11/04/2015 00:17	WG826419
(S) <i>a,a,a</i> -Trifluorotoluene(FID)	98.1		59.0-128		11/04/2015 00:17	WG826419
(S) <i>a,a,a</i> -Trifluorotoluene(PID)	89.1		54.0-144		11/04/2015 00:17	WG826419

1
Cp2
Tc3
Ss4
Cn5
Sr6
Gl7
Al8
Sc

Semi-Volatile Organic Compounds (GC) by Method 8015D/DRO

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	14.9		4.00	1	11/03/2015 23:02	WG826450
(S) <i>o</i> -Terphenyl	64.9		50.0-150		11/03/2015 23:02	WG826450

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Anthracene	ND		0.00600	1	11/04/2015 10:15	WG826462
Acenaphthene	ND		0.00600	1	11/04/2015 10:15	WG826462
Acenaphthylene	ND		0.00600	1	11/04/2015 10:15	WG826462
Benzo(a)anthracene	ND		0.00600	1	11/04/2015 10:15	WG826462
Benzo(a)pyrene	ND		0.00600	1	11/04/2015 10:15	WG826462
Benzo(b)fluoranthene	ND		0.00600	1	11/04/2015 10:15	WG826462
Benzo(g,h,i)perylene	ND		0.00600	1	11/04/2015 10:15	WG826462
Benzo(k)fluoranthene	ND		0.00600	1	11/04/2015 10:15	WG826462
Chrysene	ND		0.00600	1	11/04/2015 10:15	WG826462
Dibenz(a,h)anthracene	ND		0.00600	1	11/04/2015 10:15	WG826462
Fluoranthene	ND		0.00600	1	11/04/2015 10:15	WG826462
Fluorene	ND		0.00600	1	11/04/2015 10:15	WG826462
Indeno(1,2,3-cd)pyrene	ND		0.00600	1	11/04/2015 10:15	WG826462
Naphthalene	ND		0.0200	1	11/04/2015 10:15	WG826462
Phenanthrene	ND		0.00600	1	11/04/2015 10:15	WG826462
Pyrene	ND		0.00600	1	11/04/2015 10:15	WG826462
1-Methylnaphthalene	ND		0.0200	1	11/04/2015 10:15	WG826462
2-Methylnaphthalene	ND		0.0200	1	11/04/2015 10:15	WG826462
2-Chloronaphthalene	ND		0.0200	1	11/04/2015 10:15	WG826462
(S) <i>p</i> -Terphenyl-d14	51.6		32.2-131		11/04/2015 10:15	WG826462
(S) Nitrobenzene-d5	93.8		22.1-146		11/04/2015 10:15	WG826462
(S) 2-Fluorobiphenyl	69.0		40.6-122		11/04/2015 10:15	WG826462



Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	8.31		1	11/04/2015 10:44	WG826375

¹ Cp² Tc³ Ss⁴ Cn⁵ Sr⁶ Gl⁷ Al⁸ Sc

Calculated Results

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Chromium, Trivalent	15.7		2.00	1	11/04/2015 14:41	WG826370

Wet Chemistry by Method 2580 B-2011

Analyte	Result mV	Qualifier	Dilution	Analysis date / time	Batch
ORP	68		1	11/04/2015 01:42	WG826485

Wet Chemistry by Method 3060A/7196A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Chromium, Hexavalent	ND		2.00	1	11/04/2015 10:46	WG826402

Wet Chemistry by Method 9045D

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	7.74		1	11/04/2015 10:41	WG826401

Sample Narrative:

9045D L798254-07 WG826401: 7.74 at 23.9c

Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	Dilution	Analysis date / time	Batch
Specific Conductance	1840		1	11/04/2015 13:22	WG826495

Mercury by Method 7471A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Mercury	ND		0.0200	1	11/04/2015 08:55	WG826383

