

FORM
4Rev
04/13

State of Colorado

Oil and Gas Conservation Commission

1120 Lincoln Street, Suite 801, Denver, Colorado 80205 Phone: (303) 894-2100 Fax: (303) 894-2109



DE	ET	OE	ES
Document Number: <u>400555321</u>			
Date Received: <u>02/14/2014</u>			

SUNDRY NOTICE

Submit a signed original. This form is to be used for general, technical and environmental sundry information. For proposed or completed operations, describe in full in Comments or provide as an attachment. Identify Well by API Number; identify Oil and Gas Location by Location ID Number; identify other Facility by Facility ID Number.

OGCC Operator Number:	100185	Contact Name	Chris Hines
Name of Operator:	ENCANA OIL & GAS (USA) INC		Phone: (970) 2852653
Address:	370 17TH ST STE 1700		Fax: ()
City:	DENVER	State:	CO Zip: 80202-5632 Email: chris.hines@encana.com

Complete the Attachment
Checklist

OP OGCC

API Number :	05-04500	OGCC Facility ID Number:	334681
Well/Facility Name:	Federal	Well/Facility Number:	29-6BB (PF-29)
Location QtrQtr:	SENW	Section:	29 Township: 7S Range: 95W Meridian: 6
County:	GARFIELD	Field Name:	PARACHUTE
Federal, Indian or State Lease Number:			

Survey Plat		
Directional Survey		
Srvc Eqpmt Diagram		
Technical Info Page		
Other		

CHANGE OF LOCATION OR AS BUILT GPS REPORT

☐ Change of Location * ☐ As-Built GPS Location Report ☐ As-Built GPS Location Report with Survey

* Well location change requires new plat. A substantive surface location change may require new Form 2A.

SURFACE LOCATION GPS DATA Data must be provided for Change of Surface Location and As Built Reports.

Latitude _____ PDOP Reading _____ Date of Measurement _____
Longitude _____ GPS Instrument Operator's Name _____

LOCATION CHANGE (all measurements in Feet)

Well will be: _____ (Vertical, Directional, Horizontal)

Change of **Surface** Footage **From** Exterior Section Lines:

Change of **Surface** Footage **To** Exterior Section Lines:

Current **Surface** Location **From** QtrQtr SENW Sec 29

New **Surface** Location **To** QtrQtr _____ Sec _____

Change of **Top of Productive Zone** Footage **From** Exterior Section Lines:

Change of **Top of Productive Zone** Footage **To** Exterior Section Lines:

Current **Top of Productive Zone** Location **From** Sec _____

New **Top of Productive Zone** Location **To** Sec _____

Change of **Bottomhole** Footage **From** Exterior Section Lines:

Change of **Bottomhole** Footage **To** Exterior Section Lines:

Current **Bottomhole** Location Sec _____ Twp _____

New **Bottomhole** Location Sec _____ Twp _____

Is location in High Density Area? _____

Distance, in feet, to nearest building _____, public road: _____, above ground utility: _____, railroad: _____,

property line: _____, lease line: _____, well in same formation: _____

Ground Elevation _____ feet Surface owner consultation date _____

FNL/FSL		FEL/FWL	
1856	FNL	1584	FWL
Twp 7S	Range 95W	Meridian 6	
Twp	Range	Meridian	
			**
Twp	Range		
Twp	Range		
			**
			** attach deviated drilling plan

OTHER CHANGES

☐ **REMOVE FROM SURFACE BOND** Signed surface use agreement is a required attachment

☐ **CHANGE OF WELL, FACILITY OR OIL & GAS LOCATION NAME OR NUMBER**

From: Name FEDERAL Number 29-6BB (PF-29) Effective Date: _____

To: Name _____ Number _____

☐ **ABANDON PERMIT: Permit can only be abandoned if the permitted operation has NOT been conducted. Field inspection will be conducted to verify site status.**

☐ WELL: Abandon Application for Permit-to-Drill (Form2) – Well API Number _____ has not been drilled.

☐ PIT: Abandon Earthen Pit Permit (Form 15) – COGCC Pit Facility ID Number _____ has not been constructed (Permitted and constructed pit requires closure per Rule 905)

☐ CENTRALIZED E&P WASTE MANAGEMENT FACILITY: Abandon Centralized E&P Waste Management Facility Permit (Form 28) – Facility ID Number _____ has not been constructed (Constructed facility requires closure per Rule 908)

OIL & GAS LOCATION ID Number: _____

☐ Abandon Oil & Gas Location Assessment (Form 2A) – Location has not been constructed and site will not be used in the future.

☐ Keep Oil & Gas Location Assessment (Form 2A) active until expiration date. This site will be used in the future.

Surface disturbance from Oil and Gas Operations must be reclaimed per Rule 1003 and Rule 1004.

☐ **REQUEST FOR CONFIDENTIAL STATUS**

☐ **DIGITAL WELL LOG UPLOAD**

☐ **DOCUMENTS SUBMITTED** Purpose of Submission: _____

RECLAMATION

INTERIM RECLAMATION

☐ Interim Reclamation will commence approximately _____

Per Rule 1003.e.(3) operator shall submit Sundry Notice reporting interim reclamation is complete and site is ready for inspection when vegetation reaches 80% coverage.

☐ Interim reclamation complete, site ready for inspection.

Per Rule 1003.e(3) describe interim reclamation procedure in Comments below or provide as an attachment and attach required location photographs.

Field inspection will be conducted to document Rule 1003.e. compliance

FINAL RECLAMATION

☐ Final Reclamation will commence approximately _____

Per Rule 1004.c.(4) operator shall submit Sundry Notice reporting final reclamation is complete and site is ready for inspection when vegetation reaches 80% coverage.

☐ Final reclamation complete, site ready for inspection. Per Rule 1004.c(4) describe final reclamation procedure in Comments below or provide as an attachment.

Field inspection will be conducted to document Rule 1004.c. compliance

Comments:

ENGINEERING AND ENVIRONMENTAL WORK

☐ NOTICE OF CONTINUED TEMPORARILY ABANDONED STATUS

Indicate why the well is temporarily abandoned and describe future plans for utilization in the COMMENTS box below or provide as an attachment, as required by Rule 319.b.(3).

Date well temporarily abandoned _____ Has Production Equipment been removed from site? _____

Mechanical Integrity Test (MIT) required if shut in longer than 2 years. Date of last MIT _____

☐ SPUD DATE: _____

TECHNICAL ENGINEERING AND ENVIRONMENTAL WORK

Details of work must be described in full in the COMMENTS below or provided as an attachment.

☐ NOTICE OF INTENT Approximate Start Date _____

☒ REPORT OF WORK DONE Date Work Completed 06/27/2012

- | | | |
|--|---|--|
| <input type="checkbox"/> Intent to Recomplete (Form 2 also required) | <input type="checkbox"/> Request to Vent or Flare | <input type="checkbox"/> E&P Waste Mangement Plan |
| <input type="checkbox"/> Change Drilling Plan | <input type="checkbox"/> Repair Well | <input type="checkbox"/> Beneficial Reuse of E&P Waste |
| <input type="checkbox"/> Gross Interval Change | <input type="checkbox"/> Rule 502 variance requested. Must provide detailed info regarding request. | |
| <input checked="" type="checkbox"/> Other <u>cuttings disposal</u> | <input type="checkbox"/> Status Update/Change of Remediation Plans for Spills and Releases | |

COMMENTS:

This form is being submitted to document onsite cuttings disposal. The identified date is the date that samples were collected demonstrating compliance with Table 910-1.

Attention Carlos Lujan.

H2S REPORTING

Data Fields in this section are intended to document Sample and Location Data associated with the collection of a Gas Sample that is submitted for Laboratory Analysis.

Gas Analysis Report must be attached.

H2S Concentration: _____ in ppm (parts per million) Date of Measurement or Sample Collection _____

Description of Sample Point:

Absolute Open Flow Potential _____ in CFPD (cubic feet per day)

Description of Release Potential and Duration (If flow is not open to the atmosphere, identify the duration in which the container or pipeline would likely be opened for servicing operations.):

Distance to nearest occupied residence, school, church, park, school bus stop, place of business, or other areas where the public could reasonably be expected to frequent: _____

Distance to nearest Federal, State, County, or municipal road or highway owned and principally maintained for public use: _____

COMMENTS:

--

Best Management Practices

No BMP/COA Type

Description

--	--

Operator Comments:

This form is being submitted to document onsite cuttings disposal. The identified date is the date that samples were collected demonstrating compliance with Table 910-1.

Attention Carlos Lujan.

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

Signed: _____

Print Name: Chris Hines

Title: Env. Field Coord

Email: chris.hines@encana.com

Date: 2/14/2014

Based on the information provided herein, this Sundry Notice (Form 4) complies with COGCC Rules and applicable orders and is hereby approved.

COGCC Approved: _____

Date: _____

CONDITIONS OF APPROVAL, IF ANY:

COA Type

Description

--	--

General Comments

User Group

Comment

Comment Date

--	--	--

Total: 0 comment(s)

Attachment Check List

Att Doc Num

Name

400555321	FORM 4 SUBMITTED
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Total Attach: 1 Files

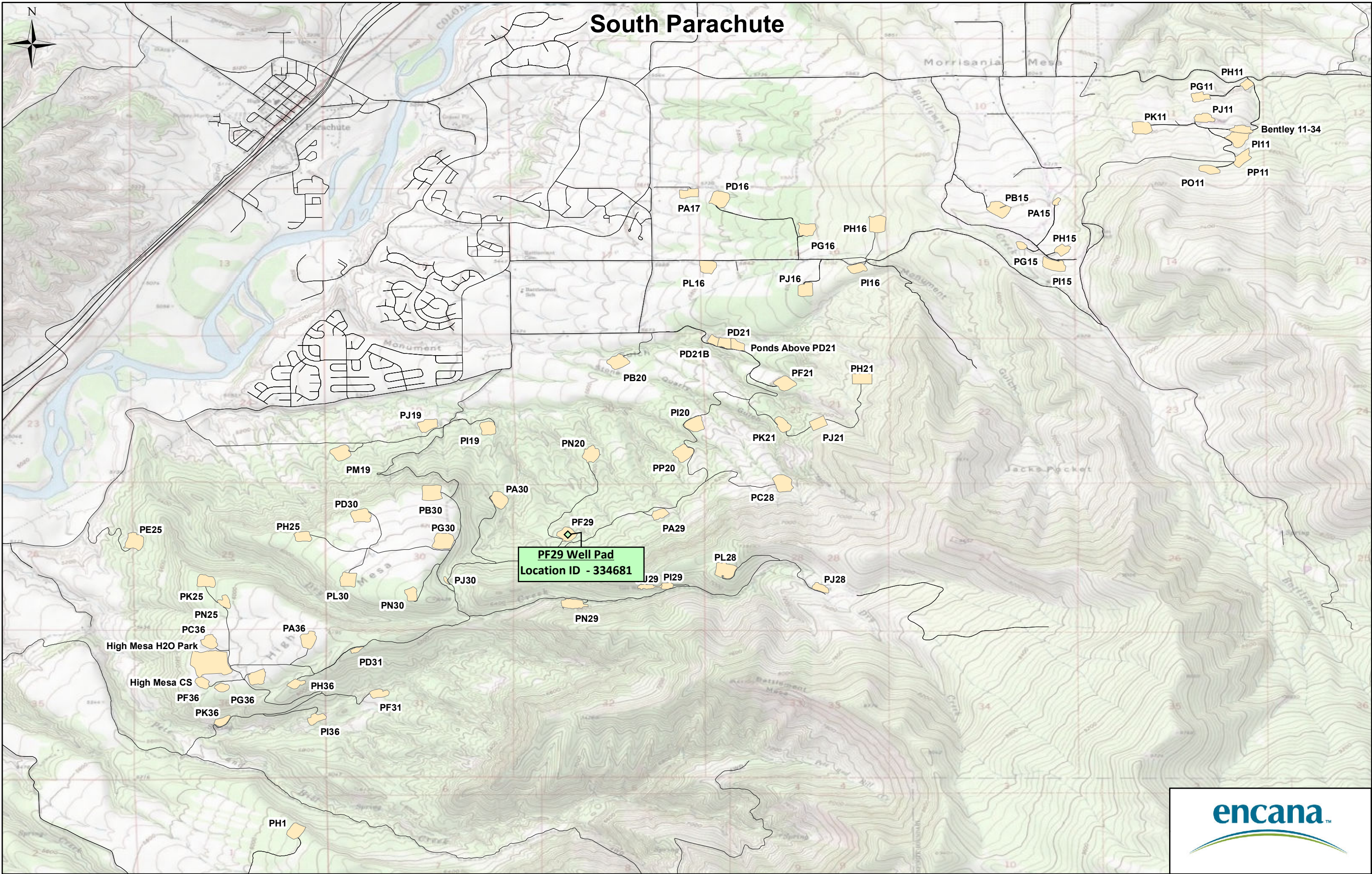
PF29 (Location ID – 334681)
Onsite Cuttings Disposal

