

TECHNICAL INFORMATION PAGE



FOR OGCC USE ONLY

1. OGCC Operator Number: \_\_\_\_\_ API Number: \_\_\_\_\_

2. Name of Operator: \_\_\_\_\_ OGCC Facility ID # \_\_\_\_\_

3. Well/Facility Name: \_\_\_\_\_ Well/Facility Number: \_\_\_\_\_

4. Location (QtrQtr, Sec, Twp, Rng, Meridian): \_\_\_\_\_

This form is to be completed whenever a Sundry Notice is submitted requiring detailed report of work to be performed or completed. This form shall be transmitted within 30 days of work completed as a "subsequent" report and must accompany Form 4, page 1.

5.

DESCRIBE PROPOSED OR COMPLETED OPERATIONS

## Introduction

Encana Oil & Gas (USA) Inc. (Encana) is submitting this Form 4 Sundry Notice to request final closure status for the earthen pit associated with the Cathedral Federal # 7-18 (COGCC facility #315298, the COGCC remediation #7582). The site investigation was conducted by a third party contractor as authorized by Encana personnel. All samples were collected in accordance with Encana's Environmental Compliance Group's Sampling Procedures. The analytical results for the respective soil samples were within the COGCC Table 910-1 standards and are provided in Table 1 and Attachment A of this submittal. The text below provides the details of the site investigation. For a visual description of the site please refer to Figures 1 and 2 – Site Maps.

## Site Investigation

August 6, 2012 - The pit was characterized utilizing a photoionization detector (PID) field unit by a third party consultant. A trackhoe was utilized for excavation purposes. There were not any indicators of hydrocarbon impacts in accordance with field screen readings and visual observations. A grab sample from the pit bottom was sent to an accredited analytical laboratory for analysis. Five (5) background samples were also collected from approximately six (6) inches beneath the grounds surface for analysis with regards to arsenic. The analytical report indicated that the grab sample was in compliance with the COGCC Table 910-1 standards.

## Conclusion

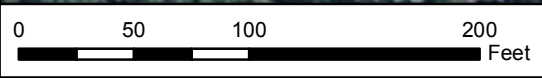
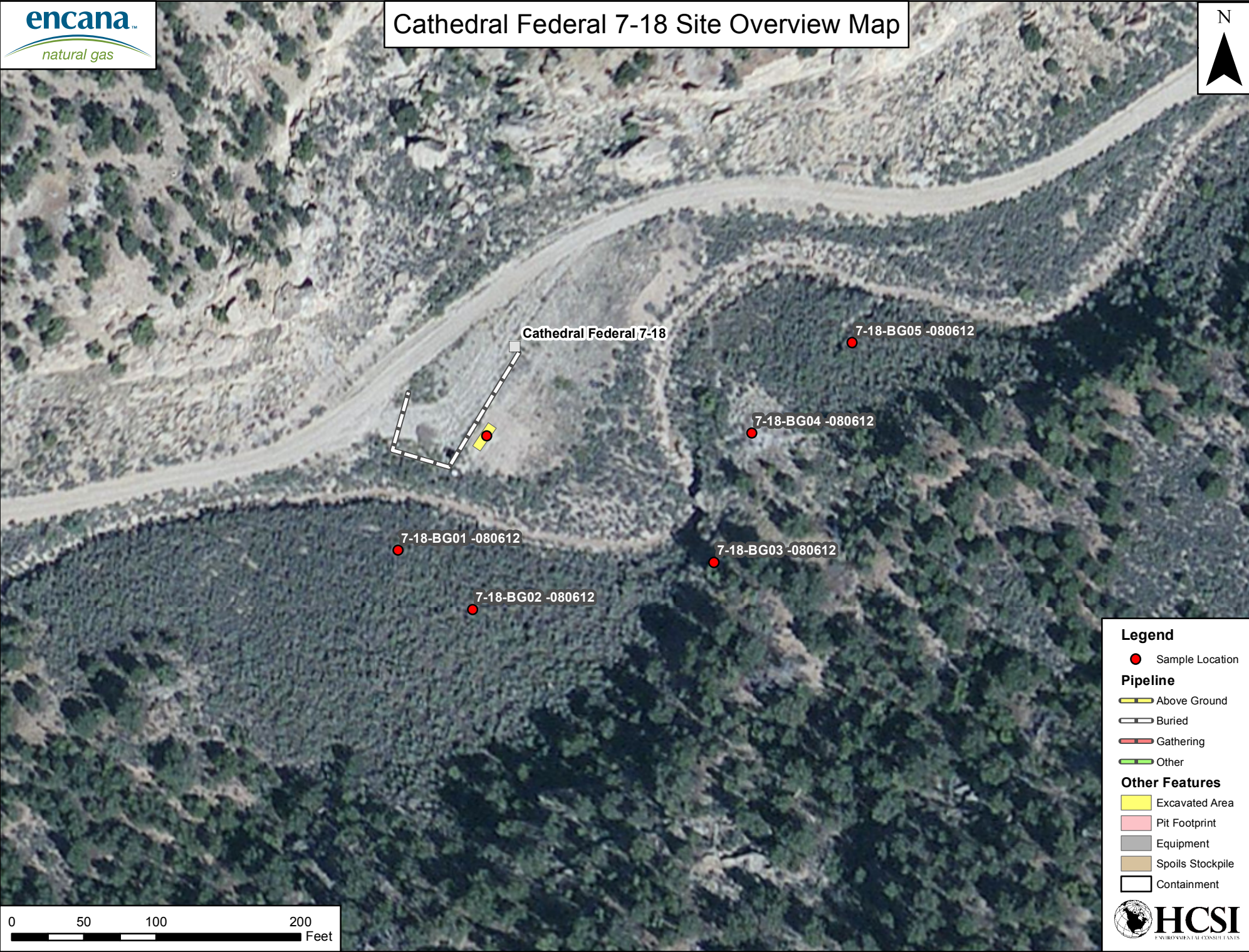
Based on the site investigation and analytical results associated with the Cathedral Federal # 7-18, the location has met the criteria required per the COGCC. Encana respectfully requests that final closure be granted for the respective pit, COGCC remediation # 7582.

## Analytical Review

Sample results indicate that the soil within the earthen pit footprint on Encana's Cathedral Federal #7-18 well pad have exceedances of COGCC Table 910-1 allowable concentrations for arsenic (2.8 ppm). Though the arsenic concentration in the soil is above the allowable concentration identified in Table 910-1, the concentration is within the range of arsenic background values (2.1-5.1 ppm) in this area as indicated by the associated background samples. 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. Please see Attachment A for the respective laboratory analytical results.



# Cathedral Federal 7-18 Site Overview Map



**Legend**


- Sample Location

**Pipeline**

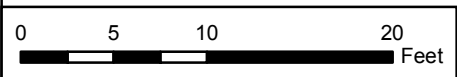
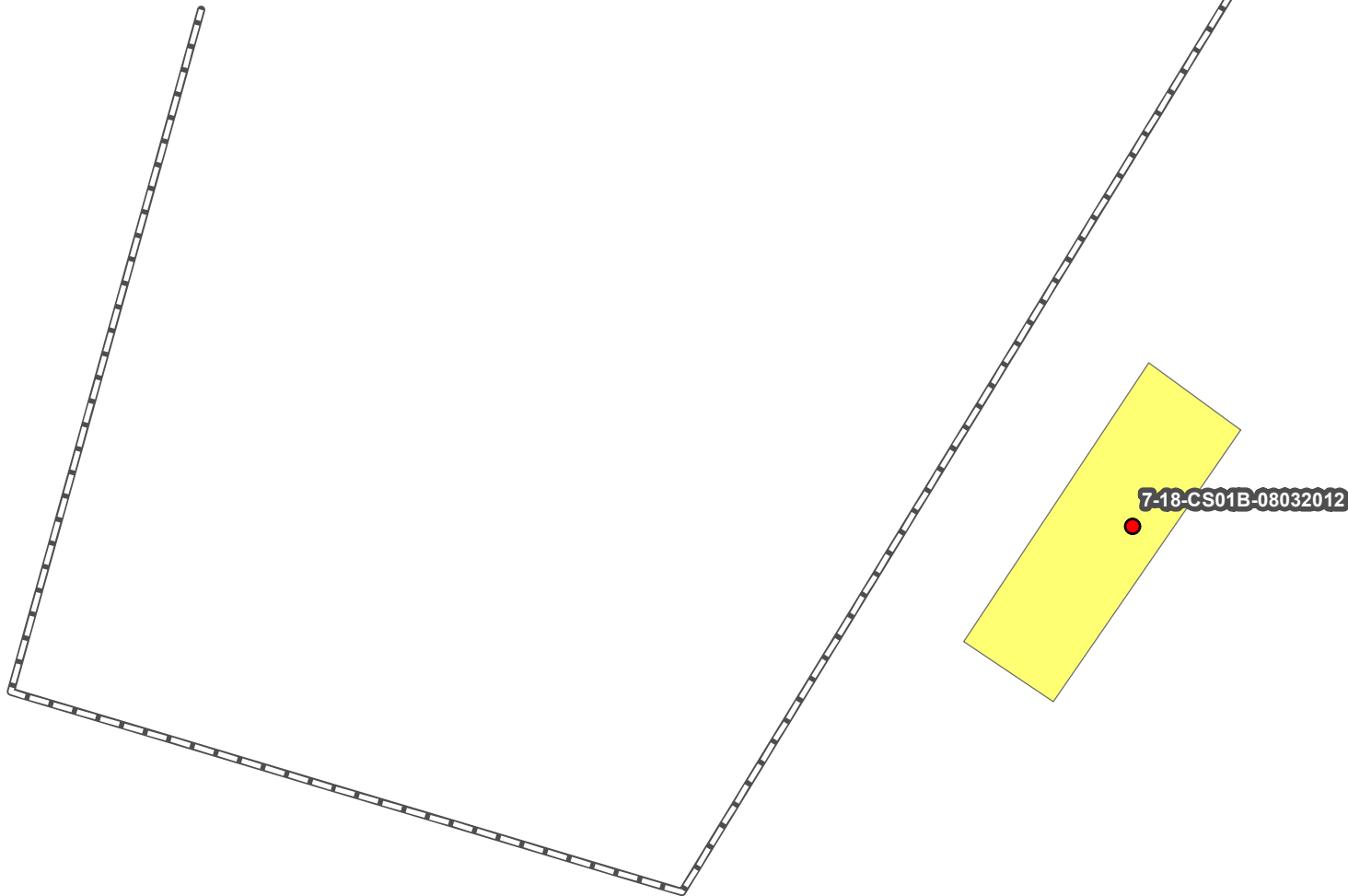
- ▬ Above Ground
- ▬ Buried
- ▬ Gathering
- ▬ Other

**Other Features**

- ▭ Excavated Area
- ▭ Pit Footprint
- ▭ Equipment
- ▭ Spoils Stockpile
- ▭ Containment

 **HCSI**  
ENVIRONMENTAL CONSULTANTS






**Legend**

**Pipeline**

- Above Ground
- Buried
- Gathering
- Other

**Other Features**

- Excavated Area
- Pit Footprint
- Equipment
- Spoils Stockpile
- Containment

 **HCSI**  
ENVIRONMENTAL CONSULTANTS

[illegible][illegible]



12065 Lebanon Rd.  
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1-800-767-5859  
Fax (615) 758-5859

Tax I.D. 62-0814289

Est. 1970

Blake Ford and Kate Ramsay  
EnCana Oil & Gas - Rangely, CO  
1125 Escalante Drive  
Rangely, CO 81648-3600

## Report Summary

Thursday August 16, 2012

Report Number: L589122

Samples Received: 08/09/12

Client Project: 10-418

Description: Pit Closure

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

Blake Ford and Kate Ramsay  
EnCana Oil & Gas - Rangely, CO  
1125 Escalante Drive  
Rangely, CO 81648-3600

August 16, 2012

Date Received : August 09, 2012  
Description : Pit Closure  
Sample ID : 7-18-BG01-08062012  
Collected By : DAP  
Collection Date : 08/06/12 14:20

ESC Sample # : L589122-01

Site ID : CATHFED 7-18

Project # : 10-418

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Arsenic	2.9	1.0	mg/kg	6010B	08/13/12	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: 08/16/12 18:16 Printed: 08/16/12 18:17



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REPORT OF ANALYSIS

Blake Ford and Kate Ramsay  
EnCana Oil & Gas - Rangely, CO  
1125 Escalante Drive  
Rangely, CO 81648-3600

August 16, 2012

Date Received : August 09, 2012  
Description : Pit Closure  
Sample ID : 7-18-BG02-08062012  
Collected By : DAP  
Collection Date : 08/06/12 14:25

ESC Sample # : L589122-02

Site ID : CATHFED 7-18

Project # : 10-418

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Arsenic	2.6	1.0	mg/kg	6010B	08/13/12	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

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# REPORT OF ANALYSIS

Blake Ford and Kate Ramsay  
EnCana Oil & Gas - Rangely, CO  
1125 Escalante Drive  
Rangely, CO 81648-3600

August 16, 2012

Date Received : August 09, 2012  
Description : Pit Closure  
Sample ID : 7-18-BG03-08062012  
Collected By : DAP  
Collection Date : 08/06/12 14:30

ESC Sample # : L589122-03

Site ID : CATHFED 7-18

Project # : 10-418

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Arsenic	5.1	1.0	mg/kg	6010B	08/13/12	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

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# REPORT OF ANALYSIS

Blake Ford and Kate Ramsay  
EnCana Oil & Gas - Rangely, CO  
1125 Escalante Drive  
Rangely, CO 81648-3600

August 16, 2012

Date Received : August 09, 2012  
Description : Pit Closure  
Sample ID : 7-18-BG04-08062012  
Collected By : DAP  
Collection Date : 08/06/12 14:35

ESC Sample # : L589122-04

Site ID : CATHFED 7-18

Project # : 10-418

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Arsenic	2.1	1.0	mg/kg	6010B	08/13/12	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

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REPORT OF ANALYSIS

Blake Ford and Kate Ramsay  
EnCana Oil & Gas - Rangely, CO  
1125 Escalante Drive  
Rangely, CO 81648-3600

August 16, 2012

Date Received : August 09, 2012  
Description : Pit Closure  
Sample ID : 7-18-BG05-08062012  
Collected By : DAP  
Collection Date : 08/06/12 14:40

ESC Sample # : L589122-05

Site ID : CATHFED 7-18

Project # : 10-418

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Arsenic	3.1	1.0	mg/kg	6010B	08/13/12	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

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REPORT OF ANALYSIS

Blake Ford and Kate Ramsay  
EnCana Oil & Gas - Rangely, CO  
1125 Escalante Drive  
Rangely, CO 81648-3600

August 16, 2012

Date Received : August 09, 2012  
Description : Pit Closure  
Sample ID : 7-18-CS01B-08062012  
Collected By : DAP  
Collection Date : 08/06/12 14:55

ESC Sample # : L589122-06

Site ID : CATHFED 7-18

Project # : 10-418

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Chromium, Hexavalent	BDL	4.0	mg/kg	3060A/7196A	08/15/12	2
Chromium, Trivalent	8.2	4.0	mg/kg	Calc.	08/12/12	1
ORP	160		mV	2580	08/10/12	1
pH	9.2		su	9045D	08/14/12	1
Sodium Adsorption Ratio	55.			Calc.	08/13/12	1
Specific Conductance	2200		umhos/cm	9050AMod	08/16/12	1
Mercury	BDL	0.10	mg/kg	7471	08/11/12	5
Arsenic	2.8	1.0	mg/kg	6010B	08/12/12	1
Barium	240	0.25	mg/kg	6010B	08/12/12	1
Cadmium	BDL	0.25	mg/kg	6010B	08/12/12	1
Chromium	8.2	0.50	mg/kg	6010B	08/12/12	1
Copper	7.9	1.0	mg/kg	6010B	08/12/12	1
Lead	10.	0.25	mg/kg	6010B	08/12/12	1
Nickel	9.5	1.0	mg/kg	6010B	08/12/12	1
Selenium	BDL	1.0	mg/kg	6010B	08/12/12	1
Silver	BDL	0.50	mg/kg	6010B	08/12/12	1
Zinc	44.	1.5	mg/kg	6010B	08/12/12	1
Benzene	BDL	0.0025	mg/kg	8021/8015	08/10/12	5
Toluene	BDL	0.025	mg/kg	8021/8015	08/10/12	5
Ethylbenzene	BDL	0.0025	mg/kg	8021/8015	08/10/12	5
Total Xylene	BDL	0.0075	mg/kg	8021/8015	08/10/12	5
TPH (GC/FID) Low Fraction	BDL	0.50	mg/kg	GRO	08/10/12	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	94.3		% Rec.	8021/8015	08/10/12	5
a,a,a-Trifluorotoluene(PID)	101.		% Rec.	8021/8015	08/10/12	5
TPH (GC/FID) High Fraction	85.	4.0	mg/kg	3546/DRO	08/13/12	1
Surrogate recovery(%)						
o-Terphenyl	53.6		% Rec.	3546/DRO	08/13/12	1
Polynuclear Aromatic Hydrocarbons						
Anthracene	BDL	0.030	mg/kg	8270C-SIM	08/12/12	5
Acenaphthene	BDL	0.030	mg/kg	8270C-SIM	08/12/12	5
Acenaphthylene	BDL	0.030	mg/kg	8270C-SIM	08/12/12	5
Benzo(a)anthracene	BDL	0.030	mg/kg	8270C-SIM	08/12/12	5
Benzo(a)pyrene	BDL	0.030	mg/kg	8270C-SIM	08/12/12	5

BDL - Below Detection Limit  
Det. Limit - Practical Quantitation Limit(PQL)  
L589122-06 (CR6) - diluted due to sample color interference  
L589122-06 (SV8270PAHSIM) - Dilution due to matrix  
L589122-06 (PH) - 9.2@20.9c

REPORT OF ANALYSIS

Blake Ford and Kate Ramsay  
EnCana Oil & Gas - Rangely, CO  
1125 Escalante Drive  
Rangely, CO 81648-3600

August 16, 2012

Date Received : August 09, 2012  
Description : Pit Closure  
Sample ID : 7-18-CS01B-08062012  
Collected By : DAP  
Collection Date : 08/06/12 14:55

ESC Sample # : L589122-06

Site ID : CATHFED 7-18

Project # : 10-418

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzo(b)fluoranthene	BDL	0.030	mg/kg	8270C-SIM	08/12/12	5
Benzo(g,h,i)perylene	BDL	0.030	mg/kg	8270C-SIM	08/12/12	5
Benzo(k)fluoranthene	BDL	0.030	mg/kg	8270C-SIM	08/12/12	5
Chrysene	BDL	0.030	mg/kg	8270C-SIM	08/12/12	5
Dibenz(a,h)anthracene	BDL	0.030	mg/kg	8270C-SIM	08/12/12	5
Fluoranthene	BDL	0.030	mg/kg	8270C-SIM	08/12/12	5
Fluorene	BDL	0.030	mg/kg	8270C-SIM	08/12/12	5
Indeno(1,2,3-cd)pyrene	BDL	0.030	mg/kg	8270C-SIM	08/12/12	5
Naphthalene	BDL	0.030	mg/kg	8270C-SIM	08/12/12	5
Phenanthrene	BDL	0.030	mg/kg	8270C-SIM	08/12/12	5
Pyrene	BDL	0.030	mg/kg	8270C-SIM	08/12/12	5
1-Methylnaphthalene	BDL	0.030	mg/kg	8270C-SIM	08/12/12	5
2-Methylnaphthalene	BDL	0.030	mg/kg	8270C-SIM	08/12/12	5
2-Chloronaphthalene	BDL	0.030	mg/kg	8270C-SIM	08/12/12	5
Surrogate Recovery						
Nitrobenzene-d5	93.6		% Rec.	8270C-SIM	08/12/12	5
2-Fluorobiphenyl	82.8		% Rec.	8270C-SIM	08/12/12	5
p-Terphenyl-d14	73.2		% Rec.	8270C-SIM	08/12/12	5

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

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L589122-06 (CR6) - diluted due to sample color interference

L589122-06 (SV8270PAHSIM) - Dilution due to matrix

L589122-06 (PH) - 9.2@20.9c

Attachment A  
List of Analytes with QC Qualifiers

Sample Number	Work Group	Sample Type	Analyte	Run ID	Qualifier
L589122-06	WG607210	SAMP	Mercury	R2299497	O
	WG606975	SAMP	Anthracene	R2298438	O
	WG606975	SAMP	Acenaphthene	R2298438	O
	WG606975	SAMP	Acenaphthylene	R2298438	O
	WG606975	SAMP	Benzo(a)anthracene	R2298438	O
	WG606975	SAMP	Benzo(a)pyrene	R2298438	J30
	WG606975	SAMP	Benzo(b)fluoranthene	R2298438	J30
	WG606975	SAMP	Benzo(g,h,i)perylene	R2298438	J30
	WG606975	SAMP	Benzo(k)fluoranthene	R2298438	O
	WG606975	SAMP	Chrysene	R2298438	O
	WG606975	SAMP	Dibenz(a,h)anthracene	R2298438	J30
	WG606975	SAMP	Fluoranthene	R2298438	O
	WG606975	SAMP	Fluorene	R2298438	O
	WG606975	SAMP	Indeno(1,2,3-cd)pyrene	R2298438	J30
	WG606975	SAMP	Naphthalene	R2298438	O
	WG606975	SAMP	Phenanthrene	R2298438	O
	WG606975	SAMP	Pyrene	R2298438	J30
	WG606975	SAMP	1-Methylnaphthalene	R2298438	O
	WG606975	SAMP	2-Methylnaphthalene	R2298438	O
	WG606975	SAMP	2-Chloronaphthalene	R2298438	O
	WG607556	SAMP	pH	R2302013	T8
	WG607351	SAMP	Chromium, Hexavalent	R2302694	O



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  
08/16/12 at 18:17:16

TSR Signing Reports: 358  
R5 - Desired TAT

Sample: L589122-01 Account: ENCANRCO Received: 08/09/12 09:00 Due Date: 08/16/12 00:00 RPT Date: 08/16/12 18:16  
Sample: L589122-02 Account: ENCANRCO Received: 08/09/12 09:00 Due Date: 08/16/12 00:00 RPT Date: 08/16/12 18:16  
Sample: L589122-03 Account: ENCANRCO Received: 08/09/12 09:00 Due Date: 08/16/12 00:00 RPT Date: 08/16/12 18:16  
Sample: L589122-04 Account: ENCANRCO Received: 08/09/12 09:00 Due Date: 08/16/12 00:00 RPT Date: 08/16/12 18:16  
Sample: L589122-05 Account: ENCANRCO Received: 08/09/12 09:00 Due Date: 08/16/12 00:00 RPT Date: 08/16/12 18:16  
Sample: L589122-06 Account: ENCANRCO Received: 08/09/12 09:00 Due Date: 08/16/12 00:00 RPT Date: 08/16/12 18:16



**YOUR LAB OF CHOICE**

EnCana Oil & Gas - Rangely, CO  
Blake Ford and Kate Ramsay  
1125 Escalante Drive

Rangely, CO 81648-3600

Quality Assurance Report  
Level II

L589122

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August 16, 2012

Analyte	Result	Laboratory Blank		Limit	Batch	Date Analyzed
		Units	% Rec			
1-Methylnaphthalene	< .006	mg/kg			WG606975	08/10/12 09:55
2-Chloronaphthalene	< .006	mg/kg			WG606975	08/10/12 09:55
2-Methylnaphthalene	< .006	mg/kg			WG606975	08/10/12 09:55
Acenaphthene	< .006	mg/kg			WG606975	08/10/12 09:55
Acenaphthylene	< .006	mg/kg			WG606975	08/10/12 09:55
Anthracene	< .006	mg/kg			WG606975	08/10/12 09:55
Benzo(a)anthracene	< .006	mg/kg			WG606975	08/10/12 09:55
Benzo(a)pyrene	< .006	mg/kg			WG606975	08/10/12 09:55
Benzo(b)fluoranthene	< .006	mg/kg			WG606975	08/10/12 09:55
Benzo(g,h,i)perylene	< .006	mg/kg			WG606975	08/10/12 09:55
Benzo(k)fluoranthene	< .006	mg/kg			WG606975	08/10/12 09:55
Chrysene	< .006	mg/kg			WG606975	08/10/12 09:55
Dibenz(a,h)anthracene	< .006	mg/kg			WG606975	08/10/12 09:55
Fluoranthene	< .006	mg/kg			WG606975	08/10/12 09:55
Fluorene	< .006	mg/kg			WG606975	08/10/12 09:55
Indeno(1,2,3-cd)pyrene	< .006	mg/kg			WG606975	08/10/12 09:55
Naphthalene	< .006	mg/kg			WG606975	08/10/12 09:55
Phenanthrene	< .006	mg/kg			WG606975	08/10/12 09:55
Pyrene	< .006	mg/kg			WG606975	08/10/12 09:55
2-Fluorobiphenyl		% Rec.	81.98	34-129	WG606975	08/10/12 09:55
Nitrobenzene-d5		% Rec.	77.10	14-141	WG606975	08/10/12 09:55
p-Terphenyl-d14		% Rec.	84.19	25-139	WG606975	08/10/12 09:55
Mercury	< .02	mg/kg			WG607210	08/11/12 11:39
Arsenic	< 1	mg/kg			WG606995	08/12/12 03:11
Barium	< .25	mg/kg			WG606995	08/12/12 03:11
Cadmium	< .25	mg/kg			WG606995	08/12/12 03:11
Chromium	< .5	mg/kg			WG606995	08/12/12 03:11
Copper	< 1	mg/kg			WG606995	08/12/12 03:11
Nickel	< 1	mg/kg			WG606995	08/12/12 03:11
Selenium	< 1	mg/kg			WG606995	08/12/12 03:11
Silver	< .5	mg/kg			WG606995	08/12/12 03:11
Zinc	< 1.5	mg/kg			WG606995	08/12/12 03:11
Lead	< .25	mg/kg			WG606995	08/12/12 15:56
Benzene	< .0005	mg/kg			WG606999	08/10/12 14:09
Ethylbenzene	< .0005	mg/kg			WG606999	08/10/12 14:09
Toluene	< .005	mg/kg			WG606999	08/10/12 14:09
TPH (GC/FID) Low Fraction	< .1	mg/kg			WG606999	08/10/12 14:09
Total Xylene	< .0015	mg/kg			WG606999	08/10/12 14:09
a,a,a-Trifluorotoluene(FID)		% Rec.	94.81	59-128	WG606999	08/10/12 14:09
a,a,a-Trifluorotoluene(PID)		% Rec.	102.1	54-144	WG606999	08/10/12 14:09
Arsenic	< 1	mg/kg			WG606935	08/13/12 04:50
TPH (GC/FID) High Fraction	< 4	ppm			WG606964	08/13/12 14:22
o-Terphenyl		% Rec.	70.81	50-150	WG606964	08/13/12 14:22
pH	4.78	su			WG607556	08/14/12 15:22
Chromium,Hexavalent	< 2	mg/kg			WG607351	08/15/12 09:05

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Quality Assurance Report  
Level II

L589122

12065 Lebanon Rd.  
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Fax (615) 758-5859

Tax I.D. 62-0814289

Est. 1970

August 16, 2012

Analyte	Result	Laboratory Blank		Limit	Batch	Date Analyzed
		Units	% Rec			
Specific Conductance	1.00	umhos/cm			WG607871	08/16/12 16:16

Analyte	Units	Duplicate		RPD	Limit	Ref Samp	Batch
		Result	Duplicate				
ORP	mV	170.	170.	0	20	L588504-06	WG607018
Mercury	mg/kg	0	0	0	20	L589122-06	WG607210
Arsenic	mg/kg	2.00	4.00	65.3*	20	L589074-93	WG606995
Barium	mg/kg	70.0	75.0	6.61	20	L589074-93	WG606995
Cadmium	mg/kg	0	0.0860	NA	20	L589074-93	WG606995
Chromium	mg/kg	20.0	21.0	4.88	20	L589074-93	WG606995
Copper	mg/kg	7.00	7.32	4.76	20	L589074-93	WG606995
Nickel	mg/kg	8.60	8.94	4.11	20	L589074-93	WG606995
Silver	mg/kg	0	0	0	20	L589074-93	WG606995
Zinc	mg/kg	24.0	26.0	8.00	20	L589074-93	WG606995
Lead	mg/kg	8.20	8.20	0.244	20	L589074-93	WG606995
Selenium	mg/kg	0	0	0	20	L589074-93	WG606995
Arsenic	mg/kg	3.00	3.10	1.95	20	L589122-05	WG606935
pH	su	9.70	9.70	0.413	1	L587109-15	WG607556
pH	su	8.00	7.60	4.75*	1	L589615-11	WG607556
Chromium, Hexavalent	mg/kg	0	0	0	20	L589210-06	WG607351
Chromium, Hexavalent	mg/kg	0	0	0	20	L589665-10	WG607351
Specific Conductance	umhos/cm	430.	370.	14.3	20	L589182-06	WG607871
Specific Conductance	umhos/cm	2000	1600	22.2*	20	L589665-10	WG607871

Analyte	Units	Laboratory Control Sample		% Rec	Limit	Batch
		Known Val	Result			
1-Methylnaphthalene	mg/kg	.033	0.0267	80.9	48-113	WG606975
2-Chloronaphthalene	mg/kg	.033	0.0266	80.5	51-114	WG606975
2-Methylnaphthalene	mg/kg	.033	0.0252	76.5	44-109	WG606975
Acenaphthene	mg/kg	.033	0.0266	80.7	52-108	WG606975
Acenaphthylene	mg/kg	.033	0.0267	80.9	51-110	WG606975
Anthracene	mg/kg	.033	0.0270	81.8	58-120	WG606975
Benzo(a)anthracene	mg/kg	.033	0.0282	85.4	54-110	WG606975
Benzo(a)pyrene	mg/kg	.033	0.0268	81.2	56-118	WG606975
Benzo(b)fluoranthene	mg/kg	.033	0.0303	91.7	55-114	WG606975
Benzo(g,h,i)perylene	mg/kg	.033	0.0338	102.	48-130	WG606975
Benzo(k)fluoranthene	mg/kg	.033	0.0294	89.0	55-122	WG606975
Chrysene	mg/kg	.033	0.0268	81.3	57-118	WG606975
Dibenz(a,h)anthracene	mg/kg	.033	0.0319	96.6	53-122	WG606975
Fluoranthene	mg/kg	.033	0.0274	83.2	58-118	WG606975
Fluorene	mg/kg	.033	0.0272	82.4	54-109	WG606975
Indeno(1,2,3-cd)pyrene	mg/kg	.033	0.0318	96.4	51-125	WG606975
Naphthalene	mg/kg	.033	0.0245	74.4	45-105	WG606975
Phenanthrene	mg/kg	.033	0.0254	77.0	53-114	WG606975
Pyrene	mg/kg	.033	0.0271	82.2	53-121	WG606975

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Analyte	Units	Laboratory Control		Sample	% Rec	Limit	Batch
		Known	Val	Result			
2-Fluorobiphenyl					90.67	34-129	
Nitrobenzene-d5					77.24	14-141	
p-Terphenyl-d14					88.42	25-139	
ORP	mV	228		227.	99.6	95.6-104.	WG607018
Mercury	mg/kg	12.4		15.9	128.*	71.6-128	WG607210
Arsenic	mg/kg	237		199.	84.0	83.1-117	WG606995
Barium	mg/kg	252		224.	88.9	84.1-116	WG606995
Cadmium	mg/kg	191		162.	84.8	83.2-117	WG606995
Chromium	mg/kg	128		115.	89.8	81.3-118	WG606995
Copper	mg/kg	123		110.	89.4	83.7-116	WG606995
Nickel	mg/kg	118		98.6	83.6	82-118	WG606995
Selenium	mg/kg	110		90.7	82.5	78.7-122	WG606995
Silver	mg/kg	47.3		42.0	88.8	66.2-134	WG606995
Zinc	mg/kg	183		157.	85.8	82-118	WG606995
Lead	mg/kg	103		93.5	90.8	83.1-117	WG606995
Benzene	mg/kg	.05		0.0431	86.1	76-113	WG606999
Ethylbenzene	mg/kg	.05		0.0504	101.	78-115	WG606999
Toluene	mg/kg	.05		0.0471	94.1	76-114	WG606999
Total Xylene	mg/kg	.15		0.158	105.	81-118	WG606999
a,a,a-Trifluorotoluene(PID)					101.3	54-144	WG606999
TPH (GC/FID) Low Fraction	mg/kg	5.5		6.44	117.	67-135	WG606999
a,a,a-Trifluorotoluene(FID)					100.4	59-128	WG606999
Arsenic	mg/kg	237		219.	92.4	83.1-117	WG606935
TPH (GC/FID) High Fraction	ppm	60		56.4	94.0	50-150	WG606964
o-Terphenyl					78.88	50-150	WG606964
pH	su	6.03		6.04	100.	98-101	WG607556
Chromium, Hexavalent	mg/kg	150		143.	95.3	50-150	WG607351
Specific Conductance	umhos/cm	495		499.	101.	85-115	WG607871

Analyte	Units	Laboratory Control		Sample Duplicate	Limit	RPD	Limit	Batch
		Result	Ref	%Rec				
1-Methylnaphthalene	mg/kg	0.0241	0.0267	73.0	48-113	10.3	24	WG606975
2-Chloronaphthalene	mg/kg	0.0262	0.0266	79.0	51-114	1.31	24	WG606975
2-Methylnaphthalene	mg/kg	0.0229	0.0252	69.0	44-109	9.83	24	WG606975
Acenaphthene	mg/kg	0.0240	0.0266	73.0	52-108	10.2	22	WG606975
Acenaphthylene	mg/kg	0.0251	0.0267	76.0	51-110	6.15	21	WG606975
Anthracene	mg/kg	0.0266	0.0270	81.0	58-120	1.37	20	WG606975
Benzo(a)anthracene	mg/kg	0.0262	0.0282	79.0	54-110	7.21	22	WG606975
Benzo(a)pyrene	mg/kg	0.0208	0.0268	63.0	56-118	25.1*	21	WG606975
Benzo(b)fluoranthene	mg/kg	0.0247	0.0303	75.0	55-114	20.4*	20	WG606975
Benzo(g,h,i)perylene	mg/kg	0.0268	0.0338	81.0	48-130	22.8*	20	WG606975
Benzo(k)fluoranthene	mg/kg	0.0236	0.0294	71.0	55-122	21.9	25	WG606975

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Analyte	Units	Laboratory Control		Sample Duplicate		Limit	RPD	Limit	Batch
		Result	Ref	%Rec					
Chrysene	mg/kg	0.0255	0.0268	77.0		57-118	5.18	20	WG606975
Dibenz(a,h)anthracene	mg/kg	0.0253	0.0319	77.0		53-122	23.0*	20	WG606975
Fluoranthene	mg/kg	0.0249	0.0274	75.0		58-118	9.82	20	WG606975
Fluorene	mg/kg	0.0265	0.0272	80.0		54-109	2.37	20	WG606975
Indeno(1,2,3-cd)pyrene	mg/kg	0.0255	0.0318	77.0		51-125	22.2*	21	WG606975
Naphthalene	mg/kg	0.0233	0.0245	71.0		45-105	5.12	24	WG606975
Phenanthrene	mg/kg	0.0240	0.0254	73.0		53-114	5.66	20	WG606975
Pyrene	mg/kg	0.0215	0.0271	65.0		53-121	22.9*	20	WG606975
2-Fluorobiphenyl				86.78		34-129			WG606975
Nitrobenzene-d5				71.12		14-141			WG606975
p-Terphenyl-d14				75.05		25-139			WG606975
ORP	mV	228.	227.	100.		95.6-104.	0.440	20	WG607018
Benzene	mg/kg	0.0447	0.0431	89.0		76-113	3.83	20	WG606999
Ethylbenzene	mg/kg	0.0516	0.0504	103.		78-115	2.23	20	WG606999
Toluene	mg/kg	0.0483	0.0471	97.0		76-114	2.70	20	WG606999
Total Xylene	mg/kg	0.161	0.158	108.		81-118	2.19	20	WG606999
a,a,a-Trifluorotoluene(PID)				101.7		54-144			WG606999
TPH (GC/FID) Low Fraction	mg/kg	6.62	6.44	120.		67-135	2.80	20	WG606999
a,a,a-Trifluorotoluene(FID)				101.0		59-128			WG606999
TPH (GC/FID) High Fraction	ppm	56.9	56.4	95.0		50-150	0.869	23	WG606964
o-Terphenyl				77.85		50-150			WG606964
pH	su	6.03	6.04	100.		98-101	0.166	20	WG607556
Chromium,Hexavalent	mg/kg	135.	143.	90.0		50-150	5.76	20	WG607351

Analyte	Units	Matrix Spike			% Rec	Limit	Ref Samp	Batch
		MS Res	Ref Res	TV				
1-Methylnaphthalene	mg/kg	1.10	0.940	.033	471.*	25-155	L589036-06	WG606975
2-Chloronaphthalene	mg/kg	0.0299	0	.033	90.4	31-153	L589036-06	WG606975
2-Methylnaphthalene	mg/kg	1.07	0.940	.033	392.*	22-172	L589036-06	WG606975
Acenaphthene	mg/kg	0.0918	0	.033	278.*	43-133	L589036-06	WG606975
Acenaphthylene	mg/kg	0.0539	0	.033	163.*	42-146	L589036-06	WG606975
Anthracene	mg/kg	0.116	0.0700	.033	138.	38-153	L589036-06	WG606975
Benzo(a)anthracene	mg/kg	0.0325	0	.033	98.3	31-142	L589036-06	WG606975
Benzo(a)pyrene	mg/kg	0.0357	0	.033	108.	26-152	L589036-06	WG606975
Benzo(b)fluoranthene	mg/kg	0.0462	0	.033	140.	10-188	L589036-06	WG606975
Benzo(g,h,i)perylene	mg/kg	0.0149	0	.033	45.2	10-176	L589036-06	WG606975
Benzo(k)fluoranthene	mg/kg	0.0359	0	.033	109.	22-163	L589036-06	WG606975
Chrysene	mg/kg	0.0673	0	.033	204.*	26-146	L589036-06	WG606975
Dibenz(a,h)anthracene	mg/kg	0.0166	0	.033	50.4	10-160	L589036-06	WG606975
Fluoranthene	mg/kg	0.0864	0	.033	262.*	23-160	L589036-06	WG606975
Fluorene	mg/kg	0.172	0.120	.033	156.*	44-143	L589036-06	WG606975
Indeno(1,2,3-cd)pyrene	mg/kg	0.0178	0	.033	54.0	10-157	L589036-06	WG606975
Naphthalene	mg/kg	0.550	0.420	.033	393.*	22-156	L589036-06	WG606975
Phenanthrene	mg/kg	0.434	0.360	.033	223.*	23-164	L589036-06	WG606975
Pyrene	mg/kg	0.0800	0	.033	242.*	12-170	L589036-06	WG606975
2-Fluorobiphenyl					132.6*	34-129		WG606975
Nitrobenzene-d5					240.8*	14-141		WG606975
p-Terphenyl-d14					92.32	25-139		WG606975

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Analyte	Units	MS Res	Matrix Spike		% Rec	Limit	Ref Samp	Batch
			Ref Res	TV				
Mercury	mg/kg	0.282	0	.05	113.	80-120	L589122-06	WG607210
Arsenic	mg/kg	43.4	4.00	50	78.8	75-125	L589074-93	WG606995
Barium	mg/kg	123.	75.0	50	96.0	75-125	L589074-93	WG606995
Cadmium	mg/kg	42.9	0.0860	50	85.6	75-125	L589074-93	WG606995
Chromium	mg/kg	66.0	21.0	50	90.0	75-125	L589074-93	WG606995
Copper	mg/kg	53.5	7.32	50	92.4	75-125	L589074-93	WG606995
Nickel	mg/kg	50.7	8.94	50	83.5	75-125	L589074-93	WG606995
Silver	mg/kg	43.9	0	50	87.8	75-125	L589074-93	WG606995
Zinc	mg/kg	70.6	26.0	50	89.2	75-125	L589074-93	WG606995
Lead	mg/kg	53.3	8.20	50	90.2	75-125	L589074-93	WG606995
Selenium	mg/kg	37.3	0	10	74.6*	75-125	L589074-93	WG606995
Benzene	mg/kg	0.208	0	.05	83.0	32-137	L589122-06	WG606999
Ethylbenzene	mg/kg	0.232	0	.05	92.8	10-150	L589122-06	WG606999
Toluene	mg/kg	0.229	0	.05	91.7	20-142	L589122-06	WG606999
Total Xylene	mg/kg	0.733	0	.15	97.7	16-141	L589122-06	WG606999
a,a,a-Trifluorotoluene(PID)					100.4	54-144		WG606999
TPH (GC/FID) Low Fraction	mg/kg	25.7	0	5.5	93.5	55-109	L589122-06	WG606999
a,a,a-Trifluorotoluene(FID)					98.59	59-128		WG606999
Arsenic	mg/kg	51.6	3.10	50	97.0	75-125	L589122-05	WG606935
TPH (GC/FID) High Fraction	ppm	63.2	0	60	105.	50-150	L589085-03	WG606964
o-Terphenyl					74.65	50-150		WG606964
Chromium,Hexavalent	mg/kg	14.3	0	20	71.5	50-150	L589673-10	WG607351

Analyte	Units	MSD	Matrix Spike Duplicate		Limit	RPD	Limit	Ref Samp	Batch
			Ref	%Rec					
1-Methylnaphthalene	mg/kg	1.07	1.10	381.*	25-155	2.74	27	L589036-06	WG606975
2-Chloronaphthalene	mg/kg	0.0355	0.0299	108.	31-153	17.4	22	L589036-06	WG606975
2-Methylnaphthalene	mg/kg	0.993	1.07	160.	22-172	7.43	29	L589036-06	WG606975
Acenaphthene	mg/kg	0.0899	0.0918	272.*	43-133	2.12	26	L589036-06	WG606975
Acenaphthylene	mg/kg	0.0565	0.0539	171.*	42-146	4.85	22	L589036-06	WG606975
Anthracene	mg/kg	0.0836	0.116	41.1	38-153	32.2*	27	L589036-06	WG606975
Benzo(a)anthracene	mg/kg	0.0373	0.0325	113.	31-142	13.8	31	L589036-06	WG606975
Benzo(a)pyrene	mg/kg	0.0404	0.0357	122.	26-152	12.5	32	L589036-06	WG606975
Benzo(b)fluoranthene	mg/kg	0.0469	0.0462	142.	10-188	1.60	33	L589036-06	WG606975
Benzo(g,h,i)perylene	mg/kg	0.0173	0.0149	52.3	10-176	14.4	30	L589036-06	WG606975
Benzo(k)fluoranthene	mg/kg	0.0389	0.0359	118.	22-163	8.18	29	L589036-06	WG606975
Chrysene	mg/kg	0.0642	0.0673	194.*	26-146	4.79	30	L589036-06	WG606975
Dibenz(a,h)anthracene	mg/kg	0.0199	0.0166	60.4	10-160	18.1	39	L589036-06	WG606975
Fluoranthene	mg/kg	0.0864	0.0864	262.*	23-160	0.0105	22	L589036-06	WG606975
Fluorene	mg/kg	0.141	0.172	64.1	44-143	19.5	23	L589036-06	WG606975
Indeno(1,2,3-cd)pyrene	mg/kg	0.0184	0.0178	55.9	10-157	3.30	40	L589036-06	WG606975
Naphthalene	mg/kg	0.474	0.550	164.*	22-156	14.8	27	L589036-06	WG606975
Phenanthrene	mg/kg	0.428	0.434	205.*	23-164	1.36	25	L589036-06	WG606975
Pyrene	mg/kg	0.0760	0.0800	230.*	12-170	5.14	24	L589036-06	WG606975
2-Fluorobiphenyl				140.4*	34-129				WG606975
Nitrobenzene-d5				221.9*	14-141				WG606975
p-Terphenyl-d14				103.6	25-139				WG606975

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Analyte	Units	MSD	Matrix Spike Duplicate		Limit	RPD	Limit	Ref Samp	Batch
			Ref	%Rec					
Mercury	mg/kg	0.305	0.282	122.*	80-120	7.84	20	L589122-06	WG607210
Arsenic	mg/kg	42.0	43.4	76.0	75-125	3.28	20	L589074-93	WG606995
Barium	mg/kg	152.	123.	154.*	75-125	21.1*	20	L589074-93	WG606995
Cadmium	mg/kg	42.1	42.9	84.0	75-125	1.88	20	L589074-93	WG606995
Chromium	mg/kg	64.5	66.0	87.0	75-125	2.30	20	L589074-93	WG606995
Copper	mg/kg	52.6	53.5	90.6	75-125	1.70	20	L589074-93	WG606995
Nickel	mg/kg	49.8	50.7	81.7	75-125	1.79	20	L589074-93	WG606995
Silver	mg/kg	43.1	43.9	86.2	75-125	1.84	20	L589074-93	WG606995
Zinc	mg/kg	69.7	70.6	87.4	75-125	1.28	20	L589074-93	WG606995
Lead	mg/kg	54.4	53.3	92.4	75-125	2.04	20	L589074-93	WG606995
Selenium	mg/kg	35.6	37.3	71.2*	75-125	4.66	20	L589074-93	WG606995
Benzene	mg/kg	0.204	0.208	81.6	32-137	1.72	39	L589122-06	WG606999
Ethylbenzene	mg/kg	0.227	0.232	90.8	10-150	2.21	44	L589122-06	WG606999
Toluene	mg/kg	0.218	0.229	87.1	20-142	5.07	42	L589122-06	WG606999
Total Xylene	mg/kg	0.710	0.733	94.6	16-141	3.19	46	L589122-06	WG606999
a,a,a-Trifluorotoluene(PID)				100.9	54-144				WG606999
TPH (GC/FID) Low Fraction	mg/kg	24.6	25.7	89.5	55-109	4.40	20	L589122-06	WG606999
a,a,a-Trifluorotoluene(FID)				98.81	59-128				WG606999
Arsenic	mg/kg	50.2	51.6	94.2	75-125	2.75	20	L589122-05	WG606935
TPH (GC/FID) High Fraction	ppm	59.8	63.2	99.6	50-150	5.63	40	L589085-03	WG606964
o-Terphenyl				73.01	50-150				WG606964
Chromium,Hexavalent	mg/kg	14.2	14.3	71.0	50-150	0.702	20	L589673-10	WG607351

Batch number /Run number / Sample number cross reference

WG606975: R2298438: L589122-06  
WG607018: R2298493: L589122-06  
WG607210: R2299497: L589122-06  
WG606995: R2299554: L589122-06  
WG606999: R2299813: L589122-06  
WG607092: R2299974: L589122-06  
WG606964: R2300133: L589122-06  
WG606935: R2300222: L589122-01 02 03 04 05  
WG607556: R2302013: L589122-06  
WG607351: R2302694: L589122-06  
WG607871: R2305713: L589122-06

\* \* 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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L589122

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Est. 1970

August 16, 2012

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.