Metals (ICP) by Method 6010B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	6.03		2.00	1	11/04/2015 01:13	WG826370
Barium	223		0.500	1	11/04/2015 01:13	WG826370
Cadmium	ND		0.500	1	11/04/2015 01:13	WG826370
Chromium	15.7		1.00	1	11/04/2015 01:13	WG826370
Copper	15.4		2.00	1	11/04/2015 01:13	WG826370
Lead	11.4		0.500	1	11/04/2015 01:13	WG826370
Nickel	12.3		2.00	1	11/04/2015 01:13	WG826370
Selenium	ND		2.00	1	11/04/2015 01:13	WG826370
Silver	ND		1.00	1	11/04/2015 01:13	WG826370
Zinc	40.2		5.00	1	11/04/2015 01:13	WG826370



Collected date/time: 10/31/15 11:05

L798254

Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00250	5	11/04/2015 00:38	WG826419
Toluene	ND		0.0250	5	11/04/2015 00:38	WG826419
Ethylbenzene	ND		0.00250	5	11/04/2015 00:38	WG826419
Total Xylene	ND		0.00750	5	11/04/2015 00:38	WG826419
TPH (GC/FID) Low Fraction	ND		0.500	5	11/04/2015 00:38	WG826419
(S) a,a,a-Trifluorotoluene(FID)	97.4		59.0-128		11/04/2015 00:38	WG826419
(S) a,a,a-Trifluorotoluene(PID)	90.4		54.0-144		11/04/2015 00:38	WG826419

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Gl

7 Al

8 Sc

Semi-Volatile Organic Compounds (GC) by Method 8015D/DRO

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	10.4		4.00	1	11/03/2015 23:14	WG826450
(S) o-Terphenyl	77.6		50.0-150		11/03/2015 23:14	WG826450

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Anthracene	ND		0.00600	1	11/04/2015 09:11	WG826462
Acenaphthene	ND		0.00600	1	11/04/2015 09:11	WG826462
Acenaphthylene	ND		0.00600	1	11/04/2015 09:11	WG826462
Benzo(a)anthracene	ND		0.00600	1	11/04/2015 09:11	WG826462
Benzo(a)pyrene	ND		0.00600	1	11/04/2015 09:11	WG826462
Benzo(b)fluoranthene	ND		0.00600	1	11/04/2015 09:11	WG826462
Benzo(g,h,i)perylene	ND		0.00600	1	11/04/2015 09:11	WG826462
Benzo(k)fluoranthene	ND		0.00600	1	11/04/2015 09:11	WG826462
Chrysene	ND		0.00600	1	11/04/2015 09:11	WG826462
Dibenz(a,h)anthracene	ND		0.00600	1	11/04/2015 09:11	WG826462
Fluoranthene	ND		0.00600	1	11/04/2015 09:11	WG826462
Fluorene	ND		0.00600	1	11/04/2015 09:11	WG826462
Indeno(1,2,3-cd)pyrene	ND		0.00600	1	11/04/2015 09:11	WG826462
Naphthalene	ND		0.0200	1	11/04/2015 09:11	WG826462
Phenanthrene	ND		0.00600	1	11/04/2015 09:11	WG826462
Pyrene	ND		0.00600	1	11/04/2015 09:11	WG826462
1-Methylnaphthalene	ND		0.0200	1	11/04/2015 09:11	WG826462
2-Methylnaphthalene	ND		0.0200	1	11/04/2015 09:11	WG826462
2-Chloronaphthalene	ND		0.0200	1	11/04/2015 09:11	WG826462
(S) p-Terphenyl-d14	55.7		32.2-131		11/04/2015 09:11	WG826462
(S) Nitrobenzene-d5	102		22.1-146		11/04/2015 09:11	WG826462
(S) 2-Fluorobiphenyl	76.4		40.6-122		11/04/2015 09:11	WG826462



Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	0.374		1	11/04/2015 10:44	WG826375

1
Cp2
Tc3
Ss4
Cn5
Sr6
Gl7
Al8
Sc

Calculated Results

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Chromium,Trivalent	12.4		2.00	1	11/04/2015 14:41	WG826370

Wet Chemistry by Method 2580 B-2011

Analyte	Result mV	Qualifier	Dilution	Analysis date / time	Batch
ORP	67		1	11/04/2015 01:42	WG826485