Encana Oil & Gas (USA) Inc. (Encana) is submitting this Sundry Notice to document the onsite disposal of drill cuttings on Encana's PF29 well pad in the South Parachute area of operation. The PF29 well pad is not found within any of the COGCC 317B, Public Water System Protection areas. The location is not within a sensitive area, and according to the soil survey in this area, there is no zone of water saturation within 80 inches of the surface.

In accordance with COGCC Rule 907 for the management of exploration and production (E&P) waste, Encana collects representative samples of drill cuttings on each of its locations for the purpose of comparing constituent levels to the allowable limits identified by the COGCC in Table 910-1. All sample collection on behalf of Encana's Parachute Field Office is carried out in accordance with the Piceance Environmental Sampling Procedure. Area background soil samples are also collected to establish a baseline for naturally occurring arsenic concentrations. Laboratory analytical results are presented in the attached summary table, and are also provided in the attached laboratory reports.

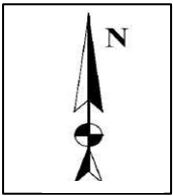
Encana generated approximately 1,200 cubic yards of cuttings from nine wells on the PF29 well pad. For stabilization purposes, the cuttings were blended with approximately 1,200 cubic yards of sawdust. The stabilized cuttings were buried in a vault on the northwest side of the pad, partially beneath the working surface and recontoured slope. Before burial, three representative five-point composite samples were collected for laboratory analysis. Laboratory analytical results indicate that the drill cuttings on Encana's PF29 well pad have exceedances of COGCC Table 910-1 allowable concentrations for arsenic (2.8 – 3.6 mg/kg), Sodium Absorption Ratio [SAR] (26 – 30), and pH (9.1). Though the arsenic concentrations in the drill cuttings are above the allowable limit identified in Table 910-1, the concentration is within the range of background values (1.2 – 33 mg/kg) in this area. Based on these results and Footnote 1 to COGCC Table 910-1, Encana requests that the COGCC consider the higher range of background arsenic value(s) as the allowable concentration for this constituent. Also, to assure successful reclamation of the pad, and to comply with the intent of the COGCC 1000 Series Rules for handling of material with elevated levels of SAR and pH, the cuttings were buried under working surface, or 3 to 5 feet of clean native subsoil and topsoil on the recontoured slope.

Attachments: Topographic Location Map
Site Diagram - Onsite Cuttings Disposal
Laboratory Results Summary Table (Cuttings)
Laboratory Results Summary Table (Area Background Arsenic)
Cuttings Laboratory Report
NOTE – Laboratory Reports for area background available upon request

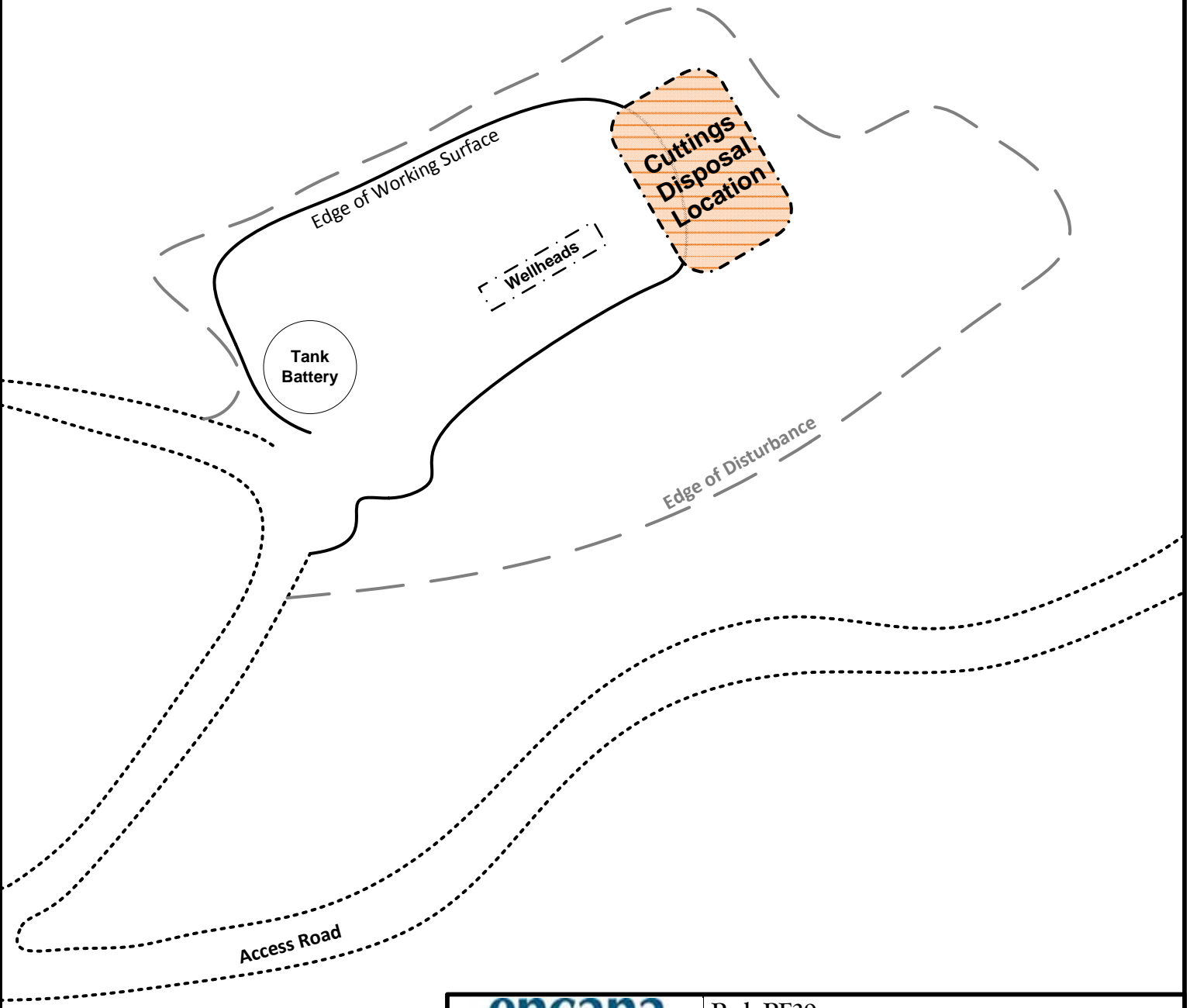


South Parachute





Encana Oil & Gas (USA) Inc.
Cuttings Disposal Site Diagram



Pad: PF29
Area: South Parachute (High Mesa)
Legal: SENW, Sec. 29, T7S, R95W, 6 th PM



Laboratory Results Summary Table

02/14/2014

Analytes (BDL = Below Detection Limit; ND = Non Detect)

Location	Sample Date:	Sample Matrix	Matrix Notes	Allowable Concentration -->	Organic Compounds in Soil (mg/kg [ppm])																		Inorganics in Soil		Metals in Soil (mg/kg [ppm])																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
					500	TPH (total volatile and extractable petroleum hydrocarbons)	TPH-GRO (C6-C10) Low Fraction	TPH-DRO (C10-C36) High Fraction	0.17	85	100	175	1000	1000	0.22	0.22	2.2	0.022	22	0.022	1000	1000	0.22	23	1000	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																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			

Laboratory Results Summary Table

02/13/2014

Location	Sample Date:	Sample Matrix	Matrix Notes	Allowable Concentration -->	Metals i
					Arsenic
PF31	12/18/13	Background	E		1.2
PJ19	06/07/11	Background			1.2
PF31	12/18/13	Background	E		1.4
PF31	12/18/13	Background	E		1.5
PF31	12/18/13	Background	E		1.5
PA30	09/21/11	Background	E		1.6
PF31	12/18/13	Background	W		1.8
PF31	12/18/13	Background	S		1.8
PF31	12/18/13	Background	S		1.9
PF31	12/18/13	Background	E		2
PF31	12/18/13	Background	S		2.1
PF29	05/09/12	Background	NW		2.4
PF31	12/18/13	Background	S		2.4
PF31	12/18/13	Background	W		2.8
PF29	05/09/12	Background	S		3
PF29	05/09/12	Background	NW		3
PF31	12/18/13	Background	W		3
PF31	12/18/13	Background	N		3.1
PF31	12/18/13	Background	W		3.2
PF31	12/18/13	Background	S		3.2
PF29	05/09/12	Background	S		3.3
PF29	05/09/12	Background	NW		3.4
PF29	05/09/12	Background	NW		3.4
PF29	05/09/12	Background	S		3.5
PF29	05/09/12	Background	NW		3.6
PF29	05/09/12	Background	NE		3.7
PF29	05/09/12	Background	NE		3.7
PF31	12/18/13	Background	W		3.7
PF29	05/09/12	Background	NE		3.8
PC28	05/09/12	Background	SE		3.9
PF29	05/09/12	Background	S		3.9
PF29	05/09/12	Background	NE		3.9
PC28	05/09/12	Background	E		4
PA30	09/21/11	Background	S		4.1
PF29	05/09/12	Background	S		4.1
PC28	05/09/12	Background	S		4.2
PC28	05/09/12	Background	S		4.4
PF31	12/18/13	Background	NW		4.4
PF31	12/18/13	Background	N		4.4
PC28	05/09/12	Background	SE		4.6

