

# **SITE ASSESSMENT SUMMARY REPORT**

**ENCANA PRODUCTION PAD #1321  
REMEDIAATION PROJECT #6731  
RIO BLANCO COUNTY, COLORADO**

**OCTOBER 2013**

**Prepared for:**

**ENCANA OIL & GAS USA INC.  
Rangely, Colorado**



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**OCTOBER 2013**

**Prepared for:**

**ENCANA OIL & GAS USA INC.  
1125 Escalante Drive  
Rangely, Colorado**

**Prepared by:**

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## **EXECUTIVE SUMMARY**

This report was prepared by LT Environmental, Inc. (LTE), under the direction of Encana Oil & Gas (USA), Inc., to document soil assessment activities at the Encana Production Pad #1321 (Site). The Site is located approximately 20 miles south-west of Rangely, Colorado.

The scope of work for this project included assessing residual petroleum hydrocarbon impacts following the identification of a release associated with a partially buried produced water corrugated steel holding tank. The source of the release was identified when the buried holding tank was removed. Additionally, the soil immediately surrounding the tank was excavated and removed on November 15, 2011 by HCSI, Environmental Consultants. Activities included advancing soil borings on site and collecting soil samples to submit for laboratory analysis, health and safety monitoring, drilling contractor oversight, and preparation of this summary report.

On August 27 and 28, 2012, Site Services Drilling Company of Golden, Colorado, was contracted to advance seven soil borings on site to depths ranging from 2.5 to 26.5 feet below ground surface. Soil borings were advanced with hollow-stem augers. All soil borings were conducted within the production pad disturbance; therefore no borings were outside the pad disturbance on Bureau of Land Management land.

Based on analytical results from soil boring samples collected during assessment activities, all impacted soil has naturally attenuated to within compliance standards of the Colorado Oil and Gas Conservation Commission Table 910-1 Concentration Levels.

No groundwater was encountered during the assessment activities. All soil borings were backfilled with soil generated from the borings during assessment drilling activities.

## **1.0 INTRODUCTION**

LT Environmental, Inc. (LTE), under the direction of Encana Oil & Gas (USA), Inc. (Encana), was contracted to document soil assessment activities at the Encana Production Pad #1321 (Site). The purpose of this project was to assess any residual hydrocarbon impacted soil remaining at the Site. A release of petroleum hydrocarbons was identified when a partially buried produced water corrugated steel holding tank was excavated and removed from the Site.

On November 15, 2011, Encana removed the buried production tank along with any observed hydrocarbon impacted soil associated with the Site as depicted on Figure 2. Tank removal and excavation of soil was conducted by HCSI, Environmental Consultants. A summary of these activities is attached in Appendix A. The buried production tank was installed prior to the development of the current liquid containment systems. At the time of excavation activities, Encana attempted to remove all associated hydrocarbon impacted soil, however the excavation extents were limited due to technical considerations, health and safety concerns, and property boundaries. Residual total petroleum hydrocarbon (TPH) concentrations of 5,900 milligrams per kilogram (mg/kg) remained in soil at the base of the excavation, 2,900 mg/kg on the south sidewall, and 1,920 mg/kg on the north sidewall. Excavation soil sample analytical results are summarized in Table 1. These concentrations exceeded the Colorado Oil and Gas Conservation Commission (COGCC) standard of 500 mg/kg, thus determining the need to assess the remaining soil conditions at the Site. Encana also collected background soil samples at the time of excavation activities, which are indicated in Table 2.

On August 27 and 28, 2012, LTE advanced seven soil borings at the Site to assess residual TPH concentrations in soil identified during production tank removal. All soil samples results were within the compliance standards of the COGCC, thus indicating that the residual hydrocarbon impacted soil has naturally attenuated to acceptable levels.

### **1.1 SITE DESCRIPTION**

The Site is located approximately 20 miles south-west of Rangely, Colorado. The legal description of the Site is the southeast quarter of the southeast quarter of Section 24, Township 2 South, Range 103 West of the Sixth Principal Meridian in Rio Blanco County, Colorado (Figure 1). The Site is surrounded by Bureau of Land Management (BLM) property.

The general site geology was observed as a predominantly brown silty-sand and gravel down to a competent yellow-brown sandstone.

The Site is located at an elevation of 6,636 feet above mean sea level in an area with localized high plateau topography associated with the western edge of the Rocky Mountains near the Colorado Plateau.

### **1.2 SCOPE OF WORK**

The scope of work for this assessment project included advancing soil borings at the Site and collecting soil samples below the previous excavation and laterally outward from the initial source area.

During on-site assessment activities, LTE personnel conducted field screening of soil samples, soil sampling, borehole logging, health and safety monitoring, and documentation of field activities.

A summary of field activities, analytical results from soil sampling, and conclusions are presented in the subsequent sections.

## **2.0 SUMMARY OF FIELD ACTIVITIES**

### **2.1 ASSESSMENT ACTIVITIES**

On August 27 and 28, 2012, LTE advanced seven soil borings (1321-CB01-082712 through 1321-CB07-082812) to depths ranging from 2.5 to 26.5 feet below ground surface. LTE contracted Site Services Drilling Company of Golden, Colorado, to install the soil borings using a CME-75 drill rig equipped with hollow-stem augers.

The soil borings were logged by an LTE environmental scientist who inspected the soil for the presence or absence of petroleum hydrocarbon odor and/or staining. The soil was characterized by visually inspecting the soil samples collected in 2-foot long split-spoon samplers and field screening the soil headspace using a photo-ionization detector (PID) to monitor for the presence of volatile organic vapors. The soil boring logs are included in Appendix B.

Soil samples were collected from each soil boring and submitted with a completed chain-of-custody form to ESC Lab Sciences of Mt. Juliet, Tennessee (ESC), for analysis of TPH-diesel range organics (DRO), TPH-gasoline range organics (GRO), benzene, toluene, ethylbenzene, and total xylenes (BTEX). Samples were collected and submitted for laboratory analysis were only analyzed for these analytes due to exceedances of the COGCC Concentration Levels at the time the culvert pit was removed. All other constituents were below COGCC Concentration Levels or were within background concentration allowances.

### **2.2 ASSESSMENT FINDINGS**

Soil conditions at the Site were identified as a brown silty-sand and gravel extending from the surface to approximately three feet bgs at which point a dense yellow-brown sandstone was encountered. Auger refusal at the sandstone layer determined the vertical depth of each soil boring with the exception of 1321-CB01-082712 and 1321-CB02-082712. Refusal from 2.5 to 4 feet bgs was encountered south and southwest of the old tank location. Groundwater was not encountered in any of the soil borings during drilling activities.

All soil samples were screened using a PID and placed in laboratory-prepared, wide-mouth glass sample jars for laboratory submittal. Soil sample 1321-CB01-082712 registered a minor PID readings of 11 and 2 parts per million. No other soils samples that were field screened were observed to have significant PID readings, hydrocarbon odors, or staining.

On December 5, 2012, Encana sampled stockpiled soil from the November 2011 excavation activities. Soil sample 1321-SPOILS-120512 was submitted to ESC for laboratory analysis of TPH-GRO, TPH-DRO, and BTEX. The stockpiled soil has been land-farmed onsite and was

again resampled on August 25, 2103 for COGCC Table 910-1 parameters. Arsenic and SAR levels exceeded the COGCC Table 910-1 concentration levels; however, these two exceedances will be addressed when final reclamation of the pad occurs after all production activities are terminated.

### **3.0 ANALYTICAL RESULTS**

Soil samples collected from all soil borings confirmed that the hydrocarbon impacted soil exceeding regulatory standards has naturally attenuated since the excavation activities in November of 2011. Soil sample laboratory analytical results are illustrated on Figure 3 and summarized in Table 3.

Spoils stockpiled soil sample laboratory analytical results are summarized in Table 4. Copies of the laboratory analytical reports are included in Appendix C.

### **4.0 SUMMARY AND CONCLUSIONS**

LTE was contracted by Encana to conduct soil assessment activities at the Encana Production Pad #1321 to assess any residual hydrocarbon impacted soil and/or groundwater following the identification of a release associated with a partially buried produced water corrugated steel holding tank. The tank was removed and associated hydrocarbon impacted soil excavated in November of 2011.

On August 27 and 28, 2012, LTE field personnel observed the installation of seven soil borings on the Site. Four borings were abandoned due to auger refusal. The three soil borings were advanced on site to depths ranging from 7 to 26.5 feet bgs. Soil samples were collected from soil borings 1321-CB01-082712 through 1321-CB03-082812. No groundwater was encountered during the assessment activities.

Four soil samples were submitted to ESC for laboratory analysis of TPH-DRO, TPH-GRO, and BTEX. Analytical results from all soil boring samples indicated hydrocarbon impacted soil has naturally attenuated to within the compliance standards of the COGCC. All soil borings were backfilled with soil removed from the borings generated during assessment activities. Additional activities included on-site health and safety monitoring and preparation of this summary report.

On December 5, 2012, Encana sampled stockpiled soil from the November 2011 excavation activities. The stockpiled soil has been land-farmed onsite and was again resampled on August 25, 2103. Arsenic and SAR levels exceeded the COGCC Table 910-1 concentration levels; however, these two exceedances will be addressed when final reclamation of the pad occurs after all production activities are terminated.

Therefore, LTE recommends that Encana Site #1321 be granted closure regarding Remediation Number 6731 and that the COGCC provide closure documentation to Encana with regard to this recommendation.

## FIGURES



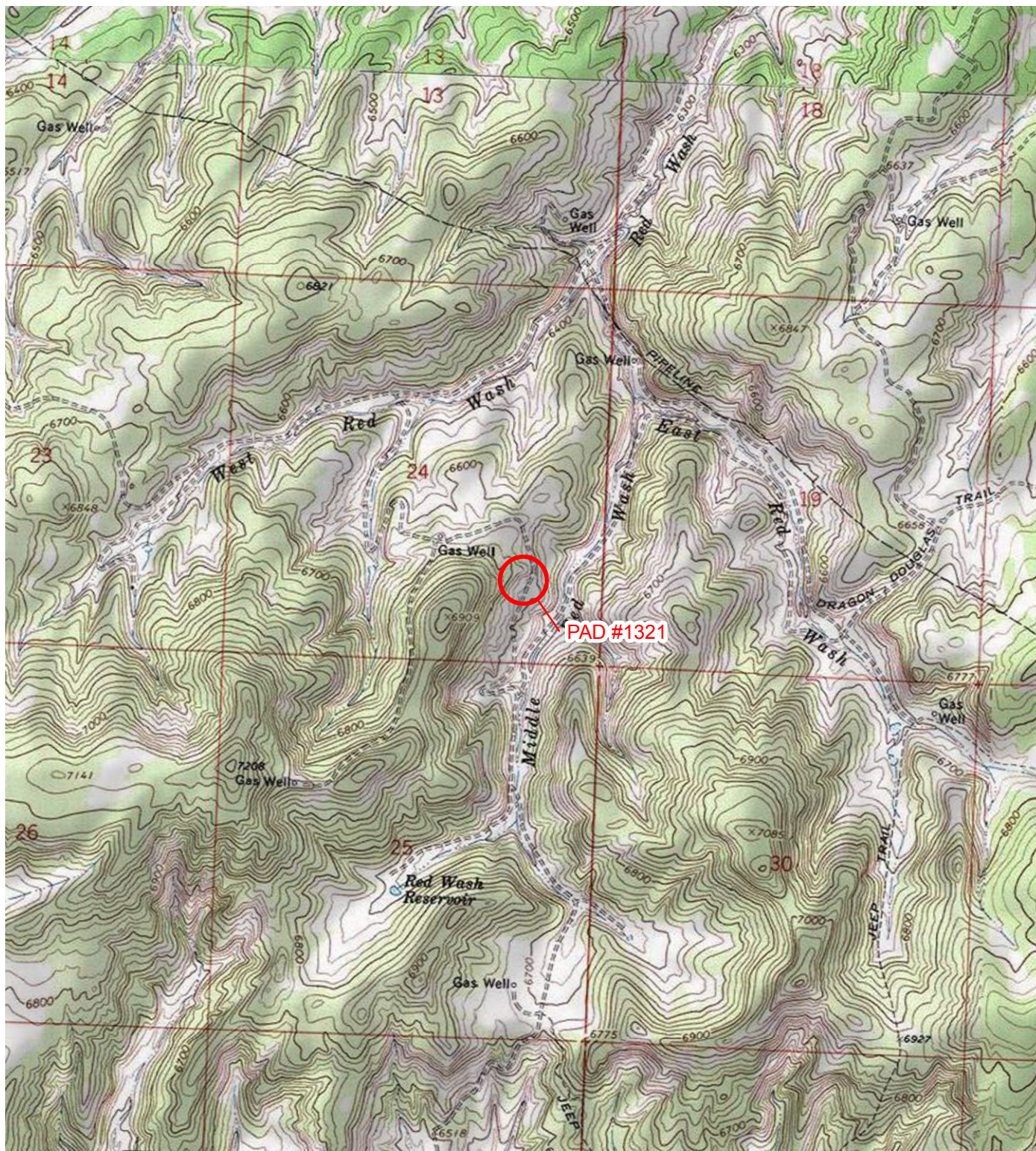


IMAGE COURTESY OF USGS/ESRI

# LEGEND

○ SITE LOCATION

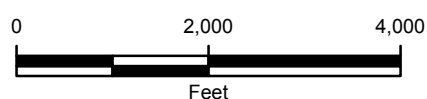


FIGURE 1  
 SITE LOCATION MAP  
 PAD #1321  
 SESE SEC 24 T2S R103W  
 RIO BLANCO COUNTY, COLORADO  
 ENCANA OIL & GAS (USA) INC.





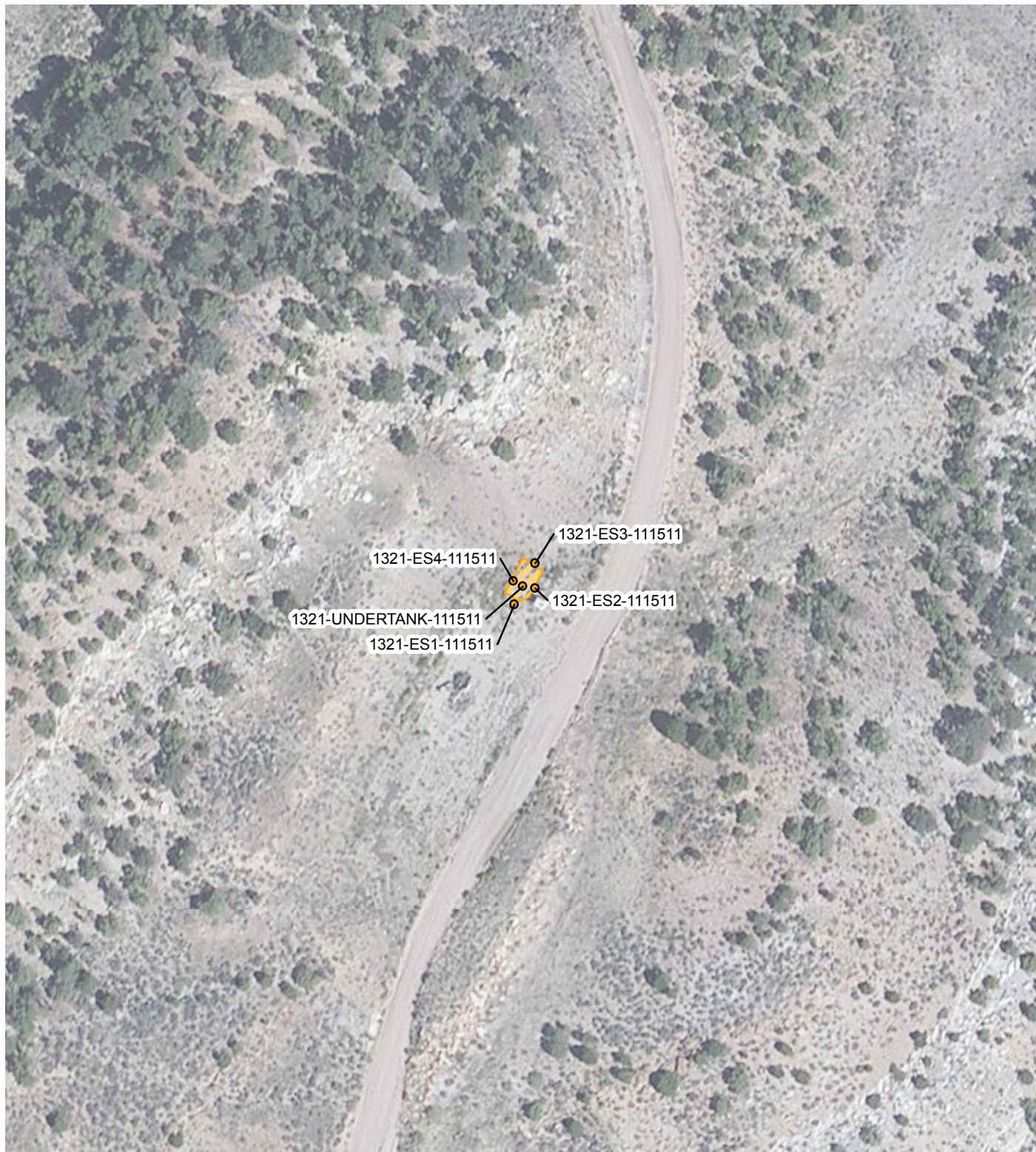


IMAGE COURTESY OF BING MAPS/ESRI

## LEGEND

- SOIL SAMPLE
- EXCAVATION EXTENT (NOVEMBER 2011)

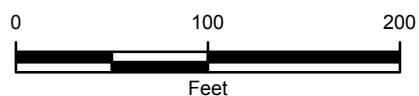


FIGURE 2  
PAD #1321  
SESE SEC 24 T2S R103W  
RIO BLANCO COUNTY, COLORADO

ENCANA OIL & GAS (USA) INC.





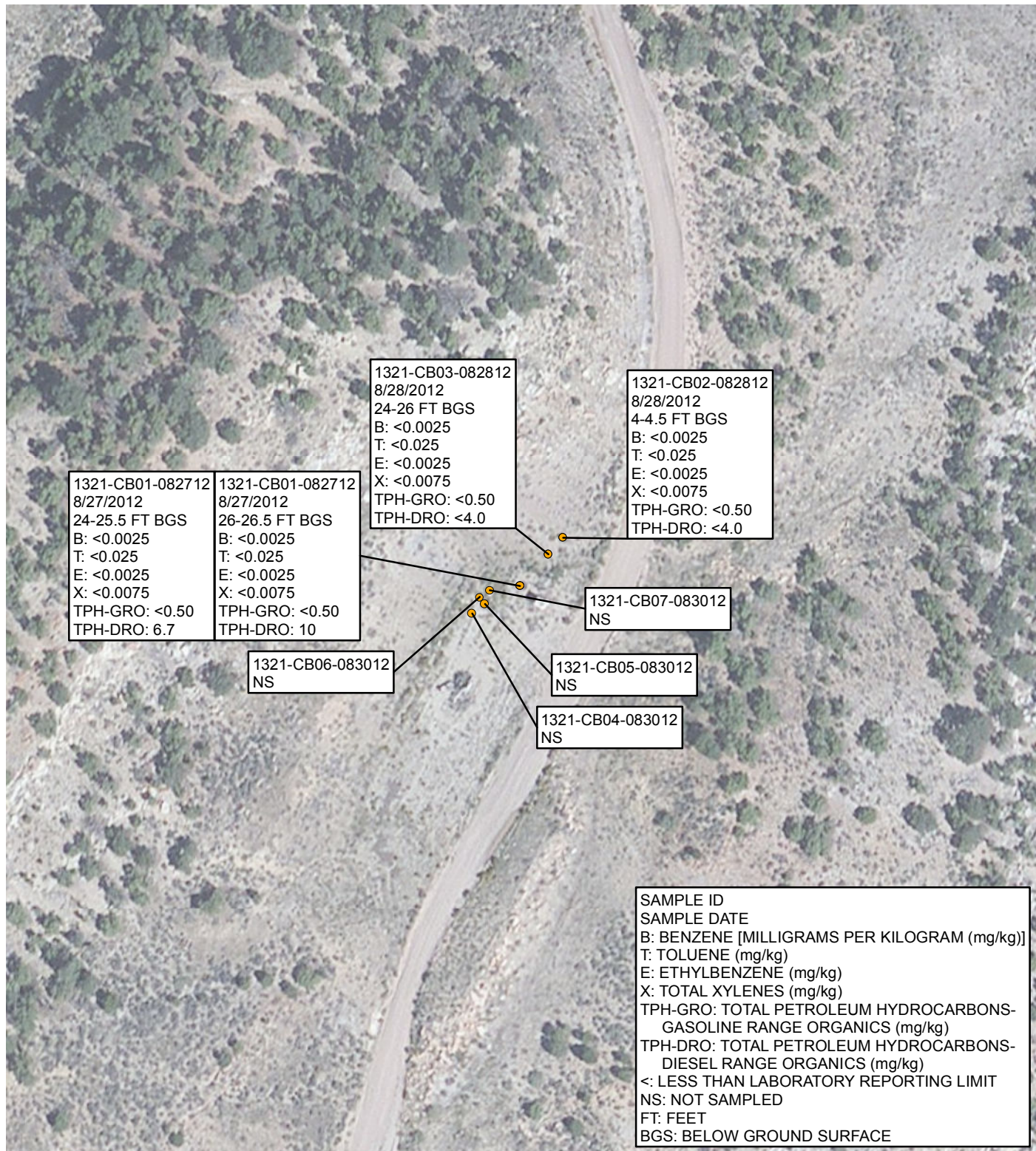
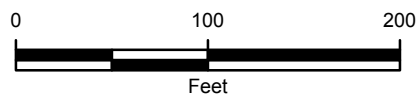


IMAGE COURTESY OF BING MAPS/ESRI

## LEGEND

- SOIL BORING LOCATIONS
- EXCAVATION EXTENT (JUNE 2012)



**FIGURE 3**  
**SOIL ANALYTICAL RESULTS**  
**PAD #1321**  
**SESE SEC 24 T2S R103W**  
**RIO BLANCO COUNTY, COLORADO**  
**ENCANA OIL & GAS (USA) INC.**



## TABLES

**TABLE 1**  
**PIT REMOVAL AND EXCAVATION**  
**ENCANA PRODUCTION PAD 1321**  
**RANGELY, COLORADO**  
**ENCANA OIL GAS (USA) INC.**

PARAMETER	COGCC CONCENTRATION LEVELS	UNITS	1321-UNDERTANK-111511	1321-ES1-111511	1321-ES2-11511	1321-ES3-111511	1321-ES4-111511
Sample Date			11/15/2011	11/15/2011	11/15/2011	11/15/2011	11/15/2011
Sample Type			Confirmation	Confirmation	Confirmation	Confirmation	Confirmation
Arsenic	0.39	mg/kg	<b>4.4</b>	NA	NA	NA	NA
Barium	15,000	mg/kg	200	NA	NA	NA	NA
Cadmium	70	mg/kg	0.42	NA	NA	NA	NA
Chromium (III)	120,000	mg/kg	11.0	NA	NA	NA	NA
Chromium (VI)	23	mg/kg	<2.0	NA	NA	NA	NA
Copper	3,100	mg/kg	11.0	NA	NA	NA	NA
Lead	400	mg/kg	25.0	NA	NA	NA	NA
Mercury	23	mg/kg	0.055	NA	NA	NA	NA
Nickel	1,600	mg/kg	9.1	NA	NA	NA	NA
Selenium	390	mg/kg	2.8	NA	NA	NA	NA
Silver	390	mg/kg	<0.50	NA	NA	NA	NA
Zinc	23,000	mg/kg	66.0	NA	NA	NA	NA
EC	4.0	mmhos/cm	3.2	NA	NA	NA	NA
pH	6 - 9	SU	8.7	NA	NA	NA	NA
SAR	12	unitless	<b>180</b>	NA	NA	NA	NA
TPH-GRO		mg/kg	<b>4100</b>	<b>1400</b>	2.7	<b>1300</b>	<0.50
TPH-DRO		mg/kg	<b>1800</b>	<b>1500</b>	110	<b>620</b>	<4.0
TPH	500	mg/kg	<b>5900</b>	<b>2900</b>	112.7	<b>1920</b>	<4.50
Benzene	0.17	mg/kg	<b>1.0</b>	<0.25	<0.0025	<0.50	<0.0025
Toluene	85	mg/kg	6.6	<2.5	<0.025	<5.0	<0.025
Ethylbenzene	100	mg/kg	12.0	5.2	0.0031	5.3	<0.0075
Total Xylenes	175	mg/kg	43.0	16.0	0.016	17.0	<0.50
Acenaphthene	1000	mg/kg	0.18	NA	NA	NA	NA
Anthracene	1000	mg/kg	0.046	NA	NA	NA	NA
Benzo(A)anthracene	0.22	mg/kg	<0.0060	NA	NA	NA	NA
Benzo(B)fluoranthene	0.22	mg/kg	<0.0060	NA	NA	NA	NA
Benzo(K)fluoranthene	2.2	mg/kg	<0.0060	NA	NA	NA	NA
Benzo(A)pyrene	0.022	mg/kg	<0.0060	NA	NA	NA	NA
Chrysene	22	mg/kg	<0.0060	NA	NA	NA	NA
Dibenzo(A,H)anthracene	0.022	mg/kg	<0.0060	NA	NA	NA	NA
Fluoranthene	1000	mg/kg	0.0075	NA	NA	NA	NA
Fluorene	1000	mg/kg	0.18	NA	NA	NA	NA
Indeno(1,2,3,C,D)pyrene	0.22	mg/kg	<0.0060	NA	NA	NA	NA
Naphthalene	23	mg/kg	1.5	NA	NA	NA	NA
Pyrene	1000	mg/kg	0.030	NA	NA	NA	NA

**NOTES:**

< - less than the stated reporting limit

**BOLD** - indicates result exceeds the COGCC concentration level

COGCC - Colorado Oil and Gas Conservation Commission

EC- electrical conductivity

mg/kg - milligrams per kilogram

mmhos/cm - millimhos per centimeter

NA - not analyzed

SU - standard unit

TPH-GRO - total petroleum hydrocarbons-gasoline range organics

TPH-DRO - total petroleum hydrocarbons-diesel range organics

TPH - combination of TPH-GRO and TPH-DRO



**TABLE 2**  
**BACKGROUND SAMPLES**  
**ENCANA PRODUCTION PAD 1321**  
**RANGELY, COLORADO**  
**ENCANA OIL GAS (USA) INC.**

PARAMETER	COGCC CONCENTRATION LEVELS	UNITS	1321-BKG1-111511	3121-BKG2-111511	3121-BKG3-111511	1321-BKG4-111511	1321-BKG5-111511
Sample Date			11/15/2011	11/15/2011	11/15/2011	11/15/2011	11/15/2011
Sample Type			Background	Background	Background	Background	Background
Arsenic	0.39	mg/kg	<b>6.8</b>	<b>2.2</b>	<b>4.0</b>	<b>2.8</b>	<b>3.6</b>
Barium	15,000	mg/kg	NA	NA	NA	NA	NA
Cadmium	70	mg/kg	NA	NA	NA	NA	NA
Chromium (III)	120,000	mg/kg	NA	NA	NA	NA	NA
Chromium (VI)	23	mg/kg	NA	NA	NA	NA	NA
Copper	3,100	mg/kg	NA	NA	NA	NA	NA
Lead	400	mg/kg	NA	NA	NA	NA	NA
Mercury	23	mg/kg	NA	NA	NA	NA	NA
Nickel	1,600	mg/kg	NA	NA	NA	NA	NA
Selenium	390	mg/kg	NA	NA	NA	NA	NA
Silver	390	mg/kg	NA	NA	NA	NA	NA
Zinc	23,000	mg/kg	NA	NA	NA	NA	NA
EC	4.0	nmhos/cm	NA	NA	NA	NA	NA
pH	6 - 9	SU	NA	NA	NA	NA	NA
SAR	12	unitless	NA	NA	NA	NA	NA
TPH-GRO		mg/kg	NA	NA	NA	NA	NA
TPH-DRO		mg/kg	NA	NA	NA	NA	NA
TPH	500	mg/kg	NA	NA	NA	NA	NA
Benzene	0.17	mg/kg	NA	NA	NA	NA	NA
Toluene	85	mg/kg	NA	NA	NA	NA	NA
Ethylbenzene	100	mg/kg	NA	NA	NA	NA	NA
Total Xylenes	175	mg/kg	NA	NA	NA	NA	NA
Acenaphthene	1000	mg/kg	NA	NA	NA	NA	NA
Anthracene	1000	mg/kg	NA	NA	NA	NA	NA
Benzo(A)anthracene	0.22	mg/kg	NA	NA	NA	NA	NA
Benzo(B)fluoranthene	0.22	mg/kg	NA	NA	NA	NA	NA
Benzo(K)fluoranthene	2.2	mg/kg	NA	NA	NA	NA	NA
Benzo(A)pyrene	0.022	mg/kg	NA	NA	NA	NA	NA
Chrysene	22	mg/kg	NA	NA	NA	NA	NA
Dibenzo(A,H)anthracene	0.022	mg/kg	NA	NA	NA	NA	NA
Fluoranthene	1000	mg/kg	NA	NA	NA	NA	NA
Fluorene	1000	mg/kg	NA	NA	NA	NA	NA
Indeno(1,2,3,C,D)pyrene	0.22	mg/kg	NA	NA	NA	NA	NA
Naphthalene	23	mg/kg	NA	NA	NA	NA	NA
Pyrene	1000	mg/kg	NA	NA	NA	NA	NA

**NOTES:**

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COGCC - Colorado Oil and Gas Conservation Commission

EC- electrical conductivity

mg/kg - milligrams per kilogram

nmhos/cm - millimhos per centimeter

NA - not analyzed

SU - standard unit

TPH-GRO - total petroleum hydrocarbons-gasoline range organics

TPH-DRO - total petroleum hydrocarbons-diesel range organics

TPH - combination of TPH-GRO and TPH-DRO



**TABLE 3**  
**SOIL CONFIRMATION BORINGS**  
**ENCANA PRODUCTION PAD 1321**  
**RANGELY, COLORADO**  
**ENCANA OIL GAS (USA) INC.**

PARAMETER	COGCC CONCENTRATION LEVELS	UNITS	1321-CB01-082712 24-25.5FT BGS	1321-CB01-082712 26-26.5FT BGS	1321-CB02-082812 4-4.5FT BGS	1321-CB03-082812 24-26FT BGS
Sample Date			8/27/2012	8/27/2012	8/27/2012	8/27/2012
Sample Type			Confirmation	Confirmation	Confirmation	Confirmation
Arsenic	0.39	mg/kg	NA	NA	NA	NA
Barium	15,000	mg/kg	NA	NA	NA	NA
Cadmium	70	mg/kg	NA	NA	NA	NA
Chromium (III)	120,000	mg/kg	NA	NA	NA	NA
Chromium (VI)	23	mg/kg	NA	NA	NA	NA
Copper	3,100	mg/kg	NA	NA	NA	NA
Lead	400	mg/kg	NA	NA	NA	NA
Mercury	23	mg/kg	NA	NA	NA	NA
Nickel	1,600	mg/kg	NA	NA	NA	NA
Selenium	390	mg/kg	NA	NA	NA	NA
Silver	390	mg/kg	NA	NA	NA	NA
Zinc	23,000	mg/kg	NA	NA	NA	NA
EC	4.0	mmhos/cm	NA	NA	NA	NA
pH	6 - 9	SU	NA	NA	NA	NA
SAR	12	unitless	NA	NA	NA	NA
TPH-GRO		mg/kg	<0.50	<0.50	<0.50	<0.50
TPH-DRO		mg/kg	6.7	10	<4.0	<4.0
TPH	500	mg/kg	6.7	10	<4.50	<4.50
Benzene	0.17	mg/kg	<0.0025	<0.0025	<0.0025	<0.0025
Toluene	85	mg/kg	<0.025	<0.025	<0.025	<0.025
Ethylbenzene	100	mg/kg	<0.0025	<0.0025	<0.0025	<0.0025
Total Xylenes	175	mg/kg	<0.0075	<0.0075	<0.0075	<0.0075
Acenaphthene	1000	mg/kg	NA	NA	NA	NA
Anthracene	1000	mg/kg	NA	NA	NA	NA
Benzo(A)anthracene	0.22	mg/kg	NA	NA	NA	NA
Benzo(B)fluoranthene	0.22	mg/kg	NA	NA	NA	NA
Benzo(K)fluoranthene	2.2	mg/kg	NA	NA	NA	NA
Benzo(A)pyrene	0.022	mg/kg	NA	NA	NA	NA
Chrysene	22	mg/kg	NA	NA	NA	NA
Dibenzo(A,H)anthracene	0.022	mg/kg	NA	NA	NA	NA
Fluoranthene	1000	mg/kg	NA	NA	NA	NA
Fluorene	1000	mg/kg	NA	NA	NA	NA
Indeno(1,2,3,C,D)pyrene	0.22	mg/kg	NA	NA	NA	NA
Naphthalene	23	mg/kg	NA	NA	NA	NA
Pyrene	1000	mg/kg	NA	NA	NA	NA

**NOTES:**

< - less than the stated reporting limit

**BOLD** - indicates result exceeds the COGCC concentration level

COGCC - Colorado Oil and Gas Conservation Commission

EC- electrical conductivity

mg/kg - milligrams per kilogram

mmhos/cm - millimhos per centimeter

NA - not analyzed

SU - standard unit

TPH-GRO - total petroleum hydrocarbons-gasoline range organics

TPH-DRO - total petroleum hydrocarbons-diesel range organics

TPH - combination of TPH-GRO and TPH-DRO

FT - feet

BGS - below ground surface



**TABLE 4**  
**SPOILS SOIL ANALYTICAL**  
**ENCANA PRODUCTION PAD 1321**  
**RANGELY, COLORADO**  
**ENCANA OIL GAS (USA) INC.**

PARAMETER	COGCC CONCENTRATION LEVELS	UNITS	1321-SPOILS-120512	082513-1321 (Spoils B1) 0-1 FT
Sample Date			12/5/2012	8/25/2013
Sample Type			Spoils	Spoils
Arsenic	0.39	mg/kg	NA	<b>11.0</b>
Barium	15,000	mg/kg	NA	180
Cadmium	70	mg/kg	NA	0.44
Chromium (III)	120,000	mg/kg	NA	<20.0
Chromium (VI)	23	mg/kg	NA	<20.0
Copper	3,100	mg/kg	NA	20.0
Lead	400	mg/kg	NA	14.0
Mercury	23	mg/kg	NA	0.17
Nickel	1,600	mg/kg	NA	18.0
Selenium	390	mg/kg	NA	<1.0
Silver	390	mg/kg	NA	<0.50
Zinc	23,000	mg/kg	NA	69.0
EC	4.0	mmhos/cm	NA	3.4
pH	6 - 9	SU	NA	7.5
SAR	12	unitless	NA	<b>16</b>
TPH-GRO		mg/kg	<0.50	<0.50
TPH-DRO		mg/kg	15.0	20.0
TPH	500	mg/kg	15.0	<0.50
Benzene	0.17	mg/kg	<0.0025	<0.0025
Toluene	85	mg/kg	<0.025	<0.025
Ethylbenzene	100	mg/kg	<0.0025	<0.0025
Total Xylenes	175	mg/kg	<0.50	<0.50
Acenaphthene	1000	mg/kg	NA	<0.0060
Anthracene	1000	mg/kg	NA	<0.0060
Benzo(A)anthracene	0.22	mg/kg	NA	<0.0060
Benzo(B)fluoranthene	0.22	mg/kg	NA	<0.0060
Benzo(K)fluoranthene	2.2	mg/kg	NA	<0.0060
Benzo(A)pyrene	0.022	mg/kg	NA	<0.0060
Chrysene	22	mg/kg	NA	<0.0060
Dibenzo(A,H)anthracene	0.022	mg/kg	NA	<0.0060
Fluoranthene	1000	mg/kg	NA	<0.0060
Fluorene	1000	mg/kg	NA	<0.0060
Indeno(1,2,3,C,D)pyrene	0.22	mg/kg	NA	<0.0060
Naphthalene	23	mg/kg	NA	<0.020
Pyrene	1000	mg/kg	NA	<0.0060

**NOTES:**

< - less than the stated reporting limit

**BOLD** - indicates result exceeds the COGCC concentration level

COGCC - Colorado Oil and Gas Conservation Commission

EC- electrical conductivity

mg/kg - milligrams per kilogram

mmhos/cm - millimhos per centimeter

NA - not analyzed

SU - standard unit

TPH-GRO - total petroleum hydrocarbons-gasoline range organics

TPH-DRO - total petroleum hydrocarbons-diesel range organics

TPH - combination of TPH-GRO and TPH-DRO



**APPENDIX A**  
**HCSI SITE INVESTIGATION SUMMARY**





2385 F ½ Road  
Grand Junction, CO 81505  
1.970.243.3271

February 15, 2013

Encana Oil and Gas USA Inc.  
Blake Ford  
1125 Escalante Drive,  
Rangely, CO 81648

**RE: Site Investigation Summary – Dragon Trail Unit #1321  
Environmental Consulting Services  
HCSI Job Number 10-418**

Dear Mr. Ford,

This document has been provided per your request for a summary of actions taken during the pit closure site investigation associated with the Dragon Trail Unit #1321 (COGCC facility #315935, COGCC remediation #6731) by HRL Compliance Solutions, Inc. (HCSI) personnel during the 2011 field season. Please see below for the respective summary.

November 10, 2011

The pit investigation was initiated by qualified Encana personnel. A grab sample from directly under the tank was collected with regards to the COGCC Table 910-1 constituents and submitted to the analytical laboratory for analysis.

November 15, 2011

The site investigation was conducted by a qualified HCSI employee as authorized by Encana personnel. All samples were collected in accordance with the protocol specified within Encana Environmental Compliance Group's Sampling Procedures.

The associated culvert was carefully removed and stored onsite for later disposal or recycling. There was no liquid associated with the pit at the time of investigation. A trackhoe was utilized during the site investigation for excavation purposes. The soil associated with the pit investigation was characterized utilizing a photoionization detector (PID) throughout the excavation process. There were strong indicators of hydrocarbon impacts in accordance with visual indicators and the field screen readings (>5,000 ppm). The substrate surrounding the pit and immediately beneath the grounds surface, was characterized by sandstone slabs ranging from one to three feet in thickness. It appeared that the bedrock where the pit was placed had been jackhammered or removed with considerable force. The substrate beneath the sandstone slabs was very rocky. The excavation activity was stopped due to the proximity to equipment, and concerns pertaining to safety due to the depth of the excavation and stability of the sandstone slabs around the excavations perimeter. The final excavation was approximately 30'W x 20'L x 25'D. Approximately 450 cubic yards of soil was removed during the excavation. Grab samples were collected from the pit side walls, spoils and pit bottom. The respective samples were

submitted for analysis with regards to specified COGCC Table 910-1 constituents. Background samples (with respect to arsenic) were collected as well from undisturbed land surrounding the well pad. Per conversation with the Encana project manager, the excavation was backfilled with soil from the pads working face while the soils excavated during the pit investigation were stockpiled onsite.

The analytical reports indicated that the grab sample collected from under the tank and two of the side walls exceeded the COGCC Table 910-1 standards with regards to total petroleum hydrocarbons (TPH). The sample collected from under the tank was also in exceedance with regards to benzene (Please see the attached Analytical Table and the Site Investigation Map for specifics).

HCSI made the recommendation to continue the pit investigation via push mounted drill rig due to the proximity to equipment and underlying geologic conditions of the well pad. A Receptor Survey was conducted during the 2011 project activities with regards to surface and groundwater features associated with the well pad. Please see below for the Receptor Survey details.

#### Receptor Survey

A receptor survey (survey) for the Dragon Trail #1331 well pad was conducted by an HCSI employee during the site investigation. The survey was conducted with regards to proximity to surface water features and areas with potential ground water interaction. The respective well pad located on a hill slope. The well pad has an eastern aspect. The surrounding topography is steep. Surrounding vegetation was dominated by sage, pinyon and juniper.

#### Surface Water

There were no surface water supply areas as defined by the COGCC Series Rules 100 definition adjacent to, or within a quarter mile of the well pad. There was one surface water feature within a quarter mile of the well pad. The Middle Red Wash, classified by the USGS as ephemeral, is approximately 570 feet to the east. Please see the site map for details pertaining to the surface water features. In the event of a release on location, the surface flow would likely migrate to the south. Potential impact to surface water is dependent on the environmental conditions during the time of the release but remains low. A release onsite would migrate into the associated bar ditch before traveling over the road and down gradient to the drainage.

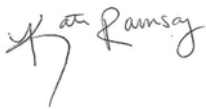
#### Groundwater

The respective well pad did not have any pits which were holding liquid during the site investigation or receptor survey. There was one pit onsite, which was investigated in accordance with this report. The historic pit was considered a production pit. The respective well pad is not underlain by an unconfined aquifer or recharge zone in accordance with the surrounding topography. It should be noted that no groundwater was

encountered during the site investigation. Per the soil survey for the respective area, the underlying soil type is the Moyerson stony clay loam, 15 to 65 percent slopes. The hydraulic conductivity of the respective soil is  $9.25700 \times 10^{-5}$  cm/sec. There are not any domestic water wells, or public water supply wells within a mile radius of the respective well pad. The well pad is not located within a 100 year floodplain. The survey did identify vegetation that could be used as an indicator of shallow groundwater (e.g., cattails, rushes) in association with the Middle Red Wash, but did not identify any in the immediate area surrounding the well pad. In accordance with the receptor survey and site investigation, the potential to impact ground water is moderate.

*Respectfully,*

**HRL Compliance Solutions, Inc.**

A handwritten signature in black ink, appearing to read "Kate Ramsay". The signature is stylized with a large, looped initial "K" and a cursive "Ramsay".

Kate Ramsay  
Environmental Consultant

cc: Chantae Pennell (Encana – Rangely)  
Herman Lucero (HCSI)

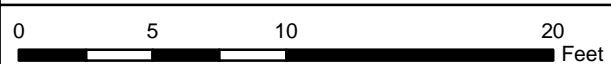
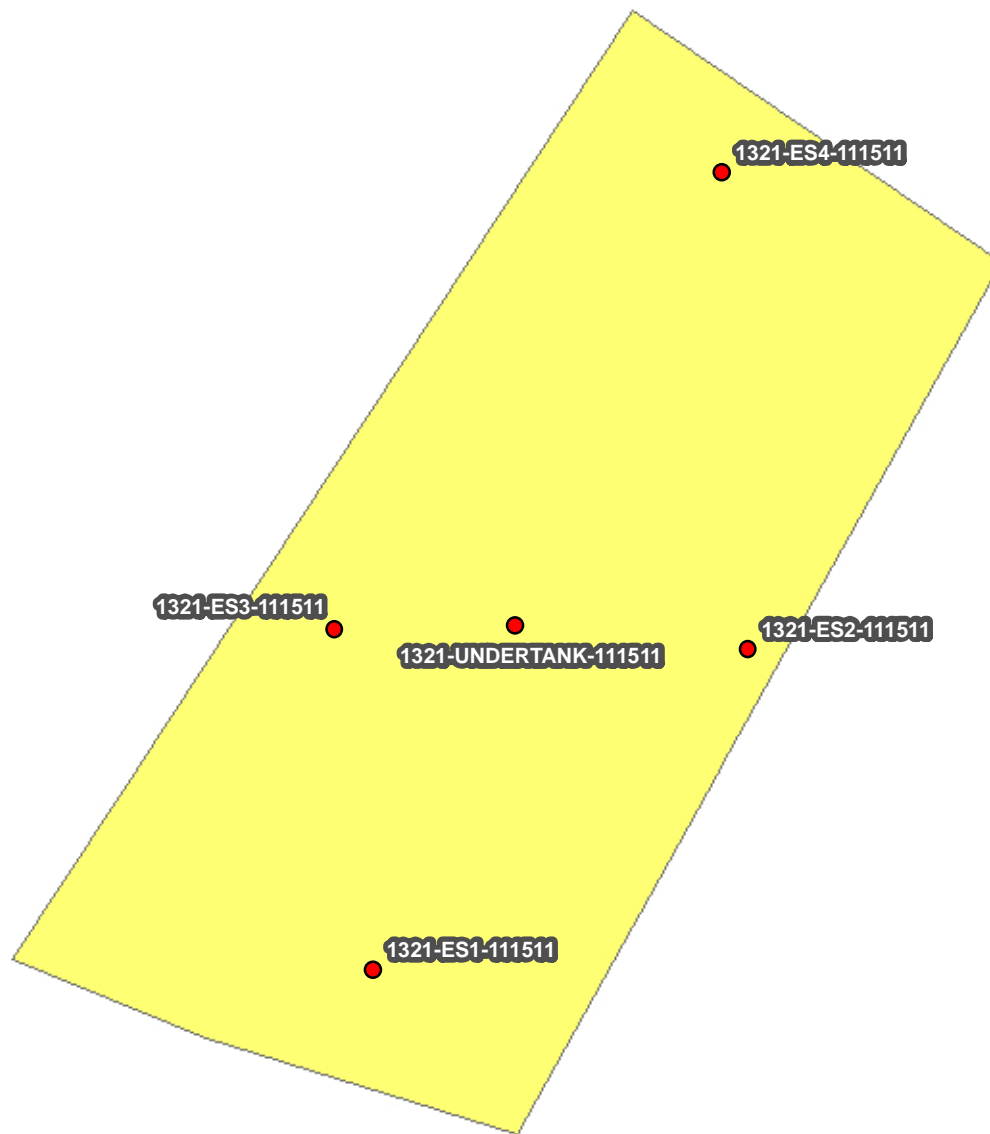
Attachment A – Analytical Summary Table  
Attachment B – Site Investigation Maps  
Attachment C – Analytical Report

						Analytes (BDL = Below Detection Limit; NA = Not Applicable; NS = Not Sampled)																									
						Organics in Soil (mg/Kg)																									
						Allowable Concentration -->		500	NA		NA	0.17	85	100	175	1000	1000	0.22	0.22	2.2	0.022	22	0.022	1000	1000	0.22	23	1000	see below	<12	(6-9)
COC ID	Date:	Lab	Sampler:	Sample Matrix	Matrix Notes	TPH	TPH-GRO (G6-ClO) Low Fraction	TPH-DRQ (ClO-C28) 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-cd)pyrene	Naphthalene	Pyrene	EC (<4 mmhos/cm or 2x background)	SAR (calculation)	pH			
1321-BKG1-111511	11/15/2011	ESC	KHR	Soil	Background 1	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS		
1321-BKG2-111511	11/15/2011	ESC	KHR	Soil	Background 2	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS		
1321-BKG3-111511	11/15/2011	ESC	KHR	Soil	Background 3	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS		
1321-BKG4-111511	11/15/2011	ESC	KHR	Soil	Background 4	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS		
1321-BKG5-111511	11/15/2011	ESC	KHR	Soil	Background 5	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS		
1321-ES1-111511	11/15/2011	ESC	KHR	Soil	Pit Side Wall	2900	1400	1500	BDL	BDL	5.2	16	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS		
1321-ES2-111511	11/15/2011	ESC	KHR	Soil	Pit Side Wall	112.7	2.7	110	BDL	BDL	0.003	0.016	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS		
1321-ES3-111511	11/15/2011	ESC	KHR	Soil	Pit Side Wall	1920	1300	620	BDL	BDL	5.3	17	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS		
1321-ES4-111511	11/15/2011	ESC	KHR	Soil	Pit Side Wall	BDL	BDL	BDL	BDL	BDL	BDL	BDL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS		
1321-UNDERTANK-111511	11/15/2011	ESC	KHR	Soil	Spoils	5900	4100	1800	1	6.6	12	43	0.18	0.046	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.008	0.18	BDL	1.5	0.03	3.2	180	8.7		

						Metals in Soil (mg/kg (ppm))											
						0.39	15000	70	120000	23	3100	400	23	1600	390	390	23000
COC ID	Date:	Lab	Sampler:	Sample Matrix	Matrix Notes	Arsenic	Barium - LDNR True Total Barium	Cadmium	Chromium (III)	Chromium (VI)	Copper	Lead	Mercury	Nickel	Selenium	Silver	Zinc
1321-BKG1-111511	11/15/2011	ESC	KHR	Soil	Background 1	6.8	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
1321-BKG2-111511	11/15/2011	ESC	KHR	Soil	Background 2	2.2	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
1321-BKG3-111511	11/15/2011	ESC	KHR	Soil	Background 3	4	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
1321-BKG4-111511	11/15/2011	ESC	KHR	Soil	Background 4	2.8	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
1321-BKG5-111511	11/15/2011	ESC	KHR	Soil	Background 5	3.6	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
1321-ES1-111511	11/15/2011	ESC	KHR	Soil	Pit Side Wall	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
1321-ES2-111511	11/15/2011	ESC	KHR	Soil	Pit Side Wall	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
1321-ES3-111511	11/15/2011	ESC	KHR	Soil	Pit Side Wall	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
1321-ES4-111511	11/15/2011	ESC	KHR	Soil	Pit Side Wall	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
1321-UNDERTANK-111511	11/15/2011	ESC	KHR	Soil	Spoils	4.4	NS	0.42	11	BDL	11	25	0.055	9.1	2.8	BDL	66



# Dragon Trail Unit 1321 Site Detail Map



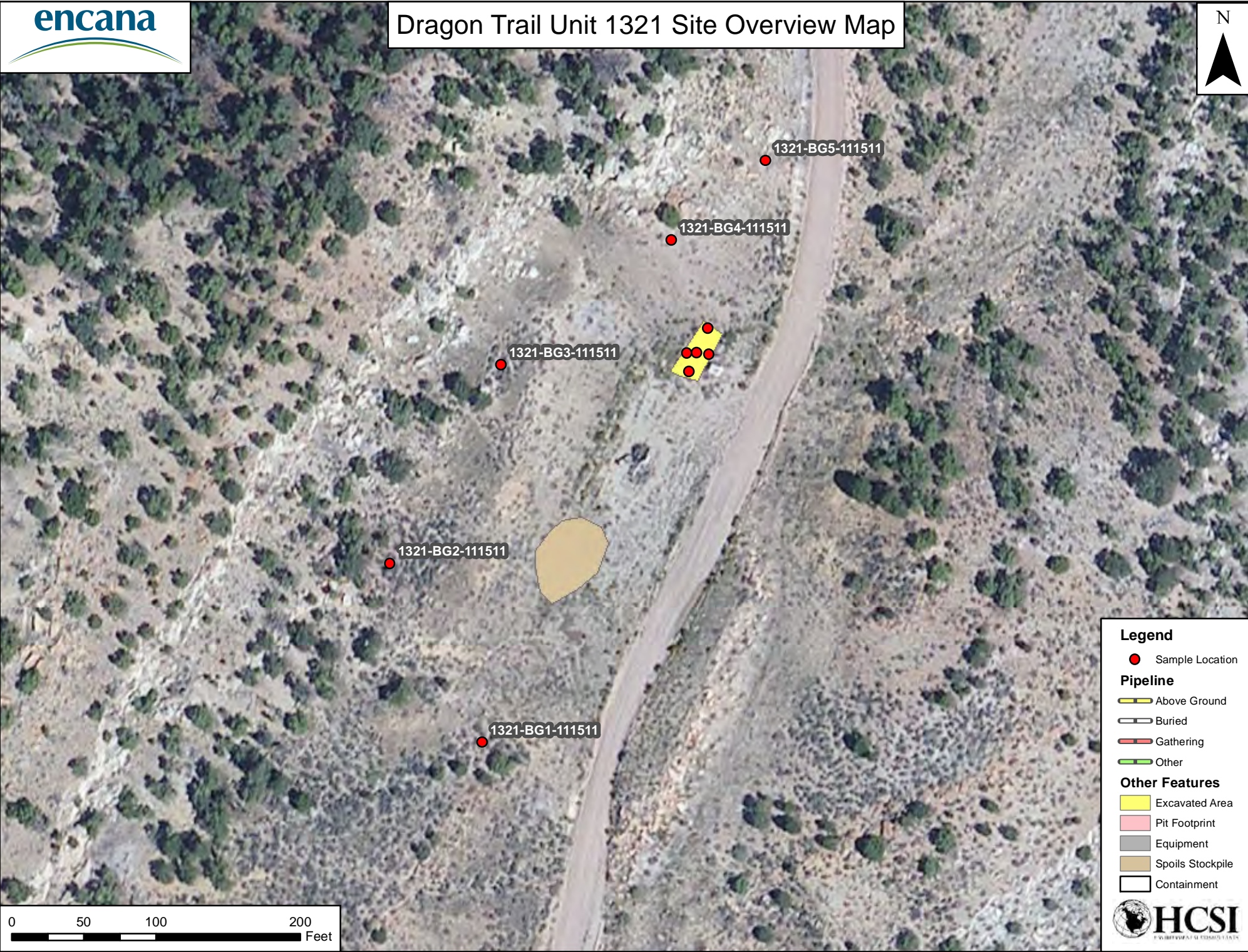
- Legend**
- Sample Location
  - Pipeline**
    - Above Ground
    - Buried
    - Gathering
    - Other
  - Other Features**
    - Excavated Area
    - Pit Footprint
    - Equipment
    - Spoils Stockpile
    - Containment







# Dragon Trail Unit 1321 Site Overview Map



0 50 100 200 Feet







# Dragon Trail Unit 1321 Site Overview Map 2



## Legend

● Sample Location

## Pipeline

— Above Ground

— Buried

— Gathering

— Other

## Other Features

— Excavated Area

— Pit Footprint

— Equipment

— Spoils Stockpile

— Containment



0 50 100 200 Feet





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Tax I.D. 62-0814289

Est. 1970

Kate Ramsay  
HRL Compliance Solutions- CO  
744 Horizon Ct., Suite 140  
Grand Junction, CO 81506

## Report Summary

Friday November 25, 2011

Report Number: L547692

Samples Received: 11/17/11

Client Project:

Description: Culvert Pit Closure Project

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 - I-2327, CT - PH-0197, FL - E87487  
GA - 923, IN - C-TN-01, KY - 90010, KYUST - 0016, NC - ENV375/DW21704, ND - R-140  
NJ - TN002, NJ NELAP - TN002, SC - 84004, TN - 2006, VA - 00109, WV - 233  
AZ - 0612, MN - 047-999-395, NY - 11742, WI - 998093910, NV - TN000032008A,  
TX - T104704245, OK-9915, PA - 68-02979

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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

Kate Ramsay  
HRL Compliance Solutions- CO  
744 Horizon Ct., Suite 140  
Grand Junction, CO 81506

November 25, 2011

Date Received : November 17, 2011  
Description : Culvert Pit Closure Project  
Sample ID : 1321-UNDERTANK-111511  
Collected By : KHR  
Collection Date : 11/15/11 09:00

ESC Sample # : L547692-01

Site ID : DTU 1321

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Chromium, Hexavalent	BDL	2.0	mg/kg	3060A/7196A	11/23/11	1
Chromium, Trivalent	11.	2.0	mg/kg	Calc.	11/20/11	1
ORP	35.		mV	2580	11/22/11	1
pH	8.7		su	9045D	11/22/11	1
Sodium Adsorption Ratio	180			Calc.	11/22/11	1
Specific Conductance	3200		umhos/cm	9050AMod	11/23/11	1
Mercury	0.055	0.020	mg/kg	7471	11/19/11	1
Arsenic	4.4	1.0	mg/kg	6010B	11/20/11	1
Barium	200	0.25	mg/kg	6010B	11/20/11	1
Cadmium	0.42	0.25	mg/kg	6010B	11/22/11	1
Chromium	11.	0.50	mg/kg	6010B	11/20/11	1
Copper	11.	1.0	mg/kg	6010B	11/20/11	1
Lead	25.	0.25	mg/kg	6010B	11/20/11	1
Nickel	9.1	1.0	mg/kg	6010B	11/20/11	1
Selenium	2.8	1.0	mg/kg	6010B	11/20/11	1
Silver	BDL	0.50	mg/kg	6010B	11/20/11	1
Zinc	66.	1.5	mg/kg	6010B	11/20/11	1
Benzene	1.0	0.25	mg/kg	8021/8015	11/20/11	500
Toluene	6.6	2.5	mg/kg	8021/8015	11/20/11	500
Ethylbenzene	12.	0.25	mg/kg	8021/8015	11/20/11	500
Total Xylene	43.	0.75	mg/kg	8021/8015	11/20/11	500
TPH (GC/FID) Low Fraction	4100	50.	mg/kg	GRO	11/20/11	500
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	91.4		% Rec.	8021/8015	11/20/11	500
a,a,a-Trifluorotoluene(PID)	93.8		% Rec.	8021/8015	11/20/11	500
TPH (GC/FID) High Fraction	1800	80.	mg/kg	3546/DRO	11/21/11	20
Surrogate recovery(%)						
o-Terphenyl	0.00		% Rec.	3546/DRO	11/21/11	20
Polynuclear Aromatic Hydrocarbons						
Anthracene	0.046	0.0060	mg/kg	8270C-SIM	11/20/11	1
Acenaphthene	0.18	0.0060	mg/kg	8270C-SIM	11/20/11	1
Acenaphthylene	0.028	0.0060	mg/kg	8270C-SIM	11/20/11	1
Benzo(a)anthracene	BDL	0.0060	mg/kg	8270C-SIM	11/20/11	1
Benzo(a)pyrene	BDL	0.0060	mg/kg	8270C-SIM	11/20/11	1

BDL - Below Detection Limit  
Det. Limit - Practical Quantitation Limit(PQL)  
L547692-01 (PH) - 8.70@21.4c



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# REPORT OF ANALYSIS

Kate Ramsay  
HRL Compliance Solutions- CO  
744 Horizon Ct., Suite 140  
Grand Junction, CO 81506

November 25, 2011

Date Received : November 17, 2011  
Description : Culvert Pit Closure Project  
Sample ID : 1321-UNDERTANK-111511  
Collected By : KHR  
Collection Date : 11/15/11 09:00

ESC Sample # : L547692-01

Site ID : DTU 1321

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzo(b)fluoranthene	BDL	0.0060	mg/kg	8270C-SIM	11/20/11	1
Benzo(g,h,i)perylene	BDL	0.0060	mg/kg	8270C-SIM	11/20/11	1
Benzo(k)fluoranthene	BDL	0.0060	mg/kg	8270C-SIM	11/20/11	1
Chrysene	BDL	0.0060	mg/kg	8270C-SIM	11/20/11	1
Dibenz(a,h)anthracene	BDL	0.0060	mg/kg	8270C-SIM	11/20/11	1
Fluoranthene	0.0075	0.0060	mg/kg	8270C-SIM	11/20/11	1
Fluorene	0.18	0.0060	mg/kg	8270C-SIM	11/20/11	1
Indeno(1,2,3-cd)pyrene	BDL	0.0060	mg/kg	8270C-SIM	11/20/11	1
Naphthalene	1.5	0.30	mg/kg	8270C-SIM	11/21/11	50
Phenanthrene	0.22	0.0060	mg/kg	8270C-SIM	11/20/11	1
Pyrene	0.030	0.0060	mg/kg	8270C-SIM	11/20/11	1
1-Methylnaphthalene	1.8	0.30	mg/kg	8270C-SIM	11/21/11	50
2-Methylnaphthalene	3.0	0.30	mg/kg	8270C-SIM	11/21/11	50
2-Chloronaphthalene	BDL	0.30	mg/kg	8270C-SIM	11/21/11	50
Surrogate Recovery						
Nitrobenzene-d5	0.00		% Rec.	8270C-SIM	11/21/11	50
2-Fluorobiphenyl	137.		% Rec.	8270C-SIM	11/20/11	1
p-Terphenyl-d14	86.1		% Rec.	8270C-SIM	11/20/11	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: 11/25/11 15:15 Printed: 11/25/11 15:16  
L547692-01 (PH) - 8.70@21.4c

REPORT OF ANALYSIS

Kate Ramsay  
HRL Compliance Solutions- CO  
744 Horizon Ct., Suite 140  
Grand Junction, CO 81506

November 25, 2011

Date Received : November 17, 2011  
Description : Culvert Pit Closure Project  
Sample ID : 1321-ES1-111511  
Collected By : KHR  
Collection Date : 11/15/11 14:34

ESC Sample # : L547692-02

Site ID : DTU 1321

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.25	mg/kg	8021/8015	11/20/11	500
Toluene	BDL	2.5	mg/kg	8021/8015	11/20/11	500
Ethylbenzene	5.2	0.25	mg/kg	8021/8015	11/20/11	500
Total Xylene	16.	0.75	mg/kg	8021/8015	11/20/11	500
TPH (GC/FID) Low Fraction	1400	50.	mg/kg	GRO	11/20/11	500
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	94.1		% Rec.	8021/8015	11/20/11	500
a,a,a-Trifluorotoluene(PID)	93.3		% Rec.	8021/8015	11/20/11	500
TPH (GC/FID) High Fraction	1500	40.	mg/kg	3546/DRO	11/21/11	10
Surrogate recovery(%)						
o-Terphenyl	97.2		% Rec.	3546/DRO	11/21/11	10

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

The reported analytical results relate only to the sample submitted.

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# REPORT OF ANALYSIS

Kate Ramsay  
HRL Compliance Solutions- CO  
744 Horizon Ct., Suite 140  
Grand Junction, CO 81506

November 25, 2011

Date Received : November 17, 2011  
Description : Culvert Pit Closure Project

Sample ID : 1321-ES2-111511

Collected By : KHR  
Collection Date : 11/15/11 15:07

ESC Sample # : L547692-03

Site ID : DTU 1321

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.0025	mg/kg	8021/8015	11/20/11	5
Toluene	BDL	0.025	mg/kg	8021/8015	11/20/11	5
Ethylbenzene	0.0031	0.0025	mg/kg	8021/8015	11/20/11	5
Total Xylene	0.016	0.0075	mg/kg	8021/8015	11/20/11	5
TPH (GC/FID) Low Fraction	2.7	0.50	mg/kg	GRO	11/20/11	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	94.2		% Rec.	8021/8015	11/20/11	5
a,a,a-Trifluorotoluene(PID)	94.2		% Rec.	8021/8015	11/20/11	5
TPH (GC/FID) High Fraction	110	4.0	mg/kg	3546/DRO	11/21/11	1
Surrogate recovery(%)						
o-Terphenyl	90.3		% Rec.	3546/DRO	11/21/11	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

The reported analytical results relate only to the sample submitted.

This report shall not be reproduced, except in full, without the written approval from ESC.

.

Reported: 11/25/11 15:15 Printed: 11/25/11 15:16



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# REPORT OF ANALYSIS

Kate Ramsay  
HRL Compliance Solutions- CO  
744 Horizon Ct., Suite 140  
Grand Junction, CO 81506

November 25, 2011

Date Received : November 17, 2011  
Description : Culvert Pit Closure Project  
Sample ID : 1321-ES3-111511  
Collected By : KHR  
Collection Date : 11/15/11 15:30

ESC Sample # : L547692-04

Site ID : DTU 1321

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.50	mg/kg	8021/8015	11/20/11	1000
Toluene	BDL	5.0	mg/kg	8021/8015	11/20/11	1000
Ethylbenzene	5.3	0.50	mg/kg	8021/8015	11/20/11	1000
Total Xylene	17.	1.5	mg/kg	8021/8015	11/20/11	1000
TPH (GC/FID) Low Fraction	1300	100	mg/kg	GRO	11/20/11	1000
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	92.1		% Rec.	8021/8015	11/20/11	1000
a,a,a-Trifluorotoluene(PID)	95.6		% Rec.	8021/8015	11/20/11	1000
TPH (GC/FID) High Fraction	620	20.	mg/kg	3546/DRO	11/21/11	5
Surrogate recovery(%)						
o-Terphenyl	90.9		% Rec.	3546/DRO	11/21/11	5

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: 11/25/11 15:15 Printed: 11/25/11 15:16



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

# REPORT OF ANALYSIS

Kate Ramsay  
HRL Compliance Solutions- CO  
744 Horizon Ct., Suite 140  
Grand Junction, CO 81506

November 25, 2011

Date Received : November 17, 2011  
Description : Culvert Pit Closure Project  
Sample ID : 1321-ES4-111511  
Collected By : KHR  
Collection Date : 11/15/11 15:40

ESC Sample # : L547692-05

Site ID : DTU 1321

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.0025	mg/kg	8021/8015	11/20/11	5
Toluene	BDL	0.025	mg/kg	8021/8015	11/20/11	5
Ethylbenzene	BDL	0.0025	mg/kg	8021/8015	11/20/11	5
Total Xylene	BDL	0.0075	mg/kg	8021/8015	11/20/11	5
TPH (GC/FID) Low Fraction	BDL	0.50	mg/kg	GRO	11/20/11	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	94.1		% Rec.	8021/8015	11/20/11	5
a,a,a-Trifluorotoluene(PID)	94.3		% Rec.	8021/8015	11/20/11	5
TPH (GC/FID) High Fraction	BDL	4.0	mg/kg	3546/DRO	11/21/11	1
Surrogate recovery(%)						
o-Terphenyl	81.2		% Rec.	3546/DRO	11/21/11	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

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REPORT OF ANALYSIS

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HRL Compliance Solutions- CO  
744 Horizon Ct., Suite 140  
Grand Junction, CO 81506

November 25, 2011

Date Received : November 17, 2011  
Description : Culvert Pit Closure Project  
Sample ID : 1321-BKG1-111511  
Collected By : KHR  
Collection Date : 11/15/11 09:45

ESC Sample # : L547692-06

Site ID : DTU 1321

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Arsenic	6.8	5.0	mg/kg	6010B	11/22/11	5

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

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744 Horizon Ct., Suite 140  
Grand Junction, CO 81506

November 25, 2011

Date Received : November 17, 2011  
Description : Culvert Pit Closure Project  
Sample ID : 1321-BKG2-111511  
Collected By : KHR  
Collection Date : 11/15/11 09:55

ESC Sample # : L547692-07

Site ID : DTU 1321

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Arsenic	2.2	1.0	mg/kg	6010B	11/22/11	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

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744 Horizon Ct., Suite 140  
Grand Junction, CO 81506

November 25, 2011

Date Received : November 17, 2011  
Description : Culvert Pit Closure Project  
Sample ID : 1321-BKG3-111511  
Collected By : KHR  
Collection Date : 11/15/11 10:00

ESC Sample # : L547692-08

Site ID : DTU 1321

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Arsenic	4.0	1.0	mg/kg	6010B	11/22/11	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

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November 25, 2011

Date Received : November 17, 2011  
Description : Culvert Pit Closure Project  
Sample ID : 1321-BKG4-111511  
Collected By : KHR  
Collection Date : 11/15/11 10:05

ESC Sample # : L547692-09

Site ID : DTU 1321

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Arsenic	2.8	1.0	mg/kg	6010B	11/22/11	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

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November 25, 2011

Date Received : November 17, 2011  
Description : Culvert Pit Closure Project  
Sample ID : 1321-BKG5-111511  
Collected By : KHR  
Collection Date : 11/15/11 10:10

ESC Sample # : L547692-10

Site ID : DTU 1321

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Arsenic	3.6	1.0	mg/kg	6010B	11/22/11	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

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Attachment A  
List of Analytes with QC Qualifiers

Sample Number	Work Group	Sample Type	Analyte	Run ID	Qualifier
L547692-01	WG566488	SAMP	Acenaphthene	R1938792	J3
	WG566488	SAMP	Naphthalene	R1938792	J3
	WG566488	SAMP	Nitrobenzene-d5	R1938792	J7
	WG566488	SAMP	2-Fluorobiphenyl	R1938792	J1
	WG566476	SAMP	o-Terphenyl	R1940092	J7

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.
J7	Surrogate recovery limits cannot be evaluated; surrogates were diluted out

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  
11/25/11 at 15:16:08

TSR Signing Reports: 358  
R5 - Desired TAT

Accounting - pending credit application. TSR - pending info release authorization.

Sample: L547692-01 Account: HRLCSCO Received: 11/17/11 09:00 Due Date: 11/25/11 00:00 RPT Date: 11/25/11 15:15  
Sample: L547692-02 Account: HRLCSCO Received: 11/17/11 09:00 Due Date: 11/25/11 00:00 RPT Date: 11/25/11 15:15  
Sample: L547692-03 Account: HRLCSCO Received: 11/17/11 09:00 Due Date: 11/25/11 00:00 RPT Date: 11/25/11 15:15  
Sample: L547692-04 Account: HRLCSCO Received: 11/17/11 09:00 Due Date: 11/25/11 00:00 RPT Date: 11/25/11 15:15  
Sample: L547692-05 Account: HRLCSCO Received: 11/17/11 09:00 Due Date: 11/25/11 00:00 RPT Date: 11/25/11 15:15  
Sample: L547692-06 Account: HRLCSCO Received: 11/17/11 09:00 Due Date: 11/25/11 00:00 RPT Date: 11/25/11 15:15  
Sample: L547692-07 Account: HRLCSCO Received: 11/17/11 09:00 Due Date: 11/25/11 00:00 RPT Date: 11/25/11 15:15  
Sample: L547692-08 Account: HRLCSCO Received: 11/17/11 09:00 Due Date: 11/25/11 00:00 RPT Date: 11/25/11 15:15  
Sample: L547692-09 Account: HRLCSCO Received: 11/17/11 09:00 Due Date: 11/25/11 00:00 RPT Date: 11/25/11 15:15  
Sample: L547692-10 Account: HRLCSCO Received: 11/17/11 09:00 Due Date: 11/25/11 00:00 RPT Date: 11/25/11 15:15



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Quality Assurance Report  
Level II

L547692

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Tax I.D. 62-0814289

Est. 1970

November 25, 2011

Analyte	Result	Laboratory Blank		Limit	Batch	Date Analyzed
		Units	% Rec			
Arsenic	< 1	mg/kg			WG566511	11/20/11 10:21
Chromium	< .5	mg/kg			WG566511	11/20/11 10:21
Copper	< 1	mg/kg			WG566511	11/20/11 10:21
Lead	< .25	mg/kg			WG566511	11/20/11 10:21
Nickel	< 1	mg/kg			WG566511	11/20/11 10:21
Selenium	< 1	mg/kg			WG566511	11/20/11 10:21
Silver	< .5	mg/kg			WG566511	11/20/11 10:21
Zinc	< 1.5	mg/kg			WG566511	11/20/11 10:21
Barium	< .25	mg/kg			WG566511	11/20/11 19:20
1-Methylnaphthalene	< .006	mg/kg			WG566488	11/20/11 19:40
2-Chloronaphthalene	< .006	mg/kg			WG566488	11/20/11 19:40
2-Methylnaphthalene	< .006	mg/kg			WG566488	11/20/11 19:40
Acenaphthene	< .006	mg/kg			WG566488	11/20/11 19:40
Acenaphthylene	< .006	mg/kg			WG566488	11/20/11 19:40
Anthracene	< .006	mg/kg			WG566488	11/20/11 19:40
Benzo(a)anthracene	< .006	mg/kg			WG566488	11/20/11 19:40
Benzo(a)pyrene	< .006	mg/kg			WG566488	11/20/11 19:40
Benzo(b)fluoranthene	< .006	mg/kg			WG566488	11/20/11 19:40
Benzo(g,h,i)perylene	< .006	mg/kg			WG566488	11/20/11 19:40
Benzo(k)fluoranthene	< .006	mg/kg			WG566488	11/20/11 19:40
Chrysene	< .006	mg/kg			WG566488	11/20/11 19:40
Dibenz(a,h)anthracene	< .006	mg/kg			WG566488	11/20/11 19:40
Fluoranthene	< .006	mg/kg			WG566488	11/20/11 19:40
Fluorene	< .006	mg/kg			WG566488	11/20/11 19:40
Indeno(1,2,3-cd)pyrene	< .006	mg/kg			WG566488	11/20/11 19:40
Naphthalene	< .006	mg/kg			WG566488	11/20/11 19:40
Phenanthrene	< .006	mg/kg			WG566488	11/20/11 19:40
Pyrene	< .006	mg/kg			WG566488	11/20/11 19:40
2-Fluorobiphenyl		% Rec.	76.14	34-129	WG566488	11/20/11 19:40
Nitrobenzene-d5		% Rec.	59.00	14-141	WG566488	11/20/11 19:40
p-Terphenyl-d14		% Rec.	83.32	25-139	WG566488	11/20/11 19:40
Mercury	< .02	mg/kg			WG566391	11/19/11 14:19
TPH (GC/FID) High Fraction	< 4	ppm			WG566476	11/21/11 14:04
o-Terphenyl		% Rec.	85.33	50-150	WG566476	11/21/11 14:04
Benzene	< .0005	mg/kg			WG566538	11/20/11 00:13
Ethylbenzene	< .0005	mg/kg			WG566538	11/20/11 00:13
Toluene	< .005	mg/kg			WG566538	11/20/11 00:13
TPH (GC/FID) Low Fraction	< .1	mg/kg			WG566538	11/20/11 00:13
Total Xylene	< .0015	mg/kg			WG566538	11/20/11 00:13
a,a,a-Trifluorotoluene(FID)		% Rec.	94.27	59-128	WG566538	11/20/11 00:13
a,a,a-Trifluorotoluene(PID)		% Rec.	93.85	54-144	WG566538	11/20/11 00:13
pH	5.60	su			WG566693	11/22/11 16:15
Arsenic	< 1	mg/kg			WG566633	11/22/11 22:36
Cadmium	< .25	mg/kg			WG566633	11/22/11 22:36
Chromium, Hexavalent	< 2	mg/kg			WG566679	11/23/11 12:44

\* 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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Quality Assurance Report  
Level II

L547692

November 25, 2011

Analyte	Result	Laboratory Blank		Limit	Batch	Date Analyzed
		Units	% Rec			
Specific Conductance	2.70	umhos/cm			WG567147	11/23/11 20:23

Analyte	Units	Result	Duplicate	RPD	Limit	Ref Samp	Batch
Arsenic	mg/kg	6.00	4.40	30.9*	20	L547797-10	WG566511
Barium	mg/kg	300.	320.	6.12	20	L547797-10	WG566511
Chromium	mg/kg	47.0	46.0	2.79	20	L547797-10	WG566511
Copper	mg/kg	14.0	16.0	9.84	20	L547797-10	WG566511
Lead	mg/kg	12.0	11.0	7.86	20	L547797-10	WG566511
Nickel	mg/kg	24.0	22.0	8.70	20	L547797-10	WG566511
Selenium	mg/kg	4.00	4.00	0.753	20	L547797-10	WG566511
Silver	mg/kg	1.20	1.30	4.72	20	L547797-10	WG566511
Zinc	mg/kg	41.0	44.0	8.04	20	L547797-10	WG566511
Mercury	mg/kg	0	0	0	20	L547556-01	WG566391
ORP	mV	69.0	68.0	1.46	20	L547684-01	WG566750
ORP	mV	29.0	33.0	12.9	20	L547894-01	WG566750
pH	su	7.90	7.90	0.508	1	L547348-01	WG566693
pH	su	9.10	9.10	0.220	1	L547894-03	WG566693
Arsenic	mg/kg	7.10	8.60	18.8	20	L547450-04	WG566633
Cadmium	mg/kg	0	0.390	NA	20	L547450-04	WG566633
Chromium,Hexavalent	mg/kg	0	1.60	NA	20	L547797-10	WG566679
Chromium,Hexavalent	mg/kg	0	0	0	20	L545376-01	WG566679
Specific Conductance	umhos/cm	4100	4300	4.76	20	L547545-01	WG567147
Specific Conductance	umhos/cm	2700	2500	7.69	20	L548284-13	WG567147

Analyte	Units	Laboratory Control Sample		% Rec	Limit	Batch
		Known Val	Result			
Arsenic	mg/kg	92.6	92.0	99.4	82.9-117	WG566511
Barium	mg/kg	169	168.	99.4	82.8-117	WG566511
Chromium	mg/kg	71.3	72.6	102.	81.8-118	WG566511
Copper	mg/kg	81.2	83.9	103.	83.9-116	WG566511
Lead	mg/kg	92.4	97.2	105.	83.3-117	WG566511
Nickel	mg/kg	59.1	56.7	95.9	83.8-116	WG566511
Selenium	mg/kg	89.5	90.2	101.	79-121	WG566511
Silver	mg/kg	34.4	34.3	99.7	66.3-134	WG566511
Zinc	mg/kg	141	135.	95.7	80.9-119	WG566511
1-Methylnaphthalene	mg/kg	.033	0.0236	71.5	48-113	WG566488
2-Chloronaphthalene	mg/kg	.033	0.0238	72.1	51-114	WG566488
2-Methylnaphthalene	mg/kg	.033	0.0191	57.9	44-109	WG566488
Acenaphthene	mg/kg	.033	0.0220	66.7	52-108	WG566488
Acenaphthylene	mg/kg	.033	0.0220	66.5	51-110	WG566488
Anthracene	mg/kg	.033	0.0244	73.9	58-120	WG566488
Benzo(a)anthracene	mg/kg	.033	0.0209	63.2	54-110	WG566488

\* 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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November 25, 2011

Analyte	Units	Laboratory Control		Sample	% Rec	Limit	Batch
		Known	Val	Result			
Benzo(a)pyrene	mg/kg	.033		0.0242	73.3	56-118	WG566488
Benzo(b)fluoranthene	mg/kg	.033		0.0225	68.3	55-114	WG566488
Benzo(g,h,i)perylene	mg/kg	.033		0.0223	67.4	48-130	WG566488
Benzo(k)fluoranthene	mg/kg	.033		0.0235	71.1	55-122	WG566488
Chrysene	mg/kg	.033		0.0220	66.5	57-118	WG566488
Dibenz(a,h)anthracene	mg/kg	.033		0.0228	69.1	53-122	WG566488
Fluoranthene	mg/kg	.033		0.0243	73.5	58-118	WG566488
Fluorene	mg/kg	.033		0.0211	63.8	54-109	WG566488
Indeno(1,2,3-cd)pyrene	mg/kg	.033		0.0229	69.3	51-125	WG566488
Naphthalene	mg/kg	.033		0.0187	56.8	45-105	WG566488
Phenanthrene	mg/kg	.033		0.0196	59.5	53-114	WG566488
Pyrene	mg/kg	.033		0.0222	67.2	53-121	WG566488
2-Fluorobiphenyl					63.10	34-129	WG566488
Nitrobenzene-d5					52.62	14-141	WG566488
p-Terphenyl-d14					73.35	25-139	WG566488
Mercury	mg/kg	3.77		4.53	120.	71.6-128	WG566391
TPH (GC/FID) High Fraction	ppm	60		49.7	82.9	50-150	WG566476
o-Terphenyl					89.70	50-150	WG566476
Benzene	mg/kg	.05		0.0464	92.8	76-113	WG566538
Ethylbenzene	mg/kg	.05		0.0472	94.4	78-115	WG566538
Toluene	mg/kg	.05		0.0508	102.	76-114	WG566538
Total Xylene	mg/kg	.15		0.134	89.6	81-118	WG566538
a,a,a-Trifluorotoluene(PID)					94.50	54-144	WG566538
TPH (GC/FID) Low Fraction	mg/kg	5.5		5.91	108.	67-135	WG566538
a,a,a-Trifluorotoluene(FID)					99.99	59-128	WG566538
ORP	mV	229		230.	100.	95.6-104.37	WG566750
pH	su	7.98		8.00	100.	98-101	WG566693
Arsenic	mg/kg	92.6		86.2	93.1	82.9-117	WG566633
Cadmium	mg/kg	61.8		57.6	93.2	83.3-117	WG566633
Chromium,Hexavalent	mg/kg	203		162.	79.8	50-150	WG566679
Specific Conductance	umhos/cm	427		430.	101.	85-115	WG567147

Analyte	Units	Laboratory Control		Sample Duplicate	Limit	RPD	Limit	Batch
		Result	Ref	%Rec				
1-Methylnaphthalene	mg/kg	0.0281	0.0236	85.0	48-113	17.6	24	WG566488
2-Chloronaphthalene	mg/kg	0.0281	0.0238	85.0	51-114	16.6	24	WG566488
2-Methylnaphthalene	mg/kg	0.0224	0.0191	68.0	44-109	16.0	24	WG566488
Acenaphthene	mg/kg	0.0276	0.0220	84.0	52-108	22.6*	22	WG566488
Acenaphthylene	mg/kg	0.0260	0.0220	79.0	51-110	16.7	21	WG566488
Anthracene	mg/kg	0.0283	0.0244	86.0	58-120	14.9	20	WG566488
Benzo(a)anthracene	mg/kg	0.0236	0.0209	72.0	54-110	12.4	22	WG566488
Benzo(a)pyrene	mg/kg	0.0275	0.0242	83.0	56-118	12.9	21	WG566488

\* 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**

HRL Compliance Solutions- CO  
Kate Ramsay  
744 Horizon Ct., Suite 140

Grand Junction, CO 81506

Quality Assurance Report  
Level II

L547692

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

November 25, 2011

Analyte	Units	Laboratory Control		Sample Duplicate		Limit	RPD	Limit	Batch
		Result	Ref	%Rec					
Benzo(b)fluoranthene	mg/kg	0.0260	0.0225	79.0		55-114	14.1	20	WG566488
Benzo(g,h,i)perylene	mg/kg	0.0255	0.0223	77.0		48-130	13.5	20	WG566488
Benzo(k)fluoranthene	mg/kg	0.0267	0.0235	81.0		55-122	12.7	25	WG566488
Chrysene	mg/kg	0.0256	0.0220	78.0		57-118	15.4	20	WG566488
Dibenz(a,h)anthracene	mg/kg	0.0259	0.0228	78.0		53-122	12.6	20	WG566488
Fluoranthene	mg/kg	0.0282	0.0243	86.0		58-118	15.1	20	WG566488
Fluorene	mg/kg	0.0256	0.0211	77.0		54-109	19.3	20	WG566488
Indeno(1,2,3-cd)pyrene	mg/kg	0.0257	0.0229	78.0		51-125	11.7	21	WG566488
Naphthalene	mg/kg	0.0242	0.0187	73.0		45-105	25.5*	24	WG566488
Phenanthrene	mg/kg	0.0229	0.0196	69.0		53-114	15.5	20	WG566488
Pyrene	mg/kg	0.0251	0.0222	76.0		53-121	12.3	20	WG566488
2-Fluorobiphenyl				80.10		34-129			WG566488
Nitrobenzene-d5				71.63		14-141			WG566488
p-Terphenyl-d14				82.96		25-139			WG566488
TPH (GC/FID) High Fraction	ppm	51.4	49.7	86.0		50-150	3.22	25	WG566476
o-Terphenyl				89.04		50-150			WG566476
Benzene	mg/kg	0.0462	0.0464	92.0		76-113	0.510	20	WG566538
Ethylbenzene	mg/kg	0.0467	0.0472	93.0		78-115	1.12	20	WG566538
Toluene	mg/kg	0.0500	0.0508	100.		76-114	1.46	20	WG566538
Total Xylene	mg/kg	0.133	0.134	89.0		81-118	0.780	20	WG566538
a,a,a-Trifluorotoluene(PID)				93.72		54-144			WG566538
TPH (GC/FID) Low Fraction	mg/kg	5.87	5.91	107.		67-135	0.690	20	WG566538
a,a,a-Trifluorotoluene(FID)				99.94		59-128			WG566538
ORP	mV	220.	230.	96.0		95.6-104.37	4.44	20	WG566750
pH	su	8.00	8.00	100.		98-101	0	20	WG566693
Chromium,Hexavalent	mg/kg	162.	162.	80.0		50-150	0	20	WG566679
Specific Conductance	umhos/	420.	430.	98.0		85-115	2.35	20	WG567147

Analyte	Units	Matrix Spike			% Rec	Limit	Ref Samp	Batch
		MS Res	Ref Res	TV				
Arsenic	mg/kg	55.8	4.40	50	103.	75-125	L547797-10	WG566511
Barium	mg/kg	357.	320.	50	74.0*	75-125	L547797-10	WG566511
Chromium	mg/kg	101.	46.0	50	110.	75-125	L547797-10	WG566511
Copper	mg/kg	70.2	16.0	50	108.	75-125	L547797-10	WG566511
Lead	mg/kg	63.3	11.0	50	105.	75-125	L547797-10	WG566511
Nickel	mg/kg	72.2	22.0	50	100.	75-125	L547797-10	WG566511
Selenium	mg/kg	51.9	4.00	50	95.8	75-125	L547797-10	WG566511
Silver	mg/kg	51.2	1.30	50	99.8	75-125	L547797-10	WG566511
Zinc	mg/kg	92.7	44.0	50	97.4	75-125	L547797-10	WG566511
1-Methylnaphthalene	mg/kg	0.0260	0	.033	78.9	25-155	L547830-03	WG566488
2-Chloronaphthalene	mg/kg	0.0288	0	.033	87.2	31-153	L547830-03	WG566488
2-Methylnaphthalene	mg/kg	0.0243	0	.033	73.5	22-172	L547830-03	WG566488
Acenaphthene	mg/kg	0.0267	0	.033	80.9	43-133	L547830-03	WG566488
Acenaphthylene	mg/kg	0.0285	0	.033	86.4	42-146	L547830-03	WG566488

\* Performance of this Analyte is outside of established criteria.

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L547692

Analyte	Units	MS Res	Matrix Spike		% Rec	Limit	Ref Samp	Batch
			Ref Res	TV				
Anthracene	mg/kg	0.0310	0	.033	93.9	38-153	L547830-03	WG566488
Benzo(a)anthracene	mg/kg	0.0291	0	.033	88.2	31-142	L547830-03	WG566488
Benzo(a)pyrene	mg/kg	0.0321	0	.033	97.3	26-152	L547830-03	WG566488
Benzo(b)fluoranthene	mg/kg	0.0313	0	.033	94.7	10-188	L547830-03	WG566488
Benzo(g,h,i)perylene	mg/kg	0.0251	0	.033	76.0	10-176	L547830-03	WG566488
Benzo(k)fluoranthene	mg/kg	0.0296	0	.033	89.7	22-163	L547830-03	WG566488
Chrysene	mg/kg	0.0298	0	.033	90.2	26-146	L547830-03	WG566488
Dibenz(a,h)anthracene	mg/kg	0.0247	0	.033	74.8	10-160	L547830-03	WG566488
Fluoranthene	mg/kg	0.0415	0	.033	126.	23-160	L547830-03	WG566488
Fluorene	mg/kg	0.0283	0	.033	85.7	44-143	L547830-03	WG566488
Indeno(1,2,3-cd)pyrene	mg/kg	0.0252	0	.033	76.2	10-157	L547830-03	WG566488
Naphthalene	mg/kg	0.0232	0	.033	70.4	22-156	L547830-03	WG566488
Phenanthrene	mg/kg	0.0332	0	.033	100.	23-164	L547830-03	WG566488
Pyrene	mg/kg	0.0359	0	.033	109.	12-170	L547830-03	WG566488
2-Fluorobiphenyl					80.74	34-129		WG566488
Nitrobenzene-d5					69.31	14-141		WG566488
p-Terphenyl-d14					85.07	25-139		WG566488
Mercury	mg/kg	0.244	0	.25	97.6	70-130	L547556-01	WG566391
TPH (GC/FID) High Fraction	ppm	205.	130.	60	125.	50-150	L547684-07	WG566476
o-Terphenyl					91.71	50-150		WG566476
Benzene	mg/kg	0.207	0	.05	82.9	32-137	L547545-01	WG566538
Ethylbenzene	mg/kg	0.212	0	.05	84.7	10-150	L547545-01	WG566538
Toluene	mg/kg	0.226	0	.05	90.4	20-142	L547545-01	WG566538
Total Xylene	mg/kg	0.607	0	.15	81.0	16-141	L547545-01	WG566538
a,a,a-Trifluorotoluene(PID)					93.75	54-144		WG566538
TPH (GC/FID) Low Fraction	mg/kg	24.4	0	5.5	88.8	55-109	L547545-01	WG566538
a,a,a-Trifluorotoluene(FID)					98.37	59-128		WG566538
Arsenic	mg/kg	57.5	8.60	10	97.8	75-125	L547450-04	WG566633
Cadmium	mg/kg	49.8	0.390	50	19.8*	75-125	L547450-04	WG566633
Chromium,Hexavalent	mg/kg	5.04	0	20	25.2*	50-150	L547797-06	WG566679

Analyte	Units	MSD	Matrix Spike Duplicate		Limit	RPD	Limit	Ref Samp	Batch
			Ref	%Rec					
Arsenic	mg/kg	51.4	55.8	94.0	75-125	8.21	20	L547797-10	WG566511
Barium	mg/kg	351.	357.	62.0*	75-125	1.69	20	L547797-10	WG566511
Chromium	mg/kg	97.2	101.	102.	75-125	3.83	20	L547797-10	WG566511
Copper	mg/kg	64.2	70.2	96.4	75-125	8.93	20	L547797-10	WG566511
Lead	mg/kg	60.6	63.3	99.2	75-125	4.36	20	L547797-10	WG566511
Nickel	mg/kg	67.1	72.2	90.2	75-125	7.32	20	L547797-10	WG566511
Selenium	mg/kg	47.8	51.9	87.6	75-125	8.22	20	L547797-10	WG566511
Silver	mg/kg	46.7	51.2	90.8	75-125	9.19	20	L547797-10	WG566511
Zinc	mg/kg	90.5	92.7	93.0	75-125	2.40	20	L547797-10	WG566511
1-Methylnaphthalene	mg/kg	0.0262	0.0260	79.4	25-155	0.615	27	L547830-03	WG566488
2-Chloronaphthalene	mg/kg	0.0292	0.0288	88.5	31-153	1.50	22	L547830-03	WG566488
2-Methylnaphthalene	mg/kg	0.0256	0.0243	77.6	22-172	5.46	29	L547830-03	WG566488
Acenaphthene	mg/kg	0.0284	0.0267	86.0	43-133	6.10	26	L547830-03	WG566488

\* Performance of this Analyte is outside of established criteria.

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Analyte	Units	MSD	Matrix Spike Duplicate		Limit	RPD	Limit	Ref Samp	Batch
			Ref	%Rec					
Acenaphthylene	mg/kg	0.0271	0.0285	82.2	42-146	5.00	22	L547830-03	WG566488
Anthracene	mg/kg	0.0329	0.0310	99.6	38-153	5.87	27	L547830-03	WG566488
Benzo(a)anthracene	mg/kg	0.0355	0.0291	108.	31-142	19.8	31	L547830-03	WG566488
Benzo(a)pyrene	mg/kg	0.0378	0.0321	115.	26-152	16.3	32	L547830-03	WG566488
Benzo(b)fluoranthene	mg/kg	0.0406	0.0313	123.	10-188	26.0	33	L547830-03	WG566488
Benzo(g,h,i)perylene	mg/kg	0.0235	0.0251	71.2	10-176	6.52	30	L547830-03	WG566488
Benzo(k)fluoranthene	mg/kg	0.0319	0.0296	96.7	22-163	7.48	29	L547830-03	WG566488
Chrysene	mg/kg	0.0351	0.0298	106.	26-146	16.5	30	L547830-03	WG566488
Dibenz(a,h)anthracene	mg/kg	0.0232	0.0247	70.2	10-160	6.40	39	L547830-03	WG566488
Fluoranthene	mg/kg	0.0592	0.0415	179.*	23-160	35.3*	22	L547830-03	WG566488
Fluorene	mg/kg	0.0291	0.0283	88.2	44-143	2.84	23	L547830-03	WG566488
Indeno(1,2,3-cd)pyrene	mg/kg	0.0251	0.0252	76.1	10-157	0.205	40	L547830-03	WG566488
Naphthalene	mg/kg	0.0238	0.0232	72.0	22-156	2.19	27	L547830-03	WG566488
Phenanthrene	mg/kg	0.0491	0.0332	149.	23-164	38.7*	25	L547830-03	WG566488
Pyrene	mg/kg	0.0487	0.0359	148.	12-170	30.3*	24	L547830-03	WG566488
2-Fluorobiphenyl				75.97	34-129				WG566488
Nitrobenzene-d5				68.45	14-141				WG566488
p-Terphenyl-d14				81.17	25-139				WG566488
Mercury	mg/kg	0.257	0.244	103.	70-130	5.19	20	L547556-01	WG566391
TPH (GC/FID) High Fraction	ppm	182.	205.	85.9	50-150	12.2	25	L547684-07	WG566476
o-Terphenyl				90.04	50-150				WG566476
Benzene	mg/kg	0.196	0.207	78.4	32-137	5.60	39	L547545-01	WG566538
Ethylbenzene	mg/kg	0.197	0.212	78.7	10-150	7.33	44	L547545-01	WG566538
Toluene	mg/kg	0.210	0.226	84.2	20-142	7.13	42	L547545-01	WG566538
Total Xylene	mg/kg	0.563	0.607	75.0	16-141	7.61	46	L547545-01	WG566538
a,a,a-Trifluorotoluene(PID)				93.69	54-144				WG566538
TPH (GC/FID) Low Fraction	mg/kg	25.0	24.4	90.8	55-109	2.27	20	L547545-01	WG566538
a,a,a-Trifluorotoluene(FID)				98.55	59-128				WG566538
Arsenic	mg/kg	66.6	57.5	116.	75-125	14.7	20	L547450-04	WG566633
Cadmium	mg/kg	57.6	49.8	22.9*	75-125	14.5	20	L547450-04	WG566633
Chromium,Hexavalent	mg/kg	4.72	5.04	23.6*	50-150	6.56	20	L547797-06	WG566679

Batch number /Run number / Sample number cross reference

WG566511: R1938714: L547692-01  
WG566488: R1938792: L547692-01  
WG566391: R1939034: L547692-01  
WG566476: R1940092: L547692-01 02 03 04 05  
WG566538: R1940793: L547692-01 02 03 04 05  
WG566750: R1941433: L547692-01  
WG566693: R1941673: L547692-01  
WG566622: R1942396: L547692-01  
WG566633: R1942575: L547692-01 06 07 08 09 10  
WG566679: R1942994: L547692-01  
WG567147: R1944095: L547692-01

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

\* Performance of this Analyte is outside of established criteria.

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



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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.

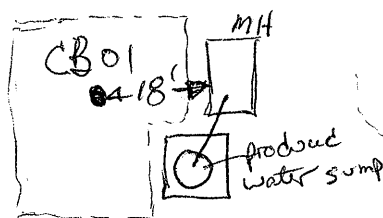
Matrix Spike and Matrix Spike Duplicate - is two aliquots of an environmental sample that is spiked with known concentrations of target analytes. The percent recovery of the target analytes also has statistical control limits. If any recoveries that are outside the method control limits, the sample that 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.

**APPENDIX B**  
**SOIL BORING LITHOLOGIC LOGS**



Location Map:

Pad 1321



CH109



Compliance <sub>m</sub> Engineering <sub>m</sub> Remediation  
 LT Environmental, Inc.  
 4600 W. 60th Avenue  
 Arvada, Colorado 80003

## BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number:

CB01

Project:

Encawa Landfill Assessments

Date:

8/27/12

Project Number:

033412042

Logged By:

C. Unger

Drilled By:

Site Services

Elevation:

Detector:

mini-Rae 3000

Drilling Method:

H.S. Augers

Sampling Method:

split spoon

Gravel Pack:

Seal:

Grout:

Casing Type:

Diameter:

Length:

Hole Diameter:

8"

Depth to Liquid:

Screen Type:

Slot:

Diameter:

Length:

Total Depth:

26.5'

Depth to Water:

dry

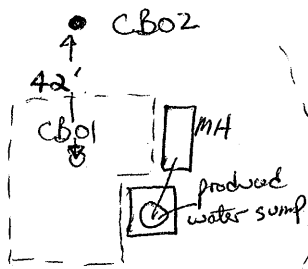
Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Soil/Rock Type	Lithology/Remarks	Well Completion
					0				
					2		Fill	Sand, v.fg. - v.c.g., clayey, gravel to boulder size rocks, brown to gray, dry to moist, excavation backfill	
					4				
					6				
					8				
					10				
					12				
					14				
					16				
					18				
					20				
					22		Fill		
					24				
24/34/16					24-25.5'				
50/5 bounding					1650				
					26		Shale	Shale, dark gray, very hard, dry, no odor	
75/5 bounding					1710				
					26-26.5'				
					28				
					30				

TA = 26.5' BGS



Location Map:

Pad 1321



Compliance <sub>m</sub> Engineering <sub>m</sub> Remediation  
 LT Environmental, Inc.  
 4600 W. 60th Avenue  
 Arvada, Colorado 80003

## BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number:

CBO2

Project:

Encana Rangely Assets

Date:

8/28/12

Project Number:

033412042

Logged By:

Unger

Drilled By:

Site Services

Elevation:

Detector:

mini-Rae 3000

Drilling Method:

H.S. Augers

Sampling Method:

split spoon

Gravel Pack:

Seal:

Grout:

Casing Type:

Diameter:

Length:

Hole Diameter:

8"

Depth to Liquid:

Screen Type:

Slot:

Diameter:

Length:

Total Depth:

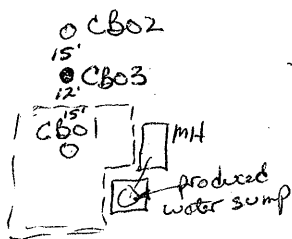
7'

Depth to Water:

dry

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Soil/Rock Type	Lithology/Remarks	Well Completion
					0				
					2		SC	Sand, v.fg. - fg, clayey, brown, dry	
			NO		4		Shale	Shale, gray, med. hard, dry to med. moist	
				4-4.5'					
					6		Shale	Shale, yellow brown, very hard, dry	
			NO						
					8			TA = 7' BGS Refused on sandstone	
					10				
					12				
					14				
					16				
					18				
					20				
					22				
					24				
					26				
					28				
					30				

Location Map:

N  
↑  
CH109

Compliance <sub>M</sub> Engineering <sub>M</sub> Remediation  
 LT Environmental, Inc.  
 4600 W. 60th Avenue  
 Arvada, Colorado 80003

## BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: **CBO3** Project: **Encana Rangely Assessments**  
 Date: **8/28/12** Project Number: **033412042**  
 Logged By: **Unger** Drilled By: **Site Services**  
 Drilling Method: **H.S. Augers** Sampling Method: **split spoon**  
 Seal: Grout:

Elevation:

Detector:

mini-Rae 3500

Gravel Pack:

Seal:

Grout:

Casing Type:

Diameter:

Length:

Hole Diameter:

8"

Depth to Liquid:

Screen Type:

Slot:

Diameter:

Length:

Total Depth:

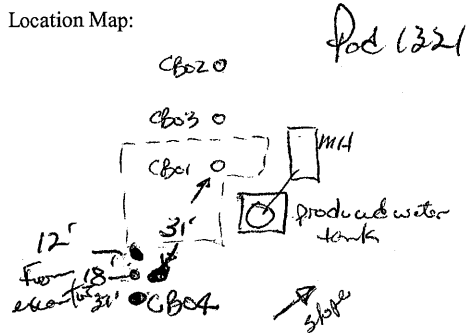
26'

Depth to Water:

dry

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Soil/Rock Type	Lithology/Remarks	Well Completion
					0				
					2		SC	Sand, v.fg.-fg., clayey, gray to brown, dry	
50/50 5		0	NO	4-4.5' 0820	4		Shale CLS	Shale, yellow brown, very hard, dry, no odor	
					6		SPS	Sandstone, v.fg.-fg., yellow brown, medium moist hard to very hard, no odor	
15/32 10/10		0	NO	9-10.5' 0830	8				
50/50 5					10				
					12		CLS shale	Shale, gray to dark gray, hard to very hard, medium moist, no odor	
31/50 10/10		0	NO	14-15' 0840	14		CLS Shale	Shale, gray to dark red, hard to very hard, medium moist, no odor	
50/50 10/10		0	NO	19-19.5' 0855	18		CLS Shale	Shale, sandy, dark red to red-brown, medium moist, no odor	
					20				
					22				
15/24 10/10		1	NO	24-26' 0910	24	24-26'	CLS	Claystone, gray, moist, medium hard, no odor or staining, very hard @ TD = 26' BGS	
30/40 10/10					26	0910			
					28				
					30				

Location Map:



Compliance <sub>M</sub> Engineering <sub>M</sub> Remediation  
 LT Environmental, Inc.  
 4600 W. 60th Avenue  
 Arvada, Colorado 80003

## BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number:

CB04

Project:

Encana Rangely Assessments

Date:

8/28/12

Project Number:

0334/2042

Logged By:

Unger

Drilled By:

Site Services

Elevation:

Detector:

mini-Rae 3000

Drilling Method:

H.S. Augers

Sampling Method:

split spoon/grab

Gravel Pack:

Seal:

Grout:

Casing Type:

Diameter:

Length:

Hole Diameter:

8"

Depth to Liquid:

Screen Type:

Slot:

Diameter:

Length:

Total Depth:

3.5'

Depth to Water:

dry

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Soil/Rock Type	Lithology/Remarks	Well Completion
50		0	NO	2-3.5'	0		SC	Sand, v. fg - fg, clayey, brown, dry	
					2	3-3.5'	SPS	Sandstone, v. fg, brown to yellow	
					4	1000		TD = 3.5' BGS brown, dry to drills very hard - refusal medium moist	
					6				
					8				
					10				
					12				
					14				
					16				
					18				
					20				
					22				
					24				
					26				
					28				
					30				

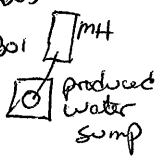
tried to drill 4 locations -  
 refusal @ 2'-3.5' - all locations  
 are sandstone, v. well  
 cemented

Location Map: <div style="display: flex; align-items: center; margin-top: 10px;"> <div style="margin-right: 20px;">           ○ CB02            ○ CB03            ○ CB01 <span style="border: 1px solid black; padding: 2px;">MH</span>  <span style="border: 1px solid black; padding: 2px;">○</span> produced water sump            12" CB05            ○ CB04         </div> <div style="text-align: center;">           N            ↑            CR109         </div> </div>		<b>Compliance <sub>M</sub> Engineering <sub>M</sub> Remediation</b> <b>LT Environmental, Inc.</b> 4600 W. 60th Avenue Arvada, Colorado 80003	
<b>BORING LOG/MONITORING WELL COMPLETION DIAGRAM</b>			
Boring/Well Number: <b>CB05</b>		Project: <b>Encana Rangeley Assessment</b>	
Date: <b>8/28/12</b>		Project Number: <b>0334-12042</b>	
Logged By: <b>Unger</b>		Drilled By: <b>Site Services</b>	
Elevation:	Detector: <b>mini-Rae 300</b>		Drilling Method: <b>A.S. Augers CME-75</b>
Gravel Pack:		Seal:	Sampling Method: <b>split spoon</b>
Casing Type:	Diameter:	Length:	Hole Diameter: <b>8"</b>
Screen Type:	Slot:	Diameter:	Depth to Liquid: <b>—</b>
		Length:	Total Depth: <b>3'</b>
			Depth to Water: <b>dry</b>

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Soil/Rock Type	Lithology/Remarks	Well Completion
			NO		0		SC	Sand, v.fg.-mg., clayey, brown, dry	
		0	NO		2		SPS	Sandstone, v.fg., brown to yellow brown, dry to slightly moist, very well cemented	
					4			TA = 3' BGS refusal	
					6				
					8				
					10				
					12				
					14				
					16				
					18				
					20				
					22				
					24				
					26				
					28				
					30				

Location Map:

o CB02  
o CB03  
o CB01   
CB06 • 5' o CB05  
o CB04

N  
↑  
CH109



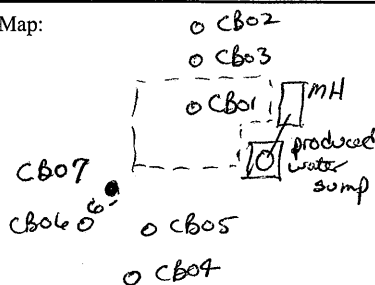
**Compliance <sub>M</sub> Engineering <sub>M</sub> Remediation**  
**LT Environmental, Inc.**  
4600 W. 60th Avenue  
Arvada, Colorado 80003

**BORING LOG/MONITORING WELL COMPLETION DIAGRAM**

Boring/Well Number:	CB06	Project:	Encana Rangely Assessments
Date:	8/28/12	Project Number:	033412042
Logged By:	Unger	Drilled By:	Site Services
Drilling Method:	H.S. Augers CME-75	Sampling Method:	split spoon
Seal:		Grout:	
Casing Type:		Diameter:	
Screen Type:		Slot:	
		Diameter:	
		Length:	
		Hole Diameter:	8"
		Depth to Liquid:	—
		Total Depth:	2.5'
		Depth to Water:	dry

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Soil/Rock Type	Lithology/Remarks	Well Completion
			NO		0		SC	Sand, v.fine - m.g., clayey, brown, dry	
			NO		2		SPS	Sandstone, v.fine, brown, very well cemented, dry to slightly moist	
					4			TA = 2.5' BGS refusal	
					6				
					8				
					10				
					12				
					14				
					16				
					18				
					20				
					22				
					24				
					26				
					28				
					30				

Location Map:



**Compliance <sub>M</sub> Engineering <sub>M</sub> Remediation**  
**LT Environmental, Inc.**  
 4600 W. 60th Avenue  
 Arvada, Colorado 80003

**BORING LOG/MONITORING WELL COMPLETION DIAGRAM**

Boring/Well Number: **CB07** Project: **Encana Rangely Assessments**

Date: **8/28/12** Project Number: **0334-12042**

Logged By: **Unger** Drilled By: **Site Services**

Elevation: Detector: **mini-Rae 3000** Drilling Method: **H.S. Augers CME-75** Sampling Method: **split spoon**

Gravel Pack: Seal: Grout:

Casing Type: Diameter: Length: Hole Diameter: **8"** Depth to Liquid:

Screen Type: Slot: Diameter: Length: Total Depth: **3'** Depth to Water: **dry**

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Soil/Rock Type	Lithology/Remarks	Well Completion
			NO		0		SC	Sand, v.fg. - m.fg., clayey, brown, dry	
			NO		2		SPS	Sandstone, v.fg., brown to yellow brown, very well cemented, dry to slightly moist	
					4			TA = 3' BGS refusal	
					6				
					8				
					10				
					12				
					14				
					16				
					18				
					20				
					22				
					24				
					26				
					28				
					30				

**APPENDIX C**  
**LABORATORY ANALYTICAL REPORTS**





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

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

## Report Summary

Monday September 10, 2012

Report Number: L592665

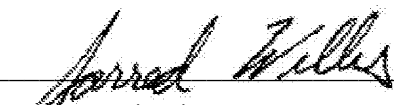
Samples Received: 08/30/12

Client Project: 033412042

Description: Encana Rangely Assessment

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  
EnCana Oil & Gas - Rangely, CO  
1125 Escalante Drive  
Rangely, CO 81648-3600

September 10, 2012

Date Received : August 30, 2012  
Description : Encana Rangely Assessment  
Sample ID : 1321-CB01-082712 24-25.5 FT  
Collected By : Mike Unger  
Collection Date : 08/27/12 16:50

ESC Sample # : L592665-01

Site ID :

Project # : 033412042

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.0025	mg/kg	8021/8015	08/31/12	5
Toluene	BDL	0.025	mg/kg	8021/8015	08/31/12	5
Ethylbenzene	BDL	0.0025	mg/kg	8021/8015	08/31/12	5
Total Xylene	BDL	0.0075	mg/kg	8021/8015	08/31/12	5
TPH (GC/FID) Low Fraction	BDL	0.50	mg/kg	GRO	08/31/12	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	94.2		% Rec.	8021/8015	08/31/12	5
a,a,a-Trifluorotoluene(PID)	99.6		% Rec.	8021/8015	08/31/12	5
TPH (GC/FID) High Fraction	6.7	4.0	mg/kg	3546/DRO	09/06/12	1
Surrogate recovery(%)						
o-Terphenyl	61.1		% Rec.	3546/DRO	09/06/12	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

The reported analytical results relate only to the sample submitted.

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REPORT OF ANALYSIS

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

September 10, 2012

Date Received : August 30, 2012  
Description : Encana Rangely Assessment  
Sample ID : 1321-CB01-082712 26-26.5 FT  
Collected By : Mike Unger  
Collection Date : 08/27/12 17:10

ESC Sample # : L592665-02

Site ID :

Project # : 033412042

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.0025	mg/kg	8021/8015	08/31/12	5
Toluene	BDL	0.025	mg/kg	8021/8015	08/31/12	5
Ethylbenzene	BDL	0.0025	mg/kg	8021/8015	08/31/12	5
Total Xylene	BDL	0.0075	mg/kg	8021/8015	08/31/12	5
TPH (GC/FID) Low Fraction	BDL	0.50	mg/kg	GRO	08/31/12	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	93.9		% Rec.	8021/8015	08/31/12	5
a,a,a-Trifluorotoluene(PID)	99.3		% Rec.	8021/8015	08/31/12	5
TPH (GC/FID) High Fraction	10.	4.0	mg/kg	3546/DRO	09/06/12	1
Surrogate recovery(%)						
o-Terphenyl	59.0		% Rec.	3546/DRO	09/06/12	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

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REPORT OF ANALYSIS

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

September 10, 2012

Date Received : August 30, 2012  
Description : Encana Rangely Assessment  
Sample ID : 1321-CB02-082812 4-4.5 FT  
Collected By : Mike Unger  
Collection Date : 08/28/12 08:00

ESC Sample # : L592665-03

Site ID :

Project # : 033412042

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.0025	mg/kg	8021/8015	08/31/12	5
Toluene	BDL	0.025	mg/kg	8021/8015	08/31/12	5
Ethylbenzene	BDL	0.0025	mg/kg	8021/8015	08/31/12	5
Total Xylene	BDL	0.0075	mg/kg	8021/8015	08/31/12	5
TPH (GC/FID) Low Fraction	BDL	0.50	mg/kg	GRO	08/31/12	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	94.3		% Rec.	8021/8015	08/31/12	5
a,a,a-Trifluorotoluene(PID)	99.5		% Rec.	8021/8015	08/31/12	5
TPH (GC/FID) High Fraction	BDL	4.0	mg/kg	3546/DRO	09/06/12	1
Surrogate recovery(%)						
o-Terphenyl	55.8		% Rec.	3546/DRO	09/06/12	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

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REPORT OF ANALYSIS

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

September 10, 2012

Date Received : August 30, 2012  
Description : Encana Rangely Assessment  
Sample ID : 1321-CB03-082812 24-26 FT  
Collected By : Mike Unger  
Collection Date : 08/28/12 09:10

ESC Sample # : L592665-04

Site ID :

Project # : 033412042

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.0025	mg/kg	8021/8015	08/31/12	5
Toluene	BDL	0.025	mg/kg	8021/8015	08/31/12	5
Ethylbenzene	BDL	0.0025	mg/kg	8021/8015	08/31/12	5
Total Xylene	BDL	0.0075	mg/kg	8021/8015	08/31/12	5
TPH (GC/FID) Low Fraction	BDL	0.50	mg/kg	GRO	08/31/12	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	94.1		% Rec.	8021/8015	08/31/12	5
a,a,a-Trifluorotoluene(PID)	99.6		% Rec.	8021/8015	08/31/12	5
TPH (GC/FID) High Fraction	BDL	4.0	mg/kg	3546/DRO	09/06/12	1
Surrogate recovery(%)						
o-Terphenyl	56.7		% Rec.	3546/DRO	09/06/12	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

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REPORT OF ANALYSIS

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EnCana Oil & Gas - Rangely, CO  
1125 Escalante Drive  
Rangely, CO 81648-3600

September 10, 2012

Date Received : August 30, 2012  
Description : Encana Rangely Assessment  
Sample ID : 1305-CB01-082812 25-26 FT  
Collected By : Mike Unger  
Collection Date : 08/28/12 13:55

ESC Sample # : L592665-05

Site ID :

Project # : 033412042

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.25	mg/kg	8021/8015	08/31/12	500
Toluene	BDL	2.5	mg/kg	8021/8015	08/31/12	500
Ethylbenzene	1.6	0.25	mg/kg	8021/8015	08/31/12	500
Total Xylene	9.9	0.75	mg/kg	8021/8015	08/31/12	500
TPH (GC/FID) Low Fraction	210	50.	mg/kg	GRO	08/31/12	500
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	95.0		% Rec.	8021/8015	08/31/12	500
a,a,a-Trifluorotoluene(PID)	100.		% Rec.	8021/8015	08/31/12	500
TPH (GC/FID) High Fraction	70.	4.0	mg/kg	3546/DRO	09/07/12	1
Surrogate recovery(%)						
o-Terphenyl	59.9		% Rec.	3546/DRO	09/07/12	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

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Tax I.D. 62-0814289

Est. 1970

# REPORT OF ANALYSIS

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

September 10, 2012

Date Received : August 30, 2012  
Description : Encana Rangely Assessment  
Sample ID : 1305-CB01-082812 34-34.5 FT  
Collected By : Mike Unger  
Collection Date : 08/28/12 16:45

ESC Sample # : L592665-06

Site ID :

Project # : 033412042

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	0.14	0.025	mg/kg	8021/8015	09/04/12	50
Toluene	2.1	0.25	mg/kg	8021/8015	09/04/12	50
Ethylbenzene	0.64	0.025	mg/kg	8021/8015	09/04/12	50
Total Xylene	6.4	0.075	mg/kg	8021/8015	09/04/12	50
TPH (GC/FID) Low Fraction	54.	5.0	mg/kg	GRO	09/04/12	50
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	96.5		% Rec.	8021/8015	09/04/12	50
a,a,a-Trifluorotoluene(PID)	102.		% Rec.	8021/8015	09/04/12	50
TPH (GC/FID) High Fraction	9.9	4.0	mg/kg	3546/DRO	09/07/12	1
Surrogate recovery(%)						
o-Terphenyl	55.2		% Rec.	3546/DRO	09/07/12	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

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REPORT OF ANALYSIS

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

September 10, 2012

Date Received : August 30, 2012  
Description : Encana Rangely Assessment  
Sample ID : 1305-CB02-082912 34-34.5 FT  
Collected By : Mike Unger  
Collection Date : 08/29/12 09:30

ESC Sample # : L592665-07

Site ID :

Project # : 033412042

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	0.29	0.025	mg/kg	8021/8015	09/04/12	50
Toluene	2.3	0.25	mg/kg	8021/8015	09/04/12	50
Ethylbenzene	0.77	0.025	mg/kg	8021/8015	09/04/12	50
Total Xylene	5.8	0.075	mg/kg	8021/8015	09/04/12	50
TPH (GC/FID) Low Fraction	83.	5.0	mg/kg	GRO	09/04/12	50
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	96.6		% Rec.	8021/8015	09/04/12	50
a,a,a-Trifluorotoluene(PID)	102.		% Rec.	8021/8015	09/04/12	50
TPH (GC/FID) High Fraction	48.	4.0	mg/kg	3546/DRO	09/07/12	1
Surrogate recovery(%)						
o-Terphenyl	99.9		% Rec.	3546/DRO	09/07/12	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

The reported analytical results relate only to the sample submitted.

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REPORT OF ANALYSIS

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

September 10, 2012

Date Received : August 30, 2012  
Description : Encana Rangely Assessment  
Sample ID : 1305-CB03-082912 34-34.5 FT  
Collected By : Mike Unger  
Collection Date : 08/29/12 11:40

ESC Sample # : L592665-08

Site ID :

Project # : 033412042

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.0025	mg/kg	8021/8015	08/31/12	5
Toluene	BDL	0.025	mg/kg	8021/8015	08/31/12	5
Ethylbenzene	BDL	0.0025	mg/kg	8021/8015	08/31/12	5
Total Xylene	BDL	0.0075	mg/kg	8021/8015	08/31/12	5
TPH (GC/FID) Low Fraction	BDL	0.50	mg/kg	GRO	08/31/12	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	93.9		% Rec.	8021/8015	08/31/12	5
a,a,a-Trifluorotoluene(PID)	97.4		% Rec.	8021/8015	08/31/12	5
TPH (GC/FID) High Fraction	BDL	4.0	mg/kg	3546/DRO	09/07/12	1
Surrogate recovery(%)						
o-Terphenyl	59.4		% Rec.	3546/DRO	09/07/12	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

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REPORT OF ANALYSIS

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

September 10, 2012

Date Received : August 30, 2012  
Description : Encana Rangely Assessment  
Sample ID : 1305-CB04-082912 33.5-34 FT  
Collected By : Mike Unger  
Collection Date : 08/29/12 14:55

ESC Sample # : L592665-09

Site ID :

Project # : 033412042

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.0025	mg/kg	8021/8015	08/31/12	5
Toluene	BDL	0.025	mg/kg	8021/8015	08/31/12	5
Ethylbenzene	BDL	0.0025	mg/kg	8021/8015	08/31/12	5
Total Xylene	0.0078	0.0075	mg/kg	8021/8015	08/31/12	5
TPH (GC/FID) Low Fraction	BDL	0.50	mg/kg	GRO	08/31/12	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	92.4		% Rec.	8021/8015	08/31/12	5
a,a,a-Trifluorotoluene(PID)	96.2		% Rec.	8021/8015	08/31/12	5
TPH (GC/FID) High Fraction	BDL	4.0	mg/kg	3546/DRO	09/07/12	1
Surrogate recovery(%)						
o-Terphenyl	72.3		% Rec.	3546/DRO	09/07/12	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: 09/10/12 10:46 Printed: 09/10/12 10:46

Summary of Remarks For Samples Printed  
09/10/12 at 10:46:38

TSR Signing Reports: 358  
R5 - Desired TAT

Sample: L592665-01 Account: ENCANRCO Received: 08/30/12 09:00 Due Date: 09/07/12 00:00 RPT Date: 09/10/12 10:46  
Change sample IDs per CM. Changed "CS" to "CB". jw 9/7  
Sample: L592665-02 Account: ENCANRCO Received: 08/30/12 09:00 Due Date: 09/07/12 00:00 RPT Date: 09/10/12 10:46  
Sample: L592665-03 Account: ENCANRCO Received: 08/30/12 09:00 Due Date: 09/07/12 00:00 RPT Date: 09/10/12 10:46  
Sample: L592665-04 Account: ENCANRCO Received: 08/30/12 09:00 Due Date: 09/07/12 00:00 RPT Date: 09/10/12 10:46  
Sample: L592665-05 Account: ENCANRCO Received: 08/30/12 09:00 Due Date: 09/07/12 00:00 RPT Date: 09/10/12 10:46  
Sample: L592665-06 Account: ENCANRCO Received: 08/30/12 09:00 Due Date: 09/07/12 00:00 RPT Date: 09/10/12 10:46  
Sample: L592665-07 Account: ENCANRCO Received: 08/30/12 09:00 Due Date: 09/07/12 00:00 RPT Date: 09/10/12 10:46  
Sample: L592665-08 Account: ENCANRCO Received: 08/30/12 09:00 Due Date: 09/07/12 00:00 RPT Date: 09/10/12 10:46  
Sample: L592665-09 Account: ENCANRCO Received: 08/30/12 09:00 Due Date: 09/07/12 00:00 RPT Date: 09/10/12 10:46



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Level II

L592665

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Est. 1970

September 10, 2012

Analyte	Result	Laboratory Blank		Limit	Batch	Date Analyzed
		Units	% Rec			
Benzene	< .0005	mg/kg			WG610407	08/31/12 07:34
Ethylbenzene	< .0005	mg/kg			WG610407	08/31/12 07:34
Toluene	< .005	mg/kg			WG610407	08/31/12 07:34
TPH (GC/FID) Low Fraction	< .1	mg/kg			WG610407	08/31/12 07:34
Total Xylene	< .0015	mg/kg			WG610407	08/31/12 07:34
a,a,a-Trifluorotoluene(FID)		% Rec.	94.87	59-128	WG610407	08/31/12 07:34
a,a,a-Trifluorotoluene(PID)		% Rec.	100.1	54-144	WG610407	08/31/12 07:34
Benzene	< .0005	mg/kg			WG610428	08/31/12 08:35
Ethylbenzene	< .0005	mg/kg			WG610428	08/31/12 08:35
Toluene	< .005	mg/kg			WG610428	08/31/12 08:35
TPH (GC/FID) Low Fraction	< .1	mg/kg			WG610428	08/31/12 08:35
Total Xylene	< .0015	mg/kg			WG610428	08/31/12 08:35
a,a,a-Trifluorotoluene(FID)		% Rec.	93.23	59-128	WG610428	08/31/12 08:35
a,a,a-Trifluorotoluene(PID)		% Rec.	96.95	54-144	WG610428	08/31/12 08:35
Benzene	< .0005	mg/kg			WG610890	09/04/12 13:40
Ethylbenzene	< .0005	mg/kg			WG610890	09/04/12 13:40
Toluene	< .005	mg/kg			WG610890	09/04/12 13:40
TPH (GC/FID) Low Fraction	< .1	mg/kg			WG610890	09/04/12 13:40
Total Xylene	< .0015	mg/kg			WG610890	09/04/12 13:40
a,a,a-Trifluorotoluene(FID)		% Rec.	96.59	59-128	WG610890	09/04/12 13:40
a,a,a-Trifluorotoluene(PID)		% Rec.	101.4	54-144	WG610890	09/04/12 13:40
TPH (GC/FID) High Fraction	< 4	ppm			WG610430	09/06/12 08:30
o-Terphenyl		% Rec.	62.78	50-150	WG610430	09/06/12 08:30
TPH (GC/FID) High Fraction	< 4	ppm			WG610431	09/07/12 08:47
o-Terphenyl		% Rec.	54.55	50-150	WG610431	09/07/12 08:47
TPH (GC/FID) High Fraction	< 4	ppm			WG611088	09/07/12 13:41
o-Terphenyl		% Rec.	63.62	50-150	WG611088	09/07/12 13:41

Analyte	Units	Laboratory Control Sample		% Rec	Limit	Batch
		Known Val	Result			
Benzene	mg/kg	.05	0.0448	89.5	76-113	WG610407
Ethylbenzene	mg/kg	.05	0.0542	108.	78-115	WG610407
Toluene	mg/kg	.05	0.0516	103.	76-114	WG610407
Total Xylene	mg/kg	.15	0.161	107.	81-118	WG610407
a,a,a-Trifluorotoluene(PID)				99.74	54-144	WG610407
TPH (GC/FID) Low Fraction	mg/kg	5.5	5.62	102.	67-135	WG610407
a,a,a-Trifluorotoluene(FID)				101.4	59-128	WG610407
TPH (GC/FID) Low Fraction	mg/kg	5.5	6.71	122.	67-135	WG610428
a,a,a-Trifluorotoluene(FID)				99.88	59-128	WG610428
Benzene	mg/kg	.05	0.0465	92.9	76-113	WG610428
Ethylbenzene	mg/kg	.05	0.0483	96.7	78-115	WG610428
Toluene	mg/kg	.05	0.0479	95.8	76-114	WG610428
Total Xylene	mg/kg	.15	0.142	94.5	81-118	WG610428
a,a,a-Trifluorotoluene(PID)				98.08	54-144	WG610428

\* Performance of this Analyte is outside of established criteria.  
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Analyte	Units	Laboratory Control Sample		% Rec	Limit	Batch
		Known Val	Result			
Benzene	mg/kg	.05	0.0498	99.7	76-113	WG610890
Ethylbenzene	mg/kg	.05	0.0548	110.	78-115	WG610890
Toluene	mg/kg	.05	0.0539	108.	76-114	WG610890
Total Xylene	mg/kg	.15	0.163	109.	81-118	WG610890
a,a,a-Trifluorotoluene(PID)				100.8	54-144	WG610890
TPH (GC/FID) Low Fraction	mg/kg	5.5	5.67	103.	67-135	WG610890
a,a,a-Trifluorotoluene(FID)				102.8	59-128	WG610890
TPH (GC/FID) High Fraction	ppm	60	45.5	75.8	50-150	WG610430
o-Terphenyl				63.20	50-150	WG610430
TPH (GC/FID) High Fraction	ppm	60	40.6	67.7	50-150	WG610431
o-Terphenyl				55.49	50-150	WG610431
TPH (GC/FID) High Fraction	ppm	60	43.5	72.5	50-150	WG611088
o-Terphenyl				54.27	50-150	WG611088

Analyte	Units	Laboratory Control Sample Duplicate		%Rec	Limit	RPD	Limit	Batch
		Result	Ref					
Benzene	mg/kg	0.0447	0.0448	89.0	76-113	0.0500	20	WG610407
Ethylbenzene	mg/kg	0.0548	0.0542	110.	78-115	1.15	20	WG610407
Toluene	mg/kg	0.0513	0.0516	103.	76-114	0.470	20	WG610407
Total Xylene	mg/kg	0.162	0.161	108.	81-118	0.330	20	WG610407
a,a,a-Trifluorotoluene(PID)				100.1	54-144			WG610407
TPH (GC/FID) Low Fraction	mg/kg	5.60	5.62	102.	67-135	0.300	20	WG610407
a,a,a-Trifluorotoluene(FID)				101.0	59-128			WG610407
TPH (GC/FID) Low Fraction	mg/kg	6.20	6.71	113.	67-135	7.91	20	WG610428
a,a,a-Trifluorotoluene(FID)				97.59	59-128			WG610428
Benzene	mg/kg	0.0475	0.0465	95.0	76-113	2.29	20	WG610428
Ethylbenzene	mg/kg	0.0497	0.0483	99.0	78-115	2.82	20	WG610428
Toluene	mg/kg	0.0477	0.0479	95.0	76-114	0.420	20	WG610428
Total Xylene	mg/kg	0.145	0.142	96.0	81-118	1.96	20	WG610428
a,a,a-Trifluorotoluene(PID)				96.39	54-144			WG610428
Benzene	mg/kg	0.0503	0.0498	101.	76-113	0.980	20	WG610890
Ethylbenzene	mg/kg	0.0552	0.0548	110.	78-115	0.720	20	WG610890
Toluene	mg/kg	0.0539	0.0539	108.	76-114	0.0400	20	WG610890
Total Xylene	mg/kg	0.163	0.163	109.	81-118	0.240	20	WG610890
a,a,a-Trifluorotoluene(PID)				101.3	54-144			WG610890
TPH (GC/FID) Low Fraction	mg/kg	5.78	5.67	105.	67-135	1.89	20	WG610890
a,a,a-Trifluorotoluene(FID)				102.6	59-128			WG610890
TPH (GC/FID) High Fraction	ppm	46.4	45.5	77.0	50-150	2.16	25	WG610430
o-Terphenyl				61.31	50-150			WG610430
TPH (GC/FID) High Fraction	ppm	44.5	40.6	74.0	50-150	9.19	20	WG610431
o-Terphenyl				62.21	50-150			WG610431
TPH (GC/FID) High Fraction	ppm	48.2	43.5	80.0	50-150	10.2	23	WG611088

\* Performance of this Analyte is outside of established criteria.

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September 10, 2012

Analyte	Units	MS Res	Matrix Spike		% Rec	Limit	Ref Samp	Batch
			Ref Res	TV				
o-Terphenyl				62.22		50-150		
Analyte	Units	MS Res	Matrix Spike		% Rec	Limit	Ref Samp	Batch
			Ref Res	TV				
Benzene	mg/kg	0.215	0	.05	85.9	32-137	L592650-02	WG610407
Ethylbenzene	mg/kg	0.260	0	.05	104.	10-150	L592650-02	WG610407
Toluene	mg/kg	0.256	0	.05	102.	20-142	L592650-02	WG610407
Total Xylene	mg/kg	0.770	0	.15	103.	16-141	L592650-02	WG610407
a,a,a-Trifluorotoluene(PID)					100.9	54-144		WG610407
TPH (GC/FID) Low Fraction	mg/kg	24.8	0	5.5	90.0	55-109	L592650-02	WG610407
a,a,a-Trifluorotoluene(FID)					100.1	59-128		WG610407
Benzene	mg/kg	0.212	0	.05	84.8	32-137	L592665-08	WG610428
Ethylbenzene	mg/kg	0.247	0	.05	98.6	10-150	L592665-08	WG610428
Toluene	mg/kg	0.236	0	.05	94.2	20-142	L592665-08	WG610428
Total Xylene	mg/kg	0.715	0	.15	95.4	16-141	L592665-08	WG610428
a,a,a-Trifluorotoluene(PID)					96.87	54-144		WG610428
TPH (GC/FID) Low Fraction	mg/kg	23.1	0	5.5	84.0	55-109	L592665-08	WG610428
a,a,a-Trifluorotoluene(FID)					94.90	59-128		WG610428
Benzene	mg/kg	0.246	0.0210	.05	90.0	32-137	L593087-03	WG610890
Ethylbenzene	mg/kg	0.269	0.0980	.05	68.2	10-150	L593087-03	WG610890
Toluene	mg/kg	0.273	0.0460	.05	91.0	20-142	L593087-03	WG610890
Total Xylene	mg/kg	0.796	0.140	.15	87.5	16-141	L593087-03	WG610890
a,a,a-Trifluorotoluene(PID)					101.5	54-144		WG610890
TPH (GC/FID) Low Fraction	mg/kg	25.6	21.8	5.5	13.6*	55-109	L593087-03	WG610890
a,a,a-Trifluorotoluene(FID)					101.5	59-128		WG610890
TPH (GC/FID) High Fraction	ppm	48.3	0	60	80.4	50-150	L592577-05	WG610430
o-Terphenyl					64.34	50-150		WG610430
TPH (GC/FID) High Fraction	ppm	50.5	0	60	84.1	50-150	L592665-09	WG610431
o-Terphenyl					76.42	50-150		WG610431
TPH (GC/FID) High Fraction	ppm	43.6	0	60	72.7	50-150	L593090-01	WG611088
o-Terphenyl					54.76	50-150		WG611088

Analyte	Units	MSD	Matrix Spike Duplicate		Limit	RPD	Limit	Ref Samp	Batch
			Ref	%Rec					
Benzene	mg/kg	0.218	0.215	87.1	32-137	1.40	39	L592650-02	WG610407
Ethylbenzene	mg/kg	0.264	0.260	106.	10-150	1.68	44	L592650-02	WG610407
Toluene	mg/kg	0.251	0.256	100.	20-142	1.80	42	L592650-02	WG610407
Total Xylene	mg/kg	0.780	0.770	104.	16-141	1.35	46	L592650-02	WG610407
a,a,a-Trifluorotoluene(PID)				99.63	54-144				WG610407
TPH (GC/FID) Low Fraction	mg/kg	24.3	24.8	88.5	55-109	1.67	20	L592650-02	WG610407
a,a,a-Trifluorotoluene(FID)				99.98	59-128				WG610407
Benzene	mg/kg	0.211	0.212	84.3	32-137	0.580	39	L592665-08	WG610428
Ethylbenzene	mg/kg	0.247	0.247	98.9	10-150	0.260	44	L592665-08	WG610428
Toluene	mg/kg	0.234	0.236	93.5	20-142	0.750	42	L592665-08	WG610428
Total Xylene	mg/kg	0.716	0.715	95.5	16-141	0.140	46	L592665-08	WG610428

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Analyte	Units	MSD	Matrix Spike Duplicate		Limit	RPD	Limit	Ref	Samp	Batch
			Ref	%Rec						
a,a,a-Trifluorotoluene(PID)				95.65	54-144					
TPH (GC/FID) Low Fraction	mg/kg	21.3	23.1	77.4	55-109	8.15	20	L592665-08		WG610428
a,a,a-Trifluorotoluene(FID)				94.17	59-128					WG610428
Benzene	mg/kg	0.253	0.246	92.6	32-137	2.63	39	L593087-03		WG610890
Ethylbenzene	mg/kg	0.280	0.269	72.8	10-150	4.21	44	L593087-03		WG610890
Toluene	mg/kg	0.268	0.273	88.8	20-142	2.00	42	L593087-03		WG610890
Total Xylene	mg/kg	0.817	0.796	90.2	16-141	2.60	46	L593087-03		WG610890
a,a,a-Trifluorotoluene(PID)				101.8	54-144					WG610890
TPH (GC/FID) Low Fraction	mg/kg	27.9	25.6	22.1*	55-109	8.81	20	L593087-03		WG610890
a,a,a-Trifluorotoluene(FID)				101.7	59-128					WG610890
TPH (GC/FID) High Fraction	ppm	40.8	48.3	68.0	50-150	16.8	25	L592577-05		WG610430
o-Terphenyl				52.25	50-150					WG610430
TPH (GC/FID) High Fraction	ppm	49.9	50.5	83.1	50-150	1.19	20	L592665-09		WG610431
o-Terphenyl				74.83	50-150					WG610431
TPH (GC/FID) High Fraction	ppm	46.6	43.6	77.7	50-150	6.67	40	L593090-01		WG611088
o-Terphenyl				58.58	50-150					WG611088

Batch number /Run number / Sample number cross reference

WG610407: R2325973: L592665-01 02 03 04 05  
WG610428: R2327793: L592665-08 09  
WG610890: R2328835: L592665-06 07  
WG610430: R2331333: L592665-01 02 03 04  
WG610431: R2333993: L592665-08 09  
WG611088: R2335955: L592665-05 06 07

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

\* Performance of this Analyte is outside of established criteria.

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





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

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

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

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



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1125 Escalante Drive  
Rangely, CO 81648-3600

## Report Summary

Thursday December 13, 2012

Report Number: L610221


Samples Received: 12/07/12

Client Project: 1321

Description: 1321 Pit Project

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

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

December 13, 2012

Date Received : December 07, 2012  
Description : 1321 Pit Project  
Sample ID : 1321-SPOILS-120512  
Collected By : Blake Ford  
Collection Date : 12/05/12 15:02

ESC Sample # : L610221-01

Site ID : 1321

Project # : 1321

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.0025	mg/kg	8021/8015	12/11/12	5
Toluene	BDL	0.025	mg/kg	8021/8015	12/11/12	5
Ethylbenzene	BDL	0.0025	mg/kg	8021/8015	12/11/12	5
Total Xylene	BDL	0.0075	mg/kg	8021/8015	12/11/12	5
TPH (GC/FID) Low Fraction	BDL	0.50	mg/kg	GRO	12/11/12	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	95.3		% Rec.	8021/8015	12/11/12	5
a,a,a-Trifluorotoluene(PID)	104.		% Rec.	8021/8015	12/11/12	5
TPH (GC/FID) High Fraction	15.	4.0	mg/kg	3546/DRO	12/12/12	1
Surrogate recovery(%)						
o-Terphenyl	56.5		% Rec.	3546/DRO	12/12/12	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

The reported analytical results relate only to the sample submitted.

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Reported: 12/13/12 10:26 Printed: 12/13/12 10:26

Attachment A  
List of Analytes with QC Qualifiers

Sample Number	Work Group	Sample Type	Analyte	Run ID	Qualifier
L610221-01	WG627497	SAMP	TPH (GC/FID) Low Fraction	R2474021	J6

Attachment B  
Explanation of QC Qualifier Codes

Qualifier	Meaning
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  
12/13/12 at 10:26:47

TSR Signing Reports: 358  
R5 - Desired TAT

Sample: L610221-01 Account: ENCANRCO Received: 12/07/12 09:45 Due Date: 12/14/12 00:00 RPT Date: 12/13/12 10:26



**YOUR LAB OF CHOICE**

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

Rangely, CO 81648-3600

Quality Assurance Report  
Level II

L610221

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

December 13, 2012

Analyte	Result	Laboratory Blank		Limit	Batch	Date Analyzed
		Units	% Rec			
Benzene	< .0005	mg/kg			WG627497	12/11/12 14:11
Ethylbenzene	< .0005	mg/kg			WG627497	12/11/12 14:11
Toluene	< .005	mg/kg			WG627497	12/11/12 14:11
TPH (GC/FID) Low Fraction	< .1	mg/kg			WG627497	12/11/12 14:11
Total Xylene	< .0015	mg/kg			WG627497	12/11/12 14:11
a,a,a-Trifluorotoluene(FID)		% Rec.	96.30	59-128	WG627497	12/11/12 14:11
a,a,a-Trifluorotoluene(PID)		% Rec.	105.1	54-144	WG627497	12/11/12 14:11

Analyte	Units	Laboratory Control Sample		% Rec	Limit	Batch
		Known Val	Result			
Benzene	mg/kg	.05	0.0508	102.	76-113	WG627497
Ethylbenzene	mg/kg	.05	0.0514	103.	78-115	WG627497
Toluene	mg/kg	.05	0.0509	102.	76-114	WG627497
Total Xylene	mg/kg	.15	0.150	100.	81-118	WG627497
a,a,a-Trifluorotoluene(PID)				104.1	54-144	WG627497
TPH (GC/FID) Low Fraction	mg/kg	5.5	5.53	101.	67-135	WG627497
a,a,a-Trifluorotoluene(FID)				102.1	59-128	WG627497

Analyte	Units	Laboratory Control Sample Duplicate			Limit	RPD	Limit	Batch
		Result	Ref	%Rec				
Benzene	mg/kg	0.0529	0.0508	106.	76-113	3.93	20	WG627497
Ethylbenzene	mg/kg	0.0535	0.0514	107.	78-115	3.93	20	WG627497
Toluene	mg/kg	0.0521	0.0509	104.	76-114	2.24	20	WG627497
Total Xylene	mg/kg	0.155	0.150	103.	81-118	3.01	20	WG627497
a,a,a-Trifluorotoluene(PID)				104.2	54-144			WG627497
TPH (GC/FID) Low Fraction	mg/kg	5.39	5.53	98.0	67-135	2.48	20	WG627497
a,a,a-Trifluorotoluene(FID)				101.3	59-128			WG627497

Analyte	Units	Matrix Spike			% Rec	Limit	Ref Samp	Batch
		MS Res	Ref Res	TV				
Benzene	mg/kg	0.153	0	.05	61.2	32-137	L610221-01	WG627497
Ethylbenzene	mg/kg	0.146	0	.05	58.3	10-150	L610221-01	WG627497
Toluene	mg/kg	0.158	0	.05	63.1	20-142	L610221-01	WG627497
Total Xylene	mg/kg	0.441	0	.15	58.8	16-141	L610221-01	WG627497
a,a,a-Trifluorotoluene(PID)					102.0	54-144		WG627497
TPH (GC/FID) Low Fraction	mg/kg	9.21	0	5.5	33.5*	55-109	L610221-01	WG627497
a,a,a-Trifluorotoluene(FID)					95.39	59-128		WG627497

Analyte	Units	Matrix Spike Duplicate			Limit	RPD	Limit	Ref Samp	Batch
		MSD	Ref	%Rec					
Benzene	mg/kg	0.130	0.153	52.0	32-137	16.2	39	L610221-01	WG627497
Ethylbenzene	mg/kg	0.106	0.146	42.4	10-150	31.5	44	L610221-01	WG627497
Toluene	mg/kg	0.116	0.158	46.2	20-142	30.9	42	L610221-01	WG627497
Total Xylene	mg/kg	0.315	0.441	42.0	16-141	33.5	46	L610221-01	WG627497
a,a,a-Trifluorotoluene(PID)				103.8	54-144				WG627497
TPH (GC/FID) Low Fraction	mg/kg	7.68	9.21	27.9*	55-109	18.1	20	L610221-01	WG627497
a,a,a-Trifluorotoluene(FID)				93.30	59-128				WG627497

Batch number /Run number / Sample number cross reference

WG627497: R2474021: L610221-01  
WG627431: R2475602: L610221-01

\* \* Calculations are performed prior to rounding of reported values.  
\* Performance of this Analyte is outside of established criteria.  
For additional information, please see Attachment A 'List of Analytes with QC Qualifiers.'





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Rangely, CO 81648-3600

Quality Assurance Report  
Level II

L610221

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Tax I.D. 62-0814289

Est. 1970

December 13, 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.



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Est. 1970

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

## Report Summary

Friday September 06, 2013

Report Number: L654177


Samples Received: 08/27/13

Client Project: 033412042

Description: Rangley Site Assessment

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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Est. 1970

# REPORT OF ANALYSIS

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

September 06, 2013

Date Received : August 27, 2013  
Description : Rangley Site Assessment  
Sample ID : 082513-1321 (SPOILS B1) 0-1FT  
Collected By : Dustin Held  
Collection Date : 08/25/13 10:00

ESC Sample # : L654177-01

Site ID : 1321

Project # : 033412042

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Chromium, Hexavalent	BDL	20.	mg/kg	3060A/7196A	08/30/13	10
Chromium, Trivalent	BDL	20.	mg/kg	Calc.	09/05/13	1
ORP	140		mV	2580 B-2011	08/30/13	1
pH	7.5		su	9045D	09/03/13	1
Sodium Adsorption Ratio	16.			Calc.	08/29/13	1
Specific Conductance	3400		umhos/cm	9050AMod	08/30/13	1
Mercury	0.17	0.020	mg/kg	7471	08/28/13	1
Arsenic	11.	1.0	mg/kg	6010B	09/04/13	1
Barium	180	0.25	mg/kg	6010B	09/04/13	1
Cadmium	0.44	0.25	mg/kg	6010B	09/04/13	1
Chromium	13.	0.50	mg/kg	6010B	09/04/13	1
Copper	20.	1.0	mg/kg	6010B	09/04/13	1
Lead	14.	0.25	mg/kg	6010B	09/04/13	1
Nickel	18.	1.0	mg/kg	6010B	09/04/13	1
Selenium	BDL	1.0	mg/kg	6010B	09/04/13	1
Silver	BDL	0.50	mg/kg	6010B	09/04/13	1
Zinc	69.	1.5	mg/kg	6010B	09/04/13	1
Benzene	BDL	0.0025	mg/kg	8021/8015	08/29/13	5
Toluene	BDL	0.025	mg/kg	8021/8015	08/29/13	5
Ethylbenzene	BDL	0.0025	mg/kg	8021/8015	08/29/13	5
Total Xylene	BDL	0.0075	mg/kg	8021/8015	08/29/13	5
TPH (GC/FID) Low Fraction	BDL	0.50	mg/kg	GRO	08/29/13	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	100.		% Rec.	8021/8015	08/29/13	5
a,a,a-Trifluorotoluene(PID)	106.		% Rec.	8021/8015	08/29/13	5
TPH (GC/FID) High Fraction	20.	4.0	mg/kg	8015D/DRO	09/01/13	1
Surrogate recovery(%)						
o-Terphenyl	71.2		% Rec.	8015D/DRO	09/01/13	1
Polynuclear Aromatic Hydrocarbons						
Anthracene	BDL	0.0060	mg/kg	8270C-SIM	09/05/13	1
Acenaphthene	BDL	0.0060	mg/kg	8270C-SIM	09/05/13	1
Acenaphthylene	BDL	0.0060	mg/kg	8270C-SIM	09/05/13	1
Benzo(a)anthracene	BDL	0.0060	mg/kg	8270C-SIM	09/05/13	1
Benzo(a)pyrene	BDL	0.0060	mg/kg	8270C-SIM	09/05/13	1

BDL - Below Detection Limit  
Det. Limit - Practical Quantitation Limit(PQL)  
L654177-01 (CR6) - diluted due to sample color/reducer  
L654177-01 (PH) - 7.5@23.4c



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Tax I.D. 62-0814289

Est. 1970

# REPORT OF ANALYSIS

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

September 06, 2013

Date Received : August 27, 2013  
Description : Rangley Site Assessment  
Sample ID : 082513-1321 (SPOILS B1) 0-1FT  
Collected By : Dustin Held  
Collection Date : 08/25/13 10:00

ESC Sample # : L654177-01

Site ID : 1321

Project # : 033412042

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzo(b)fluoranthene	BDL	0.0060	mg/kg	8270C-SIM	09/05/13	1
Benzo(g,h,i)perylene	BDL	0.0060	mg/kg	8270C-SIM	09/05/13	1
Benzo(k)fluoranthene	BDL	0.0060	mg/kg	8270C-SIM	09/05/13	1
Chrysene	BDL	0.0060	mg/kg	8270C-SIM	09/05/13	1
Dibenz(a,h)anthracene	BDL	0.0060	mg/kg	8270C-SIM	09/05/13	1
Fluoranthene	BDL	0.0060	mg/kg	8270C-SIM	09/05/13	1
Fluorene	BDL	0.0060	mg/kg	8270C-SIM	09/05/13	1
Indeno(1,2,3-cd)pyrene	BDL	0.0060	mg/kg	8270C-SIM	09/05/13	1
Naphthalene	BDL	0.020	mg/kg	8270C-SIM	09/05/13	1
Phenanthrene	BDL	0.0060	mg/kg	8270C-SIM	09/05/13	1
Pyrene	BDL	0.0060	mg/kg	8270C-SIM	09/05/13	1
1-Methylnaphthalene	BDL	0.020	mg/kg	8270C-SIM	09/05/13	1
2-Methylnaphthalene	BDL	0.020	mg/kg	8270C-SIM	09/05/13	1
2-Chloronaphthalene	BDL	0.020	mg/kg	8270C-SIM	09/05/13	1
Surrogate Recovery						
Nitrobenzene-d5	99.8		% Rec.	8270C-SIM	09/05/13	1
2-Fluorobiphenyl	82.2		% Rec.	8270C-SIM	09/05/13	1
p-Terphenyl-d14	101.		% Rec.	8270C-SIM	09/05/13	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: 09/06/13 14:06 Printed: 09/06/13 14:07  
L654177-01 (CR6) - diluted due to sample color/reducer  
L654177-01 (PH) - 7.5@23.4c

Attachment A  
List of Analytes with QC Qualifiers

Sample Number	Work Group	Sample Type	Analyte	Run ID	Qualifier
L654177-01	WG679071	SAMP	Chromium, Hexavalent	R2796682	J60

Attachment B  
Explanation of QC Qualifier Codes

Qualifier	Meaning
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low
0	(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.

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)."

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- 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  
09/06/13 at 14:07:11

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.

Sample: L654177-01 Account: ENCANACO Received: 08/27/13 09:30 Due Date: 09/05/13 00:00 RPT Date: 09/06/13 14:06