Wet Chemistry by Method 3060A/7196A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Chromium,Hexavalent	ND		2.00	1	11/04/2015 10:49	WG826402

Wet Chemistry by Method 9045D

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	7.48		1	11/04/2015 10:41	WG826401

Sample Narrative:

9045D L798254-08 WG826401: 7.48 at 23.5c

Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	Dilution	Analysis date / time	Batch
Specific Conductance	397		1	11/04/2015 13:22	WG826495

Mercury by Method 7471A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Mercury	ND		0.0200	1	11/04/2015 08:58	WG826383

Metals (ICP) by Method 6010B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	4.84		2.00	1	11/04/2015 01:16	WG826370
Barium	217		0.500	1	11/04/2015 01:16	WG826370
Cadmium	0.525		0.500	1	11/04/2015 01:16	WG826370
Chromium	12.4		1.00	1	11/04/2015 01:16	WG826370
Copper	11.8		2.00	1	11/04/2015 01:16	WG826370
Lead	9.98		0.500	1	11/04/2015 01:16	WG826370
Nickel	12.8		2.00	1	11/04/2015 01:16	WG826370
Selenium	ND		2.00	1	11/04/2015 01:16	WG826370
Silver	ND		1.00	1	11/04/2015 01:16	WG826370
Zinc	39.1		5.00	1	11/04/2015 01:16	WG826370



Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00250	5	11/04/2015 00:59	WG826419
Toluene	ND		0.0250	5	11/04/2015 00:59	WG826419
Ethylbenzene	ND		0.00250	5	11/04/2015 00:59	WG826419
Total Xylene	ND		0.00750	5	11/04/2015 00:59	WG826419
TPH (GC/FID) Low Fraction	ND		0.500	5	11/04/2015 00:59	WG826419
(S) a,a,a-Trifluorotoluene(FID)	97.6		59.0-128		11/04/2015 00:59	WG826419
(S) a,a,a-Trifluorotoluene(PID)	91.1		54.0-144		11/04/2015 00:59	WG826419

1
Cp2
Tc3
Ss4
Cn5
Sr6
Gl7
Al8
Sc

Semi-Volatile Organic Compounds (GC) by Method 8015D/DRO

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	17.3		4.00	1	11/03/2015 23:25	WG826450
(S) o-Terphenyl	81.9		50.0-150		11/03/2015 23:25	WG826450

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Anthracene	ND		0.00600	1	11/04/2015 09:32	WG826462
Acenaphthene	ND		0.00600	1	11/04/2015 09:32	WG826462
Acenaphthylene	ND		0.00600	1	11/04/2015 09:32	WG826462
Benzo(a)anthracene	ND		0.00600	1	11/04/2015 09:32	WG826462
Benzo(a)pyrene	ND		0.00600	1	11/04/2015 09:32	WG826462
Benzo(b)fluoranthene	ND		0.00600	1	11/04/2015 09:32	WG826462
Benzo(g,h,i)perylene	ND		0.00600	1	11/04/2015 09:32	WG826462
Benzo(k)fluoranthene	ND		0.00600	1	11/04/2015 09:32	WG826462
Chrysene	ND		0.00600	1	11/04/2015 09:32	WG826462
Dibenz(a,h)anthracene	ND		0.00600	1	11/04/2015 09:32	WG826462
Fluoranthene	ND		0.00600	1	11/04/2015 09:32	WG826462
Fluorene	ND		0.00600	1	11/04/2015 09:32	WG826462
Indeno(1,2,3-cd)pyrene	ND		0.00600	1	11/04/2015 09:32	WG826462
Naphthalene	ND		0.0200	1	11/04/2015 09:32	WG826462
Phenanthrene	ND		0.00600	1	11/04/2015 09:32	WG826462
Pyrene	ND		0.00600	1	11/04/2015 09:32	WG826462
1-Methylnaphthalene	ND		0.0200	1	11/04/2015 09:32	WG826462
2-Methylnaphthalene	ND		0.0200	1	11/04/2015 09:32	WG826462
2-Chloronaphthalene	ND		0.0200	1	11/04/2015 09:32	WG826462
(S) p-Terphenyl-d14	61.4		32.2-131		11/04/2015 09:32	WG826462
(S) Nitrobenzene-d5	96.6		22.1-146		11/04/2015 09:32	WG826462
(S) 2-Fluorobiphenyl	78.8		40.6-122		11/04/2015 09:32	WG826462



