

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
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Document Number:

400481092

Date Received:

09/13/2013

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:	335641
Well/Facility Name:	N PARACHUTE	Well/Facility Number:	WF01B-36A36A596
Location QtrQtr:	NENE	Section:	36
Township:	5S	Range:	96W
Meridian:	6	County:	GARFIELD
Field Name:	GRAND VALLEY	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 _____ Sec _____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	
Twp	Range	Meridian	
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 N PARACHUTE Number WF01B-36A36A596 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 05/28/2013

- | | | |
|--|---|--|
| <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 type="checkbox"/> Other _____ | <input checked="" type="checkbox"/> Status Update/Change of Remediation Plans for Spills and Releases | |

COMMENTS:

Report of work completed, and request for No Further Action (NFA). See attached.

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:

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Best Management Practices

No BMP/COA Type

Description

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Operator Comments:

Attention Carlos Lujan and Chris Canfield.

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: Environmental Field
Coord

Email: chris.hines@encana.com

Date: 9/13/2013

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

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General Comments

User Group

Comment

Comment Date

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Total: 0 comment(s)

Attachment Check List

Att Doc Num

Name

400481092	FORM 4 SUBMITTED
400485159	

Total Attach: 2 Files

REPORT OF WORK COMPLETED

Encana Oil & Gas (USA) Inc. (Encana) is submitting this Sundry Notice (Form 4) as a Report of Work Completed documenting remediation efforts carried out in response to Spill 2232685 on the A36A well pad (Location ID: 335641) in Encana's North Parachute area of operation.

Multiple soil samples were collected within the spill area to characterize impacts. (see attached summary tables and lab reports) Laboratory results identified elevated levels above the allowable limits in COGCC Table 910-1 for Benzene (0.2 and 0.26 ppm), SAR (27), and arsenic (12). These impacts were addressed in the following ways:

- The spill occurred entirely on the pad's working surface, so mitigation efforts for the SAR impacts will be undertaken during pad reclamation.
- The arsenic value is well within the range of background values within the area (). Encana requests that these background values be considered as an alternative limit to the arsenic concentration identified in COGCC Table 910-1.
- In response to the elevated benzene results, fertilizer and water were applied to the impacted area to augment natural attenuation.

Post fertilizer application samples were collected at the locations previously identified with Benzene impacts to confirm attenuation. (see attached)

All samples collected on behalf of Encana's Parachute Field Office are collected and documented in accordance with the Environmental Department's Sampling Procedures. Sample collection and laboratory analysis was conducted in accordance with COGCC Rule 910. Field sampling documentation and laboratory reports not provided with this form are kept on file at the Parachute Field Office and are available upon request.

REQUEST FOR NO FURTHER ACTION

This Sundry Notice is also being submitted to request issuance of a letter of No Further Action (NFA) for incident 2232685. If the information provided is satisfactory, please provide documentation of the closure of this release.

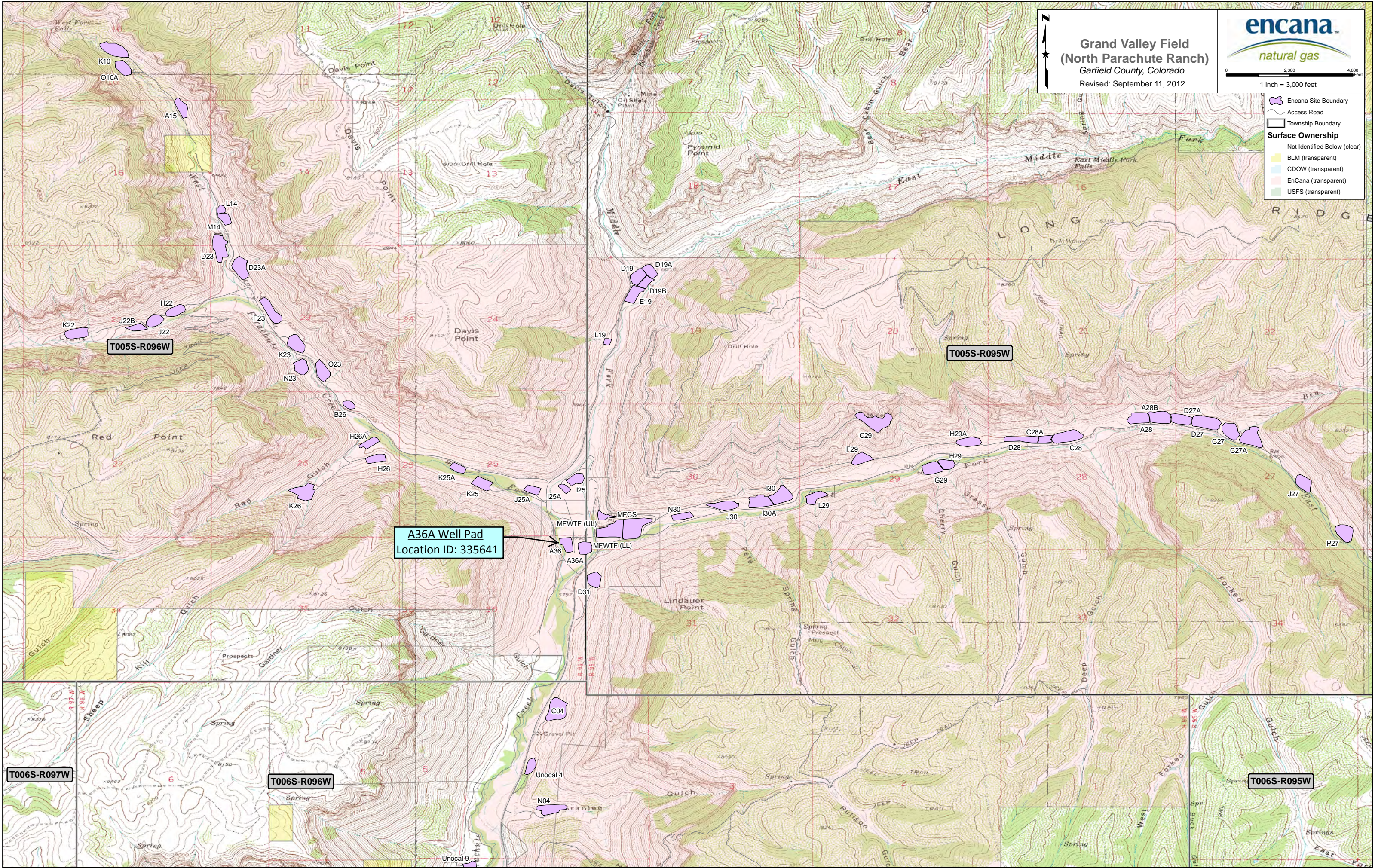
ATTACHMENTS

Topographic Location Map

A36A Site Diagram

Laboratory Results Summary Tables – A36A Spill Impacts and Area Arsenic Backgrounds

Laboratory Reports – Spill Impacts (Background lab reports available upon request)



Access Road

Edge of Working Surface

Point of Release (POR)

Mid

MidE

Spill Extent

E

Edge of Disturbance and Perimeter Controls



A36A (NPR) - 335641
Produced Water Spill (85BBL)
04/03/2013

● Sample Collection Point
1 inch = 83 feet



Laboratory Results Summary Table

9/13/2013

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

Allowable Concentration -->				Organic Compounds in Soil (mg/kg [ppm])																		Inorganics in Soil			Metals in Soil (mg/kg [ppm])																	
Location	Sample Date:	Sample Matrix	Matrix Notes	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				
				TPH (total volatile and extractable petroleum hydrocarbons)	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	Dibenzo(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				
				A36A	04/04/13	Spill	POR characterization (point-of-release)	320	70	250	0.2	1.3	0.23	2.9	0.035	BDL	BDL	0.0064	BDL	BDL	0.0075	BDL	0.025	0.12	BDL	0.14	0.027	3.9	27	8.2	12	2900	BDL	18	BDL	30	24	0.14	14	BDL	BDL	71
				A36A	04/04/13	Spill	Mid characterization - produced water	133	23	110	0.16	0.79	0.11	1.4																												
				A36A	04/04/13	Spill	MidE characterization - produced water	36	36	BDL	0.26	1.1	0.13	1.6																												
				A36A	04/04/13	Spill	E characterization - produced water	22.61	0.61	22	BDL	BDL	0.0089	0.061																												
				A36A	05/28/13	Spill	POR post-treatment (point-of-release - produced water)				BDL	BDL	BDL	BDL																												
				A36A	05/28/13	Spill	MidE post-treatment - produced water				BDL	BDL	BDL	BDL																												

Location	Sample Date:	Sample Matrix	Matrix Notes	Allowable Concentration -->	Metals i
					Arsenic
					0.39
C29	10/11/12	Background	Oil Shale 2		75
C29	10/11/12	Background	Oil Shale 2 rerun		75
C29	10/11/12	Background	Oil Shale 1		66
C29	10/11/12	Background	Oil Shale 1 rerun		66
H15	12/29/11	Background	N		59
Long Ridge	10/11/12	Background	Oil Shale 1		57
Long Ridge	10/11/12	Background	Oil Shale 1 rerun		57
Long Ridge	10/11/12	Background	Oil Shale 2		55
Long Ridge	10/11/12	Background	Oil Shale 2 rerun		55
H15	12/29/11	Background	SE		52
K26	05/31/11	Background	SW		43
A28B	08/12/10	Background	N		39
C29	11/05/09	Background	pulled from NNE side of pad		34.9
C28	10/12/10	Background	NE		34
P25	09/01/11	Background	NE		32
P27	07/07/11	Background	SE		32
L19	08/31/11	Background	NW		31
D27	02/08/12	Background	N2		30
N30	03/24/10	Background			29.1
K22	11/10/10	Background	E		28
RetortPile	11/05/09	Background	man camp pad on retort pile - sa		27.4
H26	11/10/10	Background	SSW		27
K26	05/31/11	Background	W		27
P27	07/07/11	Background	N		27
A15	04/02/13	Background	monitoring well South [40-42']		26
C27A	06/28/10	Background	NE		26
H26A	08/26/11	Background	N		26
P25	09/01/11	Background	E		26
RetortPile	11/05/09	Background	stormwater BMP - sample pulled		25.3
A15	04/02/13	Background	monitoring well South [80-82']		25
C04	04/14/11	Background	N		25
C04	04/14/11	Background	E		25
P27	07/07/11	Background	E		25
K25A	06/29/10	Background	NW background		24.7
C28A	06/28/10	Background			24.2
B26	08/26/11	Background	NNE		24
C28	10/12/10	Background	Nec		24
D23	06/29/10	Background	SW		24
E19	03/26/08	Background			24
H26	11/10/10	Background	S		24
P27	07/07/11	Background	NE		24
C28	10/12/10	Background	E		23
E09	11/02/10	Background	N		23
P25	09/01/11	Background	N		23
D19	07/29/09	Background			22.8
B26	08/26/11	Background	N		22
E09	11/02/10	Background	S		22
L19	08/31/11	Background	W		22
N04	05/13/11	Background	NW		22
K25A	06/29/10	Background	NE background		21.6
I30A	06/15/10	Background	W cut slope		21
C27	11/24/09	Background			20.7
Long Ridge	10/16/09	Background	pulled from scree shoot behind c		20.7
A15	04/03/13	Background	monitoring well North 1 [60-62']		20
A15	04/04/13	Background	monitoring well North [60-62']		20
C28	10/12/10	Background	N		20
D27	02/08/12	Background	NE		20
F23	08/29/11	Background	NE		20

Location	Sample Date:	Sample Matrix	Matrix Notes	Allowable Concentration -->	Metals i
					Arsenic
G29	06/29/10	Background	SE		20
H26A	08/26/11	Background	W		20
H26A	08/26/11	Background	SE		20
C28	03/24/10	Background			19.3
A15	05/17/11	Background	N		19
A15	04/04/13	Background	monitoring well South1 [80-82']		19
A28	12/01/10	Background	SW		19
B26	08/26/11	Background	NE		19
D27	02/08/12	Background	NE		19
H15	12/29/11	Background	NE		19
H26	11/10/10	Background	SW		19
H26	11/10/10	Background	SSE		19
I30	03/24/10	Background			18.6
A15	05/17/11	Background	S		18
A15	04/04/13	Background	monitoring well North [85']		18
D27	02/08/12	Background	N2		18
H26A	08/26/11	Background	NW		18
H26A	08/26/11	Background	SW		18
P25	09/01/11	Background	SE		18
C28MF	07/29/09	Background			17.9
A28	07/16/09	Background			17.6
G29	06/29/10	Background	SW		17.4
J22	07/17/09	Background			17.4
D28	08/05/09	Background			17.2
D27	02/08/12	Background	N2		17
E09	11/02/10	Background	E		17
I30A	03/24/10	Background			16.9
A15	05/17/11	Background	NW		16
A15	04/04/13	Background	monitoring well South [50-52']		16
A28B	08/12/10	Background	NE		16
A36A	08/31/11	Background	NE		16
C28	10/12/10	Background	SE		16
D27	02/08/12	Background	NE		16
D27	02/08/12	Background	N1		16
F23	08/29/11	Background	N		16
H15	12/29/11	Background	E		16
H29A	07/23/13	Background	S		16
J25A	09/26/11	Background	Monitoring well install 20-21'		16
J30	07/19/11	Background	E		16
M14	04/10/13	Background	SVE SE [20-22']		16
D23	06/29/10	Background	NW		15.7
Unocal 4	10/31/09	Background	irrigation ditch background - 6" p		15.2
A15	05/17/11	Background	E		15
A36A	08/31/11	Background	SE		15
A36A	08/31/11	Background	S		15
D19B	03/25/10	Background			15
E09	11/02/10	Background	Ec		15
F23	08/29/11	Background	SE		15
H29A	07/23/13	Background	N		15
K22	11/10/10	Background	W		15
K26	05/31/11	Background	N		15
L19	08/31/11	Background	N		15
K22	07/22/09	Background			14.5
A15	04/04/13	Background	monitoring well North [30-32']		14
B26	08/26/11	Background	E		14
D19A	03/25/10	Background			14
D27	02/08/12	Background	NE		14
D27	02/08/12	Background	N1		14

Location	Sample Date:	Sample Matrix	Matrix Notes	Allowable Concentration -->	Metals i
					Arsenic
D27	02/08/12	Background	N1		14
D27	02/08/12	Background	N1		14
D27	02/08/12	Background	N2		14
D27	02/08/12	Background	N3		14
D27	02/08/12	Background	NW		14
F23	08/29/11	Background	E		14
H29A	07/23/13	Background	S		14
H29A	07/23/13	Background	S 2		14
J30	07/19/11	Background	NW		14
K26	05/31/11	Background	S		14
K26	05/31/11	Background	SE		14
C04	02/22/11	Background	N		13.6
J25A	07/22/09	Background			13.5
C04	02/22/11	Background	SE		13.4
A36A	08/31/11	Background	SW		13
D27	02/08/12	Background	NE		13
D31	04/30/12	Background	E		13
E09	11/02/10	Background	SE		13
F23	08/29/11	Background	NW		13
K22	11/10/10	Background	SW		13
K22	11/10/10	Background	N		13
L19	08/31/11	Background	SW		13
M14	04/11/13	Background	SVE SW [30-32']		13
C27A	06/28/10	Background	SE		12.7
E19	07/14/09	Background			12.6
Unocal 4	10/31/09	Background	ROW background - 6" p/l rupture		12.5
C04	11/05/09	Background	6" depth taken from surface on W		12.1
A28B	08/12/10	Background	NW		12
A36A	08/31/11	Background	E		12
B26	08/26/11	Background	SE		12
D27	02/08/12	Background	N3		12
D27	02/08/12	Background	N3		12
D27	02/08/12	Background	NW		12
H29A	07/23/13	Background	N		12
H29A	07/23/13	Background	N		12
H29A	07/23/13	Background	N		12
H29A	07/23/13	Background	W		12
H29A	07/23/13	Background	W		12
NSF	10/08/12	Background			12
P25	09/01/11	Background	ESE		12
C04	02/22/11	Background	NE		11.7
C04	02/22/11	Background	E		11.5
A15	05/17/11	Background	NE		11
D27	02/08/12	Background	NW		11
D31	04/30/12	Background	E		11
D31	04/30/12	Background	E		11
D31	04/30/12	Background	E		11
H29A	07/23/13	Background	E		11
H29A	07/23/13	Background	E		11
H29A	07/23/13	Background	E		11
H29A	07/23/13	Background	W		11
H29A	07/23/13	Background	W		11
H29A	07/23/13	Background	S		11
H29A	07/23/13	Background	S 2		11
I30A	06/15/10	Background	Cut slope east		11
J30	07/19/11	Background	N		11
D09A	08/06/09	Background			10.4
D27	02/08/12	Background	N1		10

Location	Sample Date:	Sample Matrix	Matrix Notes	Allowable Concentration -->	Metals i
					Arsenic
D31	04/30/12	Background	E		10
H29A	07/23/13	Background	W		10
H29A	07/23/13	Background	S 2		10
J30	07/19/11	Background	NE		10
A28	12/01/10	Background	S		9.9
I30A	06/15/10	Background	Cut slope middle		9.9
A28B	06/28/10	Background			9.8
D27	02/08/12	Background	N3		9.8
H29A	07/23/13	Background	N		9.8
H15	12/29/11	Background	S		9.7
D27	02/08/12	Background	N3		9.6
H29A	07/23/13	Background	E		9.6
H29A	07/23/13	Background	S 2		9.6
H29A	07/23/13	Background	S		9.4
D27	02/08/12	Background	N2		9.3
H17 (Unocal 1	02/24/11	Background	NW		9.3
H29A	07/23/13	Background	E		9.3
L19	08/31/11	Background	S		9.3
C04	04/14/11	Background	SW		9.2
H29A	07/23/13	Background	S		9.2
N04	07/16/09	Background			9.2
A15	04/03/13	Background	monitoring well North 1 [40-42']		9
A28	12/01/10	Background	NE		9
D31	04/30/12	Background	SW		8.8
D31	04/30/12	Background	SE		8.6
D27	02/08/12	Background	NW		8.5
D31	04/30/12	Background	SW		8.5
D31	04/30/12	Background	SW		8.5
D31	04/30/12	Background	SE		8.3
D31	04/30/12	Background	SE		8.2
D31	04/30/12	Background	N		8.1
D31	04/30/12	Background	SW		8.1
D31	04/30/12	Background	SE		8
D31	04/30/12	Background	SW		8
D31	04/30/12	Background	N		7.8
H29A	07/23/13	Background	S 2		7.8
M14	04/09/13	Background	SVE 02 [10'-12'] SVES 02		7.8
N04	05/13/11	Background	N		7.8
D31	04/30/12	Background	SE		7.7
H26	11/10/10	Background	SE		7.7
D31	04/30/12	Background	N		7.5
D31	04/30/12	Background	N		7.4
D27	02/08/12	Background	NW		7.3
H17 (Unocal 1	02/24/11	Background	SE		7.2
D31	04/30/12	Background	N		7
H17 (Unocal 1	02/24/11	Background	S		6.7
N04	05/13/11	Background	NE		6.6
A28	12/01/10	Background	N		6.4
C04	04/14/11	Background	SE		5.1
M14	04/11/13	Background	SVE E [10-12']		5.1
H17 (Unocal 1	02/24/11	Background	NE		4.8
N04	05/13/11	Background	W		3.8
G30	08/08/13	Background	BG		3.3
M14	04/11/13	Background	SVE N [25-27']		2



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Chris Hines
EnCana Oil & Gas Inc. - CO
143 Diamond Avenue
Parachute, CO 81635

Report Summary

Wednesday June 05, 2013

Report Number: L638195

Samples Received: 05/29/13

Client Project: A36A

Description: A36A Spill

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

Entire Report Reviewed By:


Jarred Willis , ESC Representative

Laboratory Certification Numbers

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - 01157CA, CT - PH-0197,
FL - E87487, GA - 923, IN - C-IN-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, IA Lab #364

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

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

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REPORT OF ANALYSIS

Chris Hines
EnCana Oil & Gas Inc. - CO
143 Diamond Avenue
Parachute, CO 81635

June 05, 2013

Date Received : May 29, 2013
Description : A36A Spill
Sample ID : A36A-SPILL-POR-052813
Collected By : Matt Kasten
Collection Date : 05/28/13 11:15

ESC Sample # : L638195-01

Site ID :

Project # : A36A

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.0025	mg/kg	8021B	05/30/13	5
Toluene	BDL	0.025	mg/kg	8021B	05/30/13	5
Ethylbenzene	BDL	0.0025	mg/kg	8021B	05/30/13	5
Total Xylene	BDL	0.0075	mg/kg	8021B	05/30/13	5
Surrogate Recovery(%)						
a,a,a-Trifluorotoluene(PID)	107.		% Rec.	8021B	05/30/13	5

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

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Reported: 06/05/13 09:53 Printed: 06/05/13 09:53



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REPORT OF ANALYSIS

Chris Hines
EnCana Oil & Gas Inc. - CO
143 Diamond Avenue
Parachute, CO 81635

June 05, 2013

Date Received : May 29, 2013
Description : A36A Spill
Sample ID : A36A-SPILL-MIDE-052813
Collected By : Matt Kasten
Collection Date : 05/28/13 11:25

ESC Sample # : L638195-02

Site ID :

Project # : A36A

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.0025	mg/kg	8021B	06/04/13	5
Toluene	BDL	0.025	mg/kg	8021B	06/04/13	5
Ethylbenzene	BDL	0.0025	mg/kg	8021B	06/04/13	5
Total Xylene	BDL	0.0075	mg/kg	8021B	06/04/13	5
Surrogate Recovery(%)						
a,a,a-Trifluorotoluene(PID)	102.		% Rec.	8021B	06/04/13	5

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

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Reported: 06/05/13 09:53 Printed: 06/05/13 09:53

Summary of Remarks For Samples Printed
06/05/13 at 09:53:54

TSR Signing Reports: 358
R5 - Desired TAT

Log ALL samples for EDD (COGCC EDD). Log all PAHs as PAHSIM. DRO and DRO-SGT needed if TPH is listed twice on COC, one being TPH-GEL EXTRACT. Try not to report benzene as BDL above a 250x dilution.

Sample: L638195-01 Account: ENCANACO Received: 05/29/13 09:30 Due Date: 06/05/13 00:00 RPT Date: 06/05/13 09:53

Sample: L638195-02 Account: ENCANACO Received: 05/29/13 09:30 Due Date: 06/05/13 00:00 RPT Date: 06/05/13 09:53



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Quality Assurance Report
Level II

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June 05, 2013

Analyte	Result	Laboratory Blank		Limit	Batch	Date Analyzed
		Units	% Rec			
Benzene	< .0005	mg/kg			WG663849	05/29/13 20:42
Ethylbenzene	< .0005	mg/kg			WG663849	05/29/13 20:42
Toluene	< .005	mg/kg			WG663849	05/29/13 20:42
Total Xylene	< .0015	mg/kg			WG663849	05/29/13 20:42
a,a,a-Trifluorotoluene(PID)		% Rec.	108.0	54-144	WG663849	05/29/13 20:42
Benzene	< .0005	mg/kg			WG664624	06/04/13 12:01
Ethylbenzene	< .0005	mg/kg			WG664624	06/04/13 12:01
Toluene	< .005	mg/kg			WG664624	06/04/13 12:01
Total Xylene	< .0015	mg/kg			WG664624	06/04/13 12:01
a,a,a-Trifluorotoluene(PID)		% Rec.	101.8	54-144	WG664624	06/04/13 12:01

Analyte	Units	Laboratory Control Sample		% Rec	Limit	Batch
		Known Val	Result			
Benzene	mg/kg	.05	0.0505	101.	76-113	WG663849
Ethylbenzene	mg/kg	.05	0.0538	108.	78-115	WG663849
Toluene	mg/kg	.05	0.0528	106.	76-114	WG663849
Total Xylene	mg/kg	.15	0.158	105.	81-118	WG663849
a,a,a-Trifluorotoluene(PID)				107.5	54-144	WG663849
Benzene	mg/kg	.05	0.0527	105.	76-113	WG664624
Ethylbenzene	mg/kg	.05	0.0555	111.	78-115	WG664624
Toluene	mg/kg	.05	0.0544	109.	76-114	WG664624
Total Xylene	mg/kg	.15	0.162	108.	81-118	WG664624
a,a,a-Trifluorotoluene(PID)				101.4	54-144	WG664624

Analyte	Units	Laboratory Control Sample Duplicate			Limit	RPD	Limit	Batch
		Result	Ref	%Rec				
Benzene	mg/kg	0.0504	0.0505	101.	76-113	0.160	20	WG663849
Ethylbenzene	mg/kg	0.0535	0.0538	107.	78-115	0.560	20	WG663849
Toluene	mg/kg	0.0522	0.0528	104.	76-114	1.09	20	WG663849
Total Xylene	mg/kg	0.157	0.158	105.	81-118	0.450	20	WG663849
a,a,a-Trifluorotoluene(PID)				107.0	54-144			WG663849
Benzene	mg/kg	0.0515	0.0527	103.	76-113	2.15	20	WG664624
Ethylbenzene	mg/kg	0.0542	0.0555	108.	78-115	2.51	20	WG664624
Toluene	mg/kg	0.0534	0.0544	107.	76-114	1.91	20	WG664624
Total Xylene	mg/kg	0.158	0.162	106.	81-118	2.39	20	WG664624
a,a,a-Trifluorotoluene(PID)				101.7	54-144			WG664624

Analyte	Units	Matrix Spike				Limit	Ref Samp	Batch
		MS Res	Ref Res	TV	% Rec			
Benzene	mg/kg	0.245	0.000459	.05	97.9	32-137	L638013-06	WG663849
Ethylbenzene	mg/kg	0.257	0	.05	103.	10-150	L638013-06	WG663849
Toluene	mg/kg	0.254	0.000307	.05	102.	20-142	L638013-06	WG663849
Total Xylene	mg/kg	0.757	0.00110	.15	101.	16-141	L638013-06	WG663849
a,a,a-Trifluorotoluene(PID)					104.6	54-144		WG663849
Benzene	mg/kg	0.251	0.000276	.05	100.	32-137	L638195-02	WG664624
Ethylbenzene	mg/kg	0.225	0	.05	89.8	10-150	L638195-02	WG664624
Toluene	mg/kg	0.243	0.000276	.05	97.1	20-142	L638195-02	WG664624
Total Xylene	mg/kg	0.646	0.000554	.15	86.1	16-141	L638195-02	WG664624

* Performance of this Analyte is outside of established criteria.

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



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Chris Hines
143 Diamond Avenue

Parachute, CO 81635

Quality Assurance Report
Level II

L638195

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Analyte	Units	MSD	Matrix Spike Duplicate		Limit	RPD	Limit	Ref	Samp	Batch
			Ref	%Rec						
a,a,a-Trifluorotoluene(PID)					101.3	54-144				
Analyte	Units	MSD	Matrix Spike Duplicate		Limit	RPD	Limit	Ref	Samp	Batch
			Ref	%Rec						
Benzene	mg/kg	0.248	0.245	99.2	32-137	1.33	39	L638013-06		WG663849
Ethylbenzene	mg/kg	0.259	0.257	104.	10-150	0.910	44	L638013-06		WG663849
Toluene	mg/kg	0.256	0.254	102.	20-142	0.760	42	L638013-06		WG663849
Total Xylene	mg/kg	0.760	0.757	101.	16-141	0.410	46	L638013-06		WG663849
a,a,a-Trifluorotoluene(PID)				106.2	54-144					WG663849
Benzene	mg/kg	0.238	0.251	95.2	32-137	5.29	39	L638195-02		WG664624
Ethylbenzene	mg/kg	0.217	0.225	86.9	10-150	3.29	44	L638195-02		WG664624
Toluene	mg/kg	0.231	0.243	92.4	20-142	4.96	42	L638195-02		WG664624
Total Xylene	mg/kg	0.629	0.646	83.7	16-141	2.81	46	L638195-02		WG664624
a,a,a-Trifluorotoluene(PID)				100.9	54-144					WG664624

Batch number /Run number / Sample number cross reference

WG663849: R2692101: L638195-01
WG664624: R2694762: L638195-02

* * Calculations are performed prior to rounding of reported values.
* Performance of this Analyte is outside of established criteria.
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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
143 Diamond Avenue
Parachute, CO 81635

Report Summary

Friday April 12, 2013

Report Number: L628981


Samples Received: 04/05/13

Client Project: A36A

Description: A36A Spill

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

Entire Report Reviewed By:


Jarred Willis , ESC Representative

Laboratory Certification Numbers

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - 01157CA, CT - PH-0197,
FL - E87487, GA - 923, IN - C-IN-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, IA Lab #364

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REPORT OF ANALYSIS

Chris Hines / Matt Kasten
EnCana Oil & Gas Inc. - CO
143 Diamond Avenue
Parachute, CO 81635

April 12, 2013

Date Received : April 05, 2013
Description : A36A Spill
Sample ID : A36A-SPILL-POR-040413
Collected By : Matt Kasten
Collection Date : 04/04/13 12:05

ESC Sample # : L628981-01

Site ID :

Project # : A36A

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Chromium, Hexavalent	BDL	2.0	mg/kg	3060A/7196A	04/11/13	1
Chromium, Trivalent	18.	2.0	mg/kg	Calc.	04/09/13	1
ORP	180		mV	2580 B-2011	04/11/13	1
pH	8.2		su	9045D	04/09/13	1
Sodium Adsorption Ratio	27.			Calc.	04/11/13	1
Specific Conductance	3900		umhos/cm	9050AMod	04/11/13	1
Mercury	0.14	0.020	mg/kg	7471	04/06/13	1
Arsenic	12.	2.0	mg/kg	6010B	04/09/13	2
Barium	2900	0.25	mg/kg	6010B	04/09/13	1
Cadmium	BDL	0.25	mg/kg	6010B	04/09/13	1
Chromium	18.	0.50	mg/kg	6010B	04/09/13	1
Copper	30.	1.0	mg/kg	6010B	04/09/13	1
Lead	24.	0.50	mg/kg	6010B	04/09/13	2
Nickel	14.	1.0	mg/kg	6010B	04/09/13	1
Selenium	BDL	1.0	mg/kg	6010B	04/09/13	1
Silver	BDL	0.50	mg/kg	6010B	04/09/13	1
Zinc	71.	1.5	mg/kg	6010B	04/09/13	1
Benzene	0.20	0.025	mg/kg	8021/8015	04/10/13	50
Toluene	1.3	0.25	mg/kg	8021/8015	04/10/13	50
Ethylbenzene	0.23	0.025	mg/kg	8021/8015	04/10/13	50
Total Xylene	2.9	0.075	mg/kg	8021/8015	04/10/13	50
TPH (GC/FID) Low Fraction	70.	5.0	mg/kg	GRO	04/10/13	50
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	93.3		% Rec.	8021/8015	04/10/13	50
a,a,a-Trifluorotoluene(PID)	102.		% Rec.	8021/8015	04/10/13	50
TPH (GC/FID) High Fraction	250	20.	mg/kg	8015D/DRO	04/07/13	5
Surrogate recovery(%)						
o-Terphenyl	53.2		% Rec.	8015D/DRO	04/07/13	5
Polynuclear Aromatic Hydrocarbons						
Anthracene	BDL	0.0060	mg/kg	8270C-SIM	04/12/13	1
Acenaphthene	0.035	0.0060	mg/kg	8270C-SIM	04/12/13	1
Acenaphthylene	0.0096	0.0060	mg/kg	8270C-SIM	04/12/13	1
Benzo(a)anthracene	BDL	0.0060	mg/kg	8270C-SIM	04/12/13	1
Benzo(a)pyrene	BDL	0.0060	mg/kg	8270C-SIM	04/12/13	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
L628981-01 (PH) - 8.2 @ 23.9C



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REPORT OF ANALYSIS

Chris Hines / Matt Kasten
EnCana Oil & Gas Inc. - CO
143 Diamond Avenue
Parachute, CO 81635

April 12, 2013

Date Received : April 05, 2013
Description : A36A Spill
Sample ID : A36A-SPILL-POR-040413
Collected By : Matt Kasten
Collection Date : 04/04/13 12:05

ESC Sample # : L628981-01

Site ID :

Project # : A36A

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzo(b)fluoranthene	0.0064	0.0060	mg/kg	8270C-SIM	04/12/13	1
Benzo(g,h,i)perylene	BDL	0.0060	mg/kg	8270C-SIM	04/12/13	1
Benzo(k)fluoranthene	BDL	0.0060	mg/kg	8270C-SIM	04/12/13	1
Chrysene	0.0075	0.0060	mg/kg	8270C-SIM	04/12/13	1
Dibenz(a,h)anthracene	BDL	0.0060	mg/kg	8270C-SIM	04/12/13	1
Fluoranthene	0.025	0.0060	mg/kg	8270C-SIM	04/12/13	1
Fluorene	0.12	0.0060	mg/kg	8270C-SIM	04/12/13	1
Indeno(1,2,3-cd)pyrene	BDL	0.0060	mg/kg	8270C-SIM	04/12/13	1
Naphthalene	0.14	0.020	mg/kg	8270C-SIM	04/12/13	1
Phenanthrene	0.10	0.0060	mg/kg	8270C-SIM	04/12/13	1
Pyrene	0.027	0.0060	mg/kg	8270C-SIM	04/12/13	1
1-Methylnaphthalene	0.27	0.020	mg/kg	8270C-SIM	04/12/13	1
2-Methylnaphthalene	0.71	0.020	mg/kg	8270C-SIM	04/12/13	1
2-Chloronaphthalene	BDL	0.020	mg/kg	8270C-SIM	04/12/13	1
Surrogate Recovery						
Nitrobenzene-d5	182.		% Rec.	8270C-SIM	04/12/13	1
2-Fluorobiphenyl	99.6		% Rec.	8270C-SIM	04/12/13	1
p-Terphenyl-d14	87.1		% Rec.	8270C-SIM	04/12/13	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

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L628981-01 (PH) - 8.2 @ 23.9C



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REPORT OF ANALYSIS

Chris Hines / Matt Kasten
EnCana Oil & Gas Inc. - CO
143 Diamond Avenue
Parachute, CO 81635

April 12, 2013

Date Received : April 05, 2013
Description : A36A Spill
Sample ID : A36A-SPILL-MID-040413
Collected By : Matt Kasten
Collection Date : 04/04/13 12:10

ESC Sample # : L628981-02

Site ID :

Project # : A36A

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	0.16	0.025	mg/kg	8021/8015	04/10/13	50
Toluene	0.79	0.25	mg/kg	8021/8015	04/10/13	50
Ethylbenzene	0.11	0.025	mg/kg	8021/8015	04/10/13	50
Total Xylene	1.4	0.075	mg/kg	8021/8015	04/10/13	50
TPH (GC/FID) Low Fraction	23.	5.0	mg/kg	GRO	04/10/13	50
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	93.4		% Rec.	8021/8015	04/10/13	50
a,a,a-Trifluorotoluene(PID)	102.		% Rec.	8021/8015	04/10/13	50
TPH (GC/FID) High Fraction	110	20.	mg/kg	8015D/DRO	04/07/13	5
Surrogate recovery(%)						
o-Terphenyl	52.4		% Rec.	8015D/DRO	04/07/13	5

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

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Reported: 04/12/13 17:01 Printed: 04/12/13 17:01



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REPORT OF ANALYSIS

Chris Hines / Matt Kasten
EnCana Oil & Gas Inc. - CO
143 Diamond Avenue
Parachute, CO 81635

April 12, 2013

Date Received : April 05, 2013
Description : A36A Spill
Sample ID : A36A-SPILL-MIDE-040413
Collected By : Matt Kasten
Collection Date : 04/04/13 12:15

ESC Sample # : L628981-03

Site ID :

Project # : A36A

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	0.26	0.025	mg/kg	8021/8015	04/10/13	50
Toluene	1.1	0.25	mg/kg	8021/8015	04/10/13	50
Ethylbenzene	0.13	0.025	mg/kg	8021/8015	04/10/13	50
Total Xylene	1.6	0.075	mg/kg	8021/8015	04/10/13	50
TPH (GC/FID) Low Fraction	36.	5.0	mg/kg	GRO	04/10/13	50
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	93.0		% Rec.	8021/8015	04/10/13	50
a,a,a-Trifluorotoluene(PID)	102.		% Rec.	8021/8015	04/10/13	50
TPH (GC/FID) High Fraction	BDL	4.0	mg/kg	8015D/DRO	04/07/13	1
Surrogate recovery(%)						
o-Terphenyl	55.5		% Rec.	8015D/DRO	04/07/13	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: 04/12/13 17:01 Printed: 04/12/13 17:01



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Tax I.D. 62-0814289

Est. 1970

REPORT OF ANALYSIS

Chris Hines / Matt Kasten
EnCana Oil & Gas Inc. - CO
143 Diamond Avenue
Parachute, CO 81635

April 12, 2013

Date Received : April 05, 2013
Description : A36A Spill
Sample ID : A36A-SPILL-E-040413
Collected By : Matt Kasten
Collection Date : 04/04/13 12:20

ESC Sample # : L628981-04

Site ID :

Project # : A36A

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.0025	mg/kg	8021/8015	04/07/13	5
Toluene	BDL	0.025	mg/kg	8021/8015	04/07/13	5
Ethylbenzene	0.0089	0.0025	mg/kg	8021/8015	04/07/13	5
Total Xylene	0.061	0.0075	mg/kg	8021/8015	04/07/13	5
TPH (GC/FID) Low Fraction	0.61	0.50	mg/kg	GRO	04/07/13	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	101.		% Rec.	8021/8015	04/07/13	5
a,a,a-Trifluorotoluene(PID)	99.8		% Rec.	8021/8015	04/07/13	5
TPH (GC/FID) High Fraction	22.	8.0	mg/kg	8015D/DRO	04/12/13	2
Surrogate recovery(%)						
o-Terphenyl	80.7		% Rec.	8015D/DRO	04/12/13	2

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

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Reported: 04/12/13 17:01 Printed: 04/12/13 17:01

Attachment A
List of Analytes with QC Qualifiers

Sample Number	Work Group	Sample Type	Analyte	Run ID	Qualifier
L628981-01	WG655016	SAMP	Nitrobenzene-d5	R2615341	J1
L628981-04	WG654893	SAMP	Benzene	R2605642	J6J3
	WG654893	SAMP	Toluene	R2605642	J3
	WG654893	SAMP	Ethylbenzene	R2605642	J3
	WG654893	SAMP	TPH (GC/FID) Low Fraction	R2605642	J6

Attachment B
Explanation of QC Qualifier Codes

Qualifier	Meaning
J1	Surrogate recovery limits have been exceeded; values are outside upper control limits
J3	The associated batch QC was outside the established quality control range for precision.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low

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
04/12/13 at 17:01:31

TSR Signing Reports: 358
R5 - Desired TAT

Log ALL samples for EDD (COGCC EDD). DRO and DRO-SGT needed if TPH is listed twice on COC, one being TPH-GEL EXTRACT Log all PAHs as PAHSIM. Try not to report benzene as BDL above a 250x dilution.

Sample: L628981-01 Account: ENCANACO Received: 04/05/13 09:00 Due Date: 04/12/13 00:00 RPT Date: 04/12/13 17:01

Sample: L628981-02 Account: ENCANACO Received: 04/05/13 09:00 Due Date: 04/12/13 00:00 RPT Date: 04/12/13 17:01

Sample: L628981-03 Account: ENCANACO Received: 04/05/13 09:00 Due Date: 04/12/13 00:00 RPT Date: 04/12/13 17:01

Sample: L628981-04 Account: ENCANACO Received: 04/05/13 09:00 Due Date: 04/12/13 00:00 RPT Date: 04/12/13 17:01



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Analyte	Result	Laboratory Blank		Limit	Batch	Date Analyzed
		Units	% Rec			
Mercury	< .02	mg/kg			WG654883	04/06/13 11:58
Benzene	< .0005	mg/kg			WG654893	04/07/13 10:18
Ethylbenzene	< .0005	mg/kg			WG654893	04/07/13 10:18
Toluene	< .005	mg/kg			WG654893	04/07/13 10:18
TPH (GC/FID) Low Fraction	< .1	mg/kg			WG654893	04/07/13 10:18
Total Xylene	< .0015	mg/kg			WG654893	04/07/13 10:18
a,a,a-Trifluorotoluene(FID)		% Rec.	101.7	59-128	WG654893	04/07/13 10:18
a,a,a-Trifluorotoluene(PID)		% Rec.	101.8	54-144	WG654893	04/07/13 10:18
TPH (GC/FID) High Fraction	< 4	mg/kg			WG654942	04/07/13 10:11
o-Terphenyl		% Rec.	72.00	50-150	WG654942	04/07/13 10:11
Arsenic	< 1	mg/kg			WG655199	04/09/13 15:14
Barium	< .25	mg/kg			WG655199	04/09/13 15:14
Cadmium	< .25	mg/kg			WG655199	04/09/13 15:14
Chromium	< .5	mg/kg			WG655199	04/09/13 15:14
Copper	< 1	mg/kg			WG655199	04/09/13 15:14
Lead	< .25	mg/kg			WG655199	04/09/13 15:14
Nickel	< 1	mg/kg			WG655199	04/09/13 15:14
Selenium	< 1	mg/kg			WG655199	04/09/13 15:14
Silver	< .5	mg/kg			WG655199	04/09/13 15:14
Zinc	< 1.5	mg/kg			WG655199	04/09/13 15:14
Benzene	< .0005	mg/kg			WG655074	04/10/13 16:53
Ethylbenzene	< .0005	mg/kg			WG655074	04/10/13 16:53
Toluene	< .005	mg/kg			WG655074	04/10/13 16:53
TPH (GC/FID) Low Fraction	< .1	mg/kg			WG655074	04/10/13 16:53
Total Xylene	< .0015	mg/kg			WG655074	04/10/13 16:53
a,a,a-Trifluorotoluene(FID)		% Rec.	95.30	59-128	WG655074	04/10/13 16:53
a,a,a-Trifluorotoluene(PID)		% Rec.	102.7	54-144	WG655074	04/10/13 16:53
Chromium,Hexavalent	< 2	mg/kg			WG655367	04/11/13 09:01
Specific Conductance	13.7	umhos/cm			WG655557	04/11/13 15:31
1-Methylnaphthalene	< .02	mg/kg			WG655016	04/11/13 13:12
2-Chloronaphthalene	< .02	mg/kg			WG655016	04/11/13 13:12
2-Methylnaphthalene	< .02	mg/kg			WG655016	04/11/13 13:12
Acenaphthene	< .006	mg/kg			WG655016	04/11/13 13:12
Acenaphthylene	< .006	mg/kg			WG655016	04/11/13 13:12
Anthracene	< .006	mg/kg			WG655016	04/11/13 13:12
Benzo(a)anthracene	< .006	mg/kg			WG655016	04/11/13 13:12
Benzo(a)pyrene	< .006	mg/kg			WG655016	04/11/13 13:12
Benzo(b)fluoranthene	< .006	mg/kg			WG655016	04/11/13 13:12
Benzo(g,h,i)perylene	< .006	mg/kg			WG655016	04/11/13 13:12
Benzo(k)fluoranthene	< .006	mg/kg			WG655016	04/11/13 13:12
Chrysene	< .006	mg/kg			WG655016	04/11/13 13:12
Dibenz(a,h)anthracene	< .006	mg/kg			WG655016	04/11/13 13:12
Fluoranthene	< .006	mg/kg			WG655016	04/11/13 13:12
Fluorene	< .006	mg/kg			WG655016	04/11/13 13:12
Indeno(1,2,3-cd)pyrene	< .006	mg/kg			WG655016	04/11/13 13:12

* 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	Result	Laboratory Blank		Limit	Batch	Date Analyzed
		Units	% Rec			
Naphthalene	< .02	mg/kg			WG655016	04/11/13 13:12
Phenanthrene	< .006	mg/kg			WG655016	04/11/13 13:12
Pyrene	< .006	mg/kg			WG655016	04/11/13 13:12
2-Fluorobiphenyl		% Rec.	84.10	70-130	WG655016	04/11/13 13:12
Nitrobenzene-d5		% Rec.	88.20	70-130	WG655016	04/11/13 13:12
p-Terphenyl-d14		% Rec.	94.10	70-130	WG655016	04/11/13 13:12
TPH (GC/FID) High Fraction	< 4	mg/kg			WG655586	04/12/13 09:57
o-Terphenyl		% Rec.	81.90	50-150	WG655586	04/12/13 09:57

Analyte	Units	Result	Duplicate		Limit	Ref Samp	Batch
			Duplicate	RPD			
Mercury	mg/kg	0.0230	0.0290	21.2*	20	L628882-01	WG654883
pH	su	8.20	8.20	0.367	1	L628981-01	WG655167
pH	su	8.00	8.00	0.125	1	L629242-06	WG655167
Arsenic	mg/kg	7.50	9.40	22.5*	20	L629027-02	WG655199
Barium	mg/kg	75.0	77.0	2.63	20	L629027-02	WG655199
Cadmium	mg/kg	0	0	0	20	L629027-02	WG655199
Chromium	mg/kg	17.0	18.0	5.71	20	L629027-02	WG655199
Copper	mg/kg	9.70	12.3	23.6*	20	L629027-02	WG655199
Lead	mg/kg	8.40	8.50	1.18	20	L629027-02	WG655199
Nickel	mg/kg	12.0	14.1	16.1	20	L629027-02	WG655199
Selenium	mg/kg	0	0	0	20	L629027-02	WG655199
Silver	mg/kg	0	0	0	20	L629027-02	WG655199
Zinc	mg/kg	34.0	39.8	15.7	20	L629027-02	WG655199
Chromium, Hexavalent	mg/kg	0	0	0	20	L628981-01	WG655367
ORP	mV	180.	190.	3.21	20	L628855-01	WG655555
Specific Conductance	umhos/cm	1300	1300	2.33	20	L628558-18	WG655557
Specific Conductance	umhos/cm	950.	940.	1.48	20	L629643-01	WG655557

Analyte	Units	Laboratory Control Sample		% Rec	Limit	Batch
		Known Val	Result			
Mercury	mg/kg	12.4	13.0	105.	71.6-127.7	WG654883
Benzene	mg/kg	.05	0.0485	97.0	76-113	WG654893
Ethylbenzene	mg/kg	.05	0.0510	102.	78-115	WG654893
Toluene	mg/kg	.05	0.0510	102.	76-114	WG654893
Total Xylene	mg/kg	.15	0.150	100.	81-118	WG654893
a,a,a-Trifluorotoluene(PID)				98.66	54-144	WG654893
TPH (GC/FID) Low Fraction	mg/kg	5.5	6.24	113.	67-135	WG654893
a,a,a-Trifluorotoluene(FID)				97.76	59-128	WG654893
TPH (GC/FID) High Fraction	mg/kg	60	48.5	80.9	50-150	WG654942
o-Terphenyl				76.60	50-150	WG654942

* Performance of this Analyte is outside of established criteria.

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Analyte	Units	Laboratory Control Sample		% Rec	Limit	Batch
		Known Val	Result			
pH	su	5.79	5.86	101.	98.3-101.7	WG655167
Arsenic	mg/kg	237	238.	100.	83.1-117	WG655199
Barium	mg/kg	252	248.	98.4	84.1-116	WG655199
Cadmium	mg/kg	191	181.	94.8	83.2-117	WG655199
Chromium	mg/kg	128	126.	98.4	81.3-118	WG655199
Copper	mg/kg	123	118.	95.9	83.7-116	WG655199
Lead	mg/kg	103	98.4	95.5	83.1-117	WG655199
Nickel	mg/kg	118	105.	89.0	82-118	WG655199
Selenium	mg/kg	110	110.	100.	78.7-122	WG655199
Silver	mg/kg	47.3	41.7	88.2	66.2-134	WG655199
Zinc	mg/kg	183	179.	97.8	82-118	WG655199
Benzene	mg/kg	.05	0.0502	100.	76-113	WG655074
Ethylbenzene	mg/kg	.05	0.0498	99.5	78-115	WG655074
Toluene	mg/kg	.05	0.0492	98.4	76-114	WG655074
Total Xylene	mg/kg	.15	0.156	104.	81-118	WG655074
a,a,a-Trifluorotoluene(PID)				102.0	54-144	WG655074
TPH (GC/FID) Low Fraction	mg/kg	5.5	5.17	94.0	67-135	WG655074
a,a,a-Trifluorotoluene(FID)				100.4	59-128	WG655074
Chromium,Hexavalent	mg/kg	146	150.	103.	80-120	WG655367
ORP	mV	228	226.	99.1	95.6-104.	WG655555
Specific Conductance	umhos/cm	878	906.	103.	85-115	WG655557
1-Methylnaphthalene	mg/kg	.08	0.0633	79.2	70-130	WG655016
2-Chloronaphthalene	mg/kg	.08	0.0630	78.7	70-130	WG655016
2-Methylnaphthalene	mg/kg	.08	0.0643	80.3	70-130	WG655016
Acenaphthene	mg/kg	.08	0.0628	78.5	70-130	WG655016
Acenaphthylene	mg/kg	.08	0.0675	84.3	70-130	WG655016
Anthracene	mg/kg	.08	0.0679	84.9	70-130	WG655016
Benzo(a)anthracene	mg/kg	.08	0.0709	88.7	70-130	WG655016
Benzo(a)pyrene	mg/kg	.08	0.0617	77.1	70-130	WG655016
Benzo(b)fluoranthene	mg/kg	.08	0.0632	79.0	70-130	WG655016
Benzo(g,h,i)perylene	mg/kg	.08	0.0707	88.4	70-130	WG655016
Benzo(k)fluoranthene	mg/kg	.08	0.0654	81.8	70-130	WG655016
Chrysene	mg/kg	.08	0.0635	79.4	70-130	WG655016
Dibenz(a,h)anthracene	mg/kg	.08	0.0704	88.0	70-130	WG655016
Fluoranthene	mg/kg	.08	0.0745	93.2	70-130	WG655016
Fluorene	mg/kg	.08	0.0639	79.9	70-130	WG655016
Indeno(1,2,3-cd)pyrene	mg/kg	.08	0.0722	90.2	70-130	WG655016
Naphthalene	mg/kg	.08	0.0595	74.3	70-130	WG655016
Phenanthrene	mg/kg	.08	0.0632	79.0	70-130	WG655016
Pyrene	mg/kg	.08	0.0724	90.5	70-130	WG655016
2-Fluorobiphenyl				84.20	70-130	WG655016
Nitrobenzene-d5				88.80	70-130	WG655016
p-Terphenyl-d14				91.30	70-130	WG655016
TPH (GC/FID) High Fraction	mg/kg	60	41.4	69.1	50-150	WG655586
o-Terphenyl				78.30	50-150	WG655586

* 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				
Benzene	mg/kg	0.0535	0.0485	107.	76-113	9.92	20	WG654893
Ethylbenzene	mg/kg	0.0553	0.0510	110.	78-115	8.16	20	WG654893
Toluene	mg/kg	0.0553	0.0510	110.	76-114	8.06	20	WG654893
Total Xylene	mg/kg	0.162	0.150	108.	81-118	7.97	20	WG654893
a,a,a-Trifluorotoluene(PID)				99.54	54-144			WG654893
TPH (GC/FID) Low Fraction	mg/kg	6.08	6.24	110.	67-135	2.58	20	WG654893
a,a,a-Trifluorotoluene(FID)				97.58	59-128			WG654893
TPH (GC/FID) High Fraction	mg/kg	47.1	48.5	78.0	50-150	3.02	20	WG654942
o-Terphenyl				70.40	50-150			WG654942
pH	su	5.87	5.86	101.	98.3-101.7	0.171	20	WG655167
Benzene	mg/kg	0.0504	0.0502	101.	76-113	0.430	20	WG655074
Ethylbenzene	mg/kg	0.0520	0.0498	104.	78-115	4.32	20	WG655074
Toluene	mg/kg	0.0510	0.0492	102.	76-114	3.62	20	WG655074
Total Xylene	mg/kg	0.160	0.156	106.	81-118	2.23	20	WG655074
a,a,a-Trifluorotoluene(PID)				101.3	54-144			WG655074
TPH (GC/FID) Low Fraction	mg/kg	5.26	5.17	96.0	67-135	1.66	20	WG655074
a,a,a-Trifluorotoluene(FID)				98.82	59-128			WG655074
Chromium,Hexavalent	mg/kg	146.	150.	100.	80-120	2.70	20	WG655367
ORP	mV	226.	226.	99.0	95.6-104.	0	20	WG655555
Specific Conductance	umhos/	905.	906.	103.	85-115	0.110	20	WG655557
1-Methylnaphthalene	mg/kg	0.0685	0.0633	86.0	70-130	7.93	25	WG655016
2-Chloronaphthalene	mg/kg	0.0679	0.0630	85.0	70-130	7.58	25	WG655016
2-Methylnaphthalene	mg/kg	0.0706	0.0643	88.0	70-130	9.31	25	WG655016
Acenaphthene	mg/kg	0.0675	0.0628	84.0	70-130	7.21	25	WG655016
Acenaphthylene	mg/kg	0.0692	0.0675	86.0	70-130	2.51	25	WG655016
Anthracene	mg/kg	0.0722	0.0679	90.0	70-130	6.15	25	WG655016
Benzo(a)anthracene	mg/kg	0.0761	0.0709	95.0	70-130	7.06	25	WG655016
Benzo(a)pyrene	mg/kg	0.0660	0.0617	82.0	70-130	6.75	25	WG655016
Benzo(b)fluoranthene	mg/kg	0.0670	0.0632	84.0	70-130	5.88	25	WG655016
Benzo(g,h,i)perylene	mg/kg	0.0752	0.0707	94.0	70-130	6.23	25	WG655016
Benzo(k)fluoranthene	mg/kg	0.0697	0.0654	87.0	70-130	6.39	25	WG655016
Chrysene	mg/kg	0.0669	0.0635	84.0	70-130	5.12	25	WG655016
Dibenz(a,h)anthracene	mg/kg	0.0746	0.0704	93.0	70-130	5.77	25	WG655016
Fluoranthene	mg/kg	0.0793	0.0745	99.0	70-130	6.24	25	WG655016
Fluorene	mg/kg	0.0684	0.0639	85.0	70-130	6.73	25	WG655016
Indeno(1,2,3-cd)pyrene	mg/kg	0.0770	0.0722	96.0	70-130	6.45	25	WG655016
Naphthalene	mg/kg	0.0653	0.0595	82.0	70-130	9.26	25	WG655016
Phenanthrene	mg/kg	0.0675	0.0632	84.0	70-130	6.66	25	WG655016
Pyrene	mg/kg	0.0776	0.0724	97.0	70-130	6.91	25	WG655016
2-Fluorobiphenyl				89.80	70-130			WG655016
Nitrobenzene-d5				96.00	70-130			WG655016
p-Terphenyl-d14				95.70	70-130			WG655016
TPH (GC/FID) High Fraction	mg/kg	40.4	41.4	67.0	50-150	2.63	20	WG655586

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YOUR LAB OF CHOICE

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Chris Hines / Matt Kasten
143 Diamond Avenue

Parachute, CO 81635

Quality Assurance Report
Level II

L628981

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

April 12, 2013

Analyte	Units	MS Res	Matrix Spike		% Rec	Limit	Ref Samp	Batch
			Ref Res	TV				
o-Terphenyl				75.50		50-150		
Analyte	Units	MS Res	Matrix Spike		% Rec	Limit	Ref Samp	Batch
			Ref Res	TV				
Mercury	mg/kg	0.244	0.0290	.25	85.8	80-120	L628882-01	WG654883
Benzene	mg/kg	0.0541	0.00140	.05	21.1*	32-137	L628981-04	WG654893
Ethylbenzene	mg/kg	0.0386	0.00893	.05	11.9	10-150	L628981-04	WG654893
Toluene	mg/kg	0.101	0.00876	.05	36.9	20-142	L628981-04	WG654893
Total Xylene	mg/kg	0.224	0.0607	.15	21.7	16-141	L628981-04	WG654893
a,a,a-Trifluorotoluene(PID)					100.3	54-144		WG654893
TPH (GC/FID) Low Fraction	mg/kg	15.8	0.608	5.5	55.3	55-109	L628981-04	WG654893
a,a,a-Trifluorotoluene(FID)					95.57	59-128		WG654893
TPH (GC/FID) High Fraction	mg/kg	162.	89.7	12	121.	50-150	L628986-03	WG654942
o-Terphenyl					29.50*	50-150		WG654942
Arsenic	mg/kg	53.4	9.40	50	88.0	75-125	L629027-02	WG655199
Barium	mg/kg	120.	77.0	50	86.0	75-125	L629027-02	WG655199
Cadmium	mg/kg	43.3	0	50	86.6	75-125	L629027-02	WG655199
Chromium	mg/kg	63.0	18.0	50	90.0	75-125	L629027-02	WG655199
Copper	mg/kg	57.5	12.3	50	90.4	75-125	L629027-02	WG655199
Lead	mg/kg	65.6	8.50	50	114.	75-125	L629027-02	WG655199
Nickel	mg/kg	52.0	14.1	50	75.8	75-125	L629027-02	WG655199
Selenium	mg/kg	47.1	0	50	94.2	75-125	L629027-02	WG655199
Silver	mg/kg	42.4	0	50	84.8	75-125	L629027-02	WG655199
Zinc	mg/kg	83.2	39.8	50	86.8	75-125	L629027-02	WG655199
Benzene	mg/kg	0.234	0.000925	.05	93.4	32-137	L629120-01	WG655074
Ethylbenzene	mg/kg	0.248	0.000237	.05	99.3	10-150	L629120-01	WG655074
Toluene	mg/kg	0.247	0.00113	.05	98.3	20-142	L629120-01	WG655074
Total Xylene	mg/kg	0.774	0.00210	.15	103.	16-141	L629120-01	WG655074
a,a,a-Trifluorotoluene(PID)					100.4	54-144		WG655074
TPH (GC/FID) Low Fraction	mg/kg	23.3	0	5.5	84.6	55-109	L629120-01	WG655074
a,a,a-Trifluorotoluene(FID)					96.70	59-128		WG655074
Chromium,Hexavalent	mg/kg	22.4	0	20	56.0*	75-125	L628986-01	WG655367
TPH (GC/FID) High Fraction	mg/kg	31.6	6.80	60	41.4*	50-150	L629658-03	WG655586
o-Terphenyl					75.80	50-150		WG655586

Analyte	Units	MSD	Matrix Spike Duplicate		Limit	RPD	Limit	Ref Samp	Batch
			Ref	%Rec					
Mercury	mg/kg	0.269	0.244	96.2	80-120	10.1	20	L628882-01	WG654883
Benzene	mg/kg	0.0939	0.0541	37.0	32-137	53.8*	39	L628981-04	WG654893
Ethylbenzene	mg/kg	0.0659	0.0386	22.8	10-150	52.2*	44	L628981-04	WG654893
Toluene	mg/kg	0.166	0.101	63.0	20-142	49.0*	42	L628981-04	WG654893
Total Xylene	mg/kg	0.318	0.224	34.4	16-141	35.0	46	L628981-04	WG654893
a,a,a-Trifluorotoluene(PID)				99.84	54-144				WG654893

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Analyte	Units	MSD	Matrix Spike Duplicate		Limit	RPD	Limit	Ref Samp	Batch
			Ref	%Rec					
TPH (GC/FID) Low Fraction	mg/kg	13.9	15.8	48.5*	55-109	12.6	20	L628981-04	WG654893
a,a,a-Trifluorotoluene(FID)				95.23	59-128				WG654893
TPH (GC/FID) High Fraction	mg/kg	140.	162.	84.0	50-150	14.6	20	L628986-03	WG654942
o-Terphenyl				33.10*	50-150				WG654942
Arsenic	mg/kg	55.4	53.4	92.0	75-125	3.68	20	L629027-02	WG655199
Barium	mg/kg	121.	120.	88.0	75-125	0.830	20	L629027-02	WG655199
Cadmium	mg/kg	44.7	43.3	89.4	75-125	3.18	20	L629027-02	WG655199
Chromium	mg/kg	66.1	63.0	96.2	75-125	4.80	20	L629027-02	WG655199
Copper	mg/kg	59.7	57.5	94.8	75-125	3.75	20	L629027-02	WG655199
Lead	mg/kg	53.3	65.6	89.6	75-125	20.7*	20	L629027-02	WG655199
Nickel	mg/kg	54.5	52.0	80.8	75-125	4.69	20	L629027-02	WG655199
Selenium	mg/kg	50.0	47.1	100.	75-125	5.97	20	L629027-02	WG655199
Silver	mg/kg	43.7	42.4	87.4	75-125	3.02	20	L629027-02	WG655199
Zinc	mg/kg	82.8	83.2	86.0	75-125	0.482	20	L629027-02	WG655199
Benzene	mg/kg	0.227	0.234	90.4	32-137	3.17	39	L629120-01	WG655074
Ethylbenzene	mg/kg	0.230	0.248	91.9	10-150	7.65	44	L629120-01	WG655074
Toluene	mg/kg	0.231	0.247	92.0	20-142	6.65	42	L629120-01	WG655074
Total Xylene	mg/kg	0.714	0.774	95.0	16-141	8.01	46	L629120-01	WG655074
a,a,a-Trifluorotoluene(PID)				100.3	54-144				WG655074
TPH (GC/FID) Low Fraction	mg/kg	22.5	23.3	81.9	55-109	3.19	20	L629120-01	WG655074
a,a,a-Trifluorotoluene(FID)				96.66	59-128				WG655074
Chromium,Hexavalent	mg/kg	23.4	22.4	58.5*	75-125	4.37	20	L628986-01	WG655367
TPH (GC/FID) High Fraction	mg/kg	38.3	31.6	52.5	50-150	19.1	20	L629658-03	WG655586
o-Terphenyl				83.40	50-150				WG655586

Serial Dilution

Batch number /Run number / Sample number cross reference

WG654883: R2605521: L628981-01
WG654893: R2605642: L628981-04
WG654942: R2606060: L628981-01 02 03
WG655167: R2609180: L628981-01
WG655199: R2609960: L628981-01
WG655074: R2612360: L628981-01 02 03
WG655367: R2613422: L628981-01
WG655555: R2613720: L628981-01
WG655557: R2613780: L628981-01
WG655377: R2614981: L628981-01
WG655016: R2615341: L628981-01
WG655586: R2616121: L628981-04

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

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

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

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

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