Laboratory Results Summary Table

02/13/2014

Location	Sample Date:	Sample Matrix	Matrix Notes	Allowable Concentration -->	Metals i
					Arsenic
PC28	05/09/12	Background	NW		4.6
PF31	12/18/13	Background	NW		4.6
PF31	12/18/13	Background	N		4.6
PF29	05/09/12	Background	E		4.7
PF31	12/18/13	Background	NW		4.7
PF31	12/18/13	Background	N		4.7
PC28	05/09/12	Background	NW		4.8
PF31	12/18/13	Background	NW		4.8
PF31	12/18/13	Background	N		4.9
PD30	09/22/09	Background			5
PG30	06/23/10	Background	Southwest background grab		5
PF29	05/09/12	Background	E		5.1
PG30	06/23/10	Background	Northwest background grab		5.1
PC28	05/09/12	Background	S		5.2
PF29	05/09/12	Background	E		5.2
PF29	05/09/12	Background	E		5.4
PN20	08/16/10	Background	NW		5.4
PF29	05/09/12	Background	SE		5.5
PF31	12/18/13	Background	NW		5.5
PC28	05/09/12	Background	W		5.6
PC28	05/09/12	Background	W		5.6
PF29	05/09/12	Background	NE		5.6
PF29	05/09/12	Background	SE		5.7
PF29	05/09/12	Background	E		5.7
PC28	05/09/12	Background	S		5.8
PC28	05/09/12	Background	SE		5.8
PC28	05/09/12	Background	E		5.8
PC28	05/09/12	Background	W		5.9
PC28	05/09/12	Background	E		5.9
PF29	05/09/12	Background	SE		5.9
PC28	05/09/12	Background	W		6.1
PH25	10/06/10	Background	collected from cuttings pit spoil		6.1
PC28	05/09/12	Background	W		6.2
PC28	05/09/12	Background	S		6.2
PC28	05/09/12	Background	E		6.2
PF29	05/09/12	Background	SE		6.2
PC28	05/09/12	Background	SE		6.3
PC28	05/09/12	Background	NW		6.3
PC28	05/09/12	Background	E		6.4
PC28	05/09/12	Background	NW		6.4

Laboratory Results Summary Table

02/13/2014

Location	Sample Date:	Sample Matrix	Matrix Notes	Allowable Concentration -->	Metals i
				0.39	Arsenic
PA30	09/21/11	Background	South - SW		6.5
PE25	09/20/11	Background	NE		6.5
PF29	05/09/12	Background	SE		6.5
PC28	05/09/12	Background	NW		6.7
PK25	09/22/09	Background			7
PA30	09/21/11	Background	SE		7.1
PI20	07/09/09	Background			7.1
PJ19	06/30/11	Background	SW		7.1
PN20	08/16/10	Background	SW		7.3
PA30	09/22/09	Background			7.7
PJ19	06/30/11	Background	W		8
PA30	09/21/11	Background	SW		8.3
PL28	08/15/11	Background	S		8.3
PJ19	06/30/11	Background	SE		8.4
PP20	09/22/09	Background			8.4
PL30	08/16/10	Background	W		8.5
PJ19	06/30/11	Background	S		8.6
PL28	08/15/11	Background	W		8.6
PN20	08/16/10	Background	SE		9.7
PE25	09/20/11	Background	E		10
PC28	05/09/12	Background	SE		11
PH25	08/16/10	Background	NE		11
PL30	09/30/10	Background	collected from cuttings pit spoil		11.1
PH25	08/16/10	Background	S		12
PL28	08/15/11	Background	E		13
PL28	08/15/11	Background	NE		13
PL30	08/16/10	Background	SW		14
PL30	08/16/10	Background	E		15
PH25	08/16/10	Background	SW		16
PL28	08/15/11	Background	SE		16
PH25	08/16/10	Background	SE		18
PL30	08/16/10	Background	SE		33
PE25	09/20/11	Background	S		BDL
PE25	09/20/11	Background	SE		BDL
PE25	09/20/11	Background	N		BDL
PG30	05/27/09	Background			BDL



12065 Lebanon Rd.
Mt. Juliet, TN 37122
(615) 758-5858
1-800-767-5859
Fax (615) 758-5859

Tax I.D. 62-0814289

Est. 1970

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

Report Summary

Friday July 13, 2012

Report Number: L583946

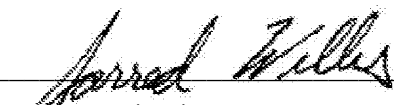
Samples Received: 06/28/12

Client Project:

Description: PF29 Cuttings

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

Entire Report Reviewed By:


Jayred Willis, ESC Representative

Laboratory Certification Numbers

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - 01157CA, CT - PH-0197,
FL - E87487, GA - 923, IN - C-TN-01, KY - 90010, KYUST - 0016,
NC - ENV375/DW21704/BIO041, ND - R-140, NJ - TN002, NJ NELAP - TN002,
SC - 84004, TN - 2006, VA - 460132, WV - 233, AZ - 0612,
MN - 047-999-395, NY - 11742, WI - 998093910, NV - TN000032011-1,
TX - T104704245-11-3, OK - 9915, PA - 68-02979

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

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

This report may not be reproduced, except in full, without written approval from ESC Lab Sciences. Where applicable, sampling conducted by ESC is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.

REPORT OF ANALYSIS

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

July 13, 2012

Date Received : June 28, 2012
Description : PF29 Cuttings

Sample ID : PF29-CUT2-062712

Collected By : Chris Bak
Collection Date : 06/27/12 10:43

ESC Sample # : L583946-01

Site ID : PF29

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Chromium, Hexavalent	BDL	2.0	mg/kg	3060A/7196A	07/12/12	1
Chromium, Trivalent	10.	2.0	mg/kg	Calc.	07/12/12	1
ORP	61.		mV	2580	07/12/12	1
pH	8.7		su	9045D	07/11/12	1
Sodium Adsorption Ratio	30.			Calc.	07/13/12	1
Specific Conductance	2500		umhos/cm	9050AMod	07/11/12	1
Mercury	0.037	0.020	mg/kg	7471	07/10/12	1
Barium	5500	0.50	mg/kg	6010B	07/12/12	2
Cadmium	BDL	0.25	mg/kg	6010B	07/12/12	1
Chromium	10.	0.50	mg/kg	6010B	07/12/12	1
Copper	16.	1.0	mg/kg	6010B	07/12/12	1
Lead	6.5	0.25	mg/kg	6010B	07/12/12	1
Nickel	7.0	1.0	mg/kg	6010B	07/12/12	1
Selenium	BDL	5.0	mg/kg	6010B	07/12/12	5
Silver	BDL	0.50	mg/kg	6010B	07/12/12	1
Zinc	42.	1.5	mg/kg	6010B	07/12/12	1
Benzene	BDL	0.0025	mg/kg	8021/8015	07/10/12	5
Toluene	BDL	0.025	mg/kg	8021/8015	07/10/12	5
Ethylbenzene	BDL	0.0025	mg/kg	8021/8015	07/10/12	5
Total Xylene	BDL	0.0075	mg/kg	8021/8015	07/10/12	5
TPH (GC/FID) Low Fraction	BDL	0.50	mg/kg	GRO	07/10/12	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	83.9		% Rec.	8021/8015	07/10/12	5
a,a,a-Trifluorotoluene(PID)	91.9		% Rec.	8021/8015	07/10/12	5
TPH (GC/FID) High Fraction	330	8.0	mg/kg	3546/DRO	07/10/12	2
Surrogate recovery(%)						
o-Terphenyl	102.		% Rec.	3546/DRO	07/10/12	2
Polynuclear Aromatic Hydrocarbons						
Anthracene	0.0065	0.0060	mg/kg	8270C-SIM	07/12/12	1
Acenaphthene	0.0060	0.0060	mg/kg	8270C-SIM	07/12/12	1
Acenaphthylene	BDL	0.0060	mg/kg	8270C-SIM	07/12/12	1
Benzo(a)anthracene	0.022	0.0060	mg/kg	8270C-SIM	07/12/12	1
Benzo(a)pyrene	BDL	0.0060	mg/kg	8270C-SIM	07/12/12	1
Benzo(b)fluoranthene	BDL	0.0060	mg/kg	8270C-SIM	07/12/12	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
L583946-01 (PH) - 8.7@20.4c



12065 Lebanon Rd.
Mt. Juliet, TN 37122
(615) 758-5858
1-800-767-5859
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Tax I.D. 62-0814289

Est. 1970

REPORT OF ANALYSIS

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

July 13, 2012

Date Received : June 28, 2012
Description : PF29 Cuttings

Sample ID : PF29-CUT2-062712

Collected By : Chris Bak
Collection Date : 06/27/12 10:43

ESC Sample # : L583946-01

Site ID : PF29

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzo(g,h,i)perylene	BDL	0.0060	mg/kg	8270C-SIM	07/12/12	1
Benzo(k)fluoranthene	BDL	0.0060	mg/kg	8270C-SIM	07/12/12	1
Chrysene	0.011	0.0060	mg/kg	8270C-SIM	07/12/12	1
Dibenz(a,h)anthracene	BDL	0.0060	mg/kg	8270C-SIM	07/12/12	1
Fluoranthene	BDL	0.0060	mg/kg	8270C-SIM	07/12/12	1
Fluorene	0.027	0.0060	mg/kg	8270C-SIM	07/12/12	1
Indeno(1,2,3-cd)pyrene	BDL	0.0060	mg/kg	8270C-SIM	07/12/12	1
Naphthalene	0.12	0.0060	mg/kg	8270C-SIM	07/12/12	1
Phenanthrene	0.059	0.0060	mg/kg	8270C-SIM	07/12/12	1
Pyrene	0.0084	0.0060	mg/kg	8270C-SIM	07/12/12	1
1-Methylnaphthalene	0.090	0.0060	mg/kg	8270C-SIM	07/12/12	1
2-Methylnaphthalene	0.28	0.0060	mg/kg	8270C-SIM	07/12/12	1
2-Chloronaphthalene	BDL	0.0060	mg/kg	8270C-SIM	07/12/12	1
Surrogate Recovery						
Nitrobenzene-d5	92.2		% Rec.	8270C-SIM	07/12/12	1
2-Fluorobiphenyl	74.0		% Rec.	8270C-SIM	07/12/12	1
p-Terphenyl-d14	54.6		% Rec.	8270C-SIM	07/12/12	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

The reported analytical results relate only to the sample submitted.

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Reported: 07/13/12 17:52 Printed: 07/13/12 17:52
L583946-01 (PH) - 8.7@20.4c

REPORT OF ANALYSIS

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

July 13, 2012

Date Received : June 28, 2012
Description : PF29 Cuttings

Sample ID : PF29-CUT3-062712

Collected By : Chris Bak
Collection Date : 06/27/12 10:54

ESC Sample # : L583946-02

Site ID : PF29

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Chromium, Hexavalent	BDL	2.0	mg/kg	3060A/7196A	07/12/12	1
Chromium, Trivalent	11.	2.0	mg/kg	Calc.	07/12/12	1
ORP	74.		mV	2580	07/12/12	1
pH	8.8		su	9045D	07/11/12	1
Sodium Adsorption Ratio	28.			Calc.	07/13/12	1
Specific Conductance	2500		umhos/cm	9050AMod	07/11/12	1
Mercury	BDL	0.020	mg/kg	7471	07/10/12	1
Barium	5400	0.50	mg/kg	6010B	07/12/12	2
Cadmium	BDL	0.25	mg/kg	6010B	07/12/12	1
Chromium	11.	0.50	mg/kg	6010B	07/12/12	1
Copper	19.	1.0	mg/kg	6010B	07/12/12	1
Lead	9.5	0.25	mg/kg	6010B	07/12/12	1
Nickel	8.1	1.0	mg/kg	6010B	07/12/12	1
Selenium	BDL	10.	mg/kg	6010B	07/12/12	10
Silver	BDL	0.50	mg/kg	6010B	07/12/12	1
Zinc	40.	1.5	mg/kg	6010B	07/12/12	1
Benzene	0.0034	0.0025	mg/kg	8021/8015	07/10/12	5
Toluene	BDL	0.025	mg/kg	8021/8015	07/10/12	5
Ethylbenzene	BDL	0.0025	mg/kg	8021/8015	07/10/12	5
Total Xylene	BDL	0.0075	mg/kg	8021/8015	07/10/12	5
TPH (GC/FID) Low Fraction	BDL	0.50	mg/kg	GRO	07/10/12	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	82.9		% Rec.	8021/8015	07/10/12	5
a,a,a-Trifluorotoluene(PID)	89.9		% Rec.	8021/8015	07/10/12	5
TPH (GC/FID) High Fraction	470	8.0	mg/kg	3546/DRO	07/10/12	2
Surrogate recovery(%)						
o-Terphenyl	125.		% Rec.	3546/DRO	07/10/12	2
Polynuclear Aromatic Hydrocarbons						
Anthracene	BDL	0.0060	mg/kg	8270C-SIM	07/12/12	1
Acenaphthene	BDL	0.0060	mg/kg	8270C-SIM	07/12/12	1
Acenaphthylene	0.018	0.0060	mg/kg	8270C-SIM	07/12/12	1
Benzo(a)anthracene	0.014	0.0060	mg/kg	8270C-SIM	07/12/12	1
Benzo(a)pyrene	BDL	0.0060	mg/kg	8270C-SIM	07/12/12	1
Benzo(b)fluoranthene	BDL	0.0060	mg/kg	8270C-SIM	07/12/12	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
L583946-02 (PH) - 8.8@20.5c

REPORT OF ANALYSIS

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

July 13, 2012

Date Received : June 28, 2012
Description : PF29 Cuttings

Sample ID : PF29-CUT3-062712

Collected By : Chris Bak
Collection Date : 06/27/12 10:54

ESC Sample # : L583946-02

Site ID : PF29

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzo(g,h,i)perylene	BDL	0.0060	mg/kg	8270C-SIM	07/12/12	1
Benzo(k)fluoranthene	BDL	0.0060	mg/kg	8270C-SIM	07/12/12	1
Chrysene	0.015	0.0060	mg/kg	8270C-SIM	07/12/12	1
Dibenz(a,h)anthracene	BDL	0.0060	mg/kg	8270C-SIM	07/12/12	1
Fluoranthene	0.0068	0.0060	mg/kg	8270C-SIM	07/12/12	1
Fluorene	0.023	0.0060	mg/kg	8270C-SIM	07/12/12	1
Indeno(1,2,3-cd)pyrene	BDL	0.0060	mg/kg	8270C-SIM	07/12/12	1
Naphthalene	0.10	0.0060	mg/kg	8270C-SIM	07/12/12	1
Phenanthrene	0.050	0.0060	mg/kg	8270C-SIM	07/12/12	1
Pyrene	0.0062	0.0060	mg/kg	8270C-SIM	07/12/12	1
1-Methylnaphthalene	0.079	0.0060	mg/kg	8270C-SIM	07/12/12	1
2-Methylnaphthalene	0.24	0.0060	mg/kg	8270C-SIM	07/12/12	1
2-Chloronaphthalene	BDL	0.0060	mg/kg	8270C-SIM	07/12/12	1
Surrogate Recovery						
Nitrobenzene-d5	100.		% Rec.	8270C-SIM	07/12/12	1
2-Fluorobiphenyl	77.4		% Rec.	8270C-SIM	07/12/12	1
p-Terphenyl-d14	46.3		% Rec.	8270C-SIM	07/12/12	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

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Reported: 07/13/12 17:52 Printed: 07/13/12 17:53

L583946-02 (PH) - 8.8@20.5c

Attachment A
List of Analytes with QC Qualifiers

Sample Number	Work Group	Sample Type	Analyte	Run ID	Qualifier
L583946-01	WG601889	SAMP	Selenium	R2252474	O
	WG601843	SAMP	Benzo(b)fluoranthene	R2252853	J3
	WG601843	SAMP	Benzo(g,h,i)perylene	R2252853	J3
	WG601843	SAMP	Dibenz(a,h)anthracene	R2252853	J3
	WG601843	SAMP	Indeno(1,2,3-cd)pyrene	R2252853	J3
	WG601961	SAMP	pH	R2251053	T8
L583946-02	WG601889	SAMP	Selenium	R2252474	O
	WG601843	SAMP	Benzo(b)fluoranthene	R2252853	J3
	WG601843	SAMP	Benzo(g,h,i)perylene	R2252853	J3
	WG601843	SAMP	Dibenz(a,h)anthracene	R2252853	J3
	WG601843	SAMP	Indeno(1,2,3-cd)pyrene	R2252853	J3
	WG601961	SAMP	pH	R2251053	T8

Attachment B
Explanation of QC Qualifier Codes

Qualifier	Meaning
J3	The associated batch QC was outside the established quality control range for precision.
O	(ESC) Sample diluted due to matrix interferences that impaired the ability to make an accurate analytical determination. The detection limit is elevated in order to reflect the necessary dilution.
T8	(ESC) - Additional method/sample information: Sample(s) received past/too close to holding time expiration.

Qualifier Report Information

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

Definitions

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

Summary of Remarks For Samples Printed
07/13/12 at 17:53:02

TSR Signing Reports: 358
R4 - Rush: Three Day

Try not to report benzene as BDL above a 250x dilution. ONLY log soil samples under this account. Waters get logged under ENCRCO. Log all PAHs as PAHSIM.

Sample: L583946-01 Account: ENCANACO Received: 06/28/12 09:00 Due Date: 07/13/12 00:00 RPT Date: 07/13/12 17:52
Relogged from L582510-02
Sample: L583946-02 Account: ENCANACO Received: 06/28/12 09:00 Due Date: 07/13/12 00:00 RPT Date: 07/13/12 17:52
Relogged from L582510-03



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Quality Assurance Report
Level II

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(615) 758-5858
1-800-767-5859
Fax (615) 758-5859

Tax I.D. 62-0814289

Est. 1970

July 13, 2012

Analyte	Result	Laboratory Blank		Limit	Batch	Date Analyzed
		Units	% Rec			
TPH (GC/FID) High Fraction	< 4	ppm			WG601845	07/10/12 14:47
o-Terphenyl		% Rec.	92.79	50-150	WG601845	07/10/12 14:47
Benzene	< .0005	mg/kg			WG601858	07/10/12 17:06
Ethylbenzene	< .0005	mg/kg			WG601858	07/10/12 17:06
Toluene	< .005	mg/kg			WG601858	07/10/12 17:06
TPH (GC/FID) Low Fraction	< .1	mg/kg			WG601858	07/10/12 17:06
Total Xylene	< .0015	mg/kg			WG601858	07/10/12 17:06
a,a,a-Trifluorotoluene(FID)		% Rec.	83.58	59-128	WG601858	07/10/12 17:06
a,a,a-Trifluorotoluene(PID)		% Rec.	91.17	54-144	WG601858	07/10/12 17:06
Mercury	< .02	mg/kg			WG601513	07/10/12 17:24
Specific Conductance	1.42	umhos/cm			WG602109	07/11/12 19:00
pH	5.83	su			WG601961	07/11/12 16:30
Barium	< .25	mg/kg			WG601889	07/12/12 10:45
Cadmium	< .25	mg/kg			WG601889	07/12/12 10:45
Chromium	< .5	mg/kg			WG601889	07/12/12 10:45
Copper	< 1	mg/kg			WG601889	07/12/12 10:45
Lead	< .25	mg/kg			WG601889	07/12/12 10:45
Nickel	< 1	mg/kg			WG601889	07/12/12 10:45
Selenium	< 1	mg/kg			WG601889	07/12/12 10:45
Silver	< .5	mg/kg			WG601889	07/12/12 10:45
Zinc	< 1.5	mg/kg			WG601889	07/12/12 10:45
Chromium,Hexavalent	< 2	mg/kg			WG601761	07/12/12 12:12
1-Methylnaphthalene	< .006	mg/kg			WG601843	07/12/12 16:43
2-Chloronaphthalene	< .006	mg/kg			WG601843	07/12/12 16:43
2-Methylnaphthalene	< .006	mg/kg			WG601843	07/12/12 16:43
Acenaphthene	< .006	mg/kg			WG601843	07/12/12 16:43
Acenaphthylene	< .006	mg/kg			WG601843	07/12/12 16:43
Anthracene	< .006	mg/kg			WG601843	07/12/12 16:43
Benzo(a)anthracene	< .006	mg/kg			WG601843	07/12/12 16:43
Benzo(a)pyrene	< .006	mg/kg			WG601843	07/12/12 16:43
Benzo(b)fluoranthene	< .006	mg/kg			WG601843	07/12/12 16:43
Benzo(g,h,i)perylene	< .006	mg/kg			WG601843	07/12/12 16:43
Benzo(k)fluoranthene	< .006	mg/kg			WG601843	07/12/12 16:43
Chrysene	< .006	mg/kg			WG601843	07/12/12 16:43
Dibenz(a,h)anthracene	< .006	mg/kg			WG601843	07/12/12 16:43
Fluoranthene	< .006	mg/kg			WG601843	07/12/12 16:43
Fluorene	< .006	mg/kg			WG601843	07/12/12 16:43
Indeno(1,2,3-cd)pyrene	< .006	mg/kg			WG601843	07/12/12 16:43
Naphthalene	< .006	mg/kg			WG601843	07/12/12 16:43
Phenanthrene	< .006	mg/kg			WG601843	07/12/12 16:43
Pyrene	< .006	mg/kg			WG601843	07/12/12 16:43
2-Fluorobiphenyl		% Rec.	86.97	34-129	WG601843	07/12/12 16:43
Nitrobenzene-d5		% Rec.	80.78	14-141	WG601843	07/12/12 16:43
p-Terphenyl-d14		% Rec.	97.15	25-139	WG601843	07/12/12 16:43

* Performance of this Analyte is outside of established criteria.

For additional information, please see Attachment A 'List of Analytes with QC Qualifiers.'



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Est. 1970

July 13, 2012

Analyte	Units	Duplicate		RPD	Limit	Ref Samp	Batch
		Result	Duplicate				
Mercury	mg/kg	0	0	0	20	L583835-02	WG601513
Specific Conductance	umhos/cm	990.	880.	11.5	20	L583652-34	WG602109
Specific Conductance	umhos/cm	2400	2500	4.50	20	L583946-02	WG602109
pH	su	6.10	6.00	1.16*	1	L583686-01	WG601961
pH	su	8.10	8.10	0.247	1	L584000-06	WG601961
Selenium	mg/kg	0	0	0	20	L583880-02	WG601889
Barium	mg/kg	34.0	34.0	0.294	20	L583880-02	WG601889
Cadmium	mg/kg	0	0	0	20	L583880-02	WG601889
Chromium	mg/kg	55.0	52.0	6.15	20	L583880-02	WG601889
Copper	mg/kg	3.10	2.84	7.46	20	L583880-02	WG601889
Lead	mg/kg	10.0	10.0	4.88	20	L583880-02	WG601889
Nickel	mg/kg	8.50	6.68	24.1*	20	L583880-02	WG601889
Silver	mg/kg	0	0	0	20	L583880-02	WG601889
Zinc	mg/kg	26.0	25.4	3.48	20	L583880-02	WG601889
Chromium,Hexavalent	mg/kg	0	0	0	20	L583835-03	WG601761
ORP	mV	160.	170.	4.20	20	L583649-06	WG601963
ORP	mV	250.	240.	3.68	20	L584053-03	WG601963

Analyte	Units	Laboratory Control Sample		% Rec	Limit	Batch
		Known Val	Result			
TPH (GC/FID) High Fraction	ppm	60	55.5	92.6	50-150	WG601845
o-Terphenyl				93.22	50-150	WG601845
Benzene	mg/kg	.05	0.0506	101.	76-113	WG601858
Ethylbenzene	mg/kg	.05	0.0507	101.	78-115	WG601858
Toluene	mg/kg	.05	0.0498	99.6	76-114	WG601858
Total Xylene	mg/kg	.15	0.156	104.	81-118	WG601858
a,a,a-Trifluorotoluene(PID)				90.75	54-144	WG601858
TPH (GC/FID) Low Fraction	mg/kg	5.5	5.19	94.3	67-135	WG601858
a,a,a-Trifluorotoluene(FID)				90.53	59-128	WG601858
Mercury	mg/kg	12.4	15.6	126.	71.6-128	WG601513
Specific Conductance	umhos/cm	495	506.	102.	85-115	WG602109
pH	su	5.7	5.80	102.*	98-101	WG601961
Barium	mg/kg	252	278.	110.	84.1-116	WG601889
Cadmium	mg/kg	191	188.	98.4	83.2-117	WG601889
Chromium	mg/kg	128	134.	105.	81.3-118	WG601889
Copper	mg/kg	123	125.	102.	83.7-116	WG601889
Lead	mg/kg	103	102.	99.0	83.1-117	WG601889
Nickel	mg/kg	118	111.	94.1	82-118	WG601889
Selenium	mg/kg	110	95.8	87.1	78.7-122	WG601889

* Performance of this Analyte is outside of established criteria.

For additional information, please see Attachment A 'List of Analytes with QC Qualifiers.'



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Analyte	Units	Laboratory Control Sample		% Rec	Limit	Batch
		Known Val	Result			
Silver	mg/kg	47.3	46.3	97.9	66.2-134	WG601889
Zinc	mg/kg	183	180.	98.4	82-118	WG601889
Chromium, Hexavalent	mg/kg	150	143.	95.3	50-150	WG601761
ORP	mV	228	225.	98.7	95.6-104.	WG601963
1-Methylnaphthalene	mg/kg	.033	0.0265	80.2	48-113	WG601843
2-Chloronaphthalene	mg/kg	.033	0.0287	87.1	51-114	WG601843
2-Methylnaphthalene	mg/kg	.033	0.0256	77.7	44-109	WG601843
Acenaphthene	mg/kg	.033	0.0284	86.1	52-108	WG601843
Acenaphthylene	mg/kg	.033	0.0283	85.7	51-110	WG601843
Anthracene	mg/kg	.033	0.0309	93.7	58-120	WG601843
Benzo(a)anthracene	mg/kg	.033	0.0337	102.	54-110	WG601843
Benzo(a)pyrene	mg/kg	.033	0.0290	87.8	56-118	WG601843
Benzo(b)fluoranthene	mg/kg	.033	0.0276	83.6	55-114	WG601843
Benzo(g,h,i)perylene	mg/kg	.033	0.0303	91.7	48-130	WG601843
Benzo(k)fluoranthene	mg/kg	.033	0.0292	88.6	55-122	WG601843
Chrysene	mg/kg	.033	0.0323	98.0	57-118	WG601843
Dibenz(a,h)anthracene	mg/kg	.033	0.0298	90.4	53-122	WG601843
Fluoranthene	mg/kg	.033	0.0309	93.7	58-118	WG601843
Fluorene	mg/kg	.033	0.0298	90.2	54-109	WG601843
Indeno(1,2,3-cd)pyrene	mg/kg	.033	0.0295	89.3	51-125	WG601843
Naphthalene	mg/kg	.033	0.0267	80.8	45-105	WG601843
Phenanthrene	mg/kg	.033	0.0296	89.7	53-114	WG601843
Pyrene	mg/kg	.033	0.0301	91.1	53-121	WG601843
2-Fluorobiphenyl				82.98	34-129	WG601843
Nitrobenzene-d5				75.08	14-141	WG601843
p-Terphenyl-d14				86.10	25-139	WG601843

Analyte	Units	Laboratory Control Sample Duplicate			Limit	RPD	Limit	Batch
		Result	Ref	%Rec				
TPH (GC/FID) High Fraction	ppm	54.2	55.5	90.0	50-150	2.34	25	WG601845
o-Terphenyl				90.60	50-150			WG601845
Benzene	mg/kg	0.0497	0.0506	99.0	76-113	1.92	20	WG601858
Ethylbenzene	mg/kg	0.0495	0.0507	99.0	78-115	2.50	20	WG601858
Toluene	mg/kg	0.0483	0.0498	96.0	76-114	3.08	20	WG601858
Total Xylene	mg/kg	0.152	0.156	101.	81-118	2.88	20	WG601858
a,a,a-Trifluorotoluene(PID)				90.57	54-144			WG601858
TPH (GC/FID) Low Fraction	mg/kg	5.14	5.19	93.0	67-135	0.930	20	WG601858
a,a,a-Trifluorotoluene(FID)				90.14	59-128			WG601858
Specific Conductance	umhos/	504.	506.	102.	85-115	0.396	20	WG602109
pH	su	5.80	5.80	102*	98-101	0	20	WG601961
Chromium, Hexavalent	mg/kg	133.	143.	89.0	50-150	7.25	20	WG601761
ORP	mV	223.	225.	98.0	95.6-104.	0.893	20	WG601963

* Performance of this Analyte is outside of established criteria.

For additional information, please see Attachment A 'List of Analytes with QC Qualifiers.'



YOUR LAB OF CHOICE

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Chris Hines / Matt Kasten
2717 County Road 215, Suite 100

Parachute, CO 81635

Quality Assurance Report
Level II

L583946

12065 Lebanon Rd.
Mt. Juliet, TN 37122
(615) 758-5858
1-800-767-5859
Fax (615) 758-5859

Tax I.D. 62-0814289

Est. 1970

July 13, 2012

Analyte	Units	Laboratory Control		Sample Duplicate		Limit	RPD	Limit	Batch
		Result	Ref	%Rec					
1-Methylnaphthalene	mg/kg	0.0302	0.0265	91.0		48-113	13.1	24	WG601843
2-Chloronaphthalene	mg/kg	0.0304	0.0287	92.0		51-114	5.63	24	WG601843
2-Methylnaphthalene	mg/kg	0.0286	0.0256	87.0		44-109	11.1	24	WG601843
Acenaphthene	mg/kg	0.0308	0.0284	93.0		52-108	8.02	22	WG601843
Acenaphthylene	mg/kg	0.0306	0.0283	93.0		51-110	7.74	21	WG601843
Anthracene	mg/kg	0.0327	0.0309	99.0		58-120	5.48	20	WG601843
Benzo(a)anthracene	mg/kg	0.0349	0.0337	106.		54-110	3.54	22	WG601843
Benzo(a)pyrene	mg/kg	0.0356	0.0290	108.		56-118	20.5	21	WG601843
Benzo(b)fluoranthene	mg/kg	0.0343	0.0276	104.		55-114	21.8*	20	WG601843
Benzo(g,h,i)perylene	mg/kg	0.0383	0.0303	116.		48-130	23.5*	20	WG601843
Benzo(k)fluoranthene	mg/kg	0.0363	0.0292	110.		55-122	21.6	25	WG601843
Chrysene	mg/kg	0.0339	0.0323	103.		57-118	4.65	20	WG601843
Dibenz(a,h)anthracene	mg/kg	0.0373	0.0298	113.		53-122	22.3*	20	WG601843
Fluoranthene	mg/kg	0.0310	0.0309	94.0		58-118	0.385	20	WG601843
Fluorene	mg/kg	0.0317	0.0298	96.0		54-109	6.41	20	WG601843
Indeno(1,2,3-cd)pyrene	mg/kg	0.0368	0.0295	112.		51-125	22.2*	21	WG601843
Naphthalene	mg/kg	0.0287	0.0267	87.0		45-105	7.30	24	WG601843
Phenanthrene	mg/kg	0.0314	0.0296	95.0		53-114	5.87	20	WG601843
Pyrene	mg/kg	0.0309	0.0301	93.0		53-121	2.54	20	WG601843
2-Fluorobiphenyl				89.71		34-129			WG601843
Nitrobenzene-d5				83.63		14-141			WG601843
p-Terphenyl-d14				88.62		25-139			WG601843

Analyte	Units	Matrix Spike			% Rec	Limit	Ref Samp	Batch
		MS Res	Ref Res	TV				
Benzene	mg/kg	0.216	0	.05	86.4	32-137	L583946-01	WG601858
Ethylbenzene	mg/kg	0.214	0	.05	85.8	10-150	L583946-01	WG601858
Toluene	mg/kg	0.217	0	.05	86.8	20-142	L583946-01	WG601858
Total Xylene	mg/kg	0.675	0	.15	90.0	16-141	L583946-01	WG601858
a,a,a-Trifluorotoluene(PID)					89.87	54-144		WG601858
TPH (GC/FID) Low Fraction	mg/kg	20.3	0	5.5	73.8	55-109	L583946-01	WG601858
a,a,a-Trifluorotoluene(FID)					87.24	59-128		WG601858
TPH (GC/FID) High Fraction	ppm	48.6	0.802	60	79.6	50-150	L583867-02	WG601845
o-Terphenyl					77.81	50-150		WG601845
Mercury	mg/kg	0.280	0	.25	112.	80-120	L583835-02	WG601513
Barium	mg/kg	84.6	34.0	50	101.	75-125	L583880-02	WG601889
Cadmium	mg/kg	49.5	0	50	99.0	75-125	L583880-02	WG601889
Chromium	mg/kg	106.	52.0	50	108.	75-125	L583880-02	WG601889
Copper	mg/kg	53.1	2.84	50	100.	75-125	L583880-02	WG601889
Lead	mg/kg	58.8	10.0	50	97.6	75-125	L583880-02	WG601889
Nickel	mg/kg	54.5	6.68	50	95.6	75-125	L583880-02	WG601889
Silver	mg/kg	46.8	0	50	93.6	75-125	L583880-02	WG601889
Zinc	mg/kg	77.6	25.4	50	104.	75-125	L583880-02	WG601889
Selenium	mg/kg	21.2	0	2.5	42.4*	75-125	L583880-02	WG601889
Chromium, Hexavalent	mg/kg	13.2	0	20	66.0	50-150	L583835-01	WG601761
1-Methylnaphthalene	mg/kg	0.0314	0	.033	95.2	25-155	L583879-01	WG601843
2-Chloronaphthalene	mg/kg	0.0334	0	.033	101.	31-153	L583879-01	WG601843
2-Methylnaphthalene	mg/kg	0.0307	0	.033	92.9	22-172	L583879-01	WG601843

* Performance of this Analyte is outside of established criteria.

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July 13, 2012

Analyte	Units	MS Res	Matrix Spike		% Rec	Limit	Ref Samp	Batch
			Ref Res	TV				
Acenaphthene	mg/kg	0.0334	0	.033	101.	43-133	L583879-01	WG601843
Acenaphthylene	mg/kg	0.0342	0	.033	104.	42-146	L583879-01	WG601843
Anthracene	mg/kg	0.0348	0	.033	105.	38-153	L583879-01	WG601843
Benzo(a)anthracene	mg/kg	0.0365	0	.033	110.	31-142	L583879-01	WG601843
Benzo(a)pyrene	mg/kg	0.0337	0	.033	102.	26-152	L583879-01	WG601843
Benzo(b)fluoranthene	mg/kg	0.0350	0	.033	106.	10-188	L583879-01	WG601843
Benzo(g,h,i)perylene	mg/kg	0.0293	0	.033	88.9	10-176	L583879-01	WG601843
Benzo(k)fluoranthene	mg/kg	0.0332	0	.033	101.	22-163	L583879-01	WG601843
Chrysene	mg/kg	0.0348	0	.033	106.	26-146	L583879-01	WG601843
Dibenz(a,h)anthracene	mg/kg	0.0307	0	.033	93.1	10-160	L583879-01	WG601843
Fluoranthene	mg/kg	0.0358	0	.033	109.	23-160	L583879-01	WG601843
Fluorene	mg/kg	0.0331	0	.033	100.	44-143	L583879-01	WG601843
Indeno(1,2,3-cd)pyrene	mg/kg	0.0300	0	.033	90.9	10-157	L583879-01	WG601843
Naphthalene	mg/kg	0.0308	0	.033	93.3	22-156	L583879-01	WG601843
Phenanthrene	mg/kg	0.0340	0	.033	103.	23-164	L583879-01	WG601843
Pyrene	mg/kg	0.0348	0	.033	106.	12-170	L583879-01	WG601843
2-Fluorobiphenyl					99.12	34-129		WG601843
Nitrobenzene-d5					92.88	14-141		WG601843
p-Terphenyl-d14					94.09	25-139		WG601843

Analyte	Units	MSD	Matrix Spike Duplicate		Limit	RPD	Limit	Ref Samp	Batch
			Ref	%Rec					
Benzene	mg/kg	0.242	0.216	97.0	32-137	11.5	39	L583946-01	WG601858
Ethylbenzene	mg/kg	0.228	0.214	91.1	10-150	6.00	44	L583946-01	WG601858
Toluene	mg/kg	0.234	0.217	93.4	20-142	7.36	42	L583946-01	WG601858
Total Xylene	mg/kg	0.705	0.675	94.0	16-141	4.30	46	L583946-01	WG601858
a,a,a-Trifluorotoluene(PID)				89.55	54-144				WG601858
TPH (GC/FID) Low Fraction	mg/kg	20.6	20.3	74.8	55-109	1.44	20	L583946-01	WG601858
a,a,a-Trifluorotoluene(FID)				87.52	59-128				WG601858
TPH (GC/FID) High Fraction	ppm	51.5	48.6	84.4	50-150	5.77	25	L583867-02	WG601845
o-Terphenyl				79.25	50-150				WG601845
Mercury	mg/kg	0.289	0.280	116.	80-120	3.16	20	L583835-02	WG601513
Barium	mg/kg	85.5	84.6	103.	75-125	1.06	20	L583880-02	WG601889
Cadmium	mg/kg	50.4	49.5	101.	75-125	1.80	20	L583880-02	WG601889
Chromium	mg/kg	105.	106.	106.	75-125	0.948	20	L583880-02	WG601889
Copper	mg/kg	54.3	53.1	103.	75-125	2.23	20	L583880-02	WG601889
Lead	mg/kg	59.4	58.8	98.8	75-125	1.02	20	L583880-02	WG601889
Nickel	mg/kg	54.4	54.5	95.4	75-125	0.184	20	L583880-02	WG601889
Silver	mg/kg	47.6	46.8	95.2	75-125	1.69	20	L583880-02	WG601889
Zinc	mg/kg	77.6	77.6	104.	75-125	0	20	L583880-02	WG601889
Selenium	mg/kg	12.6	21.2	25.2*	75-125	50.9*	20	L583880-02	WG601889
Chromium,Hexavalent	mg/kg	12.4	13.2	62.0	50-150	6.25	20	L583835-01	WG601761
1-Methylnaphthalene	mg/kg	0.0320	0.0314	96.8	25-155	1.69	27	L583879-01	WG601843
2-Chloronaphthalene	mg/kg	0.0323	0.0334	97.8	31-153	3.34	22	L583879-01	WG601843
2-Methylnaphthalene	mg/kg	0.0306	0.0307	92.6	22-172	0.352	29	L583879-01	WG601843
Acenaphthene	mg/kg	0.0324	0.0334	98.2	43-133	3.15	26	L583879-01	WG601843
Acenaphthylene	mg/kg	0.0327	0.0342	98.9	42-146	4.56	22	L583879-01	WG601843
Anthracene	mg/kg	0.0344	0.0348	104.	38-153	0.971	27	L583879-01	WG601843

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July 13, 2012

Analyte	Units	MSD	Matrix Spike	Duplicate	Limit	RPD	Limit	Ref	Samp	Batch
			Ref	%Rec						
Benzo(a)anthracene	mg/kg	0.0356	0.0365	108.	31-142	2.51	31	L583879-01		WG601843
Benzo(a)pyrene	mg/kg	0.0330	0.0337	99.9	26-152	2.22	32	L583879-01		WG601843
Benzo(b)fluoranthene	mg/kg	0.0339	0.0350	103.	10-188	3.36	33	L583879-01		WG601843
Benzo(g,h,i)perylene	mg/kg	0.0330	0.0293	99.9	10-176	11.7	30	L583879-01		WG601843
Benzo(k)fluoranthene	mg/kg	0.0339	0.0332	103.	22-163	1.91	29	L583879-01		WG601843
Chrysene	mg/kg	0.0344	0.0348	104.	26-146	1.37	30	L583879-01		WG601843
Dibenz(a,h)anthracene	mg/kg	0.0334	0.0307	101.	10-160	8.33	39	L583879-01		WG601843
Fluoranthene	mg/kg	0.0351	0.0358	106.	23-160	1.98	22	L583879-01		WG601843
Fluorene	mg/kg	0.0334	0.0331	101.	44-143	0.849	23	L583879-01		WG601843
Indeno(1,2,3-cd)pyrene	mg/kg	0.0330	0.0300	100.	10-157	9.63	40	L583879-01		WG601843
Naphthalene	mg/kg	0.0315	0.0308	95.4	22-156	2.25	27	L583879-01		WG601843
Phenanthrene	mg/kg	0.0324	0.0340	98.2	23-164	4.70	25	L583879-01		WG601843
Pyrene	mg/kg	0.0356	0.0348	108.	12-170	2.29	24	L583879-01		WG601843
2-Fluorobiphenyl				93.42	34-129					WG601843
Nitrobenzene-d5				89.62	14-141					WG601843
p-Terphenyl-d14				96.70	25-139					WG601843

Batch number /Run number / Sample number cross reference

WG601845: R2247935: L583946-01 02
WG601858: R2248454: L583946-01 02
WG601513: R2248875: L583946-01 02
WG602109: R2250733: L583946-01 02
WG601961: R2251053: L583946-01 02
WG601889: R2252474: L583946-01 02
WG601761: R2252653: L583946-01 02
WG601963: R2252713: L583946-01 02
WG601843: R2252853: L583946-01 02
WG601913: R2254713: L583946-01 02

* * Calculations are performed prior to rounding of reported values.

* Performance of this Analyte is outside of established criteria.

For additional information, please see Attachment A 'List of Analytes with QC Qualifiers.'



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

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

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

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



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

Report Summary

Monday July 09, 2012

Report Number: L582510

Samples Received: 06/28/12

Client Project:

Description: PF29 Cuttings

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

Entire Report Reviewed By:

Jayred Willis , ESC Representative

Laboratory Certification Numbers

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - 01157CA, CT - PH-0197,
FL - E87487, GA - 923, IN - C-TN-01, KY - 90010, KYUST - 0016,
NC - ENV375/DW21704/BIO041, ND - R-140. NJ - TN002, NJ NELAP - TN002,
SC - 84004, TN - 2006, VA - 460132, WV - 233, AZ - 0612,
MN - 047-999-395, NY - 11742, WI - 998093910, NV - TN000032011-1,
TX - T104704245-11-3, OK - 9915, PA - 68-02979

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

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

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REPORT OF ANALYSIS

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

July 09, 2012

Date Received : June 28, 2012
Description : PF29 Cuttings

Sample ID : PF29-CUT1-062712

Collected By : Chris Bak
Collection Date : 06/27/12 10:30

ESC Sample # : L582510-01

Site ID : PF29

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Chromium, Hexavalent	BDL	2.0	mg/kg	3060A/7196A	07/05/12	1
Chromium, Trivalent	13.	2.0	mg/kg	Calc.	07/04/12	1
ORP	-22.		mV	2580	07/02/12	1
pH	9.1		su	9045D	07/02/12	1
Sodium Adsorption Ratio	26.			Calc.	07/04/12	1
Specific Conductance	1800		umhos/cm	9050AMod	07/05/12	1
Mercury	BDL	0.020	mg/kg	7471	06/29/12	1
Arsenic	3.6	1.0	mg/kg	6010B	07/04/12	1
Barium	4600	0.25	mg/kg	6010B	07/04/12	1
Cadmium	BDL	0.25	mg/kg	6010B	07/04/12	1
Chromium	13.	0.50	mg/kg	6010B	07/04/12	1
Copper	17.	1.0	mg/kg	6010B	07/04/12	1
Lead	9.0	0.25	mg/kg	6010B	07/04/12	1
Nickel	9.8	1.0	mg/kg	6010B	07/04/12	1
Selenium	BDL	1.0	mg/kg	6010B	07/04/12	1
Silver	BDL	0.50	mg/kg	6010B	07/04/12	1
Zinc	51.	1.5	mg/kg	6010B	07/04/12	1
Benzene	0.0034	0.0025	mg/kg	8021/8015	06/28/12	5
Toluene	BDL	0.025	mg/kg	8021/8015	06/28/12	5
Ethylbenzene	BDL	0.0025	mg/kg	8021/8015	06/28/12	5
Total Xylene	BDL	0.0075	mg/kg	8021/8015	06/28/12	5
TPH (GC/FID) Low Fraction	0.65	0.50	mg/kg	GRO	06/28/12	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	96.6		% Rec.	8021/8015	06/28/12	5
a,a,a-Trifluorotoluene(PID)	104.		% Rec.	8021/8015	06/28/12	5
TPH (GC/FID) High Fraction	300	20.	mg/kg	3546/DRO	07/06/12	5
Surrogate recovery(%)						
o-Terphenyl	63.1		% Rec.	3546/DRO	07/06/12	5
Polynuclear Aromatic Hydrocarbons						
Anthracene	0.016	0.0060	mg/kg	8270C-SIM	07/04/12	1
Acenaphthene	0.013	0.0060	mg/kg	8270C-SIM	07/04/12	1
Acenaphthylene	BDL	0.0060	mg/kg	8270C-SIM	07/04/12	1
Benzo(a)anthracene	0.0064	0.0060	mg/kg	8270C-SIM	07/04/12	1
Benzo(a)pyrene	0.013	0.0060	mg/kg	8270C-SIM	07/04/12	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
L582510-01 (PH) - 9.1@15.9c



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REPORT OF ANALYSIS

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

July 09, 2012

Date Received : June 28, 2012
Description : PF29 Cuttings

Sample ID : PF29-CUT1-062712

Collected By : Chris Bak
Collection Date : 06/27/12 10:30

ESC Sample # : L582510-01

Site ID : PF29

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzo(b)fluoranthene	0.010	0.0060	mg/kg	8270C-SIM	07/04/12	1
Benzo(g,h,i)perylene	BDL	0.0060	mg/kg	8270C-SIM	07/04/12	1
Benzo(k)fluoranthene	BDL	0.0060	mg/kg	8270C-SIM	07/04/12	1
Chrysene	0.040	0.0060	mg/kg	8270C-SIM	07/04/12	1
Dibenz(a,h)anthracene	BDL	0.0060	mg/kg	8270C-SIM	07/04/12	1
Fluoranthene	0.0061	0.0060	mg/kg	8270C-SIM	07/04/12	1
Fluorene	0.074	0.0060	mg/kg	8270C-SIM	07/04/12	1
Indeno(1,2,3-cd)pyrene	BDL	0.0060	mg/kg	8270C-SIM	07/04/12	1
Naphthalene	0.20	0.0060	mg/kg	8270C-SIM	07/04/12	1
Phenanthrene	0.14	0.0060	mg/kg	8270C-SIM	07/04/12	1
Pyrene	0.016	0.0060	mg/kg	8270C-SIM	07/04/12	1
1-Methylnaphthalene	0.17	0.0060	mg/kg	8270C-SIM	07/04/12	1
2-Methylnaphthalene	0.83	0.12	mg/kg	8270C-SIM	07/05/12	20
2-Chloronaphthalene	BDL	0.0060	mg/kg	8270C-SIM	07/04/12	1
Surrogate Recovery						
Nitrobenzene-d5	130.		% Rec.	8270C-SIM	07/04/12	1
2-Fluorobiphenyl	52.9		% Rec.	8270C-SIM	07/04/12	1
p-Terphenyl-d14	90.4		% Rec.	8270C-SIM	07/04/12	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

The reported analytical results relate only to the sample submitted.

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L582510-01 (PH) - 9.1@15.9c



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Est. 1970

REPORT OF ANALYSIS

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

July 09, 2012

Date Received : June 28, 2012
Description : PF29 Cuttings

Sample ID : PF29-CUT2-062712

Collected By : Chris Bak
Collection Date : 06/27/12 10:43

ESC Sample # : L582510-02

Site ID : PF29

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Arsenic	3.4	1.0	mg/kg	6010B	07/04/12	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

The reported analytical results relate only to the sample submitted.

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REPORT OF ANALYSIS

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

July 09, 2012

Date Received : June 28, 2012
Description : PF29 Cuttings

Sample ID : PF29-CUT3-062712

Collected By : Chris Bak
Collection Date : 06/27/12 10:54

ESC Sample # : L582510-03

Site ID : PF29

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Arsenic	2.8	1.0	mg/kg	6010B	07/04/12	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

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Reported: 07/09/12 14:15 Printed: 07/09/12 15:02

Attachment A
List of Analytes with QC Qualifiers

Sample Number	Work Group	Sample Type	Analyte	Run ID	Qualifier
L582510-01	WG600544	SAMP	pH	R2236074	T8

Attachment B
Explanation of QC Qualifier Codes

Qualifier	Meaning
T8	(ESC) - Additional method/sample information: Sample(s) received past/too close to holding time expiration.

Qualifier Report Information

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

Definitions

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



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Analyte	Result	Laboratory Blank		Limit	Batch	Date Analyzed
		Units	% Rec			
Benzene	< .0005	mg/kg			WG600391	06/28/12 21:50
Ethylbenzene	< .0005	mg/kg			WG600391	06/28/12 21:50
Toluene	< .005	mg/kg			WG600391	06/28/12 21:50
TPH (GC/FID) Low Fraction	< .1	mg/kg			WG600391	06/28/12 21:50
Total Xylene	< .0015	mg/kg			WG600391	06/28/12 21:50
a,a,a-Trifluorotoluene(FID)		% Rec.	98.41	59-128	WG600391	06/28/12 21:50
a,a,a-Trifluorotoluene(PID)		% Rec.	106.5	54-144	WG600391	06/28/12 21:50
Mercury	< .02	mg/kg			WG600384	06/29/12 18:12
pH	4.33	su			WG600544	07/02/12 11:41
Arsenic	< 1	mg/kg			WG600317	07/04/12 17:09
Barium	< .25	mg/kg			WG600317	07/04/12 17:09
Cadmium	< .25	mg/kg			WG600317	07/04/12 17:09
Chromium	< .5	mg/kg			WG600317	07/04/12 17:09
Copper	< 1	mg/kg			WG600317	07/04/12 17:09
Lead	< .25	mg/kg			WG600317	07/04/12 17:09
Nickel	< 1	mg/kg			WG600317	07/04/12 17:09
Selenium	< 1	mg/kg			WG600317	07/04/12 17:09
Silver	< .5	mg/kg			WG600317	07/04/12 17:09
Zinc	< 1.5	mg/kg			WG600317	07/04/12 17:09
TPH (GC/FID) High Fraction	< 4	ppm			WG600658	07/05/12 08:51
o-Terphenyl		% Rec.	80.04	50-150	WG600658	07/05/12 08:51
Chromium,Hexavalent	< 2	mg/kg			WG600812	07/05/12 13:29
Specific Conductance	2.22	umhos/cm			WG601174	07/05/12 14:22
1-Methylnaphthalene	< .006	mg/kg			WG600930	07/04/12 02:51
2-Chloronaphthalene	< .006	mg/kg			WG600930	07/04/12 02:51
2-Methylnaphthalene	< .006	mg/kg			WG600930	07/04/12 02:51
Acenaphthene	< .006	mg/kg			WG600930	07/04/12 02:51
Acenaphthylene	< .006	mg/kg			WG600930	07/04/12 02:51
Anthracene	< .006	mg/kg			WG600930	07/04/12 02:51
Benzo(a)anthracene	< .006	mg/kg			WG600930	07/04/12 02:51
Benzo(a)pyrene	< .006	mg/kg			WG600930	07/04/12 02:51
Benzo(b)fluoranthene	< .006	mg/kg			WG600930	07/04/12 02:51
Benzo(g,h,i)perylene	< .006	mg/kg			WG600930	07/04/12 02:51
Benzo(k)fluoranthene	< .006	mg/kg			WG600930	07/04/12 02:51
Chrysene	< .006	mg/kg			WG600930	07/04/12 02:51
Dibenz(a,h)anthracene	< .006	mg/kg			WG600930	07/04/12 02:51
Fluoranthene	< .006	mg/kg			WG600930	07/04/12 02:51
Fluorene	< .006	mg/kg			WG600930	07/04/12 02:51
Indeno(1,2,3-cd)pyrene	< .006	mg/kg			WG600930	07/04/12 02:51
Naphthalene	< .006	mg/kg			WG600930	07/04/12 02:51
Phenanthrene	< .006	mg/kg			WG600930	07/04/12 02:51
Pyrene	< .006	mg/kg			WG600930	07/04/12 02:51
2-Fluorobiphenyl		% Rec.	72.69	34-129	WG600930	07/04/12 02:51
Nitrobenzene-d5		% Rec.	68.99	14-141	WG600930	07/04/12 02:51
p-Terphenyl-d14		% Rec.	119.3	25-139	WG600930	07/04/12 02:51

* Performance of this Analyte is outside of established criteria.

For additional information, please see Attachment A 'List of Analytes with QC Qualifiers.'



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July 09, 2012

Analyte	Units	Duplicate		RPD	Limit	Ref Samp	Batch
		Result	Duplicate				
Mercury	mg/kg	0.0240	0.0300	21.4*	20	L582406-01	WG600384
pH	su	7.30	7.40	1.22*	1	L582592-01	WG600544
pH	su	9.50	9.50	0.422	1	L582841-07	WG600544
ORP	mV	0	0	0	20	L582385-11	WG600530
ORP	mV	120.	110.	12.8	20	L582876-01	WG600530
Arsenic	mg/kg	3.20	3.30	2.45	20	L582532-14	WG600317
Barium	mg/kg	25.0	27.0	9.30	20	L582532-14	WG600317
Cadmium	mg/kg	0	0	0	20	L582532-14	WG600317
Chromium	mg/kg	6.90	7.30	5.63	20	L582532-14	WG600317
Copper	mg/kg	3.50	3.55	1.42	20	L582532-14	WG600317
Lead	mg/kg	7.20	7.60	5.68	20	L582532-14	WG600317
Nickel	mg/kg	4.00	3.29	18.7	20	L582532-14	WG600317
Selenium	mg/kg	0	0	0	20	L582532-14	WG600317
Silver	mg/kg	0	0	0	20	L582532-14	WG600317
Zinc	mg/kg	8.70	9.60	10.1	20	L582532-14	WG600317
Chromium, Hexavalent	mg/kg	0	0	0	20	L583185-01	WG600812
Chromium, Hexavalent	mg/kg	0	0	0	20	L582841-01	WG600812
Specific Conductance	umhos/cm	1800	1800	0	20	L582510-01	WG601174

Analyte	Units	Laboratory Control Sample		% Rec	Limit	Batch
		Known Val	Result			
Benzene	mg/kg	.05	0.0415	83.0	76-113	WG600391
Ethylbenzene	mg/kg	.05	0.0443	88.7	78-115	WG600391
Toluene	mg/kg	.05	0.0430	85.9	76-114	WG600391
Total Xylene	mg/kg	.15	0.129	86.2	81-118	WG600391
a,a,a-Trifluorotoluene(PID)				103.4	54-144	WG600391
TPH (GC/FID) Low Fraction	mg/kg	5.5	5.51	100.	67-135	WG600391
a,a,a-Trifluorotoluene(FID)				103.8	59-128	WG600391
Mercury	mg/kg	12.4	14.4	116.	71.6-128	WG600384
pH	su	5.7	5.69	99.8	98-101	WG600544
ORP	mV	228	231.	101.	95.6-104.	WG600530
Arsenic	mg/kg	237	232.	97.9	83.1-117	WG600317
Barium	mg/kg	252	259.	103.	84.1-116	WG600317
Cadmium	mg/kg	191	185.	96.9	83.2-117	WG600317
Chromium	mg/kg	128	134.	105.	81.3-118	WG600317
Copper	mg/kg	123	127.	103.	83.7-116	WG600317
Lead	mg/kg	103	102.	99.0	83.1-117	WG600317
Nickel	mg/kg	118	115.	97.5	82-118	WG600317
Selenium	mg/kg	110	106.	96.4	78.7-122	WG600317
Silver	mg/kg	47.3	48.3	102.	66.2-134	WG600317

* Performance of this Analyte is outside of established criteria.

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Analyte	Units	Laboratory Control	Sample	% Rec	Limit	Batch
		Known Val	Result			
Zinc	mg/kg	183	182.	99.5	82-118	WG600317
TPH (GC/FID) High Fraction	ppm	60	47.0	78.3	50-150	WG600658
o-Terphenyl				79.55	50-150	WG600658
Chromium,Hexavalent	mg/kg	150	134.	89.3	50-150	WG600812
Specific Conductance	umhos/cm	495	493.	99.6	85-115	WG601174
1-Methylnaphthalene	mg/kg	.033	0.0222	67.4	48-113	WG600930
2-Chloronaphthalene	mg/kg	.033	0.0222	67.2	51-114	WG600930
2-Methylnaphthalene	mg/kg	.033	0.0244	74.0	44-109	WG600930
Acenaphthene	mg/kg	.033	0.0217	65.9	52-108	WG600930
Acenaphthylene	mg/kg	.033	0.0228	69.0	51-110	WG600930
Anthracene	mg/kg	.033	0.0271	82.3	58-120	WG600930
Benzo(a)anthracene	mg/kg	.033	0.0267	80.8	54-110	WG600930
Benzo(a)pyrene	mg/kg	.033	0.0299	90.6	56-118	WG600930
Benzo(b)fluoranthene	mg/kg	.033	0.0329	99.8	55-114	WG600930
Benzo(g,h,i)perylene	mg/kg	.033	0.0292	88.3	48-130	WG600930
Benzo(k)fluoranthene	mg/kg	.033	0.0245	74.3	55-122	WG600930
Chrysene	mg/kg	.033	0.0261	79.1	57-118	WG600930
Dibenz(a,h)anthracene	mg/kg	.033	0.0322	97.5	53-122	WG600930
Fluoranthene	mg/kg	.033	0.0266	80.7	58-118	WG600930
Fluorene	mg/kg	.033	0.0256	77.5	54-109	WG600930
Indeno(1,2,3-cd)pyrene	mg/kg	.033	0.0314	95.0	51-125	WG600930
Naphthalene	mg/kg	.033	0.0213	64.6	45-105	WG600930
Phenanthrene	mg/kg	.033	0.0262	79.3	53-114	WG600930
Pyrene	mg/kg	.033	0.0256	77.5	53-121	WG600930
2-Fluorobiphenyl				68.33	34-129	WG600930
Nitrobenzene-d5				69.66	14-141	WG600930
p-Terphenyl-d14				114.7	25-139	WG600930

Analyte	Units	Laboratory Control	Sample Duplicate	Limit	RPD	Limit	Batch
		Result	Ref	%Rec			
Benzene	mg/kg	0.0425	0.0415	85.0	76-113	2.41	WG600391
Ethylbenzene	mg/kg	0.0451	0.0443	90.0	78-115	1.78	WG600391
Toluene	mg/kg	0.0435	0.0430	87.0	76-114	1.20	WG600391
Total Xylene	mg/kg	0.131	0.129	88.0	81-118	1.52	WG600391
a,a,a-Trifluorotoluene(PID)				103.6	54-144		WG600391
TPH (GC/FID) Low Fraction	mg/kg	5.45	5.51	99.0	67-135	1.11	WG600391
a,a,a-Trifluorotoluene(FID)				103.8	59-128		WG600391
pH	su	5.67	5.69	99.0	98-101	0.352	WG600544
ORP	mV	230.	231.	101.	95.6-104.	0.434	WG600530
TPH (GC/FID) High Fraction	ppm	47.7	47.0	79.0	50-150	1.45	WG600658
o-Terphenyl				82.18	50-150		WG600658
Chromium,Hexavalent	mg/kg	128.	134.	85.0	50-150	4.58	WG600812

* Performance of this Analyte is outside of established criteria.

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Analyte	Units	Laboratory Control Sample Duplicate			Limit	RPD	Limit	Batch
		Result	Ref	%Rec				
Specific Conductance	umhos/	493.	493.	100.	85-115	0	20	WG601174
1-Methylnaphthalene	mg/kg	0.0236	0.0222	71.0	48-113	5.88	24	WG600930
2-Chloronaphthalene	mg/kg	0.0239	0.0222	72.0	51-114	7.57	24	WG600930
2-Methylnaphthalene	mg/kg	0.0252	0.0244	76.0	44-109	3.27	24	WG600930
Acenaphthene	mg/kg	0.0236	0.0217	72.0	52-108	8.35	22	WG600930
Acenaphthylene	mg/kg	0.0237	0.0228	72.0	51-110	4.05	21	WG600930
Anthracene	mg/kg	0.0267	0.0271	81.0	58-120	1.65	20	WG600930
Benzo(a)anthracene	mg/kg	0.0274	0.0267	83.0	54-110	2.58	22	WG600930
Benzo(a)pyrene	mg/kg	0.0304	0.0299	92.0	56-118	1.57	21	WG600930
Benzo(b)fluoranthene	mg/kg	0.0324	0.0329	98.0	55-114	1.69	20	WG600930
Benzo(g,h,i)perylene	mg/kg	0.0305	0.0292	92.0	48-130	4.44	20	WG600930
Benzo(k)fluoranthene	mg/kg	0.0267	0.0245	81.0	55-122	8.56	25	WG600930
Chrysene	mg/kg	0.0266	0.0261	81.0	57-118	1.91	20	WG600930
Dibenz(a,h)anthracene	mg/kg	0.0339	0.0322	103.	53-122	5.34	20	WG600930
Fluoranthene	mg/kg	0.0266	0.0266	81.0	58-118	0.0252	20	WG600930
Fluorene	mg/kg	0.0269	0.0256	81.0	54-109	4.82	20	WG600930
Indeno(1,2,3-cd)pyrene	mg/kg	0.0315	0.0314	96.0	51-125	0.515	21	WG600930
Naphthalene	mg/kg	0.0230	0.0213	70.0	45-105	7.43	24	WG600930
Phenanthrene	mg/kg	0.0263	0.0262	80.0	53-114	0.344	20	WG600930
Pyrene	mg/kg	0.0261	0.0256	79.0	53-121	2.10	20	WG600930
2-Fluorobiphenyl				74.29	34-129			WG600930
Nitrobenzene-d5				68.56	14-141			WG600930
p-Terphenyl-d14				115.7	25-139			WG600930

Analyte	Units	Matrix Spike				Limit	Ref Samp	Batch
		MS Res	Ref Res	TV	% Rec			
Benzene	mg/kg	0.170	0.00340	.05	66.8	32-137	L582510-01	WG600391
Ethylbenzene	mg/kg	0.165	0	.05	66.1	10-150	L582510-01	WG600391
Toluene	mg/kg	0.177	0	.05	70.6	20-142	L582510-01	WG600391
Total Xylene	mg/kg	0.493	0	.15	65.7	16-141	L582510-01	WG600391
a,a,a-Trifluorotoluene(PID)					103.2	54-144		WG600391
TPH (GC/FID) Low Fraction	mg/kg	19.7	0.650	5.5	69.2	55-109	L582510-01	WG600391
a,a,a-Trifluorotoluene(FID)					100.9	59-128		WG600391
Mercury	mg/kg	0.325	0.0300	.25	118.	80-120	L582406-01	WG600384
Arsenic	mg/kg	49.0	3.30	50	91.4	75-125	L582532-14	WG600317
Barium	mg/kg	73.6	27.0	50	93.2	75-125	L582532-14	WG600317
Cadmium	mg/kg	48.0	0	50	96.0	75-125	L582532-14	WG600317
Chromium	mg/kg	58.0	7.30	50	101.	75-125	L582532-14	WG600317
Copper	mg/kg	52.4	3.55	50	97.7	75-125	L582532-14	WG600317
Lead	mg/kg	56.4	7.60	50	97.6	75-125	L582532-14	WG600317
Nickel	mg/kg	49.5	3.29	50	92.4	75-125	L582532-14	WG600317
Selenium	mg/kg	43.0	0	50	86.0	75-125	L582532-14	WG600317
Silver	mg/kg	50.1	0	50	100.	75-125	L582532-14	WG600317
Zinc	mg/kg	58.8	9.60	50	98.4	75-125	L582532-14	WG600317
Chromium,Hexavalent	mg/kg	13.2	0	20	66.0	50-150	L582841-03	WG600812
TPH (GC/FID) High Fraction	ppm	37.9	6.00	60	53.1	50-150	L582546-06	WG600658
o-Terphenyl					50.27	50-150		WG600658

* Performance of this Analyte is outside of established criteria.

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Est. 1970

July 09, 2012

Analyte	Units	MSD	Matrix Spike Duplicate		Limit	RPD	Limit	Ref Samp	Batch
			Ref	%Rec					
Benzene	mg/kg	0.183	0.170	71.8	32-137	6.98	39	L582510-01	WG600391
Ethylbenzene	mg/kg	0.165	0.165	66.0	10-150	0.0900	44	L582510-01	WG600391
Toluene	mg/kg	0.182	0.177	72.6	20-142	2.76	42	L582510-01	WG600391
Total Xylene	mg/kg	0.488	0.493	65.1	16-141	0.860	46	L582510-01	WG600391
a,a,a-Trifluorotoluene(PID)	mg/kg	20.6	19.7	103.1	54-144	4.43	20	L582510-01	WG600391
TPH (GC/FID) Low Fraction				72.5	55-109				WG600391
a,a,a-Trifluorotoluene(FID)				101.1	59-128				WG600391
Mercury	mg/kg	0.298	0.325	107.	80-120	8.67	20	L582406-01	WG600384
Arsenic	mg/kg	47.8	49.0	89.0	75-125	2.48	20	L582532-14	WG600317
Barium	mg/kg	74.5	73.6	95.0	75-125	1.22	20	L582532-14	WG600317
Cadmium	mg/kg	48.5	48.0	97.0	75-125	1.04	20	L582532-14	WG600317
Chromium	mg/kg	56.7	58.0	98.8	75-125	2.27	20	L582532-14	WG600317
Copper	mg/kg	53.1	52.4	99.1	75-125	1.33	20	L582532-14	WG600317
Lead	mg/kg	55.4	56.4	95.6	75-125	1.79	20	L582532-14	WG600317
Nickel	mg/kg	48.8	49.5	91.0	75-125	1.42	20	L582532-14	WG600317
Selenium	mg/kg	41.6	43.0	83.2	75-125	3.31	20	L582532-14	WG600317
Silver	mg/kg	49.0	50.1	98.0	75-125	2.22	20	L582532-14	WG600317
Zinc	mg/kg	57.3	58.8	95.4	75-125	2.58	20	L582532-14	WG600317
Chromium,Hexavalent	mg/kg	15.4	13.2	77.0	50-150	15.4	20	L582841-03	WG600812
TPH (GC/FID) High Fraction	ppm	48.5	37.9	70.8	50-150	24.6	40	L582546-06	WG600658
o-Terphenyl				65.57	50-150				WG600658

Batch number /Run number / Sample number cross reference

WG600391: R2233493: L582510-01
WG600384: R2235835: L582510-01
WG600544: R2236074: L582510-01
WG600530: R2236953: L582510-01
WG600644: R2239933: L582510-01
WG600317: R2239935: L582510-01 02 03
WG600658: R2240458: L582510-01
WG600812: R2240773: L582510-01
WG601174: R2241036: L582510-01
WG600930: R2241054: L582510-01

* * Calculations are performed prior to rounding of reported values.

* Performance of this Analyte is outside of established criteria.

For additional information, please see Attachment A 'List of Analytes with QC Qualifiers.'



YOUR LAB OF CHOICE

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

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

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

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