Abbreviations and Definitions

SDG	Sample Delivery Group.
MDL	Method Detection Limit.
RDL	Reported Detection Limit.
ND,U	Not detected at the Reporting Limit (or MDL where applicable).
RPD	Relative Percent Difference.
(dry)	Results are reported based on the dry weight of the sample. [this will only be present on a dry report basis for soils].
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.
(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.
Rec.	Recovery.
SDL	Sample Detection Limit.
MQL	Method Quantitation Limit.
Unadj. MQL	Unadjusted Method Quantitation Limit.

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

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Gl

⁷ Al

⁸ Sc



ESC Lab Sciences is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our "one location" design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be **YOUR LAB OF CHOICE**.

State Accreditations

Alabama	40660	Nevada	TN-03-2002-34
Alaska	UST-080	New Hampshire	2975
Arizona	AZ0612	New Jersey–NELAP	TN002
Arkansas	88-0469	New Mexico	TN00003
California	01157CA	New York	11742
Colorado	TN00003	North Carolina	Env375
Connecticut	PH-0197	North Carolina ¹	DW21704
Florida	E87487	North Carolina ²	41
Georgia	NELAP	North Dakota	R-140
Georgia ¹	923	Ohio–VAP	CL0069
Idaho	TN00003	Oklahoma	9915
Illinois	200008	Oregon	TN200002
Indiana	C-TN-01	Pennsylvania	68-02979
Iowa	364	Rhode Island	221
Kansas	E-10277	South Carolina	84004
Kentucky ¹	90010	South Dakota	n/a
Kentucky ²	16	Tennessee ¹⁴	2006
Louisiana	AI30792	Texas	T 104704245-07-TX
Maine	TN0002	Texas ⁵	LAB0152
Maryland	324	Utah	6157585858
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	109
Minnesota	047-999-395	Washington	C1915
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA
Nebraska	NE-OS-15-05		

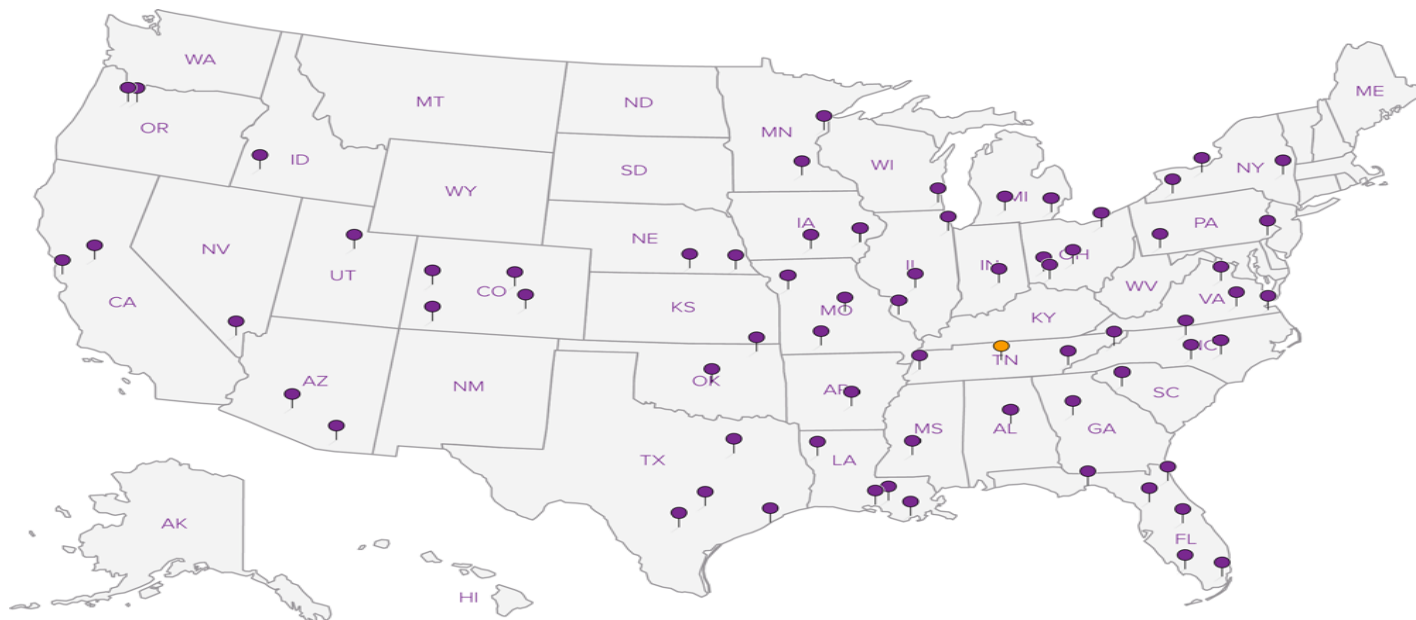
¹ Drinking Water ² Underground Storage Tanks ³ Aquatic Toxicity ⁴ Chemical/Microbiological ⁵ Mold ^{n/a} Accreditation not applicable

Third Party & Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA	100789
Canada	1461.01	DOD	1461.01
EPA–Crypto	TN00003	USDA	S-67674

Our Locations

ESC Lab Sciences has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. **ESC Lab Sciences performs all testing at our central laboratory.**



Encana Oil & Gas (USA)
143 Diamond Avenue
Parachute, CO 81635
ENCANACO-LTENV

Billing Information:

Brett Middleton
143 Diamond Avenue
Parachute, CO 81635
970-285-2653

Report to:

Brett Middleton

Email to:

brett.middleton@encana.com

Analysis/Container/Preservative

Chain of Custody
Page 1 of 1



12065 Lebanon Road
Mt. Juliet, TN 37122

Phone: (800) 767-5859
Phone: (615) 758-5858
Fax: (615) 758-5859

C211

CoCode (lab use only)

Template/Prelogin

Shipped Via:

Remarks/Contaminant

Sample # (lab only)

Project Description: PK36 Spill Response
City/State Collected: Parachute, CO
Phone: 970-285-2653
FAX: 970-285-2653
Client Project #: PK36
ESC Key: ENCANACO-LTENV
Collected by: WT and CM
Site/Facility ID#: PK36
P.O.#: Middleton
Collected by (signature):
Immediately Packed on Ice N ☒ Y ☒

Rush? (Lab MUST Be Notified)
Same Day.....200%
☒ Next Day.....100%
Two Day.....50%
Three Day.....25%

Date Results Needed:
Email? ☐ No ☒ Yes
FAX? ☒ No ☐ Yes

Sample ID	Comp/Grab	Matrix*	Depth	Date	Time	No. of Cntrs	BTEX	TPH (GRO + DRO)	Table 910-1 PAHs 8270 SIM	pH, EC, SAR	As, Ba, Cd, Cr III, Cr VI, Cu, Pb, Hg, Ni, Se, Ag, Zn	Remarks/Contaminant	Sample # (lab only)
20151031 - PK36 (POR)	Grab	SS	Surface	10/31/15	0935	3	X	X	X	X	X		798254-01
20151031 - PK36 (POR)	Grab	SS	1'	10/31/15	0945	3	X	X	X	X	X		02
20151031 - PK36 (EXT-S01)	Grab	SS	Surface	10/31/15	1010	3	X	X	X	X	X		03
20151031 - PK36 (EXT-S01)	Grab	SS	6"	10/31/15	1020	3	X	X	X	X	X		04
20151031 - PK36 (EXT-S02)	Grab	SS	Surface	10/31/15	1045	3	X	X	X	X	X		05
20151031 - PK36 (EXT-N01)	Grab	SS	Surface	10/31/15	1055	3	X	X	X	X	X		06
20151031 - PK36 (EXT-N01)	Grab	SS	8"	10/31/15	1105	3	X	X	X	X	X		07
20151031 - PK36 (EXT-N02)	Grab	SS	Surface	10/31/15	1115	3	X	X	X	X	X		08

*Matrix: SS - Soil/Solid GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other

Remarks:

pH Temp

Flow Other

Relinquished by: (Signature)	Date: 11/2/15	Time: 1530	Received by: (Signature)	Samples returned via: <input checked="" type="checkbox"/> UPS <input type="checkbox"/> FedEx <input type="checkbox"/> Courier	Condition: (lab use only)
Relinquished by: (Signature)	Date: 11/2/15	Time: 1700	Received by: (Signature)	Temp: 24°C	Bottles Received: 48
Relinquished by: (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 11/03/15	Time: 0900

CoC Seals Intact: ☐ Y ☒ N ☐ NA

pH Checked: NCF:

Encana Oil & Gas (USA)
143 Diamond Avenue
Parachute, CO 81635
ENCANACO-LTENV

Billing Information:

Brett Middleton
143 Diamond Avenue
Parachute, CO 81635
970-285-2653

Report to:

Brett Middleton

Email to:

brett.middleton@encana.com

Analysis/Container/Preservative

Chain of Custody
Page 1 of 1



12065 Lebanon Road
Mt. Juliet, TN 37122

Phone: (800) 767-5859
Phone: (615) 758-5858
Fax: (615) 758-5859

Project Description: PK36 Spill Response
City/State Collected: Parachute, CO
Phone: 970-285-2653
FAX: 970-285-2653
Client Project #: PK36
ESC Key: ENCANACO-LTENV
Collected by: CM and WT
Site/Facility ID#: PK36
P.O.#: Middleton

Collected by (signature):

[Signature]

Rush? (Lab MUST Be Notified)

Same Day.....200%
☒ Next Day.....100%
Two Day.....50%
Three Day.....25%

Date Results Needed:

Email? ☐ No ☒ Yes

FAX? ☒ No ☐ Yes

No.
of
Cntrs

Immediately Packed on Ice N ☒ Y ☒

CoCode ENCANACO (lab use only)

Template/Prelogin

Shipped Via:

Remarks/Contaminant

Sample # (lab only)

Sample ID	Comp/Grab	Matrix*	Depth	Date	Time	No. of Cntrs	BTEX	TDS	Chloride, Sulfate								
20151031 - PK36 (SPRG-S01)	Grab	GW		10-31-15	1200	5	X	X	X								798254-09
20151031 - PK36 (SW-S01)	Grab	GW		10-31-15	1230	5	X	X	X								10
20151031 - PK36 (SPRG-N01)	Grab	GW		10-31-15	1255	5	X	X	X								11
20151031 - PK36 (SW-N01)	Grab	GW		10-31-15	1310	5	X	X	X								12
20151031 - PK36 (SW-N02)	Grab	GW		10-31-15	1325	4	X	X	X								13

*Matrix: SS - Soil/Solid GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other _____

Remarks:

pH _____ Temp _____

Flow _____ Other _____

Relinquished by: (Signature) <i>[Signature]</i>	Date: 11-2-15	Time: 1530	Received by: (Signature) <i>[Signature]</i>	Samples returned via: <input type="checkbox"/> UPS <input checked="" type="checkbox"/> FedEx <input type="checkbox"/> Courier <input type="checkbox"/> _____	Condition: (lab use only) <i>[Signature]</i>
Relinquished by: (Signature) <i>[Signature]</i>	Date: 11/2/15	Time: 1700	Received by: (Signature) <i>[Signature]</i>	Temp: 2.4°	Bottles Received: 458
Relinquished by: (Signature) <i>[Signature]</i>	Date:	Time:	Received for lab by: (Signature) <i>[Signature]</i>	Date: 11/03/15	Time: 0900
				CoC Seals Intact: <input type="checkbox"/> Y <input type="checkbox"/> N <input checked="" type="checkbox"/> NA	
				pH Checked:	NCF: