KC HARVEY

August 31, 2010

Ms. Kathy Brown
Wyoming Department of Environmental Quality
510 Meadowview Drive
Lander, WY 82520

Re: REMEDIAL ALTERNATIVES EVALUATION - TRIBAL PAVILLION 42-11

Dear Ms. Brown:

EnCana Oil & Gas USA Inc. (EnCana) has prepared this REMEDIAL ALTERNATIVES EVALUATION REPORT for the Tribal Pavillion (TP) 42-11 Voluntary Remediation Program (VRP) location. This report is divided into five generalized categories for each location including:

- Project Background
- Targeted Soil Remediation Activity
- Groundwater Contaminant Distribution and Characterization
- Groundwater Remedial Action Alternatives
- Recommended Remedy

Please contact Mike Larson at (406) 585-7402 (ext. 14) with any questions or comments.

Sincerely,

Michael Larson
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EXECUTIVE SUMMARY

In 2006, EnCana voluntarily initiated site assessment work for the TP 42-11 natural gas well location where the historic use of unlined pits was identified. The facility was officially placed under the Wyoming Department of Environmental Quality (DEQ) Voluntary Remediation Program (VRP) following review of the first round of groundwater monitoring results in October, 2006. The site is currently owned by Mr. and Mrs. Jeffrey Locker and EnCana actively operates the natural gas well location.

Site assessment activities have included the installation and semi-annual monitoring of five monitoring wells (MW-1 through MW-5) and installation of Geoprobe borings from which soil total hydrocarbon concentrations were measured at 21 locations. These activities, along with review of a historic aerial photograph, indicated that hydrocarbon liquids had leaked from a single rectangular-shaped pit east of the separators. Constituents of concern (COCs) being evaluated include diesel and gasoline range organics (DROs and GROs), benzene, toluene, ethylbenzene and xylenes (BTEX compounds).

A targeted soil remediation source removal involved excavation of approximately 900 cubic yards of hydrocarbon contaminated soil from the TP-42-11 location in September 2008 in an area immediately west of MW-2. Soil excavation was guided in part by the observation of a distinct boundary between contaminated and non-impacted soil visible during the trenching and excavation activities. Soil confirmation samples collected from the excavation walls and floor provided confirmation of successful removal of the majority of the hydrocarbon targeted source area. All confirmation samples had hydrocarbon concentrations that were well below cleanup threshold levels.

Groundwater monitoring data show that hydrocarbon concentrations are decreasing in response to source removal activities. At MW-4, located about 20 ft down gradient of the excavation area, concentrations of benzene, along with some other constituents, have decreased by as much as 50 % per year and benzene concentrations at MW-2 are decreasing at a similar rate. This suggests that the size of the hydrocarbon plume is shrinking in response to soil remediation.

Because past remediation activities were effective at removing the contaminant source and natural processes are subsequently improving groundwater conditions, EnCana proposes no additional soil remediation or groundwater treatment work for the TP-42-11 site. Instead, continued monitoring of groundwater hydrocarbon concentrations is proposed in order to track groundwater hydrocarbon trends and to confirm that natural processes continue to reduce and will eventually eliminate the hydrocarbon plume.

Based on the Wyoming DEQ's acceptance of this preferred remedy, EnCana will continue with the approved groundwater monitoring plan.

1.0 INTRODUCTION

This report describes the remedial alternatives evaluation for the Tribal Pavillion (TP) 42-11 location (Figure 1). The report presents summary information of all soil and groundwater data collected to date and provides relevant information for determining the best suited groundwater treatment option. In addition, the report contains a subsection describing groundwater sampling and analysis planned for future monitoring events at the site.

2.0 TP 42-11 BACKGROUND

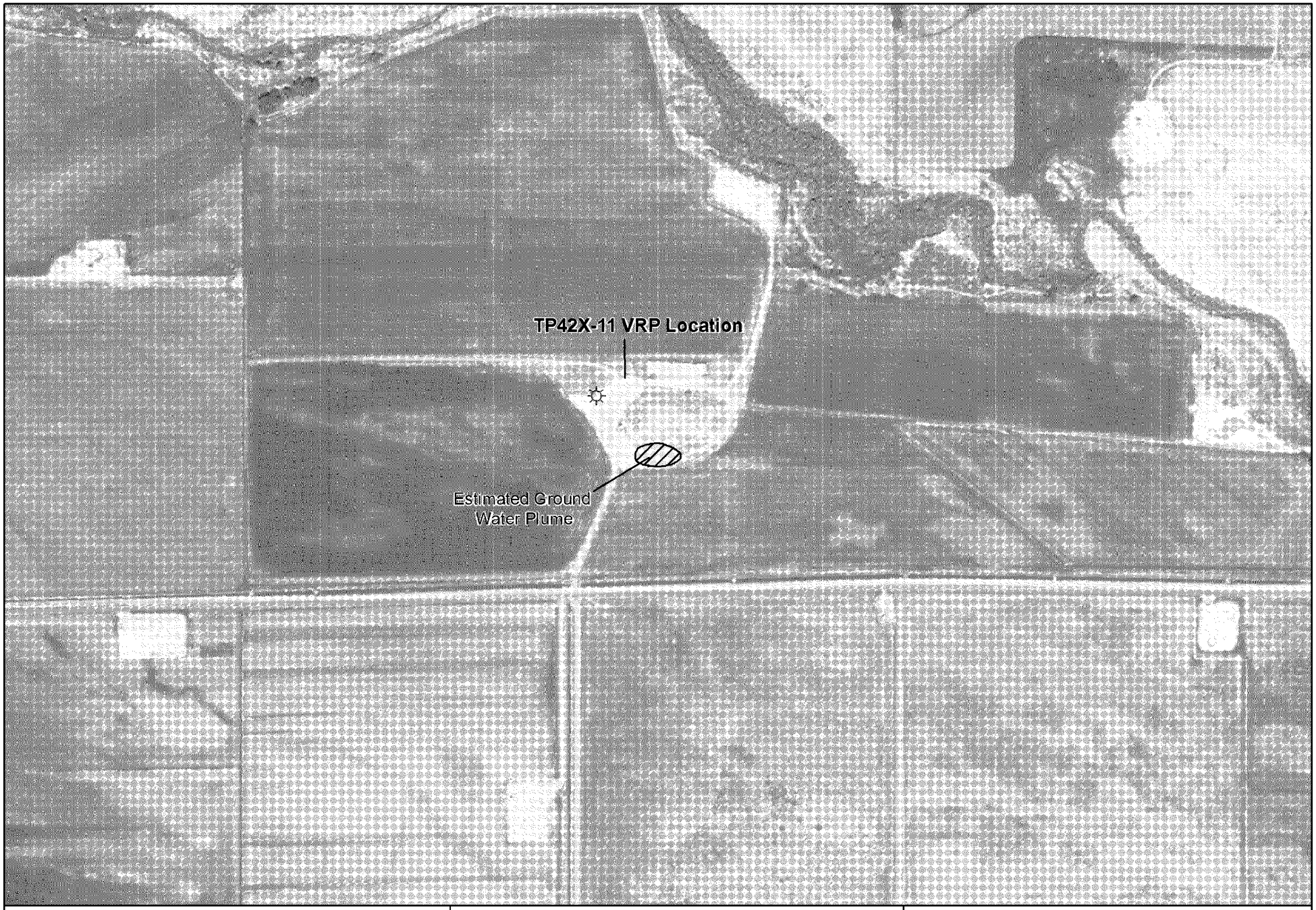
In 2006, EnCana voluntarily initiated site assessment work for the TP 42-11 facility location along with approximately thirty other Pavillion-area natural gas well locations where the historic use of unlined pits was identified. Hydrocarbon groundwater impacts were detected and attributed to a release that likely occurred over several years beginning in the 1960s when the natural gas well was drilled. The pathway for hydrocarbon migration to groundwater likely consisted of an open pit subsurface release and subsequent vertically downward migration. In addition, site soils in the vicinity of the historic pit may have also been impacted with hydrocarbons during reclamation and regrading operations.

Based on the nature and extent of soil and groundwater petroleum hydrocarbons observed, the TP 42-11 facility was officially placed under the Wyoming Department of Environmental Quality (DEQ) Voluntary Remediation Program (VRP) following review of the first round of groundwater monitoring results. The data indicated that a groundwater volatile organic compound (VOC) plume was present on site.

In addition, site assessment activities have included the installation of five monitoring wells (MW-1 through MW-5) to monitor and characterize groundwater (Figure 2). The main focus of the soil and groundwater data collection program was to determine the nature and extent of hydrocarbons.

2.1 Legal Description and Ownership

The TP 42-11 surface location (SE 1/4 of the NE1/4 of Section 11, Township 3N, Range 2E) is currently owned by Mr. and Mrs. Jeffrey Locker. EnCana actively operates the natural gas well (Figure 1). Figure 2 illustrates a plan view of the TP 42-11 facility including natural gas well-related equipment, the targeted soil excavation area delineation, monitoring well locations, groundwater elevations, and the estimated groundwater flow direction.



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0 400 800 Feet

Background: 2009 NAIP Aerial Photography

EnCana Oil & Gas USA, Inc.

Pavillion VRP
Figure 1: General Site Location
TP 42X-11

Date: August 16, 2010

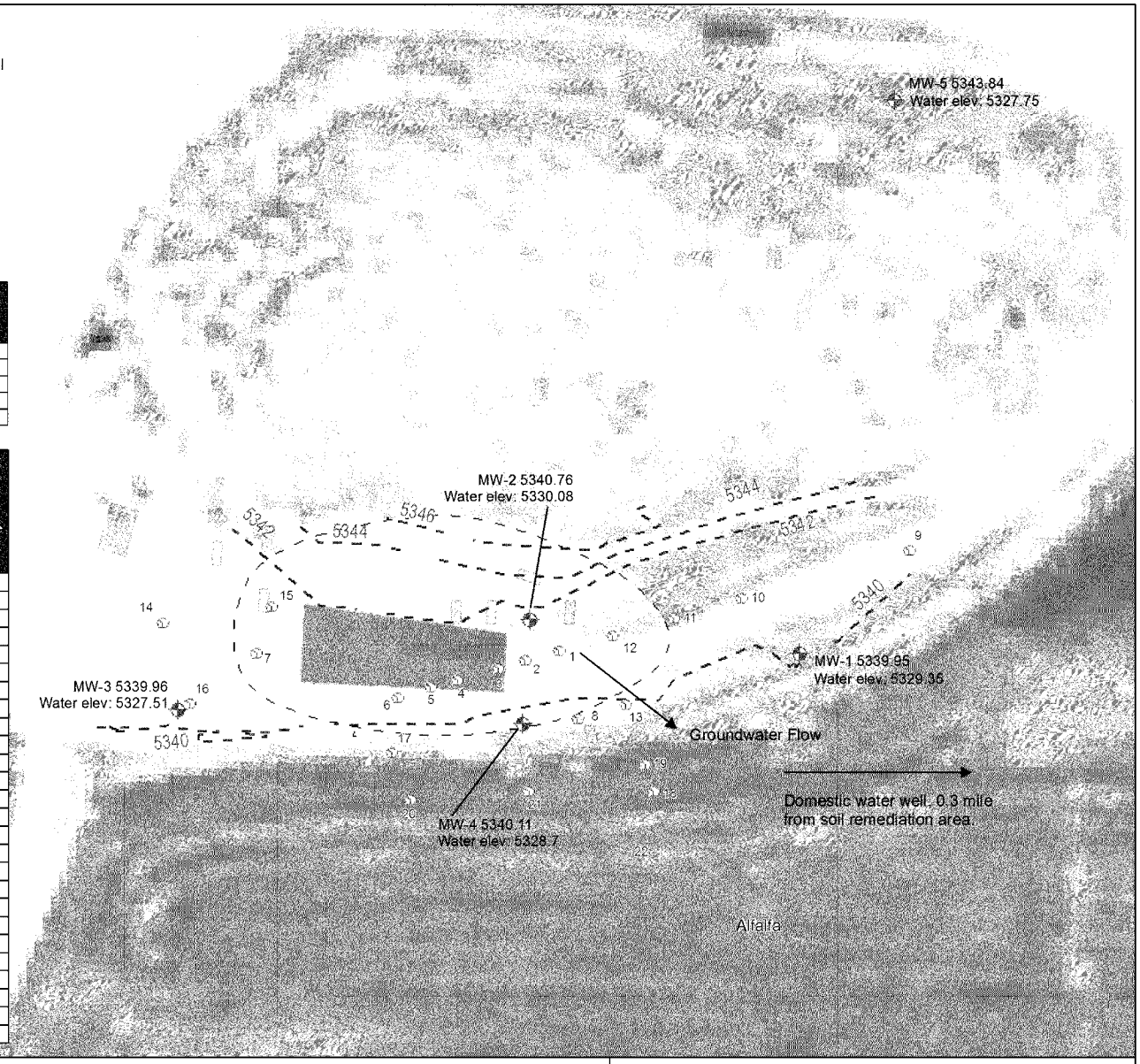
Version: 2010-1

TP 42-11 PID Readings			
Date	Boring	Soil Concentration (mg/kg)	Depth of PID (feet)
11/29/2006	1	2000+	12
11/29/2006	2	2000+	12
11/29/2006	3	2000+	12
11/29/2006	4	2000+	11.5
11/29/2006	5	2000+	11.5
11/29/2006	6	2000+	11.5
11/29/2006	7	2000+	11.5
11/29/2006	8	1917	11.5
11/29/2006	9	0	5
11/29/2006	10	0	3
11/29/2006	11	0	10
11/29/2006	12	650	12.5
11/29/2006	13	2000+	12
11/29/2006	14	0	15
11/29/2006	15	2000+	9
11/29/2006	16	0	15
11/29/2006	17	1810	12
3/20/2007	18	845	12
3/20/2007	19	0	12
3/20/2007	20	0	12
3/20/2007	21	0	12

Table 8. TP 42-11 Soil Excavation Confirmation Sampling	
Surface	TPH (DRO/GRO) Concentration (mg/kg)
North Wall	247
East Wall	Not Detected
South Wall	2,170
West Wall	Not Detected
Excavation Floor	33

Table 7. TP 42-11 Groundwater Quality Data

Well ID Number	Date Sampled m/d/y	Diesel range organics (DROs) mg/L	Gasoline range organics (GROs) mg/L	Benzene ug/L	Toluene ug/L	Ethyl-Benzene ug/L	Total Xylene ug/L	Naphthalene ug/L	2-Methyl naphthalene ug/L
Threshold		1.1/10	7.3	5	1000	700	10,000	729	146
MW-1	7/17/2007	ND	0.672	NA	NA	NA	NA	NA	NA
MW-1	5/7/2008	ND	ND	ND	ND	ND	ND	ND	ND
MW-1	10/29/2008	ND	ND	ND	ND	ND	ND	ND	ND
MW-1	3/6/2009	ND/ND	ND/ND	ND/ND	ND/ND	ND/ND	ND/ND	ND/ND	ND/ND
MW-1	10/29/2009	ND/ND	ND/ND	ND/ND	ND/ND	ND/ND	ND/ND	NA	NA
MW-1	4/12/2010	ND	ND	ND	ND	ND	ND	NA	NA
MW-2	7/17/2007	**5.4**	2.3	NA	NA	NA	NA	NA	NA
MW-2	5/7/2008	3.6	1.3	**27**	ND	ND	19	43	15
MW-2	10/29/2008	**11**	0.438	**13**	ND	ND	ND	2.1	ND
MW-2	3/6/2009	9.4	1.15	**14**	ND	76	54	13	5.6
MW-2	10/29/2009	**3.2**	0.28	**7.9**	ND	5.2	32	NA	NA
MW-2	4/12/2010	**5.6**	0.313	4.2	0.13	23	34	NA	NA
MW-3	7/17/2007	ND	ND	NA	NA	NA	NA	NA	NA
MW-3	5/7/2008	ND	ND	NA	NA	NA	NA	NA	NA
MW-3	10/29/2008	ND	ND	ND	ND	ND	ND	ND	ND
MW-3	3/6/2009	ND	ND	ND	ND	ND	ND	ND	ND
MW-3	10/29/2009	ND	ND	ND	ND	ND	ND	NA	NA
MW-3	4/12/2010	ND	ND	ND	ND	ND	ND	NA	NA
MW-4	10/29/2008	ND	4.91	2.1	ND	ND	32	2.9	ND
MW-4	3/6/2009	**12**	**7.76**	**21**	ND	190	505	236	**225**
MW-4	10/29/2009	0.27	0.73	1.3	ND	16	40	NA	NA
MW-4	4/12/2010	**13/13**	2.83/1.79	**11/10**	0.61/.62	111/97	289/264	NA	NA
MW-5	3/6/2009	ND	ND	ND	ND	ND	ND	ND	ND
MW-5	10/29/2009	ND	ND	ND	ND	ND	ND	NA	NA
MW-5	4/12/2010	ND	ND	ND	ND	ND	ND	NA	NA



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0 25 50 100 Feet

Monitoring Wells
Boring
Gas Well
Topgraphic Contour
Test Trench
Soil Remediation Area
Separator
Estimated Benzene Groundwater Plume

Labeled values shown in feet

Background: 2009 NAIP Aerial Photography

EnCana Oil & Gas USA, Inc.

Pavillion VRP
Figure 2: Soil and Groundwater Assessment Location
42X-11

Date: August 16, 2010 | Version: 2010-3

2.2 Constituents of Concern

The primary source material for soil and groundwater contamination at this site is related to unlined pit storage of hydrocarbon liquids. Review of a historic aerial photograph prior to initial site assessment activities revealed a single rectangular-shaped pit footprint southeast of the separator. Hydrocarbon liquids contained in the pit likely consisted of some combination of drilling and separation fluids, produced water, and condensate. As expected, residual hydrocarbon source material was primarily found in the subsurface in the vicinity of the pit location where hydrocarbon liquids storage took place.

The constituents of concern (COCs) being evaluated therefore include diesel and gasoline range organics (DROs and GROs), benzene, toluene, ethylbenzene and xylenes (BTEX compounds). BTEX compounds are detectable in the GRO range and are biodegradable under both aerobic and anaerobic conditions. DROs are also biodegradable under both aerobic and anaerobic conditions. Both DROs and GROs have been assessed for regulatory compliance purposes.

2.3 Soil Characterization

Soil profile descriptions were recorded during the 2006 and 2007 Geoprobe borehole installation at TP-42-11. Soils were described to the full depth of the borings which ranged from 3 to 15 feet in depth. Topsoil at TP-42-11 generally consists of brown loamy sand to a depth of about 10 feet where a color change to greenish-brown was noted.

Refusal was met in borings (#9, #10, #11, and #15) at a depth ranging between 3-10 feet due to proximity of the sandstone mesa (reddish brown conglomerated sand) feature located on the site. The water table was located 8 feet below ground surface and was intercepted in all borings that reached this depth. In borings where hydrocarbons were observed or detected with a PID, the depth to hydrocarbons was 11.5 to 12 feet.

Table 1 presents photoionization detector (PID) readings for Geoprobe borings installed in 2006 and 2007.

Table 1. TP 42-11 PID Readings

Date	Boring	Soil Concentration (mg/kg)	Depth of PID (feet)	Date	Boring	Soil Concentration (mg/kg)	Depth of PID (feet)
11/29/2006	1	2000+	12	11/29/2006	12	650	12.5
11/29/2006	2	2000+	12	11/29/2006	13	2000+	12
11/29/2006	3	2000+	12	11/29/2006	14	0	15
11/29/2006	4	2000+	11.5	11/29/2006	15	2000+	9
11/29/2006	5	2000+	11.5	11/29/2006	16	0	15
11/29/2006	6	2000+	11.5	11/29/2006	17	1810	12
11/29/2006	7	2000+	11.5	3/20/2007	18	845	12
11/29/2006	8	1917	11.5	3/20/2007	19	0	12
11/29/2006	9	0	5	3/20/2007	20	0	12
11/29/2006	10	0	3	3/20/2007	21	0	12
11/29/2006	11	0	10				

2.4 Soil Remediation Effort

Approximately 900 cubic yards of hydrocarbon contaminated soil was excavated and removed from the TP-42-11 location in September 2008 in an area immediately west of MW-2. Soil excavation was guided in part by the observation of a distinct boundary between contaminated and non-impacted soil visible during the trenching and excavation activities.

The soil excavation was a targeted remediation activity focused on removal of soil from the footprint of a historic unlined pit. Soil beneath the pit was identified as the main source of hydrocarbon contamination in groundwater based on elevated hydrocarbon readings during the Geoprobe and trenching assessment, and previous groundwater monitoring results for monitoring wells MW-1, MW-2, MW-3, and MW-4. The TP 42-11 aerial image showing the historic pit location was also referenced prior to excavation activities.

2.5 Nature and Distribution of Hydrocarbon Impact in Soil

Once the excavation removed the impacted soil, confirmation composite soil sampling was performed on each wall and the floor of the excavation "footprint" to confirm representative concentrations of total petroleum hydrocarbons diesel range organics (DROs) and gasoline range organics (GROs). Each composite sample consisted of 5-8 subsamples representing each of the five surface areas. The samples were compared to soil cleanup level goals of <1,000 mg/kg in accordance with the Wyoming Oil and Gas Conservation Commission (WYOGCC) risk-based pit closure guidance. Concentrations of DROs and GROs measured in all samples were well below the soil cleanup level goal of (Table 2).

Table 2. TP 42-11 Soil Excavation Confirmation Sampling

Surface	TPH (DRO/GRO) Concentration (mg/kg)
North Wall	68
East Wall	45
South Wall	114
West Wall	177
Excavation Floor	273

2.6 Monitoring Well Network

A network of five monitoring wells was installed to monitor groundwater in order to define and track potential migration of the hydrocarbon groundwater plume at TP-42-11. Four wells (i.e. MW-1, through MW-4) were installed in July 2007 while a fifth well (MW-5) was installed in March 2009 to further establish the northeast extent of the hydrocarbon plume.

Wells MW-2, -3, and -4 are located within about 50 feet of the perimeter of the excavation while MW-1 and -5 are more distant, respectively about 125 feet east and 275 feet northeast.

2.7 Monitoring Well Sampling

Monitoring wells were sampled upon completion and are currently sampled twice per year; in the spring time, typically between March and May, and a fall sampling event in October. Groundwater samples collected from the TP-42-11 monitoring wells are analyzed for DRO, GRO, BTEX, naphthalene, and 2-methylnaphthalene. Monitoring has been performed six times for monitoring wells MW-1 through MW-4 and three times for MW-5.

2.8 Hydrogeology

Drill logs from the project site indicate that the sandy loam surface soil is underlain by a 10 to 20-foot thick layer of alluvial/sandstone sedimentary bedrock. This is consistent with general aquifer descriptions provided for the Tribal Pavilion area by USGS (2005) that report shallow local aquifers consisting of alluvial, colluvial, terrace, pediment, landslide, glacial, and travertine deposits. These aquifers are generally less than 50 feet thick but can be as thick as 200 feet. Water yields from these aquifers range from 2 to 60 gpm and with total dissolved solids concentrations that range from 109 to 4,630 mg/L.

Local aquifers are underlain by the Tertiary Wind River Formation. In places, local aquifers are separated from the Wind River Formation by leaky confining layers of the Wiggins, Tepee Trail, and Aycross formations.

2.8.1 Groundwater Flow Direction

Groundwater elevations measured during monitoring events have shown groundwater moves in a predominantly southeast direction.

2.8.2 Groundwater Velocity

The horizontal hydraulic conductivity (Kr) of an aquifer can be estimated based on data collected during slug tests of a monitoring well. During a slug test, water is rapidly added to or removed from a monitoring well and the subsequent change in water level is monitored regularly during the time it takes for the water level to re-equilibrate to a static level. Curves of the water level/head change over time, along with parameters describing the well (i.e. radius, screened length, etc), and the saturated thickness of the aquifer are then used in calculations to arrive at an estimate of Kr (aka groundwater velocity).

Slug testing of monitoring well MW-2 at TP-42-11 was conducted in November 2009 (Trihydro 2009). The water level did not re-equilibrate to the static water level during the test period, indicating that Kr at this site is lower compared to that at other nearby sites (i.e. TP-24-3 and TP-14-11). Raw data from the slug test were input into the aquifer test software Aqtesolv to calculate Kr using the Bouwer-Rice (1976) method which is effective in lower Kr situations. The analysis yielded a Kr value of 0.0026 ft/day. This value is well within the range for both unconsolidated silt (0.00028 and 5.6 ft/day) reported by Domenico and Schwartz (1990) suggesting that there is more silt and less sand present at this site compared to others in the vicinity.

2.9 Groundwater Characterization

Summary statistics have been calculated for MW-2, and MW-4; the two monitoring wells where COCs are routinely detected (Table 3). COCs have not been detected in monitoring wells MW-3, or MW-5, and only a single low-level GRO detection (0.672 ug/L) has occurred at MW-1.

The highest mean benzene concentration at the location is observed in monitoring well MW-2 located adjacent to the excavation area. Hydrocarbon concentrations at monitoring well MW-4 appear to fluctuate seasonally with concentrations measured in the fall of 2008 and 2009 being lower than those measured in the spring of 2009 and 2010. DROs and benzene do not exceed threshold concentrations in fall samples, however, they do exceed threshold concentrations during spring sampling events. GRO concentrations exceeded threshold concentrations only during spring 2009 sampling. With the exception of DROs, hydrocarbon concentrations at MW-

4 are decreasing when seasonal fluctuations are taken into account. For instance, the spring 2010 benzene concentration was half of that measured in spring 2009.

Table 3. TP 42-11 Groundwater Quality Data Summary

		Date Sampled m/d/y	Diesel Range Organics (DROs)	Gasoline Range Organics (GROs)	Benzene	Toluene	Ethyl-Benzene	Total Xylene	Naph-thalene	2-Methyl naphtha-lene
			mg/L	mg/L	ug/L	ug/L	ug/L	ug/L	mg/L	mg/L
MW-2	Data	Threshold [1]	1.1/10	7.3	5	1000	700	10,000	729	146
		7/17/2007	**5.4**	2.3	NA	NA	NA	NA	NA	NA
		5/7/2008	3.6	1.3	**27**	0	0	19	43	15
		10/29/2008	**11**	1.44	**13**	0	0	0	2.1	0
		3/6/2009	9.4	1.15	**14**	0	76	54	13	5.6
		10/29/2009	**3.2**	0.28	**7.9**	0	5.2	32	NA	NA
		4/12/2010	**5.6**	0.3	4.2	0.1	23	34	NA	NA
	Summary Statistics	Minimum	3.2	0.3	4.2	0.0	0.0	0.0	2.1	0.0
		Maximum	11.0	2.3	27.0	0.1	76.0	54.0	43.0	15.0
		Mean	6.4	1.1	13.2	0.0	20.8	27.8	19.4	6.9
		Mean (Fall)	7.1	0.9	10.5	0.0	2.6	16.0	2.1	0.0
		Mean (Spring)	6.0	1.3	15.1	0.0	33.0	35.7	28.0	10.3
MW-4	Data	Threshold	1.1/10	7.3	5	1000	700	10,000	729	146
		10/29/2008	0	4.9	2.1	0	0	32	2.9	0
		3/6/2009	**12**	**7.8**	**21**	0	190	505	236	**225**
		10/29/2009	0.27	0.73	1.3	0	16	40	NA	NA
		4/12/2010	**13**	2.31	**10.5**	0.615	104	276.5	NA	NA
	Summary Statistics	Minimum	0.0	0.7	1.3	0.0	0.0	32.0	2.9	0.0
		Maximum	13.0	7.8	21.0	0.6	190.0	505.0	236.0	225.0
		Mean	6.3	3.9	8.7	0.2	77.5	213.4	119.5	112.5
		Mean (Fall)	0.1	2.8	1.7	0.0	8.0	36.0	2.9	0.0
		Mean (Spring)	12.5	5.1	15.8	0.3	147.0	390.8	236.0	225.0

[1] Threshold for DROs assumed to be 1.1 mg/L
Averages of natural and duplicate sample data used in calculations when available.
Non-detect values reported as zeros and calculated as such in summary statistics.

Similar seasonal trends are evident at monitoring well MW-2; however, threshold concentrations for DROs and benzene have been exceeded more often at this well compared to monitoring well MW-4 despite lower mean concentrations at monitoring well MW-2. It is important to note that benzene concentrations at monitoring well MW-2 have decreased steadily from a high of 27 ug/L measured in spring 2008 to a low of 7.9 ug/L measured in spring 2010.

The estimated plume contour map shown in Figure 2 is primarily based on analytical results from monitoring wells MW-1 through MW-5 although groundwater results obtained from the Geoprobe assessment were also considered. Geoprobe boring summary results are shown in Table 2. Actual laboratory data from the most recent sampling event in April 2010 are provided in Attachment 1.

2.9.1 Groundwater Concentrations and Distribution

The southeast groundwater flow direction and benzene concentrations observed at monitoring well MW-2 may indicate a positive response following the 2008 soil remediation activities. Hydrocarbon concentrations exhibited at monitoring well MW-4, on the other hand, appear to fluctuate depending on the time of year sampling takes place.

Based on the groundwater plume map, the width of the hydrocarbon groundwater impacts where groundwater hydrocarbon concentrations exceed regulatory thresholds is estimated to be approximately 375 ft long by 100 ft wide (Figure 2). The contour illustrates that the groundwater hydrocarbon plume extends southeast (down gradient) from the primary source area by about 50 ft. Dissolved hydrocarbons from the source area decrease over time due to natural attenuation, dispersion, and dilution over time.

The unlined storage pit would have allowed the hydrocarbon liquids to flow primarily vertically under the influence of gravity, through the sandy loam textured soils, although to a lesser extent, capillary forces would have resulted in some lateral spreading. The dissolved-, vapor-, and adsorbed-phase soil hydrocarbon concentrations within and surrounding the soil source area have likely decreased over the years due to biodegradation processes.

Groundwater is found at about 10 to 11 ft below ground surface (bgs). With regard to groundwater impacts, if sufficient volumes of hydrocarbon liquids released to the subsurface reached the shallow water table, a capillary fringe saturated with hydrocarbon product can form. Seasonal water table fluctuations due to irrigation practices likely also influence the hydrocarbon levels as evidenced by lower benzene concentrations detected in the fall sampling events.

Figure 3 illustrates the trends in benzene concentrations detected in site monitoring wells versus time (i.e., 2-3 years). Hydrocarbon concentration trend analysis is a means of monitoring progress. The plot shows the level of hydrocarbons since the initial site assessment phase and following the soil remediation effort based on five sampling events that was performed in September 2008. Five or more data points are generally regarded as the minimum for estimating temporal data trends. The benzene trend plot also provides an indication of outliers, or extreme observations, in the data. If there are, it is important to determine whether they reflect a real departure from the general trend.

This plot will ultimately provide an estimate of natural attenuation success and plume morphology over time. In addition, concentration data will eventually be plotted on a logarithmic scale against time on a linear scale to capture both large and small changes.

Eventually the contaminant concentrations are expected to be reduced to levels so the risk to human and environmental health is minimal. As mentioned above, no human receptors have been identified down gradient of the known source area for up to 0.3 of a mile.

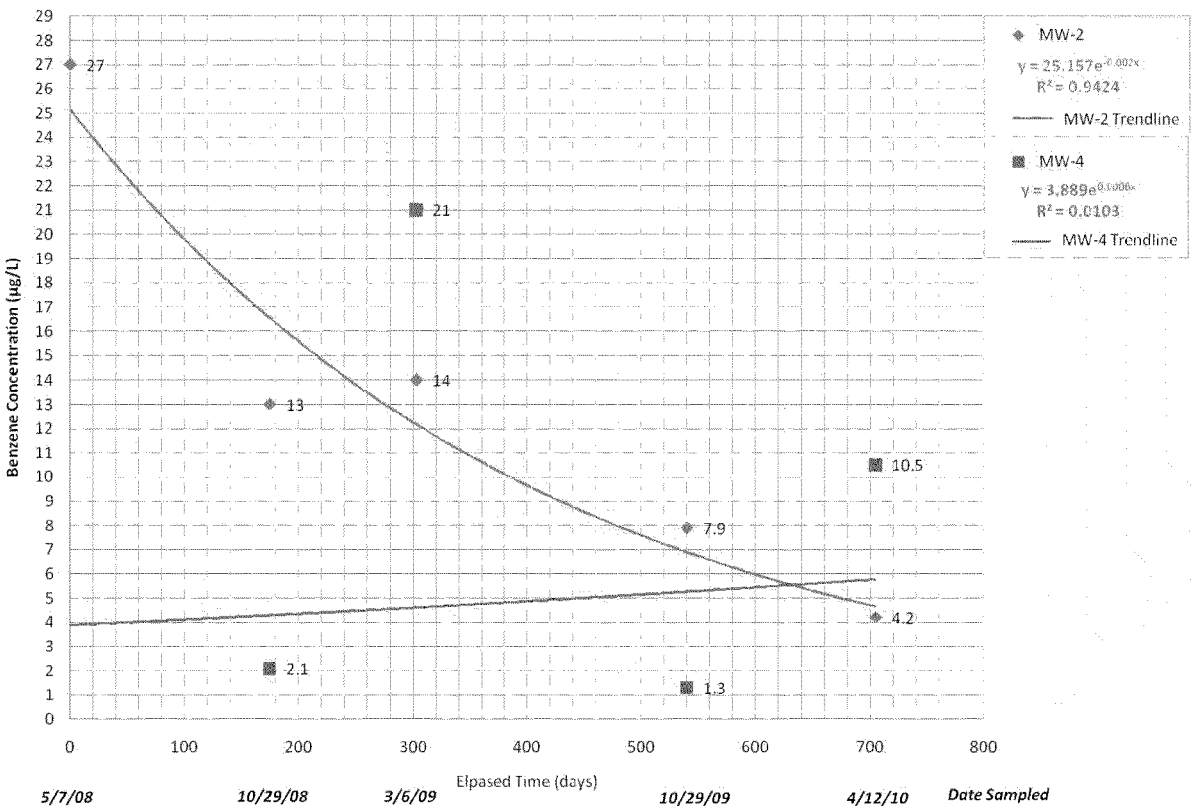

Figure 3. TP 42-11 Benzene Trend Analysis Plot

3.0 DEVELOPMENT OF REMEDIAL ACTION ALTERNATIVES

3.1 Remedial Action Objectives (RAOs)

Remedial action objectives for the TP-42-11 are as follows:

- Reduction of all groundwater COCs to levels at or below the cleanup levels described below within a reasonable time period; and
- Collection of sufficient monitoring data over time to demonstrate that remediation is effective and progressing at a reasonable rate and is not being hindered by on-going sources or unfavorable conditions.

Groundwater COCs were identified and associated cleanup levels for soil and groundwater have been established for TP-42-11 (Tables 4 and 5). These site specific cleanup levels are applicable to this site only and shall not be used for any other purpose. Groundwater cleanup levels for the site are based on the VRP Groundwater Cleanup Level Tables in consideration of VRP Fact Sheet #12, Appendix: Cleanup Levels for Total Petroleum Hydrocarbons (TPH) in Soil and Groundwater and VRP Fact Sheet #13.

The selected groundwater cleanup levels meet the four threshold criteria established in the EQA W.S. 35-11-1605(a):

- Be protective of human health and the environment;
- Comply with applicable standards;
- Control the source(s) of release to reduce or eliminate, to the extent practicable, further releases of contaminants; and
- Comply with applicable standards for waste management.

Table 4. Groundwater Cleanup Levels for Volatile Organic Compounds (VOCs)

Product Parameter/Constituent	Cleanup Level (ug/L)
Benzene	5
Toluene	1,000
Ethylbenzene	700
Xylenes	10,000

Table 5. Groundwater Cleanup Levels for Petroleum Hydrocarbon Contamination

Product	Parameter/Constituent	Cleanup Level
Gasoline	TPH, GRO	7.3 mg/L [a]
	Naphthalene [d]	0.729 mg/L
	2-Methylnaphthalene [d]	0.146 mg/L
Diesel/Crude Oil	TPH DRO [b]	1.1 mg/L [b]
	TPH DRO [c]	or 10 mg/L [c]
	Naphthalene [d]	same as gasoline
	2-Methylnaphthalene [d]	same as gasoline

[a] Cleanup level based on protection of groundwater for non-cancer effects during drinking water use (Drinking Water Equivalent Level (DWEL) equation, Chapter 17 Wyoming Water Quality Rules and Regulations).

[b] Cleanup level based on protection of groundwater for non-cancer effects during drinking water use (Drinking Water Equivalent Level equation, Chapter 17 Wyoming Water Quality Rules and Regulations). This level is applicable when naphthalene and/or methylnaphthalenes along with the other chemicals of concern are detected in groundwater above Maximum Contaminant Level (MCL)/Wyoming Drinking Water Equivalent Level (DWEL) (assuming that reporting limits are adequate in comparison to cleanup levels) OR when there is free product present on the groundwater table.

[c] Cleanup level based on Chapter 4 and Chapter 17, Wyoming Water Quality Rules and Regulations. This level is applicable when naphthalene and/or 2-Methylnaphthalene along with the other chemicals of concern are below MCL/DWEL concentrations in groundwater AND no free product is present on the groundwater table.

[d] These constituents are required for confirmation sampling on a site specific basis as described in Section 4 of VRP Fact Sheet #12, Appendix: Cleanup Levels for Total Petroleum Hydrocarbons (TPH)

*If naphthalene and BTEX concentrations are below the cleanup levels and free product is not present on the groundwater table, then TPH-GRO plus TPH-DRO must be equal to or less than 10 mg/L (action level).

3.2 Remedial Action Alternatives

Recent groundwater data collection has been performed to develop a site conceptual model and evaluation of remedial options for the TP 24-3 location. Several data gaps were addressed to confirm the estimated groundwater plume boundaries including installation of monitoring well MW-5 and installation of Geoprobe borings along the south boundary. The data collection program also included groundwater sampling and analyses of geochemical parameters and

EPAPAV0129119

hydraulic well testing and data interpretation. In addition, to better understand site conditions, the following characteristics were evaluated:

- Soil characteristics;
- Seasonal depth and flow direction of groundwater;
- General properties of the aquifer including background water quality;
- Location of hydrocarbon source areas relative to the overall site;
- Description and distribution of soil and groundwater hydrocarbons; and
- Estimated distance to human and ecological receptors.

In EnCana's opinion, the TP 42-11 groundwater remedy should be consistent with the level of risk associated with the known impacts. As such, the preferred remedial treatment of groundwater impacted by hydrocarbons at TP 42-11 is supplemented with the following components:

- Hydrocarbon releases have been controlled and there are no known continuing releases;
- Targeted source removal of approximately 900 cubic yards of contaminated soil was completed in September 2008;
- The extent of the hydrocarbon plume is well defined based on the monitoring well network and overall groundwater aquifer hydraulic characteristics; and
- There are no down gradient receptors within approximately 0.3 of a mile of the TP 42-11 location.

To support the selection of the preferred groundwater remedial options for the TP 42-11, two general approaches were considered below for purposes of comparison including (i) source removal with monitored natural attenuation (MNA) or enhanced MNA (EMNA) and (ii) source removal with in situ chemical oxidation.

3.3 Monitored Natural Attenuation (MNA)

Natural attenuation, or the reduction of mass, toxicity, mobility, volume, flux or concentrations of contaminants in soil or groundwater without human intervention, occurs through a number of physical, chemical and/or biological process. The use of passive groundwater remediation options (e.g., MNA) is consistent with DEQ and USEPA's initiatives provided certain conditions are met as defined below:

> *"the reliance of natural attenuation processes (within the context of a carefully controlled and monitored site cleanup approach) to achieve site-specific remedial objectives within a time frame that is reasonable compare to that offered by other more active methods" (USEPA OSWER, 1997).*

Natural attenuation, also commonly called biodegradation, of petroleum hydrocarbons (e.g., site compounds such BTEX compounds) occurs through their use by microorganisms as primary sources of carbon and energy. The degradation of petroleum hydrocarbons occurs most

effectively under aerobic (oxygen reducing) conditions. However, biodegradation of petroleum hydrocarbons under anaerobic conditions may also be effective in degrading the total mass (Wiedemeier & Pound, 1998). Attenuation also occurs through dilution/dispersion, which in many cases is the primary mechanism for natural attenuation at a site. These physical processes of natural attenuation reduce concentrations when finite amounts of mass of contaminants migrate into an ever increasing volume of groundwater (dilution) or as contaminants are spread into groundwater by chemical diffusion (movement due to concentration gradients) and dispersion (Wiedemeier & Pound, 1998).

3.4 Enhanced Monitored Natural Attenuation (EMNA)

The distinction between MNA and EMNA is that MNA involves demonstrating that natural attenuation processes are resulting in the mass loss of hydrocarbons in the groundwater and therefore decreasing the aerial distribution of the plume. In comparison, EMNA involves enhancing existing rates of mass removal of hydrocarbons by amending groundwater with nutrients (e.g., sulfate) to increase the rate and extent of microbial degradation processes. For example, sulfate can be utilized as an electron acceptor to support the anaerobic oxidation of hydrocarbons in groundwater.

3.5 Chemical Oxidation

In situ chemical oxidation involves the delivery of chemical oxidants to hydrocarbon-impacted groundwater where oxidation reactions can cause carbon-to-carbon bonds within the hydrocarbon molecules to be broken. These reactions convert hydrocarbons to innocuous compounds such as carbon dioxide and water.

A number of oxidizing reagents are available for use in remediation projects (e.g. permanganate KMn_4, sodium persulfate $Na_2S_2O_8$, ozone O_3, hydrogen peroxide H_2O_2, Fenton's Reagent, etc). Each oxidant must be evaluated for effectiveness and feasibility prior to use during remediation projects. For instance, permanganate is unable to oxidize benzene while Fenton's Reagent may be ineffective in carbonate-rich aquifers. Because of oxidant-specific and site-specific factors discussed below, the ultimate feasibility of a chemical oxidation remediation program is usually evaluated using bench- or field-scale pilot studies.

The effectiveness of chemical oxidation to reduce hydrocarbon concentrations is influenced by a number of site-specific factors. Oxidation reactions are non-specific and a portion of chemical oxidants will be consumed through oxidation of naturally occurring organic matter, reduced mineral species, or overcoming other reducing chemical conditions within an aquifer. In these settings, increased amounts of chemical oxidants are needed to overcome the natural "oxidant demand" while degrading the target contaminant.

Some chemical oxidants, such as Fenton's Reagent, owe some or all of their effectiveness to the generation of hydroxyl ions (OH-) as an intermediate step to oxidizing hydrocarbons. In carbonate-rich (i.e. high alkalinity) environments similar to the TP 42-11 conditions, hydroxyl ions are scavenged by carbonate ions before degradation of hydrocarbon contaminants can occur. In contrast, oxidation by permanganate is generally enhanced in high-carbonate settings.

Soil and aquifer permeability must also be evaluated to determine the feasibility of a chemical oxidation remediation strategy. In low permeability environments oxidants may be inactivated before reaching the hydrocarbons targeted for remediation.

A number of health and safety factors need to be considered when evaluating the feasibility of chemical oxidation for groundwater remediation programs. One concern in the Tribal Pavillion area is the presence of underground utilities that are often within the boundary of contaminant plumes. Some chemical oxidants such as persulfate and peroxide can be corrosive and may present a hazard to underground pipelines. Oxidant delivery methods may involve extremely high pressures and, in some cases (e.g. when using peroxide or Fenton's Reagent), may result in highly exothermic conditions and generation of explosive gases that could pose hazards to pipelines and other underground utilities.

The interaction between chemical oxidants and geologic materials must be considered where down gradient receptors are sensitive to increased inorganic constituent concentrations in groundwater. Many naturally occurring elements (i.e. arsenic, iron, chromium, copper, selenium) become more soluble under oxidized conditions and can be mobilized into groundwater at concentrations above applicable water quality standards. Potassium permanganate and sodium permanganate, two common chemical oxidants, often contain arsenic, chromium, and lead as impurities.

Oxidation reactions may also dissolve or remobilize hydrocarbons that were previously immobilized through sorption to the aquifer matrix.

Additional concerns include worker health and safety during transport and handling of the chemical oxidants. High implementation costs are also a drawback with $200,000 being a fairly typical cost for relatively small sites (e.g. 100' x 100' site with a leaking UST) and costs in excess of $1 million are not unheard of.

Chemical oxidation-based remediation projects are considerably more complex than monitored natural attenuation (MNA) and enhanced monitored natural attenuation (EMNA) projects. Implementation of any of these strategies requires monitoring of groundwater conditions, reporting, and permitting activities. However, chemical oxidation requires additional inputs of chemical oxidants and associated infrastructure (e.g. injection wells, storages tanks) which can be costly and burdensome from transport and health and safety standpoints. Unlike chemical oxidation, MNA and EMNA pose no hazards to underground utilities and do not require additional pilot-scale studies or delays related to identifying suitable reactants.

3.6 Evaluation of Remedial Action Alternatives

The three potential remedial actions presented in this report (i.e. chemical oxidation and monitored natural attenuation, and enhanced monitored natural attenuation) as well as current conditions (no action) were evaluated with respect to the four standards presented in VRP Fact Sheet # 21. All remedies under the voluntary remediation program must:

- Protect human health, safety, and the environment.
- Remediate contaminated air, soil, and water to attain applicable cleanup levels established under Federal or State law or regulation or to attain site-specific risk-based cleanup levels developed for the site in question.
- Control any sources of releases so as to reduce or eliminate, to the extent technically practicable, further releases as required to protect human health and the environment.
- Comply with any applicable standard for management of wastes generated as a consequence of the remedy.

Threats to human health, safety, and the environment attributable to the hydrocarbon plume at TP-42-11 are limited to potential for contamination of down gradient private wells if the plume migrates off-site at concentrations that are harmful to human or livestock health. As mentioned in Section 2.9.1, the nearest water supply well (receptor) is located 0.3 miles east of the excavation area and is not directly down gradient as groundwater flows to the southeast.

Monitoring well MW-4 is located a short distance (about 20 feet) down gradient from the excavated area at the inferred edge of the hydrocarbon plume. As discussed in Section 3.9, hydrocarbon concentrations are decreasing at this well location with benzene concentrations that exceed the threshold value only during spring sampling events. Concentrations of benzene, along with some other constituents, have decreased by as much as 50 % per year and benzene concentrations at MW-2 are decreasing at a similar rate. This suggests that the size of the hydrocarbon plume is shrinking in response to the effective excavation of contaminated soil in 2008.

These data indicate that remediation at TP 42-11 has been successful and continued decreases of hydrocarbon concentrations are expected over time. Threats to human health and the environment are therefore unlikely and all four of the evaluation standards listed above are currently being met. For these reasons, no further remediation is recommended for the site. Instead, continued monitoring of groundwater hydrocarbon concentrations is proposed in order to confirm that natural processes will continue to reduce and eventually eliminate the hydrocarbon plume.

4.0 RECOMMENDED REMEDY

4.1 Recommended Monitoring and Analytical Methods Schedule 2010 - 2015

Table 6 provides a schedule for groundwater sampling events including the types of analysis for groundwater samples. Field measurements (e.g., groundwater elevation, dissolved oxygen, water levels, temperature, redox potential, and conductivity) will also be collected.

Table 6. Proposed Sampling Event Schedule and Suite of Analyses for TP-42-11

Sampling Event	Volatile Organic Compounds (VOCs) by EPA Method 8260	Gasoline Range Organics (GRO) by EPA Method 8015	Diesel Range Organics (DRO) by EPA Method 8015
October 2010	X	X	X
January 2011	X	X	X
April 2011	X	X	X
August 2011	X	X	X
October 2011	X	X	X
January 2012	X	X	X
April 2012	X	X	X
August 2012	X	X	X
October 2012	X	X	X
January 2013	X	X	X
April 2013	X	X	X
August 2013	X	X	X
October 2013	X	X	X
January 2014	X	X	X
April 2014	X	X	X
August 2014	X	X	X
October 2014	X	X	X
January 2015	X	X	X
April 2015	X	X	X
August 2015	X	X	X
October 2015	X	X	X
January 2016	X	X	X

4.2 Recommended Points of Compliance

Based on the information gathered, EnCana proposes using monitoring wells MW-2 and MW-4 as candidate wells for monitoring the continued reduction in hydrocarbon concentrations.

5.0 SUMMARY

Site assessment activities conducted by EnCana beginning in 2006 have identified a hydrocarbon groundwater plume at the TP 42-11 natural gas well location resulting from the historic use of an unlined pit which leaked hydrocarbon liquids into the subsurface environment. A targeted remediation project followed whereby approximately 900 cubic yards of contaminated soil was excavated from the area beneath the pit footprint.

Recent groundwater monitoring data show that hydrocarbon concentrations are decreasing in response to source removal activities. At MW-4, located about 20 ft down gradient of the excavation area, concentrations of benzene, along with some other constituents, have decreased by as much as 50 % per year and benzene concentrations at MW-2 are decreasing at a similar rate. This suggests that the size of the hydrocarbon plume is shrinking in response to reclamation.

Because past soil remediation activities were effective at removing the contaminant source and natural processes are subsequently improving groundwater conditions, EnCana proposes no

additional soil remediation work for the TP 42-11 site. Instead, continued monitoring of groundwater hydrocarbon concentrations is proposed in order to track groundwater hydrocarbon trends and to confirm that natural processes continue to reduce and will eventually eliminate the hydrocarbon plume.

6.0 REFERENCES

ASTM (1997). Standard Guide for Remediation by Natural Attenuation at Petroleum Release Sites.

Bouwer, H. and R.C. Rice. 1976. A slug test method for determining hydraulic conductivity of unconfined aquifers with completely or partially penetrating wells. Water Resources Research. Vol. 12, no. 3, pp. 443-428.

Butler, J.J., Jr. 1998. The Design, Performance, and Analysis of Slug Tests. Lewis Publishers. Boca Raton. 252p.

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Trihydro Corp. 2009. Memo to Mr. Mike Larson / EnCana Oil and Gas RE: Slug Test Results, EnCana Oil & Gas (USA), Inc. Pavillian VRP sites, Wind River Field, Wyoming. December 1, 2009.

Wiedemeier, T. H., Wilson, J.T., Miller, R.N., & D.H. Kambell (1994). United States Air Force Guidelines for Successfully Supporting Intrinsic Remediation with an Example from Hill Air force Base. National Ground Water Association.

USGS. 2005. Monitoring-Well Network and Sampling Design for Groundwater Quality, Wind River Indian Reservation Wyoming. Scientific Investigations Report 2005-5027.

Attachment 1.

April 2010 Laboratory Analytical Results

ENERGY LABORATORIES, INC. * 1120 S 27th St * PO Box 30916 * Billings, MT 59107-0916
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ANALYTICAL SUMMARY REPORT

April 28, 2010

Mike Larson
Encana Oil and Gas USA Inc
462 S Federal
Riverton, WY 82501-4732

Workorder No.: B10041311

Project Name: Tribal Pavillion 42-11 (VRP)

Energy Laboratories Inc received the following 7 samples for Encana Oil and Gas USA Inc on 4/15/2010 for analysis.

Sample ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
B10041311-001	TP 42-11 MW1	04/12/10 15:20	04/15/10	Aqueous	DRO-Liquid-Liquid Extraction Diesel Range Organics, API Gasoline Range Organics 8260-Volatile Organic Compounds-Short
B10041311-002	TP 42-11 MW2	04/12/10 17:30	04/15/10	Aqueous	Same As Above
B10041311-003	TP 42-11 MW3	04/12/10 16:20	04/15/10	Aqueous	Same As Above
B10041311-004	TP 42-11 MW4	04/12/10 16:45	04/15/10	Aqueous	Same As Above
B10041311-005	TP 42-11 MW4B	04/12/10 16:50	04/15/10	Aqueous	Same As Above
B10041311-006	TP 42-11 MW5	04/13/10 9:15	04/15/10	Aqueous	Same As Above
B10041311-007	Trip Blank Lot #032310, B-TS 0246	04/12/10 15:20	04/15/10	Trip Blank	8260-Volatile Organic Compounds-Short

Any exceptions or problems with the analyses are noted in the Laboratory Analytical Report, the QA/QC Summary Report, or the Case Narrative.

The results as reported relate only to the item(s) submitted for testing.

If you have any questions regarding these test results, please call.

Report Approved By:

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LABORATORY ANALYTICAL REPORT

Client: Encana Oil and Gas USA Inc
Project: Tribal Pavillion 42-11 (VRP)
Lab ID: B10041311-001
Client Sample ID: TP 42-11 MW1

Report Date: 04/28/10
Collection Date: 04/12/10 15:20
DateReceived: 04/15/10
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
VOLATILE ORGANIC COMPOUNDS							
Benzene	ND	ug/L		1.0		SW8260B	04/19/10 17:06 / jrj
Bromobenzene	ND	ug/L		1.0		SW8260B	04/19/10 17:06 / jrj
Bromochloromethane	ND	ug/L		1.0		SW8260B	04/19/10 17:06 / jrj
Bromodichloromethane	ND	ug/L		1.0		SW8260B	04/19/10 17:06 / jrj
Bromoform	ND	ug/L		1.0		SW8260B	04/19/10 17:06 / jrj
Bromomethane	ND	ug/L		1.0		SW8260B	04/19/10 17:06 / jrj
Carbon tetrachloride	ND	ug/L		1.0		SW8260B	04/19/10 17:06 / jrj
Chlorobenzene	ND	ug/L		1.0		SW8260B	04/19/10 17:06 / jrj
Chlorodibromomethane	ND	ug/L		1.0		SW8260B	04/19/10 17:06 / jrj
Chloroethane	ND	ug/L		1.0		SW8260B	04/19/10 17:06 / jrj
2-Chloroethyl vinyl ether	ND	ug/L		1.0		SW8260B	04/19/10 17:06 / jrj
Chloroform	ND	ug/L		1.0		SW8260B	04/19/10 17:06 / jrj
Chloromethane	ND	ug/L		1.0		SW8260B	04/19/10 17:06 / jrj
1,2-Dibromoethane	ND	ug/L		1.0		SW8260B	04/19/10 17:06 / jrj
2-Chlorotoluene	ND	ug/L		1.0		SW8260B	04/19/10 17:06 / jrj
4-Chlorotoluene	ND	ug/L		1.0		SW8260B	04/19/10 17:06 / jrj
Dibromomethane	ND	ug/L		1.0		SW8260B	04/19/10 17:06 / jrj
1,2-Dichlorobenzene	ND	ug/L		1.0		SW8260B	04/19/10 17:06 / jrj
1,3-Dichlorobenzene	ND	ug/L		1.0		SW8260B	04/19/10 17:06 / jrj
1,4-Dichlorobenzene	ND	ug/L		1.0		SW8260B	04/19/10 17:06 / jrj
Dichlorodifluoromethane	ND	ug/L		1.0		SW8260B	04/19/10 17:06 / jrj
1,1-Dichloroethane	ND	ug/L		1.0		SW8260B	04/19/10 17:06 / jrj
1,2-Dichloroethane	ND	ug/L		1.0		SW8260B	04/19/10 17:06 / jrj
1,1-Dichloroethene	ND	ug/L		1.0		SW8260B	04/19/10 17:06 / jrj
cis-1,2-Dichloroethene	ND	ug/L		1.0		SW8260B	04/19/10 17:06 / jrj
trans-1,2-Dichloroethene	ND	ug/L		1.0		SW8260B	04/19/10 17:06 / jrj
1,2-Dichloropropane	ND	ug/L		1.0		SW8260B	04/19/10 17:06 / jrj
1,3-Dichloropropane	ND	ug/L		1.0		SW8260B	04/19/10 17:06 / jrj
2,2-Dichloropropane	ND	ug/L		1.0		SW8260B	04/19/10 17:06 / jrj
1,1-Dichloropropene	ND	ug/L		1.0		SW8260B	04/19/10 17:06 / jrj
cis-1,3-Dichloropropene	ND	ug/L		1.0		SW8260B	04/19/10 17:06 / jrj
trans-1,3-Dichloropropene	ND	ug/L		1.0		SW8260B	04/19/10 17:06 / jrj
Ethylbenzene	ND	ug/L		1.0		SW8260B	04/19/10 17:06 / jrj
Methyl ethyl ketone	ND	ug/L		20		SW8260B	04/19/10 17:06 / jrj
Methyl tert-butyl ether (MTBE)	ND	ug/L		1.0		SW8260B	04/19/10 17:06 / jrj
Methylene chloride	ND	ug/L		1.0		SW8260B	04/19/10 17:06 / jrj
Styrene	ND	ug/L		1.0		SW8260B	04/19/10 17:06 / jrj
1,1,1,2-Tetrachloroethane	ND	ug/L		1.0		SW8260B	04/19/10 17:06 / jrj
1,1,2,2-Tetrachloroethane	ND	ug/L		1.0		SW8260B	04/19/10 17:06 / jrj
Tetrachloroethene	ND	ug/L		1.0		SW8260B	04/19/10 17:06 / jrj
Toluene	ND	ug/L		1.0		SW8260B	04/19/10 17:06 / jrj
1,1,1-Trichloroethane	ND	ug/L		1.0		SW8260B	04/19/10 17:06 / jrj
1,1,2-Trichloroethane	ND	ug/L		1.0		SW8260B	04/19/10 17:06 / jrj

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Encana Oil and Gas USA Inc
Project: Tribal Pavillion 42-11 (VRP)
Lab ID: B10041311-001
Client Sample ID: TP 42-11 MW1

Report Date: 04/28/10
Collection Date: 04/12/10 15:20
DateReceived: 04/15/10
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
VOLATILE ORGANIC COMPOUNDS							
Trichloroethene	ND	ug/L		1.0		SW8260B	04/19/10 17:06 / jrj
Trichlorofluoromethane	ND	ug/L		1.0		SW8260B	04/19/10 17:06 / jrj
1,2,3-Trichloropropane	ND	ug/L		1.0		SW8260B	04/19/10 17:06 / jrj
Vinyl chloride	ND	ug/L		1.0		SW8260B	04/19/10 17:06 / jrj
m+p-Xylenes	ND	ug/L		1.0		SW8260B	04/19/10 17:06 / jrj
o-Xylene	ND	ug/L		1.0		SW8260B	04/19/10 17:06 / jrj
Xylenes, Total	ND	ug/L		1.0		SW8260B	04/19/10 17:06 / jrj
Surr: Dibromofluoromethane	102	%REC		77-126		SW8260B	04/19/10 17:06 / jrj
Surr: 1,2-Dichloroethane-d4	101	%REC		70-130		SW8260B	04/19/10 17:06 / jrj
Surr: Toluene-d8	102	%REC		79-122		SW8260B	04/19/10 17:06 / jrj
Surr: p-Bromofluorobenzene	101	%REC		76-127		SW8260B	04/19/10 17:06 / jrj
PETROLEUM HYDROCARBONS-VOLATILE							
Gasoline Range Organics (GRO)	ND	ug/L		20		SW8015M as	04/21/10 18:14 / bw
GRO as Gasoline	ND	ug/L		20		SW8015M as	04/21/10 18:14 / bw
Total Purgeable Hydrocarbons	ND	ug/L		20		SW8015M as	04/21/10 18:14 / bw
Surr: Trifluorotoluene	92.0	%REC		50-150		SW8015M as	04/21/10 18:14 / bw

- Note 1: Gasoline Range Organics(GRO) are defined as all hydrocarbons eluting between 2-Methylpentane and 1,2,4-Trimethylbenzene.
- Note 2: GRO as Gasoline is defined by the analyst as the portion of the GRO range that resembles gasoline.
- Note 3: Total Purgeable Hydrocarbons are defined as the total hydrocarbon responses regardless of elution time.

PETROLEUM HYDROCARBONS-SEMI-VOLATILE							
Diesel Range Organics (DRO)	ND	mg/L		0.30		SW8015M as	04/18/10 09:20 / pbf
Diesel Range Organics as Diesel	ND	mg/L		0.30		SW8015M as	04/18/10 09:20 / pbf
Total Extractable Hydrocarbons	ND	mg/L		0.30		SW8015M as	04/18/10 09:20 / pbf
Surr: o-Terphenyl	67.0	%REC		50-150		SW8015M as	04/18/10 09:20 / pbf

- Note 1: Diesel Range Organics are defined as all hydrocarbons eluting between C10 and C28.
- Note 2: Diesel Range Organics as Diesel are defined by the analyst as the portion of the chromatogram between C10 and C28 that resembles diesel fuel.
- Note 3: Total Extractable Hydrocarbons are defined as the total hydrocarbon response regardless of elution time.

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Encana Oil and Gas USA Inc
Project: Tribal Pavillion 42-11 (VRP)
Lab ID: B10041311-002
Client Sample ID: TP 42-11 MW2

Report Date: 04/28/10
Collection Date: 04/12/10 17:30
DateReceived: 04/15/10
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
VOLATILE ORGANIC COMPOUNDS							
Benzene	4.2	ug/L		1.0		SW8260B	04/16/10 21:46 / jrj
Bromobenzene	ND	ug/L		1.0		SW8260B	04/16/10 21:46 / jrj
Bromochloromethane	ND	ug/L		1.0		SW8260B	04/16/10 21:46 / jrj
Bromodichloromethane	ND	ug/L		1.0		SW8260B	04/16/10 21:46 / jrj
Bromoform	ND	ug/L		1.0		SW8260B	04/16/10 21:46 / jrj
Bromomethane	ND	ug/L		1.0		SW8260B	04/16/10 21:46 / jrj
Carbon tetrachloride	ND	ug/L		1.0		SW8260B	04/16/10 21:46 / jrj
Chlorobenzene	ND	ug/L		1.0		SW8260B	04/16/10 21:46 / jrj
Chlorodibromomethane	ND	ug/L		1.0		SW8260B	04/16/10 21:46 / jrj
Chloroethane	ND	ug/L		1.0		SW8260B	04/16/10 21:46 / jrj
2-Chloroethyl vinyl ether	ND	ug/L		1.0		SW8260B	04/16/10 21:46 / jrj
Chloroform	ND	ug/L		1.0		SW8260B	04/16/10 21:46 / jrj
Chloromethane	ND	ug/L		1.0		SW8260B	04/16/10 21:46 / jrj
1,2-Dibromoethane	ND	ug/L		1.0		SW8260B	04/16/10 21:46 / jrj
2-Chlorotoluene	ND	ug/L		1.0		SW8260B	04/16/10 21:46 / jrj
4-Chlorotoluene	ND	ug/L		1.0		SW8260B	04/16/10 21:46 / jrj
Dibromomethane	ND	ug/L		1.0		SW8260B	04/16/10 21:46 / jrj
1,2-Dichlorobenzene	ND	ug/L		1.0		SW8260B	04/16/10 21:46 / jrj
1,3-Dichlorobenzene	ND	ug/L		1.0		SW8260B	04/16/10 21:46 / jrj
1,4-Dichlorobenzene	ND	ug/L		1.0		SW8260B	04/16/10 21:46 / jrj
Dichlorodifluoromethane	ND	ug/L		1.0		SW8260B	04/16/10 21:46 / jrj
1,1-Dichloroethane	ND	ug/L		1.0		SW8260B	04/16/10 21:46 / jrj
1,2-Dichloroethane	ND	ug/L		1.0		SW8260B	04/16/10 21:46 / jrj
1,1-Dichloroethene	ND	ug/L		1.0		SW8260B	04/16/10 21:46 / jrj
cis-1,2-Dichloroethene	ND	ug/L		1.0		SW8260B	04/16/10 21:46 / jrj
trans-1,2-Dichloroethene	ND	ug/L		1.0		SW8260B	04/16/10 21:46 / jrj
1,2-Dichloropropane	ND	ug/L		1.0		SW8260B	04/16/10 21:46 / jrj
1,3-Dichloropropane	ND	ug/L		1.0		SW8260B	04/16/10 21:46 / jrj
2,2-Dichloropropane	ND	ug/L		1.0		SW8260B	04/16/10 21:46 / jrj
1,1-Dichloropropene	ND	ug/L		1.0		SW8260B	04/16/10 21:46 / jrj
cis-1,3-Dichloropropene	ND	ug/L		1.0		SW8260B	04/16/10 21:46 / jrj
trans-1,3-Dichloropropene	ND	ug/L		1.0		SW8260B	04/16/10 21:46 / jrj
Ethylbenzene	23	ug/L		2.0		SW8260B	04/20/10 14:17 / jrj
Methyl ethyl ketone	ND	ug/L		20		SW8260B	04/16/10 21:46 / jrj
Methyl tert-butyl ether (MTBE)	ND	ug/L		1.0		SW8260B	04/16/10 21:46 / jrj
Methylene chloride	ND	ug/L		1.0		SW8260B	04/16/10 21:46 / jrj
Styrene	ND	ug/L		1.0		SW8260B	04/16/10 21:46 / jrj
1,1,1,2-Tetrachloroethane	ND	ug/L		1.0		SW8260B	04/16/10 21:46 / jrj
1,1,2,2-Tetrachloroethane	ND	ug/L		1.0		SW8260B	04/16/10 21:46 / jrj
Tetrachloroethene	ND	ug/L		1.0		SW8260B	04/16/10 21:46 / jrj
Toluene	0.13	ug/L	J	1.0		SW8260B	04/16/10 21:46 / jrj
1,1,1-Trichloroethane	ND	ug/L		1.0		SW8260B	04/16/10 21:46 / jrj
1,1,2-Trichloroethane	ND	ug/L		1.0		SW8260B	04/16/10 21:46 / jrj

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
J - Estimated value. The analyte was present but less than the reporting limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Encana Oil and Gas USA Inc
Project: Tribal Pavillion 42-11 (VRP)
Lab ID: B10041311-002
Client Sample ID: TP 42-11 MW2

Report Date: 04/28/10
Collection Date: 04/12/10 17:30
DateReceived: 04/15/10
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
VOLATILE ORGANIC COMPOUNDS							
Trichloroethene	ND	ug/L		1.0		SW8260B	04/16/10 21:46 / jrj
Trichlorofluoromethane	ND	ug/L		1.0		SW8260B	04/16/10 21:46 / jrj
1,2,3-Trichloropropane	ND	ug/L		1.0		SW8260B	04/16/10 21:46 / jrj
Vinyl chloride	ND	ug/L		1.0		SW8260B	04/16/10 21:46 / jrj
m+p-Xylenes	34	ug/L		1.0		SW8260B	04/16/10 21:46 / jrj
o-Xylene	0.21	ug/L	J	1.0		SW8260B	04/16/10 21:46 / jrj
Xylenes, Total	34	ug/L		1.0		SW8260B	04/16/10 21:46 / jrj
Surr: Dibromofluoromethane	98.0	%REC		77-126		SW8260B	04/16/10 21:46 / jrj
Surr: 1,2-Dichloroethane-d4	95.0	%REC		70-130		SW8260B	04/20/10 14:17 / jrj
Surr: Toluene-d8	98.0	%REC		79-122		SW8260B	04/16/10 21:46 / jrj
Surr: p-Bromofluorobenzene	100	%REC		76-127		SW8260B	04/16/10 21:46 / jrj
PETROLEUM HYDROCARBONS-VOLATILE							
Gasoline Range Organics (GRO)	313	ug/L		20		SW8015M as	04/21/10 19:55 / bw
GRO as Gasoline	313	ug/L		20		SW8015M as	04/21/10 19:55 / bw
Total Purgeable Hydrocarbons	509	ug/L		20		SW8015M as	04/21/10 19:55 / bw
Surr: Trifluorotoluene	95.0	%REC		50-150		SW8015M as	04/21/10 19:55 / bw

- Note 1: Gasoline Range Organics(GRO) are defined as all hydrocarbons eluting between 2-Methylpentane and 1,2,4-Trimethylbenzene.
- Note 2: GRO as Gasoline is defined by the analyst as the portion of the GRO range that resembles gasoline.
- Note 3: Total Purgeable Hydrocarbons are defined as the total hydrocarbon responses regardless of elution time.
- The sample was received in the laboratory with a pH > 2. The pH was 3.

PETROLEUM HYDROCARBONS-SEMI-VOLATILE							
Diesel Range Organics (DRO)	5.6	mg/L		3.0		SW8015M as	04/18/10 10:52 / pbf
Diesel Range Organics as Diesel	ND	mg/L		3.0		SW8015M as	04/18/10 10:52 / pbf
Total Extractable Hydrocarbons	8.1	mg/L		3.0		SW8015M as	04/18/10 10:52 / pbf
Surr: o-Terphenyl	79.0	%REC		50-150		SW8015M as	04/18/10 10:52 / pbf

- Note 1: Diesel Range Organics are defined as all hydrocarbons eluting between C10 and C28.
- Note 2: Diesel Range Organics as Diesel are defined by the analyst as the portion of the chromatogram between C10 and C28 that resembles diesel fuel.
- Note 3: Total Extractable Hydrocarbons are defined as the total hydrocarbon response regardless of elution time.

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
J - Estimated value. The analyte was present but less than the reporting limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Encana Oil and Gas USA Inc
Project: Tribal Pavillion 42-11 (VRP)
Lab ID: B10041311-003
Client Sample ID: TP 42-11 MW3

Report Date: 04/28/10
Collection Date: 04/12/10 16:20
DateReceived: 04/15/10
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
VOLATILE ORGANIC COMPOUNDS							
Benzene	ND	ug/L		1.0		SW8260B	04/21/10 12:08 / jrj
Bromobenzene	ND	ug/L		1.0		SW8260B	04/21/10 12:08 / jrj
Bromochloromethane	ND	ug/L		1.0		SW8260B	04/21/10 12:08 / jrj
Bromodichloromethane	ND	ug/L		1.0		SW8260B	04/21/10 12:08 / jrj
Bromoform	ND	ug/L		1.0		SW8260B	04/21/10 12:08 / jrj
Bromomethane	ND	ug/L		1.0		SW8260B	04/21/10 12:08 / jrj
Carbon tetrachloride	ND	ug/L		1.0		SW8260B	04/21/10 12:08 / jrj
Chlorobenzene	ND	ug/L		1.0		SW8260B	04/21/10 12:08 / jrj
Chlorodibromomethane	ND	ug/L		1.0		SW8260B	04/21/10 12:08 / jrj
Chloroethane	ND	ug/L		1.0		SW8260B	04/21/10 12:08 / jrj
2-Chloroethyl vinyl ether	ND	ug/L		1.0		SW8260B	04/21/10 12:08 / jrj
Chloroform	ND	ug/L		1.0		SW8260B	04/21/10 12:08 / jrj
Chloromethane	ND	ug/L		1.0		SW8260B	04/21/10 12:08 / jrj
1,2-Dibromoethane	ND	ug/L		1.0		SW8260B	04/21/10 12:08 / jrj
2-Chlorotoluene	ND	ug/L		1.0		SW8260B	04/21/10 12:08 / jrj
4-Chlorotoluene	ND	ug/L		1.0		SW8260B	04/21/10 12:08 / jrj
Dibromomethane	ND	ug/L		1.0		SW8260B	04/21/10 12:08 / jrj
1,2-Dichlorobenzene	ND	ug/L		1.0		SW8260B	04/21/10 12:08 / jrj
1,3-Dichlorobenzene	ND	ug/L		1.0		SW8260B	04/21/10 12:08 / jrj
1,4-Dichlorobenzene	ND	ug/L		1.0		SW8260B	04/21/10 12:08 / jrj
Dichlorodifluoromethane	ND	ug/L		1.0		SW8260B	04/21/10 12:08 / jrj
1,1-Dichloroethane	ND	ug/L		1.0		SW8260B	04/21/10 12:08 / jrj
1,2-Dichloroethane	ND	ug/L		1.0		SW8260B	04/21/10 12:08 / jrj
1,1-Dichloroethene	ND	ug/L		1.0		SW8260B	04/21/10 12:08 / jrj
cis-1,2-Dichloroethene	ND	ug/L		1.0		SW8260B	04/21/10 12:08 / jrj
trans-1,2-Dichloroethene	ND	ug/L		1.0		SW8260B	04/21/10 12:08 / jrj
1,2-Dichloropropane	ND	ug/L		1.0		SW8260B	04/21/10 12:08 / jrj
1,3-Dichloropropane	ND	ug/L		1.0		SW8260B	04/21/10 12:08 / jrj
2,2-Dichloropropane	ND	ug/L		1.0		SW8260B	04/21/10 12:08 / jrj
1,1-Dichloropropene	ND	ug/L		1.0		SW8260B	04/21/10 12:08 / jrj
cis-1,3-Dichloropropene	ND	ug/L		1.0		SW8260B	04/21/10 12:08 / jrj
trans-1,3-Dichloropropene	ND	ug/L		1.0		SW8260B	04/21/10 12:08 / jrj
Ethylbenzene	ND	ug/L		1.0		SW8260B	04/21/10 12:08 / jrj
Methyl ethyl ketone	ND	ug/L		20		SW8260B	04/21/10 12:08 / jrj
Methyl tert-butyl ether (MTBE)	ND	ug/L		1.0		SW8260B	04/21/10 12:08 / jrj
Methylene chloride	ND	ug/L		1.0		SW8260B	04/21/10 12:08 / jrj
Styrene	ND	ug/L		1.0		SW8260B	04/21/10 12:08 / jrj
1,1,1,2-Tetrachloroethane	ND	ug/L		1.0		SW8260B	04/21/10 12:08 / jrj
1,1,2,2-Tetrachloroethane	ND	ug/L		1.0		SW8260B	04/21/10 12:08 / jrj
Tetrachloroethene	ND	ug/L		1.0		SW8260B	04/21/10 12:08 / jrj
Toluene	ND	ug/L		1.0		SW8260B	04/21/10 12:08 / jrj
1,1,1-Trichloroethane	ND	ug/L		1.0		SW8260B	04/21/10 12:08 / jrj
1,1,2-Trichloroethane	ND	ug/L		1.0		SW8260B	04/21/10 12:08 / jrj

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Encana Oil and Gas USA Inc
Project: Tribal Pavillion 42-11 (VRP)
Lab ID: B10041311-003
Client Sample ID: TP 42-11 MW3

Report Date: 04/28/10
Collection Date: 04/12/10 16:20
DateReceived: 04/15/10
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
VOLATILE ORGANIC COMPOUNDS							
Trichloroethene	ND	ug/L		1.0		SW8260B	04/21/10 12:08 / jrj
Trichlorofluoromethane	ND	ug/L		1.0		SW8260B	04/21/10 12:08 / jrj
1,2,3-Trichloropropane	ND	ug/L		1.0		SW8260B	04/21/10 12:08 / jrj
Vinyl chloride	ND	ug/L		1.0		SW8260B	04/21/10 12:08 / jrj
m+p-Xylenes	ND	ug/L		1.0		SW8260B	04/21/10 12:08 / jrj
o-Xylene	ND	ug/L		1.0		SW8260B	04/21/10 12:08 / jrj
Xylenes, Total	ND	ug/L		1.0		SW8260B	04/21/10 12:08 / jrj
Surr: Dibromofluoromethane	94.0	%REC		77-126		SW8260B	04/21/10 12:08 / jrj
Surr: 1,2-Dichloroethane-d4	90.0	%REC		70-130		SW8260B	04/21/10 12:08 / jrj
Surr: Toluene-d8	104	%REC		79-122		SW8260B	04/21/10 12:08 / jrj
Surr: p-Bromofluorobenzene	103	%REC		76-127		SW8260B	04/21/10 12:08 / jrj
PETROLEUM HYDROCARBONS-VOLATILE							
Gasoline Range Organics (GRO)	ND	ug/L		20		SW8015M as	04/21/10 18:48 / bw
GRO as Gasoline	ND	ug/L		20		SW8015M as	04/21/10 18:48 / bw
Total Purgeable Hydrocarbons	ND	ug/L		20		SW8015M as	04/21/10 18:48 / bw
Surr: Trifluorotoluene	90.0	%REC		50-150		SW8015M as	04/21/10 18:48 / bw

- Note 1: Gasoline Range Organics(GRO) are defined as all hydrocarbons eluting between 2-Methylpentane and 1,2,4-Trimethylbenzene.
- Note 2: GRO as Gasoline is defined by the analyst as the portion of the GRO range that resembles gasoline.
- Note 3: Total Purgeable Hydrocarbons are defined as the total hydrocarbon responses regardless of elution time.

PETROLEUM HYDROCARBONS-SEMI-VOLATILE							
Diesel Range Organics (DRO)	ND	mg/L		0.30		SW8015M as	04/18/10 10:05 / pbf
Diesel Range Organics as Diesel	ND	mg/L		0.30		SW8015M as	04/18/10 10:05 / pbf
Total Extractable Hydrocarbons	ND	mg/L		0.30		SW8015M as	04/18/10 10:05 / pbf
Surr: o-Terphenyl	87.0	%REC		50-150		SW8015M as	04/18/10 10:05 / pbf

- Note 1: Diesel Range Organics are defined as all hydrocarbons eluting between C10 and C28.
- Note 2: Diesel Range Organics as Diesel are defined by the analyst as the portion of the chromatogram between C10 and C28 that resembles diesel fuel.
- Note 3: Total Extractable Hydrocarbons are defined as the total hydrocarbon response regardless of elution time.

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Encana Oil and Gas USA Inc
Project: Tribal Pavillion 42-11 (VRP)
Lab ID: B10041311-004
Client Sample ID: TP 42-11 MW4

Report Date: 04/28/10
Collection Date: 04/12/10 16:45
DateReceived: 04/15/10
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
VOLATILE ORGANIC COMPOUNDS							
Benzene	11	ug/L		1.0		SW8260B	04/20/10 13:40 / jrj
Bromobenzene	ND	ug/L		1.0		SW8260B	04/20/10 13:40 / jrj
Bromochloromethane	ND	ug/L		1.0		SW8260B	04/20/10 13:40 / jrj
Bromodichloromethane	ND	ug/L		1.0		SW8260B	04/20/10 13:40 / jrj
Bromoform	ND	ug/L		1.0		SW8260B	04/20/10 13:40 / jrj
Bromomethane	ND	ug/L		1.0		SW8260B	04/20/10 13:40 / jrj
Carbon tetrachloride	ND	ug/L		1.0		SW8260B	04/20/10 13:40 / jrj
Chlorobenzene	ND	ug/L		1.0		SW8260B	04/20/10 13:40 / jrj
Chlorodibromomethane	ND	ug/L		1.0		SW8260B	04/20/10 13:40 / jrj
Chloroethane	ND	ug/L		1.0		SW8260B	04/20/10 13:40 / jrj
2-Chloroethyl vinyl ether	ND	ug/L		1.0		SW8260B	04/20/10 13:40 / jrj
Chloroform	ND	ug/L		1.0		SW8260B	04/20/10 13:40 / jrj
Chloromethane	ND	ug/L		1.0		SW8260B	04/20/10 13:40 / jrj
1,2-Dibromoethane	ND	ug/L		1.0		SW8260B	04/20/10 13:40 / jrj
2-Chlorotoluene	ND	ug/L		1.0		SW8260B	04/20/10 13:40 / jrj
4-Chlorotoluene	ND	ug/L		1.0		SW8260B	04/20/10 13:40 / jrj
Dibromomethane	ND	ug/L		1.0		SW8260B	04/20/10 13:40 / jrj
1,2-Dichlorobenzene	ND	ug/L		1.0		SW8260B	04/20/10 13:40 / jrj
1,3-Dichlorobenzene	ND	ug/L		1.0		SW8260B	04/20/10 13:40 / jrj
1,4-Dichlorobenzene	ND	ug/L		1.0		SW8260B	04/20/10 13:40 / jrj
Dichlorodifluoromethane	ND	ug/L		1.0		SW8260B	04/20/10 13:40 / jrj
1,1-Dichloroethane	ND	ug/L		1.0		SW8260B	04/20/10 13:40 / jrj
1,2-Dichloroethane	ND	ug/L		1.0		SW8260B	04/20/10 13:40 / jrj
1,1-Dichloroethene	ND	ug/L		1.0		SW8260B	04/20/10 13:40 / jrj
cis-1,2-Dichloroethene	ND	ug/L		1.0		SW8260B	04/20/10 13:40 / jrj
trans-1,2-Dichloroethene	ND	ug/L		1.0		SW8260B	04/20/10 13:40 / jrj
1,2-Dichloropropane	ND	ug/L		1.0		SW8260B	04/20/10 13:40 / jrj
1,3-Dichloropropane	ND	ug/L		1.0		SW8260B	04/20/10 13:40 / jrj
2,2-Dichloropropane	ND	ug/L		1.0		SW8260B	04/20/10 13:40 / jrj
1,1-Dichloropropene	ND	ug/L		1.0		SW8260B	04/20/10 13:40 / jrj
cis-1,3-Dichloropropene	ND	ug/L		1.0		SW8260B	04/20/10 13:40 / jrj
trans-1,3-Dichloropropene	ND	ug/L		1.0		SW8260B	04/20/10 13:40 / jrj
Ethylbenzene	111	ug/L		10		SW8260B	04/21/10 16:43 / jrj
Methyl ethyl ketone	ND	ug/L		20		SW8260B	04/20/10 13:40 / jrj
Methyl tert-butyl ether (MTBE)	ND	ug/L		1.0		SW8260B	04/20/10 13:40 / jrj
Methylene chloride	ND	ug/L		1.0		SW8260B	04/20/10 13:40 / jrj
Styrene	ND	ug/L		1.0		SW8260B	04/20/10 13:40 / jrj
1,1,1,2-Tetrachloroethane	ND	ug/L		1.0		SW8260B	04/20/10 13:40 / jrj
1,1,2,2-Tetrachloroethane	ND	ug/L		1.0		SW8260B	04/20/10 13:40 / jrj
Tetrachloroethene	ND	ug/L		1.0		SW8260B	04/20/10 13:40 / jrj
Toluene	0.61	ug/L	J	1.0		SW8260B	04/20/10 13:40 / jrj
1,1,1-Trichloroethane	ND	ug/L		1.0		SW8260B	04/20/10 13:40 / jrj
1,1,2-Trichloroethane	ND	ug/L		1.0		SW8260B	04/20/10 13:40 / jrj

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
J - Estimated value. The analyte was present but less than the reporting limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Encana Oil and Gas USA Inc
Project: Tribal Pavillion 42-11 (VRP)
Lab ID: B10041311-004
Client Sample ID: TP 42-11 MW4

Report Date: 04/28/10
Collection Date: 04/12/10 16:45
DateReceived: 04/15/10
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
VOLATILE ORGANIC COMPOUNDS							
Trichloroethene	ND	ug/L		1.0		SW8260B	04/20/10 13:40 / jrj
Trichlorofluoromethane	ND	ug/L		1.0		SW8260B	04/20/10 13:40 / jrj
1,2,3-Trichloropropane	ND	ug/L		1.0		SW8260B	04/20/10 13:40 / jrj
Vinyl chloride	ND	ug/L		1.0		SW8260B	04/20/10 13:40 / jrj
m+p-Xylenes	285	ug/L		10		SW8260B	04/21/10 16:43 / jrj
o-Xylene	3.8	ug/L		1.0		SW8260B	04/20/10 13:40 / jrj
Xylenes, Total	289	ug/L		10		SW8260B	04/21/10 16:43 / jrj
Surr: Dibromofluoromethane	100	%REC		77-126		SW8260B	04/20/10 13:40 / jrj
Surr: 1,2-Dichloroethane-d4	93.0	%REC		70-130		SW8260B	04/20/10 13:40 / jrj
Surr: Toluene-d8	106	%REC		79-122		SW8260B	04/20/10 13:40 / jrj
Surr: p-Bromofluorobenzene	102	%REC		76-127		SW8260B	04/20/10 13:40 / jrj
PETROLEUM HYDROCARBONS-VOLATILE							
Gasoline Range Organics (GRO)	2830	ug/L		40		SW8015M as	04/22/10 17:01 / bw
GRO as Gasoline	2830	ug/L		40		SW8015M as	04/22/10 17:01 / bw
Total Purgeable Hydrocarbons	3720	ug/L		40		SW8015M as	04/22/10 17:01 / bw
Surr: Trifluorotoluene	135	%REC		50-150		SW8015M as	04/22/10 17:01 / bw

- Note 1: Gasoline Range Organics(GRO) are defined as all hydrocarbons eluting between 2-Methylpentane and 1,2,4-Trimethylbenzene.
- Note 2: GRO as Gasoline is defined by the analyst as the portion of the GRO range that resembles gasoline.
- Note 3: Total Purgeable Hydrocarbons are defined as the total hydrocarbon responses regardless of elution time.
- The sample was received in the laboratory with a pH > 2. The pH was 6.

PETROLEUM HYDROCARBONS-SEMI-VOLATILE							
Diesel Range Organics (DRO)	13	mg/L		0.30		SW8015M as	04/18/10 13:11 / pbf
Diesel Range Organics as Diesel	13	mg/L		0.30		SW8015M as	04/18/10 13:11 / pbf
Total Extractable Hydrocarbons	15	mg/L		0.30		SW8015M as	04/18/10 13:11 / pbf
Surr: o-Terphenyl	52.0	%REC		50-150		SW8015M as	04/18/10 13:11 / pbf

- Note 1: Diesel Range Organics are defined as all hydrocarbons eluting between C10 and C28.
- Note 2: Diesel Range Organics as Diesel are defined by the analyst as the portion of the chromatogram between C10 and C28 that resembles diesel fuel.
- Note 3: Total Extractable Hydrocarbons are defined as the total hydrocarbon response regardless of elution time.

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Encana Oil and Gas USA Inc
Project: Tribal Pavillion 42-11 (VRP)
Lab ID: B10041311-005
Client Sample ID: TP 42-11 MW4B

Report Date: 04/28/10
Collection Date: 04/12/10 16:50
DateReceived: 04/15/10
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
VOLATILE ORGANIC COMPOUNDS							
Benzene	10	ug/L		1.0		SW8260B	04/20/10 12:27 / jrj
Bromobenzene	ND	ug/L		1.0		SW8260B	04/20/10 12:27 / jrj
Bromochloromethane	ND	ug/L		1.0		SW8260B	04/20/10 12:27 / jrj
Bromodichloromethane	ND	ug/L		1.0		SW8260B	04/20/10 12:27 / jrj
Bromoform	ND	ug/L		1.0		SW8260B	04/20/10 12:27 / jrj
Bromomethane	ND	ug/L		1.0		SW8260B	04/20/10 12:27 / jrj
Carbon tetrachloride	ND	ug/L		1.0		SW8260B	04/20/10 12:27 / jrj
Chlorobenzene	ND	ug/L		1.0		SW8260B	04/20/10 12:27 / jrj
Chlorodibromomethane	ND	ug/L		1.0		SW8260B	04/20/10 12:27 / jrj
Chloroethane	ND	ug/L		1.0		SW8260B	04/20/10 12:27 / jrj
2-Chloroethyl vinyl ether	ND	ug/L		1.0		SW8260B	04/20/10 12:27 / jrj
Chloroform	ND	ug/L		1.0		SW8260B	04/20/10 12:27 / jrj
Chloromethane	ND	ug/L		1.0		SW8260B	04/20/10 12:27 / jrj
1,2-Dibromoethane	ND	ug/L		1.0		SW8260B	04/20/10 12:27 / jrj
2-Chlorotoluene	ND	ug/L		1.0		SW8260B	04/20/10 12:27 / jrj
4-Chlorotoluene	ND	ug/L		1.0		SW8260B	04/20/10 12:27 / jrj
Dibromomethane	ND	ug/L		1.0		SW8260B	04/20/10 12:27 / jrj
1,2-Dichlorobenzene	ND	ug/L		1.0		SW8260B	04/20/10 12:27 / jrj
1,3-Dichlorobenzene	ND	ug/L		1.0		SW8260B	04/20/10 12:27 / jrj
1,4-Dichlorobenzene	ND	ug/L		1.0		SW8260B	04/20/10 12:27 / jrj
Dichlorodifluoromethane	ND	ug/L		1.0		SW8260B	04/20/10 12:27 / jrj
1,1-Dichloroethane	ND	ug/L		1.0		SW8260B	04/20/10 12:27 / jrj
1,2-Dichloroethane	ND	ug/L		1.0		SW8260B	04/20/10 12:27 / jrj
1,1-Dichloroethene	ND	ug/L		1.0		SW8260B	04/20/10 12:27 / jrj
cis-1,2-Dichloroethene	ND	ug/L		1.0		SW8260B	04/20/10 12:27 / jrj
trans-1,2-Dichloroethene	ND	ug/L		1.0		SW8260B	04/20/10 12:27 / jrj
1,2-Dichloropropane	ND	ug/L		1.0		SW8260B	04/20/10 12:27 / jrj
1,3-Dichloropropane	ND	ug/L		1.0		SW8260B	04/20/10 12:27 / jrj
2,2-Dichloropropane	ND	ug/L		1.0		SW8260B	04/20/10 12:27 / jrj
1,1-Dichloropropene	ND	ug/L		1.0		SW8260B	04/20/10 12:27 / jrj
cis-1,3-Dichloropropene	ND	ug/L		1.0		SW8260B	04/20/10 12:27 / jrj
trans-1,3-Dichloropropene	ND	ug/L		1.0		SW8260B	04/20/10 12:27 / jrj
Ethylbenzene	97	ug/L		10		SW8260B	04/21/10 17:20 / jrj
Methyl ethyl ketone	ND	ug/L		20		SW8260B	04/20/10 12:27 / jrj
Methyl tert-butyl ether (MTBE)	ND	ug/L		1.0		SW8260B	04/20/10 12:27 / jrj
Methylene chloride	ND	ug/L		1.0		SW8260B	04/20/10 12:27 / jrj
Styrene	ND	ug/L		1.0		SW8260B	04/20/10 12:27 / jrj
1,1,1,2-Tetrachloroethane	ND	ug/L		1.0		SW8260B	04/20/10 12:27 / jrj
1,1,2,2-Tetrachloroethane	ND	ug/L		1.0		SW8260B	04/20/10 12:27 / jrj
Tetrachloroethene	ND	ug/L		1.0		SW8260B	04/20/10 12:27 / jrj
Toluene	0.62	ug/L	J	1.0		SW8260B	04/20/10 12:27 / jrj
1,1,1-Trichloroethane	ND	ug/L		1.0		SW8260B	04/20/10 12:27 / jrj
1,1,2-Trichloroethane	ND	ug/L		1.0		SW8260B	04/20/10 12:27 / jrj

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
J - Estimated value. The analyte was present but less than the reporting limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Encana Oil and Gas USA Inc
Project: Tribal Pavillion 42-11 (VRP)
Lab ID: B10041311-005
Client Sample ID: TP 42-11 MW4B

Report Date: 04/28/10
Collection Date: 04/12/10 16:50
DateReceived: 04/15/10
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
VOLATILE ORGANIC COMPOUNDS							
Trichloroethene	ND	ug/L		1.0		SW8260B	04/20/10 12:27 / jrj
Trichlorofluoromethane	ND	ug/L		1.0		SW8260B	04/20/10 12:27 / jrj
1,2,3-Trichloropropane	ND	ug/L		1.0		SW8260B	04/20/10 12:27 / jrj
Vinyl chloride	ND	ug/L		1.0		SW8260B	04/20/10 12:27 / jrj
m+p-Xylenes	260	ug/L		10		SW8260B	04/21/10 17:20 / jrj
o-Xylene	4.2	ug/L		1.0		SW8260B	04/20/10 12:27 / jrj
Xylenes, Total	264	ug/L		10		SW8260B	04/21/10 17:20 / jrj
Surr: Dibromofluoromethane	97.0	%REC		77-126		SW8260B	04/20/10 12:27 / jrj
Surr: 1,2-Dichloroethane-d4	95.0	%REC		70-130		SW8260B	04/20/10 12:27 / jrj
Surr: Toluene-d8	105	%REC		79-122		SW8260B	04/20/10 12:27 / jrj
Surr: p-Bromofluorobenzene	98.0	%REC		76-127		SW8260B	04/20/10 12:27 / jrj
PETROLEUM HYDROCARBONS-VOLATILE							
Gasoline Range Organics (GRO)	1790	ug/L		40		SW8015M as	04/22/10 18:08 / bw
GRO as Gasoline	1790	ug/L		40		SW8015M as	04/22/10 18:08 / bw
Total Purgeable Hydrocarbons	2460	ug/L		40		SW8015M as	04/22/10 18:08 / bw
Surr: Trifluorotoluene	112	%REC		50-150		SW8015M as	04/22/10 18:08 / bw

- Note 1: Gasoline Range Organics(GRO) are defined as all hydrocarbons eluting between 2-Methylpentane and 1,2,4-Trimethylbenzene.
- Note 2: GRO as Gasoline is defined by the analyst as the portion of the GRO range that resembles gasoline.
- Note 3: Total Purgeable Hydrocarbons are defined as the total hydrocarbon responses regardless of elution time.

PETROLEUM HYDROCARBONS-SEMI-VOLATILE							
Diesel Range Organics (DRO)	13	mg/L		0.30		SW8015M as	04/18/10 13:57 / pbf
Diesel Range Organics as Diesel	13	mg/L		0.30		SW8015M as	04/18/10 13:57 / pbf
Total Extractable Hydrocarbons	15	mg/L		0.30		SW8015M as	04/18/10 13:57 / pbf
Surr: o-Terphenyl	55.0	%REC		50-150		SW8015M as	04/18/10 13:57 / pbf

- Note 1: Diesel Range Organics are defined as all hydrocarbons eluting between C10 and C28.
- Note 2: Diesel Range Organics as Diesel are defined by the analyst as the portion of the chromatogram between C10 and C28 that resembles diesel fuel.
- Note 3: Total Extractable Hydrocarbons are defined as the total hydrocarbon response regardless of elution time.

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Encana Oil and Gas USA Inc
Project: Tribal Pavillion 42-11 (VRP)
Lab ID: B10041311-006
Client Sample ID: TP 42-11 MW5

Report Date: 04/28/10
Collection Date: 04/13/10 09:15
DateReceived: 04/15/10
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
VOLATILE ORGANIC COMPOUNDS							
Benzene	ND	ug/L		1.0		SW8260B	04/19/10 17:42 / jrj
Bromobenzene	ND	ug/L		1.0		SW8260B	04/19/10 17:42 / jrj
Bromochloromethane	ND	ug/L		1.0		SW8260B	04/19/10 17:42 / jrj
Bromodichloromethane	ND	ug/L		1.0		SW8260B	04/19/10 17:42 / jrj
Bromoform	ND	ug/L		1.0		SW8260B	04/19/10 17:42 / jrj
Bromomethane	ND	ug/L		1.0		SW8260B	04/19/10 17:42 / jrj
Carbon tetrachloride	ND	ug/L		1.0		SW8260B	04/19/10 17:42 / jrj
Chlorobenzene	ND	ug/L		1.0		SW8260B	04/19/10 17:42 / jrj
Chlorodibromomethane	ND	ug/L		1.0		SW8260B	04/19/10 17:42 / jrj
Chloroethane	ND	ug/L		1.0		SW8260B	04/19/10 17:42 / jrj
2-Chloroethyl vinyl ether	ND	ug/L		1.0		SW8260B	04/19/10 17:42 / jrj
Chloroform	ND	ug/L		1.0		SW8260B	04/19/10 17:42 / jrj
Chloromethane	ND	ug/L		1.0		SW8260B	04/19/10 17:42 / jrj
1,2-Dibromoethane	ND	ug/L		1.0		SW8260B	04/19/10 17:42 / jrj
2-Chlorotoluene	ND	ug/L		1.0		SW8260B	04/19/10 17:42 / jrj
4-Chlorotoluene	ND	ug/L		1.0		SW8260B	04/19/10 17:42 / jrj
Dibromomethane	ND	ug/L		1.0		SW8260B	04/19/10 17:42 / jrj
1,2-Dichlorobenzene	ND	ug/L		1.0		SW8260B	04/19/10 17:42 / jrj
1,3-Dichlorobenzene	ND	ug/L		1.0		SW8260B	04/19/10 17:42 / jrj
1,4-Dichlorobenzene	ND	ug/L		1.0		SW8260B	04/19/10 17:42 / jrj
Dichlorodifluoromethane	ND	ug/L		1.0		SW8260B	04/19/10 17:42 / jrj
1,1-Dichloroethane	ND	ug/L		1.0		SW8260B	04/19/10 17:42 / jrj
1,2-Dichloroethane	ND	ug/L		1.0		SW8260B	04/19/10 17:42 / jrj
1,1-Dichloroethene	ND	ug/L		1.0		SW8260B	04/19/10 17:42 / jrj
cis-1,2-Dichloroethene	ND	ug/L		1.0		SW8260B	04/19/10 17:42 / jrj
trans-1,2-Dichloroethene	ND	ug/L		1.0		SW8260B	04/19/10 17:42 / jrj
1,2-Dichloropropane	ND	ug/L		1.0		SW8260B	04/19/10 17:42 / jrj
1,3-Dichloropropane	ND	ug/L		1.0		SW8260B	04/19/10 17:42 / jrj
2,2-Dichloropropane	ND	ug/L		1.0		SW8260B	04/19/10 17:42 / jrj
1,1-Dichloropropene	ND	ug/L		1.0		SW8260B	04/19/10 17:42 / jrj
cis-1,3-Dichloropropene	ND	ug/L		1.0		SW8260B	04/19/10 17:42 / jrj
trans-1,3-Dichloropropene	ND	ug/L		1.0		SW8260B	04/19/10 17:42 / jrj
Ethylbenzene	ND	ug/L		1.0		SW8260B	04/19/10 17:42 / jrj
Methyl ethyl ketone	ND	ug/L		20		SW8260B	04/19/10 17:42 / jrj
Methyl tert-butyl ether (MTBE)	ND	ug/L		1.0		SW8260B	04/19/10 17:42 / jrj
Methylene chloride	ND	ug/L		1.0		SW8260B	04/19/10 17:42 / jrj
Styrene	ND	ug/L		1.0		SW8260B	04/19/10 17:42 / jrj
1,1,1,2-Tetrachloroethane	ND	ug/L		1.0		SW8260B	04/19/10 17:42 / jrj
1,1,2,2-Tetrachloroethane	ND	ug/L		1.0		SW8260B	04/19/10 17:42 / jrj
Tetrachloroethene	ND	ug/L		1.0		SW8260B	04/19/10 17:42 / jrj
Toluene	ND	ug/L		1.0		SW8260B	04/19/10 17:42 / jrj
1,1,1-Trichloroethane	ND	ug/L		1.0		SW8260B	04/19/10 17:42 / jrj
1,1,2-Trichloroethane	ND	ug/L		1.0		SW8260B	04/19/10 17:42 / jrj

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Encana Oil and Gas USA Inc
Project: Tribal Pavillion 42-11 (VRP)
Lab ID: B10041311-006
Client Sample ID: TP 42-11 MW5

Report Date: 04/28/10
Collection Date: 04/13/10 09:15
DateReceived: 04/15/10
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
VOLATILE ORGANIC COMPOUNDS							
Trichloroethene	ND	ug/L		1.0		SW8260B	04/19/10 17:42 / jrj
Trichlorofluoromethane	ND	ug/L		1.0		SW8260B	04/19/10 17:42 / jrj
1,2,3-Trichloropropane	ND	ug/L		1.0		SW8260B	04/19/10 17:42 / jrj
Vinyl chloride	ND	ug/L		1.0		SW8260B	04/19/10 17:42 / jrj
m+p-Xylenes	ND	ug/L		1.0		SW8260B	04/19/10 17:42 / jrj
o-Xylene	ND	ug/L		1.0		SW8260B	04/19/10 17:42 / jrj
Xylenes, Total	ND	ug/L		1.0		SW8260B	04/19/10 17:42 / jrj
Surr: Dibromofluoromethane	103	%REC		77-126		SW8260B	04/19/10 17:42 / jrj
Surr: 1,2-Dichloroethane-d4	104	%REC		70-130		SW8260B	04/19/10 17:42 / jrj
Surr: Toluene-d8	101	%REC		79-122		SW8260B	04/19/10 17:42 / jrj
Surr: p-Bromofluorobenzene	106	%REC		76-127		SW8260B	04/19/10 17:42 / jrj
PETROLEUM HYDROCARBONS-VOLATILE							
Gasoline Range Organics (GRO)	ND	ug/L		20		SW8015M as	04/21/10 19:22 / bw
GRO as Gasoline	ND	ug/L		20		SW8015M as	04/21/10 19:22 / bw
Total Purgeable Hydrocarbons	ND	ug/L		20		SW8015M as	04/21/10 19:22 / bw
Surr: Trifluorotoluene	91.0	%REC		50-150		SW8015M as	04/21/10 19:22 / bw

- Note 1: Gasoline Range Organics(GRO) are defined as all hydrocarbons eluting between 2-Methylpentane and 1,2,4-Trimethylbenzene.
- Note 2: GRO as Gasoline is defined by the analyst as the portion of the GRO range that resembles gasoline.
- Note 3: Total Purgeable Hydrocarbons are defined as the total hydrocarbon responses regardless of elution time.

PETROLEUM HYDROCARBONS-SEMI-VOLATILE							
Diesel Range Organics (DRO)	ND	mg/L		0.30		SW8015M as	04/18/10 15:29 / pbf
Diesel Range Organics as Diesel	ND	mg/L		0.30		SW8015M as	04/18/10 15:29 / pbf
Total Extractable Hydrocarbons	0.36	mg/L		0.30		SW8015M as	04/18/10 15:29 / pbf
Surr: o-Terphenyl	70.0	%REC		50-150		SW8015M as	04/18/10 15:29 / pbf

- Note 1: Diesel Range Organics are defined as all hydrocarbons eluting between C10 and C28.
- Note 2: Diesel Range Organics as Diesel are defined by the analyst as the portion of the chromatogram between C10 and C28 that resembles diesel fuel.
- Note 3: Total Extractable Hydrocarbons are defined as the total hydrocarbon response regardless of elution time.

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Encana Oil and Gas USA Inc
Project: Tribal Pavillion 42-11 (VRP)
Lab ID: B10041311-007
Client Sample ID: Trip Blank Lot #032310, B-TS 0246

Report Date: 04/28/10
Collection Date: 04/12/10 15:20
DateReceived: 04/15/10
Matrix: Trip Blank

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
VOLATILE ORGANIC COMPOUNDS							
Benzene	ND	ug/L		1.0		SW8260B	04/16/10 20:37 / jrj
Bromobenzene	ND	ug/L		1.0		SW8260B	04/16/10 20:37 / jrj
Bromochloromethane	ND	ug/L		1.0		SW8260B	04/16/10 20:37 / jrj
Bromodichloromethane	ND	ug/L		1.0		SW8260B	04/16/10 20:37 / jrj
Bromoform	ND	ug/L		1.0		SW8260B	04/16/10 20:37 / jrj
Bromomethane	ND	ug/L		1.0		SW8260B	04/16/10 20:37 / jrj
Carbon tetrachloride	ND	ug/L		1.0		SW8260B	04/16/10 20:37 / jrj
Chlorobenzene	ND	ug/L		1.0		SW8260B	04/16/10 20:37 / jrj
Chlorodibromomethane	ND	ug/L		1.0		SW8260B	04/16/10 20:37 / jrj
Chloroethane	ND	ug/L		1.0		SW8260B	04/16/10 20:37 / jrj
2-Chloroethyl vinyl ether	ND	ug/L		1.0		SW8260B	04/16/10 20:37 / jrj
Chloroform	ND	ug/L		1.0		SW8260B	04/16/10 20:37 / jrj
Chloromethane	ND	ug/L		1.0		SW8260B	04/16/10 20:37 / jrj
1,2-Dibromoethane	ND	ug/L		1.0		SW8260B	04/16/10 20:37 / jrj
2-Chlorotoluene	ND	ug/L		1.0		SW8260B	04/16/10 20:37 / jrj
4-Chlorotoluene	ND	ug/L		1.0		SW8260B	04/16/10 20:37 / jrj
Dibromomethane	ND	ug/L		1.0		SW8260B	04/16/10 20:37 / jrj
1,2-Dichlorobenzene	ND	ug/L		1.0		SW8260B	04/16/10 20:37 / jrj
1,3-Dichlorobenzene	ND	ug/L		1.0		SW8260B	04/16/10 20:37 / jrj
1,4-Dichlorobenzene	ND	ug/L		1.0		SW8260B	04/16/10 20:37 / jrj
Dichlorodifluoromethane	ND	ug/L		1.0		SW8260B	04/16/10 20:37 / jrj
1,1-Dichloroethane	ND	ug/L		1.0		SW8260B	04/16/10 20:37 / jrj
1,2-Dichloroethane	ND	ug/L		1.0		SW8260B	04/16/10 20:37 / jrj
1,1-Dichloroethene	ND	ug/L		1.0		SW8260B	04/16/10 20:37 / jrj
cis-1,2-Dichloroethene	ND	ug/L		1.0		SW8260B	04/16/10 20:37 / jrj
trans-1,2-Dichloroethene	ND	ug/L		1.0		SW8260B	04/16/10 20:37 / jrj
1,2-Dichloropropane	ND	ug/L		1.0		SW8260B	04/16/10 20:37 / jrj
1,3-Dichloropropane	ND	ug/L		1.0		SW8260B	04/16/10 20:37 / jrj
2,2-Dichloropropane	ND	ug/L		1.0		SW8260B	04/16/10 20:37 / jrj
1,1-Dichloropropene	ND	ug/L		1.0		SW8260B	04/16/10 20:37 / jrj
cis-1,3-Dichloropropene	ND	ug/L		1.0		SW8260B	04/16/10 20:37 / jrj
trans-1,3-Dichloropropene	ND	ug/L		1.0		SW8260B	04/16/10 20:37 / jrj
Ethylbenzene	ND	ug/L		1.0		SW8260B	04/16/10 20:37 / jrj
Methyl ethyl ketone	ND	ug/L		20		SW8260B	04/16/10 20:37 / jrj
Methyl tert-butyl ether (MTBE)	ND	ug/L		1.0		SW8260B	04/16/10 20:37 / jrj
Methylene chloride	ND	ug/L		1.0		SW8260B	04/16/10 20:37 / jrj
Styrene	ND	ug/L		1.0		SW8260B	04/16/10 20:37 / jrj
1,1,1,2-Tetrachloroethane	ND	ug/L		1.0		SW8260B	04/16/10 20:37 / jrj
1,1,2,2-Tetrachloroethane	ND	ug/L		1.0		SW8260B	04/16/10 20:37 / jrj
Tetrachloroethene	ND	ug/L		1.0		SW8260B	04/16/10 20:37 / jrj
Toluene	ND	ug/L		1.0		SW8260B	04/16/10 20:37 / jrj
1,1,1-Trichloroethane	ND	ug/L		1.0		SW8260B	04/16/10 20:37 / jrj
1,1,2-Trichloroethane	ND	ug/L		1.0		SW8260B	04/16/10 20:37 / jrj

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Encana Oil and Gas USA Inc
Project: Tribal Pavillion 42-11 (VRP)
Lab ID: B10041311-007
Client Sample ID: Trip Blank Lot #032310, B-TS 0246

Report Date: 04/28/10
Collection Date: 04/12/10 15:20
DateReceived: 04/15/10
Matrix: Trip Blank

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
VOLATILE ORGANIC COMPOUNDS							
Trichloroethene	ND	ug/L		1.0		SW8260B	04/16/10 20:37 / jrj
Trichlorofluoromethane	ND	ug/L		1.0		SW8260B	04/16/10 20:37 / jrj
1,2,3-Trichloropropane	ND	ug/L		1.0		SW8260B	04/16/10 20:37 / jrj
Vinyl chloride	ND	ug/L		1.0		SW8260B	04/16/10 20:37 / jrj
m+p-Xylenes	ND	ug/L		1.0		SW8260B	04/16/10 20:37 / jrj
o-Xylene	ND	ug/L		1.0		SW8260B	04/16/10 20:37 / jrj
Xylenes, Total	ND	ug/L		1.0		SW8260B	04/16/10 20:37 / jrj
Surr: Dibromofluoromethane	99.0	%REC		77-126		SW8260B	04/16/10 20:37 / jrj
Surr: 1,2-Dichloroethane-d4	64.0	%REC	S	70-130		SW8260B	04/16/10 20:37 / jrj
Surr: Toluene-d8	97.0	%REC		79-122		SW8260B	04/16/10 20:37 / jrj
Surr: p-Bromofluorobenzene	96.0	%REC		76-127		SW8260B	04/16/10 20:37 / jrj

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
S - Spike recovery outside of advisory limits.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

QA/QC Summary Report

Client: Encana Oil and Gas USA Inc
Project: Tribal Pavillion 42-11 (VRP)

Report Date: 04/28/10
Work Order: B10041311

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW8260B									Batch: R146212
Sample ID: blk041610	Method Blank				Run: SV5972.I_100416A				04/16/10 13:11
Benzene	ND	ug/L	1.0						
Bromobenzene	ND	ug/L	1.0						
Bromochloromethane	ND	ug/L	1.0						
Bromodichloromethane	ND	ug/L	1.0						
Bromoform	ND	ug/L	1.0						
Bromomethane	ND	ug/L	1.0						
Carbon tetrachloride	ND	ug/L	1.0						
Chlorobenzene	ND	ug/L	1.0						
Chlorodibromomethane	ND	ug/L	1.0						
Chloroethane	ND	ug/L	1.0						
Chloroform	ND	ug/L	1.0						
Chloromethane	ND	ug/L	1.0						
2-Chloroethyl vinyl ether	ND	ug/L	1.0						
1,2-Dibromoethane	ND	ug/L	1.0						
2-Chlorotoluene	ND	ug/L	1.0						
Dibromomethane	ND	ug/L	1.0						
1,2-Dichlorobenzene	ND	ug/L	1.0						
4-Chlorotoluene	ND	ug/L	1.0						
1,3-Dichlorobenzene	ND	ug/L	1.0						
1,4-Dichlorobenzene	ND	ug/L	1.0						
Dichlorodifluoromethane	ND	ug/L	1.0						
1,1-Dichloroethane	ND	ug/L	1.0						
1,2-Dichloroethane	ND	ug/L	1.0						
1,1-Dichloroethene	ND	ug/L	1.0						
cis-1,2-Dichloroethene	ND	ug/L	1.0						
trans-1,2-Dichloroethene	ND	ug/L	1.0						
1,2-Dichloropropane	ND	ug/L	1.0						
1,3-Dichloropropane	ND	ug/L	1.0						
2,2-Dichloropropane	ND	ug/L	1.0						
1,1-Dichloropropene	ND	ug/L	1.0						
cis-1,3-Dichloropropene	ND	ug/L	1.0						
trans-1,3-Dichloropropene	ND	ug/L	1.0						
Ethylbenzene	ND	ug/L	1.0						
Methyl tert-butyl ether (MTBE)	ND	ug/L	1.0						
Methyl ethyl ketone	ND	ug/L	20						
Methylene chloride	ND	ug/L	1.0						
Styrene	ND	ug/L	1.0						
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0						
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0						
Tetrachloroethene	ND	ug/L	1.0						
Toluene	ND	ug/L	1.0						
1,1,1-Trichloroethane	ND	ug/L	1.0						
1,1,2-Trichloroethane	ND	ug/L	1.0						

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

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QA/QC Summary Report

Client: Encana Oil and Gas USA Inc
Project: Tribal Pavillion 42-11 (VRP)

Report Date: 04/28/10
Work Order: B10041311

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW8260B									Batch: R146212
Sample ID: blk041610	Method Blank				Run: SV5972.I_100416A				04/16/10 13:11
Trichloroethene	ND	ug/L	1.0						
Trichlorofluoromethane	ND	ug/L	1.0						
1,2,3-Trichloropropane	ND	ug/L	1.0						
Vinyl chloride	ND	ug/L	1.0						
m+p-Xylenes	ND	ug/L	1.0						
o-Xylene	ND	ug/L	1.0						
Xylenes, Total	ND	ug/L	1.0						
Surr: 1,2-Dichloroethane-d4			1.0	97	70	130			
Surr: Dibromofluoromethane			1.0	98	77	126			
Surr: p-Bromofluorobenzene			1.0	100	76	127			
Surr: Toluene-d8			1.0	98	79	122			
Sample ID: lcs041610	Laboratory Control Sample				Run: SV5972.I_100416A				04/16/10 12:14
Benzene	4.60	ug/L	1.0	92	71	133			
Bromobenzene	4.80	ug/L	1.0	96	78	133			
Bromochloromethane	4.56	ug/L	1.0	91	68	131			
Bromodichloromethane	4.60	ug/L	1.0	92	67	138			
Bromoform	4.56	ug/L	1.0	91	64	136			
Bromomethane	5.72	ug/L	1.0	114	60	138			
Carbon tetrachloride	3.94	ug/L	1.0	79	61	144			
Chlorobenzene	4.84	ug/L	1.0	97	78	136			
Chlorodibromomethane	4.80	ug/L	1.0	96	72	136			
Chloroethane	5.56	ug/L	1.0	111	64	136			
Chloroform	4.56	ug/L	1.0	91	69	133			
Chloromethane	5.36	ug/L	1.0	107	63	149			
2-Chloroethyl vinyl ether	5.16	ug/L	1.0	103	64	132			
1,2-Dibromoethane	4.76	ug/L	1.0	95	75	131			
2-Chlorotoluene	4.72	ug/L	1.0	94	74	135			
Dibromomethane	4.88	ug/L	1.0	98	72	133			
1,2-Dichlorobenzene	4.84	ug/L	1.0	97	78	129			
4-Chlorotoluene	4.88	ug/L	1.0	98	79	135			
1,3-Dichlorobenzene	4.84	ug/L	1.0	97	79	132			
1,4-Dichlorobenzene	4.80	ug/L	1.0	96	78	131			
Dichlorodifluoromethane	6.88	ug/L	1.0	138	55	141			
1,1-Dichloroethane	4.52	ug/L	1.0	90	72	130			
1,2-Dichloroethane	4.64	ug/L	1.0	93	57	146			
1,1-Dichloroethene	4.60	ug/L	1.0	92	66	142			
cis-1,2-Dichloroethene	4.68	ug/L	1.0	94	74	133			
trans-1,2-Dichloroethene	4.56	ug/L	1.0	91	76	138			
1,2-Dichloropropane	4.68	ug/L	1.0	94	72	135			
1,3-Dichloropropane	4.64	ug/L	1.0	93	75	134			
2,2-Dichloropropane	4.64	ug/L	1.0	93	42	167			
1,1-Dichloropropene	3.44	ug/L	1.0	69	72	140			S

Qualifiers:

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S - Spike recovery outside of advisory limits.

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QA/QC Summary Report

Client: Encana Oil and Gas USA Inc
Project: Tribal Pavillion 42-11 (VRP)

Report Date: 04/28/10
Work Order: B10041311

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW8260B									Batch: R146212
Sample ID: lcs041610	Laboratory Control Sample				Run: SV5972.I_100416A				04/16/10 12:14
cis-1,3-Dichloropropene	4.60	ug/L	1.0	92	75	132			
trans-1,3-Dichloropropene	5.00	ug/L	1.0	100	77	145			
Ethylbenzene	4.84	ug/L	1.0	97	78	131			
Methyl tert-butyl ether (MTBE)	4.80	ug/L	1.0	96	58	151			
Methyl ethyl ketone	48.0	ug/L	20	96	55	145			
Methylene chloride	4.24	ug/L	1.0	85	73	126			
Styrene	4.84	ug/L	1.0	97	76	134			
1,1,1,2-Tetrachloroethane	4.76	ug/L	1.0	95	75	135			
1,1,2,2-Tetrachloroethane	4.84	ug/L	1.0	97	72	132			
Tetrachloroethene	4.96	ug/L	1.0	99	78	137			
Toluene	4.76	ug/L	1.0	95	78	134			
1,1,1-Trichloroethane	4.16	ug/L	1.0	83	64	141			
1,1,2-Trichloroethane	4.68	ug/L	1.0	94	72	133			
Trichloroethene	4.72	ug/L	1.0	94	75	138			
Trichlorofluoromethane	5.48	ug/L	1.0	110	58	139			
1,2,3-Trichloropropane	4.32	ug/L	1.0	86	67	133			
Vinyl chloride	5.28	ug/L	1.0	106	66	140			
m+p-Xylenes	9.68	ug/L	1.0	97	78	133			
o-Xylene	4.88	ug/L	1.0	98	79	136			
Surr: 1,2-Dichloroethane-d4			1.0	95	70	130			
Surr: Dibromofluoromethane			1.0	97	77	126			
Surr: p-Bromofluorobenzene			1.0	98	76	127			
Surr: Toluene-d8			1.0	97	79	122			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Client: Encana Oil and Gas USA Inc
Project: Tribal Pavillion 42-11 (VRP)

Report Date: 04/28/10
Work Order: B10041311

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW8260B									Batch: R146325
Sample ID: blk041910	Method Blank				Run: 5971A.I_100419A				04/19/10 15:06
Benzene	ND	ug/L	0.50						
Bromobenzene	ND	ug/L	0.50						
Bromochloromethane	ND	ug/L	0.50						
Bromodichloromethane	ND	ug/L	0.50						
Bromoform	ND	ug/L	0.50						
Bromomethane	ND	ug/L	0.50						
Carbon tetrachloride	ND	ug/L	0.50						
Chlorobenzene	ND	ug/L	0.50						
Chlorodibromomethane	ND	ug/L	0.50						
Chloroethane	ND	ug/L	0.50						
Chloroform	ND	ug/L	0.50						
Chloromethane	ND	ug/L	0.50						
2-Chloroethyl vinyl ether	ND	ug/L	0.50						
1,2-Dibromoethane	ND	ug/L	0.50						
2-Chlorotoluene	ND	ug/L	0.50						
Dibromomethane	ND	ug/L	0.50						
1,2-Dichlorobenzene	ND	ug/L	0.50						
4-Chlorotoluene	ND	ug/L	0.50						
1,3-Dichlorobenzene	ND	ug/L	0.50						
1,4-Dichlorobenzene	ND	ug/L	0.50						
Dichlorodifluoromethane	ND	ug/L	0.50						
1,1-Dichloroethane	ND	ug/L	0.50						
1,2-Dichloroethane	ND	ug/L	0.50						
1,1-Dichloroethene	ND	ug/L	0.50						
cis-1,2-Dichloroethene	ND	ug/L	0.50						
trans-1,2-Dichloroethene	ND	ug/L	0.50						
1,2-Dichloropropane	ND	ug/L	0.50						
1,3-Dichloropropane	ND	ug/L	0.50						
2,2-Dichloropropane	ND	ug/L	0.50						
1,1-Dichloropropene	ND	ug/L	0.50						
cis-1,3-Dichloropropene	ND	ug/L	0.50						
trans-1,3-Dichloropropene	ND	ug/L	0.50						
Ethylbenzene	ND	ug/L	0.50						
Methyl tert-butyl ether (MTBE)	ND	ug/L	0.50						
Methyl ethyl ketone	ND	ug/L	10						
Methylene chloride	ND	ug/L	0.50						
Styrene	ND	ug/L	0.50						
1,1,1,2-Tetrachloroethane	ND	ug/L	0.50						
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50						
Tetrachloroethene	ND	ug/L	0.50						
Toluene	ND	ug/L	0.50						
1,1,1-Trichloroethane	ND	ug/L	0.50						
1,1,2-Trichloroethane	ND	ug/L	0.50						

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Client: Encana Oil and Gas USA Inc
Project: Tribal Pavillion 42-11 (VRP)

Report Date: 04/28/10
Work Order: B10041311

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW8260B									Batch: R146325
Sample ID: blk041910	Method Blank				Run: 5971A.I_100419A				04/19/10 15:06
Trichloroethene	ND	ug/L	0.50						
Trichlorofluoromethane	ND	ug/L	0.50						
1,2,3-Trichloropropane	ND	ug/L	0.50						
Vinyl chloride	ND	ug/L	0.50						
m+p-Xylenes	ND	ug/L	0.50						
o-Xylene	ND	ug/L	0.50						
Xylenes, Total	ND	ug/L	0.50						
Surr: 1,2-Dichloroethane-d4			0.50	100	70	130			
Surr: Dibromofluoromethane			0.50	102	77	126			
Surr: p-Bromofluorobenzene			0.50	104	76	127			
Surr: Toluene-d8			0.50	101	79	122			
Sample ID: lcs041910	Laboratory Control Sample				Run: 5971A.I_100419A				04/19/10 13:49
Benzene	5.56	ug/L	1.0	111	71	133			
Bromobenzene	5.56	ug/L	1.0	111	78	133			
Bromochloromethane	5.80	ug/L	1.0	116	68	131			
Bromodichloromethane	5.68	ug/L	1.0	114	67	138			
Bromoform	5.72	ug/L	1.0	114	64	136			
Bromomethane	6.64	ug/L	1.0	133	60	138			
Carbon tetrachloride	5.76	ug/L	1.0	115	61	144			
Chlorobenzene	5.72	ug/L	1.0	114	78	136			
Chlorodibromomethane	5.84	ug/L	1.0	117	72	136			
Chloroethane	6.12	ug/L	1.0	122	64	136			
Chloroform	5.60	ug/L	1.0	112	69	133			
Chloromethane	5.72	ug/L	1.0	114	63	149			
2-Chloroethyl vinyl ether	6.56	ug/L	1.0	131	64	132			
1,2-Dibromoethane	5.88	ug/L	1.0	118	75	131			
2-Chlorotoluene	5.64	ug/L	1.0	113	74	135			
Dibromomethane	6.00	ug/L	1.0	120	72	133			
1,2-Dichlorobenzene	5.84	ug/L	1.0	117	78	129			
4-Chlorotoluene	5.84	ug/L	1.0	117	79	135			
1,3-Dichlorobenzene	5.76	ug/L	1.0	115	79	132			
1,4-Dichlorobenzene	5.88	ug/L	1.0	118	78	131			
Dichlorodifluoromethane	6.84	ug/L	1.0	137	55	141			
1,1-Dichloroethane	5.44	ug/L	1.0	109	72	130			
1,2-Dichloroethane	5.76	ug/L	1.0	115	57	146			
1,1-Dichloroethene	5.52	ug/L	1.0	110	66	142			
cis-1,2-Dichloroethene	5.40	ug/L	1.0	108	74	133			
trans-1,2-Dichloroethene	5.08	ug/L	1.0	102	76	138			
1,2-Dichloropropane	5.48	ug/L	1.0	110	72	135			
1,3-Dichloropropane	5.60	ug/L	1.0	112	75	134			
2,2-Dichloropropane	5.84	ug/L	1.0	117	42	167			
1,1-Dichloropropene	5.60	ug/L	1.0	112	72	140			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Client: Encana Oil and Gas USA Inc
Project: Tribal Pavillion 42-11 (VRP)

Report Date: 04/28/10
Work Order: B10041311

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW8260B									Batch: R146325
Sample ID: lcs041910	Laboratory Control Sample				Run: 5971A.I_100419A				04/19/10 13:49
cis-1,3-Dichloropropene	5.72	ug/L	1.0	114	75	132			
trans-1,3-Dichloropropene	6.28	ug/L	1.0	126	77	145			
Ethylbenzene	5.60	ug/L	1.0	112	78	131			
Methyl tert-butyl ether (MTBE)	5.68	ug/L	1.0	114	58	151			
Methyl ethyl ketone	55.2	ug/L	20	110	55	145			
Methylene chloride	5.40	ug/L	1.0	108	73	126			
Styrene	5.80	ug/L	1.0	116	76	134			
1,1,1,2-Tetrachloroethane	5.92	ug/L	1.0	118	75	135			
1,1,2,2-Tetrachloroethane	5.48	ug/L	1.0	110	72	132			
Tetrachloroethene	6.04	ug/L	1.0	121	78	137			
Toluene	5.72	ug/L	1.0	114	78	134			
1,1,1-Trichloroethane	5.68	ug/L	1.0	114	64	141			
1,1,2-Trichloroethane	4.80	ug/L	1.0	96	72	133			
Trichloroethene	5.92	ug/L	1.0	118	75	138			
Trichlorofluoromethane	6.24	ug/L	1.0	125	58	139			
1,2,3-Trichloropropane	5.12	ug/L	1.0	102	67	133			
Vinyl chloride	5.80	ug/L	1.0	116	66	140			
m+p-Xylenes	11.8	ug/L	1.0	118	78	133			
o-Xylene	5.52	ug/L	1.0	110	79	136			
Surr: 1,2-Dichloroethane-d4			1.0	107	70	130			
Surr: Dibromofluoromethane			1.0	106	77	126			
Surr: p-Bromofluorobenzene			1.0	102	76	127			
Surr: Toluene-d8			1.0	107	79	122			
Sample ID: b10041163-002ams	Sample Matrix Spike				Run: 5971A.I_100419A				04/20/10 00:33
Benzene	52.8	ug/L	5.0	106	71	133			
Bromobenzene	51.6	ug/L	5.0	103	78	133			
Bromochloromethane	55.2	ug/L	5.0	110	68	131			
Bromodichloromethane	58.8	ug/L	5.0	118	67	138			
Bromoform	50.4	ug/L	5.0	101	64	136			
Bromomethane	64.0	ug/L	5.0	128	60	138			
Carbon tetrachloride	49.2	ug/L	5.0	98	61	144			
Chlorobenzene	54.8	ug/L	5.0	110	78	136			
Chlorodibromomethane	57.6	ug/L	5.0	115	72	136			
Chloroethane	58.8	ug/L	5.0	118	64	136			
Chloroform	54.8	ug/L	5.0	110	69	133			
Chloromethane	54.4	ug/L	5.0	109	63	149			
2-Chloroethyl vinyl ether	64.0	ug/L	5.0	128	64	132			
1,2-Dibromoethane	58.0	ug/L	5.0	116	75	131			
2-Chlorotoluene	56.0	ug/L	5.0	112	74	135			
Dibromomethane	60.4	ug/L	5.0	121	72	133			
1,2-Dichlorobenzene	54.0	ug/L	5.0	108	78	129			
4-Chlorotoluene	53.6	ug/L	5.0	107	79	135			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Client: Encana Oil and Gas USA Inc
Project: Tribal Pavillion 42-11 (VRP)

Report Date: 04/28/10
Work Order: B10041311

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW8260B									Batch: R146325
Sample ID: b10041163-002ams	Sample Matrix Spike				Run: 5971A.I_100419A				04/20/10 00:33
1,3-Dichlorobenzene	52.0	ug/L	5.0	104	79	132			
1,4-Dichlorobenzene	54.0	ug/L	5.0	108	78	131			
Dichlorodifluoromethane	61.2	ug/L	5.0	122	55	141			
1,1-Dichloroethane	51.6	ug/L	5.0	103	72	130			
1,2-Dichloroethane	56.0	ug/L	5.0	112	57	146			
1,1-Dichloroethene	51.2	ug/L	5.0	102	66	142			
cis-1,2-Dichloroethene	52.8	ug/L	5.0	106	74	133			
trans-1,2-Dichloroethene	50.4	ug/L	5.0	101	76	138			
1,2-Dichloropropane	56.0	ug/L	5.0	112	72	135			
1,3-Dichloropropane	59.2	ug/L	5.0	118	75	134			
2,2-Dichloropropane	45.2	ug/L	5.0	90	42	167			
1,1-Dichloropropene	52.0	ug/L	5.0	104	72	140			
cis-1,3-Dichloropropene	54.4	ug/L	5.0	109	75	132			
trans-1,3-Dichloropropene	60.0	ug/L	5.0	120	77	145			
Ethylbenzene	52.8	ug/L	5.0	106	78	131			
Methyl tert-butyl ether (MTBE)	53.2	ug/L	5.0	106	58	151			
Methyl ethyl ketone	492	ug/L	100	98	55	145			
Methylene chloride	54.0	ug/L	5.0	108	73	126			
Styrene	55.6	ug/L	5.0	111	76	134			
1,1,1,2-Tetrachloroethane	56.0	ug/L	5.0	112	75	135			
1,1,2,2-Tetrachloroethane	55.2	ug/L	5.0	110	72	132			
Tetrachloroethene	216	ug/L	5.0	125	78	137			
Toluene	56.4	ug/L	5.0	113	78	134			
1,1,1-Trichloroethane	53.2	ug/L	5.0	106	64	141			
1,1,2-Trichloroethane	49.6	ug/L	5.0	99	72	133			
Trichloroethene	56.0	ug/L	5.0	112	75	138			
Trichlorofluoromethane	54.8	ug/L	5.0	110	58	139			
1,2,3-Trichloropropane	48.0	ug/L	5.0	96	67	133			
Vinyl chloride	53.2	ug/L	5.0	106	66	140			
m+p-Xylenes	111	ug/L	5.0	111	78	133			
o-Xylene	53.6	ug/L	5.0	107	79	136			
Surr: 1,2-Dichloroethane-d4			5.0	105	70	130			
Surr: Dibromofluoromethane			5.0	105	77	126			
Surr: p-Bromofluorobenzene			5.0	102	76	127			
Surr: Toluene-d8			5.0	110	79	122			
Sample ID: b10041163-002amsd	Sample Matrix Spike Duplicate				Run: 5971A.I_100419A				04/20/10 01:08
Benzene	56.0	ug/L	5.0	112	71	133	5.9	20	
Bromobenzene	55.2	ug/L	5.0	110	78	133	6.7	20	
Bromochloromethane	56.0	ug/L	5.0	112	68	131	1.4	20	
Bromodichloromethane	59.2	ug/L	5.0	118	67	138	0.7	20	
Bromoform	52.0	ug/L	5.0	104	64	136	3.1	20	
Bromomethane	65.6	ug/L	5.0	131	60	138	2.5	20	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Client: Encana Oil and Gas USA Inc
Project: Tribal Pavillion 42-11 (VRP)

Report Date: 04/28/10
Work Order: B10041311

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW8260B								Batch: R146325	
Sample ID: b10041163-002amsd	Sample Matrix Spike Duplicate				Run: 5971A.I_100419A			04/20/10 01:08	
Carbon tetrachloride	54.0	ug/L	5.0	108	61	144	9.3	20	
Chlorobenzene	57.6	ug/L	5.0	115	78	136	5	20	
Chlorodibromomethane	58.8	ug/L	5.0	118	72	136	2.1	20	
Chloroethane	63.2	ug/L	5.0	126	64	136	7.2	20	
Chloroform	56.0	ug/L	5.0	112	69	133	2.2	20	
Chloromethane	57.2	ug/L	5.0	114	63	149	5	20	
2-Chloroethyl vinyl ether	118	ug/L	5.0	235	64	132	59	20	SR
1,2-Dibromoethane	57.6	ug/L	5.0	115	75	131	0.7	20	
2-Chlorotoluene	56.4	ug/L	5.0	113	74	135	0.7	20	
Dibromomethane	59.2	ug/L	5.0	118	72	133	2	20	
1,2-Dichlorobenzene	57.6	ug/L	5.0	115	78	129	6.5	20	
4-Chlorotoluene	56.0	ug/L	5.0	112	79	135	4.4	20	
1,3-Dichlorobenzene	56.4	ug/L	5.0	113	79	132	8.1	20	
1,4-Dichlorobenzene	57.6	ug/L	5.0	115	78	131	6.5	20	
Dichlorodifluoromethane	59.6	ug/L	5.0	119	55	141	2.6	20	
1,1-Dichloroethane	55.2	ug/L	5.0	110	72	130	6.7	20	
1,2-Dichloroethane	56.0	ug/L	5.0	112	57	146	0	20	
1,1-Dichloroethene	53.6	ug/L	5.0	107	66	142	4.6	20	
cis-1,2-Dichloroethene	56.0	ug/L	5.0	112	74	133	5.9	20	
trans-1,2-Dichloroethene	52.4	ug/L	5.0	105	76	138	3.9	20	
1,2-Dichloropropane	56.0	ug/L	5.0	112	72	135	0	20	
1,3-Dichloropropane	59.2	ug/L	5.0	118	75	134	0	20	
2,2-Dichloropropane	48.0	ug/L	5.0	96	42	167	6	20	
1,1-Dichloropropene	56.4	ug/L	5.0	113	72	140	8.1	20	
cis-1,3-Dichloropropene	56.4	ug/L	5.0	113	75	132	3.6	20	
trans-1,3-Dichloropropene	56.4	ug/L	5.0	113	77	145	6.2	20	
Ethylbenzene	56.8	ug/L	5.0	114	78	131	7.3	20	
Methyl tert-butyl ether (MTBE)	52.4	ug/L	5.0	105	58	151	1.5	20	
Methyl ethyl ketone	520	ug/L	100	104	55	145	5.5	20	
Methylene chloride	56.0	ug/L	5.0	112	73	126	3.6	20	
Styrene	58.0	ug/L	5.0	116	76	134	4.2	20	
1,1,1,2-Tetrachloroethane	58.8	ug/L	5.0	118	75	135	4.9	20	
1,1,2,2-Tetrachloroethane	55.2	ug/L	5.0	110	72	132	0	20	
Tetrachloroethene	228	ug/L	5.0	148	78	137	5.2	20	S
Toluene	57.6	ug/L	5.0	115	78	134	2.1	20	
1,1,1-Trichloroethane	56.8	ug/L	5.0	114	64	141	6.5	20	
1,1,2-Trichloroethane	52.0	ug/L	5.0	104	72	133	4.7	20	
Trichloroethene	58.4	ug/L	5.0	117	75	138	4.2	20	
Trichlorofluoromethane	58.0	ug/L	5.0	116	58	139	5.7	20	
1,2,3-Trichloropropane	50.0	ug/L	5.0	100	67	133	4.1	20	
Vinyl chloride	56.8	ug/L	5.0	114	66	140	6.5	20	
m+p-Xylenes	119	ug/L	5.0	119	78	133	6.6	20	
o-Xylene	57.6	ug/L	5.0	115	79	136	7.2	20	

Qualifiers:

RL - Analyte reporting limit.
R - RPD exceeds advisory limit.
ND - Not detected at the reporting limit.
S - Spike recovery outside of advisory limits.

ENERGY LABORATORIES, INC. * 1120 S 27th St * PO Box 30916 * Billings, MT 59107-0916
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QA/QC Summary Report

Client: Encana Oil and Gas USA Inc
Project: Tribal Pavillion 42-11 (VRP)

Report Date: 04/28/10
Work Order: B10041311

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW8260B									Batch: R146325
Sample ID: b10041163-002amsd	Sample Matrix Spike Duplicate				Run: 5971A.I_100419A				04/20/10 01:08
Surr: 1,2-Dichloroethane-d4			5.0	105	70	130			
Surr: Dibromofluoromethane			5.0	104	77	126			
Surr: p-Bromofluorobenzene			5.0	102	76	127			
Surr: Toluene-d8			5.0	108	79	122			

Qualifiers:
RL - Analyte reporting limit.
ND - Not detected at the reporting limit.

QA/QC Summary Report

Client: Encana Oil and Gas USA Inc
Project: Tribal Pavillion 42-11 (VRP)

Report Date: 04/28/10
Work Order: B10041311

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW8260B									Batch: R146356
Sample ID: blk042010	Method Blank				Run: 5971A.I_100420A				04/20/10 11:14
Benzene	ND	ug/L	1.0						
Bromobenzene	ND	ug/L	1.0						
Bromochloromethane	ND	ug/L	1.0						
Bromodichloromethane	ND	ug/L	1.0						
Bromoform	ND	ug/L	1.0						
Bromomethane	ND	ug/L	1.0						
Carbon tetrachloride	ND	ug/L	1.0						
Chlorobenzene	ND	ug/L	1.0						
Chlorodibromomethane	ND	ug/L	1.0						
Chloroethane	ND	ug/L	1.0						
Chloroform	ND	ug/L	1.0						
Chloromethane	ND	ug/L	1.0						
2-Chloroethyl vinyl ether	ND	ug/L	1.0						
1,2-Dibromoethane	ND	ug/L	1.0						
2-Chlorotoluene	ND	ug/L	1.0						
Dibromomethane	ND	ug/L	1.0						
1,2-Dichlorobenzene	ND	ug/L	1.0						
4-Chlorotoluene	ND	ug/L	1.0						
1,3-Dichlorobenzene	ND	ug/L	1.0						
1,4-Dichlorobenzene	ND	ug/L	1.0						
Dichlorodifluoromethane	ND	ug/L	1.0						
1,1-Dichloroethane	ND	ug/L	1.0						
1,2-Dichloroethane	ND	ug/L	1.0						
1,1-Dichloroethene	ND	ug/L	1.0						
cis-1,2-Dichloroethene	ND	ug/L	1.0						
trans-1,2-Dichloroethene	ND	ug/L	1.0						
1,2-Dichloropropane	ND	ug/L	1.0						
1,3-Dichloropropane	ND	ug/L	1.0						
2,2-Dichloropropane	ND	ug/L	1.0						
1,1-Dichloropropene	ND	ug/L	1.0						
cis-1,3-Dichloropropene	ND	ug/L	1.0						
trans-1,3-Dichloropropene	ND	ug/L	1.0						
Ethylbenzene	ND	ug/L	1.0						
Methyl tert-butyl ether (MTBE)	ND	ug/L	1.0						
Methyl ethyl ketone	ND	ug/L	20						
Methylene chloride	ND	ug/L	1.0						
Styrene	ND	ug/L	1.0						
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0						
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0						
Tetrachloroethene	ND	ug/L	1.0						
Toluene	ND	ug/L	1.0						
1,1,1-Trichloroethane	ND	ug/L	1.0						
1,1,2-Trichloroethane	ND	ug/L	1.0						

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Client: Encana Oil and Gas USA Inc
Project: Tribal Pavillion 42-11 (VRP)

Report Date: 04/28/10
Work Order: B10041311

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW8260B									Batch: R146356
Sample ID: blk042010	Method Blank				Run: 5971A.I_100420A				04/20/10 11:14
Trichloroethene	ND	ug/L	1.0						
Trichlorofluoromethane	ND	ug/L	1.0						
1,2,3-Trichloropropane	ND	ug/L	1.0						
Vinyl chloride	ND	ug/L	1.0						
m+p-Xylenes	ND	ug/L	1.0						
o-Xylene	ND	ug/L	1.0						
Xylenes, Total	ND	ug/L	1.0						
Surr: 1,2-Dichloroethane-d4			1.0	101	70	130			
Surr: Dibromofluoromethane			1.0	101	77	126			
Surr: p-Bromofluorobenzene			1.0	107	76	127			
Surr: Toluene-d8			1.0	102	79	122			
Sample ID: lcs042010	Laboratory Control Sample				Run: 5971A.I_100420A				04/20/10 10:02
Benzene	5.20	ug/L	1.0	104	71	133			
Bromobenzene	5.08	ug/L	1.0	102	78	133			
Bromochloromethane	5.24	ug/L	1.0	105	68	131			
Bromodichloromethane	5.16	ug/L	1.0	103	67	138			
Bromoform	4.48	ug/L	1.0	90	64	136			
Bromomethane	6.60	ug/L	1.0	132	60	138			
Carbon tetrachloride	5.00	ug/L	1.0	100	61	144			
Chlorobenzene	5.12	ug/L	1.0	102	78	136			
Chlorodibromomethane	5.04	ug/L	1.0	101	72	136			
Chloroethane	6.16	ug/L	1.0	123	64	136			
Chloroform	5.20	ug/L	1.0	104	69	133			
Chloromethane	5.76	ug/L	1.0	115	63	149			
2-Chloroethyl vinyl ether	5.84	ug/L	1.0	117	64	132			
1,2-Dibromoethane	5.12	ug/L	1.0	102	75	131			
2-Chlorotoluene	5.56	ug/L	1.0	111	74	135			
Dibromomethane	5.28	ug/L	1.0	106	72	133			
1,2-Dichlorobenzene	5.20	ug/L	1.0	104	78	129			
4-Chlorotoluene	5.52	ug/L	1.0	110	79	135			
1,3-Dichlorobenzene	5.20	ug/L	1.0	104	79	132			
1,4-Dichlorobenzene	5.28	ug/L	1.0	106	78	131			
Dichlorodifluoromethane	6.92	ug/L	1.0	138	55	141			
1,1-Dichloroethane	4.84	ug/L	1.0	97	72	130			
1,2-Dichloroethane	5.20	ug/L	1.0	104	57	146			
1,1-Dichloroethene	5.20	ug/L	1.0	104	66	142			
cis-1,2-Dichloroethene	5.00	ug/L	1.0	100	74	133			
trans-1,2-Dichloroethene	4.92	ug/L	1.0	98	76	138			
1,2-Dichloropropane	5.00	ug/L	1.0	100	72	135			
1,3-Dichloropropane	5.20	ug/L	1.0	104	75	134			
2,2-Dichloropropane	5.28	ug/L	1.0	106	42	167			
1,1-Dichloropropene	5.32	ug/L	1.0	106	72	140			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

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QA/QC Summary Report

Client: Encana Oil and Gas USA Inc
Project: Tribal Pavillion 42-11 (VRP)

Report Date: 04/28/10
Work Order: B10041311

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW8260B									Batch: R146356
Sample ID: lcs042010	Laboratory Control Sample				Run: 5971A.I_100420A				04/20/10 10:02
cis-1,3-Dichloropropene	5.20	ug/L	1.0	104	75	132			
trans-1,3-Dichloropropene	5.80	ug/L	1.0	116	77	145			
Ethylbenzene	5.20	ug/L	1.0	104	78	131			
Methyl tert-butyl ether (MTBE)	4.88	ug/L	1.0	98	58	151			
Methyl ethyl ketone	50.0	ug/L	20	100	55	145			
Methylene chloride	5.00	ug/L	1.0	100	73	126			
Styrene	5.28	ug/L	1.0	106	76	134			
1,1,1,2-Tetrachloroethane	5.24	ug/L	1.0	105	75	135			
1,1,2,2-Tetrachloroethane	5.04	ug/L	1.0	101	72	132			
Tetrachloroethene	5.36	ug/L	1.0	107	78	137			
Toluene	5.32	ug/L	1.0	106	78	134			
1,1,1-Trichloroethane	5.04	ug/L	1.0	101	64	141			
1,1,2-Trichloroethane	4.96	ug/L	1.0	99	72	133			
Trichloroethene	5.04	ug/L	1.0	101	75	138			
Trichlorofluoromethane	6.16	ug/L	1.0	123	58	139			
1,2,3-Trichloropropane	4.32	ug/L	1.0	86	67	133			
Vinyl chloride	5.64	ug/L	1.0	113	66	140			
m+p-Xylenes	10.8	ug/L	1.0	108	78	133			
o-Xylene	5.04	ug/L	1.0	101	79	136			
Surr: 1,2-Dichloroethane-d4			1.0	103	70	130			
Surr: Dibromofluoromethane			1.0	101	77	126			
Surr: p-Bromofluorobenzene			1.0	104	76	127			
Surr: Toluene-d8			1.0	106	79	122			
Sample ID: b10041311-002cms	Sample Matrix Spike				Run: 5971A.I_100420A				04/20/10 21:18
Benzene	16.3	ug/L	2.0	88	71	133			
Bromobenzene	8.96	ug/L	2.0	90	78	133			
Bromochloromethane	9.04	ug/L	2.0	90	68	131			
Bromodichloromethane	12.6	ug/L	2.0	126	67	138			
Bromoform	7.58	ug/L	2.0	76	64	136			
Bromomethane	7.90	ug/L	2.0	79	60	138			
Carbon tetrachloride	7.66	ug/L	2.0	77	61	144			
Chlorobenzene	9.04	ug/L	2.0	90	78	136			
Chlorodibromomethane	8.96	ug/L	2.0	90	72	136			
Chloroethane	11.9	ug/L	2.0	119	64	136			
Chloroform	31.4	ug/L	2.0	314	69	133			S
Chloromethane	10.4	ug/L	2.0	104	63	149			
2-Chloroethyl vinyl ether	9.92	ug/L	2.0	99	64	132			
1,2-Dibromoethane	8.96	ug/L	2.0	90	75	131			
2-Chlorotoluene	10.2	ug/L	2.0	102	74	135			
Dibromomethane	9.36	ug/L	2.0	94	72	133			
1,2-Dichlorobenzene	8.80	ug/L	2.0	88	78	129			
4-Chlorotoluene	9.04	ug/L	2.0	90	79	135			

Qualifiers:

RL - Analyte reporting limit.
ND - Not detected at the reporting limit.
S - Spike recovery outside of advisory limits.

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QA/QC Summary Report

Client: Encana Oil and Gas USA Inc
Project: Tribal Pavillion 42-11 (VRP)

Report Date: 04/28/10
Work Order: B10041311

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW8260B									Batch: R146356
Sample ID: b10041311-002cms	Sample Matrix Spike				Run: 5971A.I_100420A			04/20/10 21:18	
1,3-Dichlorobenzene	8.48	ug/L	2.0	85	79	132			
1,4-Dichlorobenzene	8.80	ug/L	2.0	88	78	131			
Dichlorodifluoromethane	12.5	ug/L	2.0	125	55	141			
1,1-Dichloroethane	8.24	ug/L	2.0	82	72	130			
1,2-Dichloroethane	8.32	ug/L	2.0	83	57	146			
1,1-Dichloroethene	7.62	ug/L	2.0	76	66	142			
cis-1,2-Dichloroethene	8.80	ug/L	2.0	88	74	133			
trans-1,2-Dichloroethene	8.16	ug/L	2.0	82	76	138			
1,2-Dichloropropane	8.80	ug/L	2.0	88	72	135			
1,3-Dichloropropane	9.36	ug/L	2.0	94	75	134			
2,2-Dichloropropane	7.57	ug/L	2.0	76	42	167			
1,1-Dichloropropene	8.56	ug/L	2.0	86	72	140			
cis-1,3-Dichloropropene	8.80	ug/L	2.0	88	75	132			
trans-1,3-Dichloropropene	9.04	ug/L	2.0	90	77	145			
Ethylbenzene	31.8	ug/L	2.0	90	78	131			
Methyl tert-butyl ether (MTBE)	9.20	ug/L	2.0	92	58	151			
Methyl ethyl ketone	92.8	ug/L	40	93	55	145			
Methylene chloride	8.32	ug/L	2.0	83	73	126			
Styrene	8.88	ug/L	2.0	89	76	134			
1,1,1,2-Tetrachloroethane	8.48	ug/L	2.0	85	75	135			
1,1,2,2-Tetrachloroethane	8.48	ug/L	2.0	85	72	132			
Tetrachloroethene	8.64	ug/L	2.0	86	78	137			
Toluene	9.52	ug/L	2.0	95	78	134			
1,1,1-Trichloroethane	7.94	ug/L	2.0	79	64	141			
1,1,2-Trichloroethane	11.7	ug/L	2.0	117	72	133			
Trichloroethene	8.88	ug/L	2.0	89	75	138			
Trichlorofluoromethane	10.9	ug/L	2.0	109	58	139			
1,2,3-Trichloropropane	10.7	ug/L	2.0	107	67	133			
Vinyl chloride	10.3	ug/L	2.0	103	66	140			
m+p-Xylenes	50.6	ug/L	2.0	90	78	133			
o-Xylene	7.97	ug/L	2.0	80	79	136			
Surr: 1,2-Dichloroethane-d4			2.0	93	70	130			
Surr: Dibromofluoromethane			2.0	99	77	126			
Surr: p-Bromofluorobenzene			2.0	95	76	127			
Surr: Toluene-d8			2.0	114	79	122			
Sample ID: b10041311-002cmsd	Sample Matrix Spike Duplicate				Run: 5971A.I_100420A			04/20/10 21:56	
Benzene	18.1	ug/L	2.0	106	71	133	10	20	
Bromobenzene	10.8	ug/L	2.0	108	78	133	19	20	
Bromochloromethane	10.6	ug/L	2.0	106	68	131	16	20	
Bromodichloromethane	14.4	ug/L	2.0	144	67	138	14	20	S
Bromoform	9.44	ug/L	2.0	94	64	136	22	20	R
Bromomethane	6.92	ug/L	2.0	69	60	138	13	20	

Qualifiers:

RL - Analyte reporting limit.
ND - Not detected at the reporting limit.
R - RPD exceeds advisory limit.
S - Spike recovery outside of advisory limits.

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QA/QC Summary Report

Client: Encana Oil and Gas USA Inc
Project: Tribal Pavillion 42-11 (VRP)

Report Date: 04/28/10
Work Order: B10041311

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW8260B								Batch: R146356	
Sample ID: b10041311-002cmsd	Sample Matrix Spike Duplicate				Run: 5971A.I_100420A			04/20/10 21:56	
Carbon tetrachloride	9.44	ug/L	2.0	94	61	144	21	20	R
Chlorobenzene	11.0	ug/L	2.0	110	78	136	20	20	
Chlorodibromomethane	10.8	ug/L	2.0	108	72	136	19	20	
Chloroethane	9.68	ug/L	2.0	97	64	136	21	20	R
Chloroform	31.9	ug/L	2.0	319	69	133	1.5	20	S
Chloromethane	9.28	ug/L	2.0	93	63	149	11	20	
2-Chloroethyl vinyl ether	10.1	ug/L	2.0	101	64	132	1.6	20	
1,2-Dibromoethane	11.0	ug/L	2.0	110	75	131	21	20	R
2-Chlorotoluene	12.3	ug/L	2.0	123	74	135	18	20	
Dibromomethane	11.6	ug/L	2.0	116	72	133	21	20	R
1,2-Dichlorobenzene	11.0	ug/L	2.0	110	78	129	23	20	R
4-Chlorotoluene	11.1	ug/L	2.0	111	79	135	21	20	R
1,3-Dichlorobenzene	10.6	ug/L	2.0	106	79	132	22	20	R
1,4-Dichlorobenzene	11.0	ug/L	2.0	110	78	131	22	20	R
Dichlorodifluoromethane	9.76	ug/L	2.0	98	55	141	24	20	R
1,1-Dichloroethane	10.2	ug/L	2.0	102	72	130	21	20	R
1,2-Dichloroethane	10.3	ug/L	2.0	103	57	146	21	20	R
1,1-Dichloroethene	9.68	ug/L	2.0	97	66	142	24	20	R
cis-1,2-Dichloroethene	10.7	ug/L	2.0	107	74	133	20	20	
trans-1,2-Dichloroethene	10.1	ug/L	2.0	101	76	138	21	20	R
1,2-Dichloropropane	11.2	ug/L	2.0	112	72	135	24	20	R
1,3-Dichloropropane	11.7	ug/L	2.0	117	75	134	22	20	R
2,2-Dichloropropane	8.96	ug/L	2.0	90	42	167	17	20	
1,1-Dichloropropene	10.5	ug/L	2.0	105	72	140	20	20	R
cis-1,3-Dichloropropene	11.0	ug/L	2.0	110	75	132	22	20	R
trans-1,3-Dichloropropene	11.4	ug/L	2.0	114	77	145	23	20	R
Ethylbenzene	33.8	ug/L	2.0	111	78	131	6.3	20	
Methyl tert-butyl ether (MTBE)	9.36	ug/L	2.0	94	58	151	1.7	20	
Methyl ethyl ketone	100	ug/L	40	100	55	145	7.5	20	
Methylene chloride	10.2	ug/L	2.0	102	73	126	21	20	R
Styrene	11.0	ug/L	2.0	110	76	134	21	20	R
1,1,1,2-Tetrachloroethane	10.7	ug/L	2.0	107	75	135	23	20	R
1,1,2,2-Tetrachloroethane	11.0	ug/L	2.0	110	72	132	26	20	R
Tetrachloroethene	10.9	ug/L	2.0	109	78	137	23	20	R
Toluene	11.8	ug/L	2.0	118	78	134	22	20	R
1,1,1-Trichloroethane	9.84	ug/L	2.0	98	64	141	21	20	R
1,1,2-Trichloroethane	13.0	ug/L	2.0	130	72	133	11	20	
Trichloroethene	11.3	ug/L	2.0	113	75	138	24	20	R
Trichlorofluoromethane	8.64	ug/L	2.0	86	58	139	23	20	R
1,2,3-Trichloropropane	9.76	ug/L	2.0	98	67	133	9.4	20	
Vinyl chloride	8.32	ug/L	2.0	83	66	140	21	20	R
m+p-Xylenes	55.1	ug/L	2.0	113	78	133	8.6	20	
o-Xylene	10.0	ug/L	2.0	100	79	136	23	20	R

Qualifiers:

RL - Analyte reporting limit.
ND - Not detected at the reporting limit.
R - RPD exceeds advisory limit.
S - Spike recovery outside of advisory limits.

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QA/QC Summary Report

Client: Encana Oil and Gas USA Inc
Project: Tribal Pavillion 42-11 (VRP)

Report Date: 04/28/10
Work Order: B10041311

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW8260B									Batch: R146356
Sample ID: b10041311-002cmsd	Sample Matrix Spike Duplicate				Run: 5971A.I_100420A				04/20/10 21:56
Surr: 1,2-Dichloroethane-d4			2.0	96	70	130			
Surr: Dibromofluoromethane			2.0	99	77	126			
Surr: p-Bromofluorobenzene			2.0	100	76	127			
Surr: Toluene-d8			2.0	116	79	122			

Qualifiers:
RL - Analyte reporting limit.
ND - Not detected at the reporting limit.

QA/QC Summary Report

Client: Encana Oil and Gas USA Inc
Project: Tribal Pavillion 42-11 (VRP)

Report Date: 04/28/10
Work Order: B10041311

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW8260B									Batch: R146439
Sample ID: blk042110	Method Blank				Run: 5971A.I_100421A				04/21/10 11:27
Benzene	ND	ug/L	1.0						
Bromobenzene	ND	ug/L	1.0						
Bromochloromethane	ND	ug/L	1.0						
Bromodichloromethane	ND	ug/L	1.0						
Bromoform	ND	ug/L	1.0						
Bromomethane	ND	ug/L	1.0						
Carbon tetrachloride	ND	ug/L	1.0						
Chlorobenzene	ND	ug/L	1.0						
Chlorodibromomethane	ND	ug/L	1.0						
Chloroethane	ND	ug/L	1.0						
Chloroform	ND	ug/L	1.0						
Chloromethane	ND	ug/L	1.0						
2-Chloroethyl vinyl ether	ND	ug/L	1.0						
1,2-Dibromoethane	ND	ug/L	1.0						
2-Chlorotoluene	ND	ug/L	1.0						
Dibromomethane	ND	ug/L	1.0						
1,2-Dichlorobenzene	ND	ug/L	1.0						
4-Chlorotoluene	ND	ug/L	1.0						
1,3-Dichlorobenzene	ND	ug/L	1.0						
1,4-Dichlorobenzene	ND	ug/L	1.0						
Dichlorodifluoromethane	ND	ug/L	1.0						
1,1-Dichloroethane	ND	ug/L	1.0						
1,2-Dichloroethane	ND	ug/L	1.0						
1,1-Dichloroethene	ND	ug/L	1.0						
cis-1,2-Dichloroethene	ND	ug/L	1.0						
trans-1,2-Dichloroethene	ND	ug/L	1.0						
1,2-Dichloropropane	ND	ug/L	1.0						
1,3-Dichloropropane	ND	ug/L	1.0						
2,2-Dichloropropane	ND	ug/L	1.0						
1,1-Dichloropropene	ND	ug/L	1.0						
cis-1,3-Dichloropropene	ND	ug/L	1.0						
trans-1,3-Dichloropropene	ND	ug/L	1.0						
Ethylbenzene	ND	ug/L	1.0						
Methyl tert-butyl ether (MTBE)	ND	ug/L	1.0						
Methyl ethyl ketone	ND	ug/L	20						
Methylene chloride	ND	ug/L	1.0						
Styrene	ND	ug/L	1.0						
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0						
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0						
Tetrachloroethene	ND	ug/L	1.0						
Toluene	ND	ug/L	1.0						
1,1,1-Trichloroethane	ND	ug/L	1.0						
1,1,2-Trichloroethane	ND	ug/L	1.0						

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Client: Encana Oil and Gas USA Inc
Project: Tribal Pavillion 42-11 (VRP)

Report Date: 04/28/10
Work Order: B10041311

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW8260B									Batch: R146439
Sample ID: blk042110	Method Blank				Run: 5971A.I_100421A				04/21/10 11:27
Trichloroethene	ND	ug/L	1.0						
Trichlorofluoromethane	ND	ug/L	1.0						
1,2,3-Trichloropropane	ND	ug/L	1.0						
Vinyl chloride	ND	ug/L	1.0						
m+p-Xylenes	ND	ug/L	1.0						
o-Xylene	ND	ug/L	1.0						
Xylenes, Total	ND	ug/L	1.0						
Surr: 1,2-Dichloroethane-d4			1.0	91	70	130			
Surr: Dibromofluoromethane			1.0	97	77	126			
Surr: p-Bromofluorobenzene			1.0	104	76	127			
Surr: Toluene-d8			1.0	103	79	122			
Sample ID: lcs042110	Laboratory Control Sample				Run: 5971A.I_100421A				04/21/10 10:09
Benzene	4.96	ug/L	1.0	99	71	133			
Bromobenzene	4.88	ug/L	1.0	98	78	133			
Bromochloromethane	5.04	ug/L	1.0	101	68	131			
Bromodichloromethane	4.92	ug/L	1.0	98	67	138			
Bromoform	4.40	ug/L	1.0	88	64	136			
Bromomethane	5.60	ug/L	1.0	112	60	138			
Carbon tetrachloride	4.48	ug/L	1.0	90	61	144			
Chlorobenzene	5.28	ug/L	1.0	106	78	136			
Chlorodibromomethane	4.96	ug/L	1.0	99	72	136			
Chloroethane	6.08	ug/L	1.0	122	64	136			
Chloroform	4.72	ug/L	1.0	94	69	133			
Chloromethane	5.52	ug/L	1.0	110	63	149			
2-Chloroethyl vinyl ether	6.04	ug/L	1.0	121	64	132			
1,2-Dibromoethane	5.08	ug/L	1.0	102	75	131			
2-Chlorotoluene	5.16	ug/L	1.0	103	74	135			
Dibromomethane	5.00	ug/L	1.0	100	72	133			
1,2-Dichlorobenzene	5.04	ug/L	1.0	101	78	129			
4-Chlorotoluene	5.12	ug/L	1.0	102	79	135			
1,3-Dichlorobenzene	5.04	ug/L	1.0	101	79	132			
1,4-Dichlorobenzene	5.08	ug/L	1.0	102	78	131			
Dichlorodifluoromethane	6.00	ug/L	1.0	120	55	141			
1,1-Dichloroethane	4.72	ug/L	1.0	94	72	130			
1,2-Dichloroethane	4.60	ug/L	1.0	92	57	146			
1,1-Dichloroethene	4.56	ug/L	1.0	91	66	142			
cis-1,2-Dichloroethene	4.88	ug/L	1.0	98	74	133			
trans-1,2-Dichloroethene	4.40	ug/L	1.0	88	76	138			
1,2-Dichloropropane	4.92	ug/L	1.0	98	72	135			
1,3-Dichloropropane	5.36	ug/L	1.0	107	75	134			
2,2-Dichloropropane	4.80	ug/L	1.0	96	42	167			
1,1-Dichloropropene	4.92	ug/L	1.0	98	72	140			

Qualifiers:

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ND - Not detected at the reporting limit.

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QA/QC Summary Report

Client: Encana Oil and Gas USA Inc
Project: Tribal Pavillion 42-11 (VRP)

Report Date: 04/28/10
Work Order: B10041311

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW8260B									Batch: R146439
Sample ID: lcs042110	Laboratory Control Sample				Run: 5971A.I_100421A				04/21/10 10:09
cis-1,3-Dichloropropene	5.16	ug/L	1.0	103	75	132			
trans-1,3-Dichloropropene	5.16	ug/L	1.0	103	77	145			
Ethylbenzene	5.12	ug/L	1.0	102	78	131			
Methyl tert-butyl ether (MTBE)	5.20	ug/L	1.0	104	58	151			
Methyl ethyl ketone	55.6	ug/L	20	111	55	145			
Methylene chloride	4.52	ug/L	1.0	90	73	126			
Styrene	5.20	ug/L	1.0	104	76	134			
1,1,1,2-Tetrachloroethane	4.96	ug/L	1.0	99	75	135			
1,1,2,2-Tetrachloroethane	5.12	ug/L	1.0	102	72	132			
Tetrachloroethene	5.04	ug/L	1.0	101	78	137			
Toluene	5.20	ug/L	1.0	104	78	134			
1,1,1-Trichloroethane	4.64	ug/L	1.0	93	64	141			
1,1,2-Trichloroethane	5.16	ug/L	1.0	103	72	133			
Trichloroethene	5.16	ug/L	1.0	103	75	138			
Trichlorofluoromethane	5.48	ug/L	1.0	110	58	139			
1,2,3-Trichloropropane	4.56	ug/L	1.0	91	67	133			
Vinyl chloride	5.28	ug/L	1.0	106	66	140			
m+p-Xylenes	10.5	ug/L	1.0	105	78	133			
o-Xylene	4.96	ug/L	1.0	99	79	136			
Surr: 1,2-Dichloroethane-d4			1.0	96	70	130			
Surr: Dibromofluoromethane			1.0	98	77	126			
Surr: p-Bromofluorobenzene			1.0	104	76	127			
Surr: Toluene-d8			1.0	112	79	122			
Sample ID: b10041795-001dms	Sample Matrix Spike				Run: 5971A.I_100421A				04/21/10 21:17
Benzene	5.48	ug/L	1.0	110	71	133			
Bromobenzene	5.04	ug/L	1.0	101	78	133			
Bromochloromethane	5.44	ug/L	1.0	109	68	131			
Bromodichloromethane	5.20	ug/L	1.0	104	67	138			
Bromoform	4.28	ug/L	1.0	86	64	136			
Bromomethane	4.24	ug/L	1.0	85	60	138			
Carbon tetrachloride	4.44	ug/L	1.0	89	61	144			
Chlorobenzene	5.56	ug/L	1.0	111	78	136			
Chlorodibromomethane	4.88	ug/L	1.0	98	72	136			
Chloroethane	4.72	ug/L	1.0	94	64	136			
Chloroform	5.04	ug/L	1.0	101	69	133			
Chloromethane	4.60	ug/L	1.0	92	63	149			
2-Chloroethyl vinyl ether	ND	ug/L	1.0		64	132			S
1,2-Dibromoethane	5.52	ug/L	1.0	110	75	131			
2-Chlorotoluene	5.48	ug/L	1.0	110	74	135			
Dibromomethane	5.32	ug/L	1.0	106	72	133			
1,2-Dichlorobenzene	5.28	ug/L	1.0	106	78	129			
4-Chlorotoluene	5.32	ug/L	1.0	106	79	135			

Qualifiers:

RL - Analyte reporting limit.
ND - Not detected at the reporting limit.
S - Spike recovery outside of advisory limits.

QA/QC Summary Report

Client: Encana Oil and Gas USA Inc
Project: Tribal Pavillion 42-11 (VRP)

Report Date: 04/28/10
Work Order: B10041311

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW8260B									Batch: R146439
Sample ID: b10041795-001dms	Sample Matrix Spike				Run: 5971A.I_100421A				04/21/10 21:17
1,3-Dichlorobenzene	5.28	ug/L	1.0	106	79	132			
1,4-Dichlorobenzene	5.40	ug/L	1.0	108	78	131			
Dichlorodifluoromethane	4.60	ug/L	1.0	92	55	141			
1,1-Dichloroethane	5.00	ug/L	1.0	100	72	130			
1,2-Dichloroethane	4.84	ug/L	1.0	97	57	146			
1,1-Dichloroethene	4.96	ug/L	1.0	99	66	142			
cis-1,2-Dichloroethene	5.36	ug/L	1.0	107	74	133			
trans-1,2-Dichloroethene	5.20	ug/L	1.0	104	76	138			
1,2-Dichloropropane	5.60	ug/L	1.0	112	72	135			
1,3-Dichloropropane	5.76	ug/L	1.0	115	75	134			
2,2-Dichloropropane	4.32	ug/L	1.0	86	42	167			
1,1-Dichloropropene	5.12	ug/L	1.0	102	72	140			
cis-1,3-Dichloropropene	5.36	ug/L	1.0	107	75	132			
trans-1,3-Dichloropropene	5.04	ug/L	1.0	101	77	145			
Ethylbenzene	5.40	ug/L	1.0	108	78	131			
Methyl tert-butyl ether (MTBE)	4.68	ug/L	1.0	94	58	151			
Methyl ethyl ketone	57.6	ug/L	20	115	55	145			
Methylene chloride	5.00	ug/L	1.0	100	73	126			
Styrene	4.80	ug/L	1.0	96	76	134			
1,1,1,2-Tetrachloroethane	5.24	ug/L	1.0	105	75	135			
1,1,2,2-Tetrachloroethane	5.48	ug/L	1.0	110	72	132			
Tetrachloroethene	5.12	ug/L	1.0	102	78	137			
Toluene	5.92	ug/L	1.0	118	78	134			
1,1,1-Trichloroethane	4.64	ug/L	1.0	93	64	141			
1,1,2-Trichloroethane	5.52	ug/L	1.0	110	72	133			
Trichloroethene	5.48	ug/L	1.0	110	75	138			
Trichlorofluoromethane	4.52	ug/L	1.0	90	58	139			
1,2,3-Trichloropropane	5.20	ug/L	1.0	104	67	133			
Vinyl chloride	4.60	ug/L	1.0	92	66	140			
m+p-Xylenes	10.7	ug/L	1.0	107	78	133			
o-Xylene	5.20	ug/L	1.0	104	79	136			
Surr: 1,2-Dichloroethane-d4			1.0	92	70	130			
Surr: Dibromofluoromethane			1.0	96	77	126			
Surr: p-Bromofluorobenzene			1.0	104	76	127			
Surr: Toluene-d8			1.0	109	79	122			
Sample ID: b10041795-001dmsd	Sample Matrix Spike Duplicate				Run: 5971A.I_100421A				04/21/10 21:58
Benzene	5.64	ug/L	1.0	113	71	133	2.9	20	
Bromobenzene	5.28	ug/L	1.0	106	78	133	4.7	20	
Bromochloromethane	5.76	ug/L	1.0	115	68	131	5.7	20	
Bromodichloromethane	5.20	ug/L	1.0	104	67	138	0	20	
Bromoform	4.28	ug/L	1.0	86	64	136	0	20	
Bromomethane	4.36	ug/L	1.0	87	60	138	2.8	20	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Client: Encana Oil and Gas USA Inc
Project: Tribal Pavillion 42-11 (VRP)

Report Date: 04/28/10
Work Order: B10041311

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW8260B								Batch: R146439	
Sample ID: b10041795-001dmsd	Sample Matrix Spike Duplicate				Run: 5971A.I_100421A			04/21/10 21:58	
Carbon tetrachloride	4.64	ug/L	1.0	93	61	144	4.4	20	
Chlorobenzene	5.56	ug/L	1.0	111	78	136	0	20	
Chlorodibromomethane	4.88	ug/L	1.0	98	72	136	0	20	
Chloroethane	4.96	ug/L	1.0	99	64	136	5	20	
Chloroform	5.08	ug/L	1.0	102	69	133	0.8	20	
Chloromethane	4.56	ug/L	1.0	91	63	149	0.9	20	
2-Chloroethyl vinyl ether	ND	ug/L	1.0		64	132		20	S
1,2-Dibromoethane	5.56	ug/L	1.0	111	75	131	0.7	20	
2-Chlorotoluene	5.80	ug/L	1.0	116	74	135	5.7	20	
Dibromomethane	5.56	ug/L	1.0	111	72	133	4.4	20	
1,2-Dichlorobenzene	5.48	ug/L	1.0	110	78	129	3.7	20	
4-Chlorotoluene	5.56	ug/L	1.0	111	79	135	4.4	20	
1,3-Dichlorobenzene	5.60	ug/L	1.0	112	79	132	5.9	20	
1,4-Dichlorobenzene	5.60	ug/L	1.0	112	78	131	3.6	20	
Dichlorodifluoromethane	4.64	ug/L	1.0	93	55	141	0.9	20	
1,1-Dichloroethane	5.12	ug/L	1.0	102	72	130	2.4	20	
1,2-Dichloroethane	4.68	ug/L	1.0	94	57	146	3.4	20	
1,1-Dichloroethene	5.04	ug/L	1.0	101	66	142	1.6	20	
cis-1,2-Dichloroethene	5.60	ug/L	1.0	112	74	133	4.4	20	
trans-1,2-Dichloroethene	5.44	ug/L	1.0	109	76	138	4.5	20	
1,2-Dichloropropane	5.72	ug/L	1.0	114	72	135	2.1	20	
1,3-Dichloropropane	6.00	ug/L	1.0	120	75	134	4.1	20	
2,2-Dichloropropane	4.36	ug/L	1.0	87	42	167	0.9	20	
1,1-Dichloropropene	5.36	ug/L	1.0	107	72	140	4.6	20	
cis-1,3-Dichloropropene	5.44	ug/L	1.0	109	75	132	1.5	20	
trans-1,3-Dichloropropene	5.00	ug/L	1.0	100	77	145	0.8	20	
Ethylbenzene	5.44	ug/L	1.0	109	78	131	0.7	20	
Methyl tert-butyl ether (MTBE)	4.80	ug/L	1.0	96	58	151	2.5	20	
Methyl ethyl ketone	51.6	ug/L	20	103	55	145	11	20	
Methylene chloride	5.20	ug/L	1.0	104	73	126	3.9	20	
Styrene	4.64	ug/L	1.0	93	76	134	3.4	20	
1,1,1,2-Tetrachloroethane	5.36	ug/L	1.0	107	75	135	2.3	20	
1,1,2,2-Tetrachloroethane	5.76	ug/L	1.0	115	72	132	5	20	
Tetrachloroethene	5.36	ug/L	1.0	107	78	137	4.6	20	
Toluene	6.16	ug/L	1.0	123	78	134	4	20	
1,1,1-Trichloroethane	4.96	ug/L	1.0	99	64	141	6.7	20	
1,1,2-Trichloroethane	5.56	ug/L	1.0	111	72	133	0.7	20	
Trichloroethene	5.60	ug/L	1.0	112	75	138	2.2	20	
Trichlorofluoromethane	4.52	ug/L	1.0	90	58	139	0	20	
1,2,3-Trichloropropane	5.36	ug/L	1.0	107	67	133	3	20	
Vinyl chloride	4.44	ug/L	1.0	89	66	140	3.5	20	
m+p-Xylenes	11.2	ug/L	1.0	112	78	133	4.4	20	
o-Xylene	5.20	ug/L	1.0	104	79	136	0	20	

Qualifiers:

RL - Analyte reporting limit.
ND - Not detected at the reporting limit.
S - Spike recovery outside of advisory limits.

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QA/QC Summary Report

Client: Encana Oil and Gas USA Inc
Project: Tribal Pavillion 42-11 (VRP)

Report Date: 04/28/10
Work Order: B10041311

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW8260B									Batch: R146439
Sample ID: b10041795-001dmsd	Sample Matrix Spike Duplicate				Run: 5971A.I_100421A				04/21/10 21:58
Surr: 1,2-Dichloroethane-d4			1.0	94	70	130			
Surr: Dibromofluoromethane			1.0	98	77	126			
Surr: p-Bromofluorobenzene			1.0	102	76	127			
Surr: Toluene-d8			1.0	113	79	122			

Qualifiers:
RL - Analyte reporting limit.
ND - Not detected at the reporting limit.

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QA/QC Summary Report

Client: Encana Oil and Gas USA Inc
Project: Tribal Pavillion 42-11 (VRP)

Report Date: 04/28/10
Work Order: B10041311

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW8015M as G								Analytical Run: R146477	
Sample ID: CCV_0421VAR03r-W	Continuing Calibration Verification Standard							04/21/10 10:05	
2-Methylpentane	32.5	ug/L	1.0	108	75	125			
Benzene	10.7	ug/L	1.0	107	75	125			
2,2,4-Trimethylpentane	31.9	ug/L	1.0	106	75	125			
Toluene	31.9	ug/L	1.0	106	75	125			
Ethylbenzene	10.6	ug/L	1.0	106	75	125			
m+p-Xylenes	42.3	ug/L	1.0	106	75	125			
n-Heptane	11.6	ug/L	1.0	116	75	125			
o-Xylene	20.6	ug/L	1.0	103	75	125			
1,2,4-Trimethylbenzene	19.5	ug/L	1.0	98	75	125			
Total GRO	212	ug/L		106	75	125			
Surr: Trifluorotoluene			1.0	98	75	125			
Method: SW8015M as G								Batch: R146477	
Sample ID: LCS_0421VAR04r	Laboratory Control Sample				Run: VARIAN1_100421B			04/21/10 10:48	
Total Purgeable Hydrocarbons	139	ug/L	20	70	50	100			
Surr: Trifluorotoluene			1.0	102	50	150			
Sample ID: MBLK_0421VAR05r	Method Blank				Run: VARIAN1_100421B			04/21/10 11:23	
Gasoline Range Organics (GRO)	ND	ug/L	20						
GRO as Gasoline	ND	ug/L	20						
Total Purgeable Hydrocarbons	ND	ug/L	20						
Surr: Trifluorotoluene			1.0	97	50	150			
Sample ID: B10041800-002CMS	Sample Matrix Spike				Run: VARIAN1_100421B			04/22/10 15:22	
Total Purgeable Hydrocarbons	293	ug/L	20	73	50	100			
Surr: Trifluorotoluene			1.0	102	50	150			
Sample ID: B10041800-002CMSD	Sample Matrix Spike Duplicate				Run: VARIAN1_100421B			04/22/10 15:55	
Total Purgeable Hydrocarbons	291	ug/L	20	73	50	100	0.6	20	
Surr: Trifluorotoluene			1.0	101	50	150			

Qualifiers:

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ND - Not detected at the reporting limit.

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QA/QC Summary Report

Client: Encana Oil and Gas USA Inc
Project: Tribal Pavillion 42-11 (VRP)

Report Date: 04/28/10
Work Order: B10041311

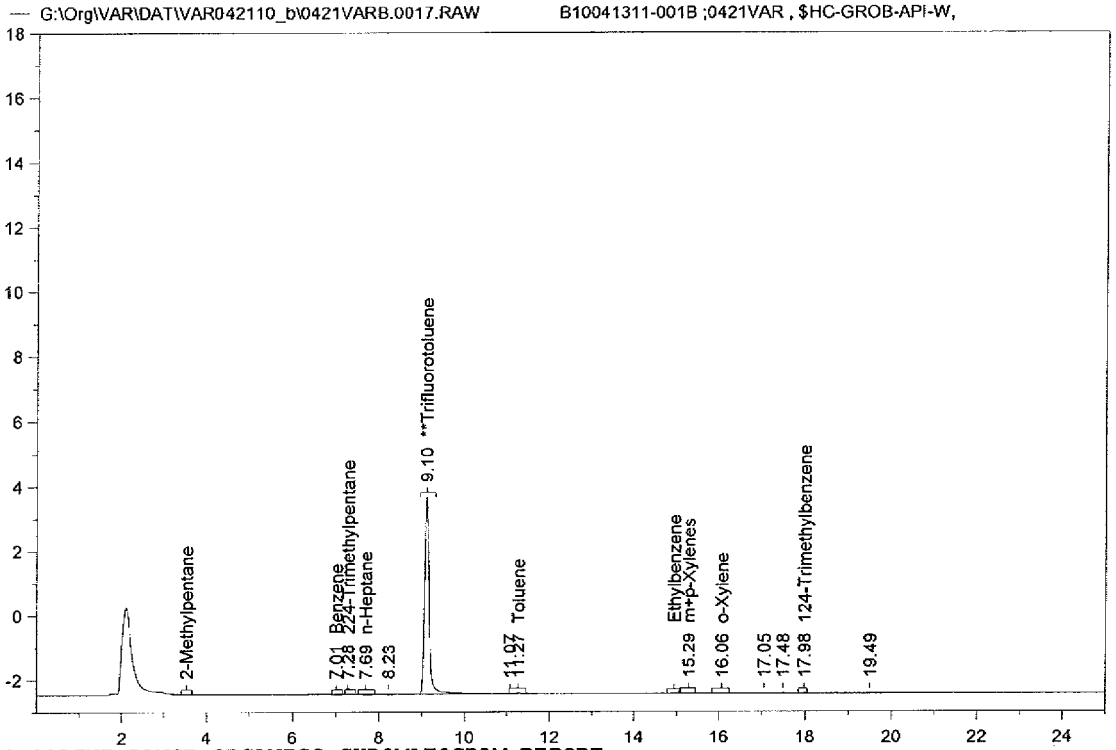
Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW8015M as G								Analytical Run: R146544	
Sample ID: CCV_0422VAR04r-W	Continuing Calibration Verification Standard							04/22/10 13:32	
2-Methylpentane	30.9	ug/L	1.0	103	75	125			
Benzene	10.6	ug/L	1.0	106	75	125			
2,2,4-Trimethylpentane	31.7	ug/L	1.0	106	75	125			
Toluene	32.1	ug/L	1.0	107	75	125			
Ethylbenzene	10.8	ug/L	1.0	108	75	125			
m+p-Xylenes	43.1	ug/L	1.0	108	75	125			
n-Heptane	11.6	ug/L	1.0	116	75	125			
o-Xylene	22.0	ug/L	1.0	110	75	125			
1,2,4-Trimethylbenzene	20.0	ug/L	1.0	100	75	125			
Total GRO	213	ug/L		106	75	125			
Surr: Trifluorotoluene			1.0	106	75	125			
Method: SW8015M as G								Batch: R146544	
Sample ID: LCS_0422VAR05r	Laboratory Control Sample				Run: VARIAN1_100422A			04/22/10 14:15	
Total Purgeable Hydrocarbons	139	ug/L	20	69	50	100			
Surr: Trifluorotoluene			1.0	99	50	150			
Sample ID: MBLK_0422VAR06r	Method Blank				Run: VARIAN1_100422A			04/22/10 14:48	
Gasoline Range Organics (GRO)	ND	ug/L	20						
GRO as Gasoline	ND	ug/L	20						
Total Purgeable Hydrocarbons	ND	ug/L	20						
Surr: Trifluorotoluene			1.0	95	50	150			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

TP 42-11 MW1



GASOLINE RANGE ORGANICS CHROMATOGRAM REPORT

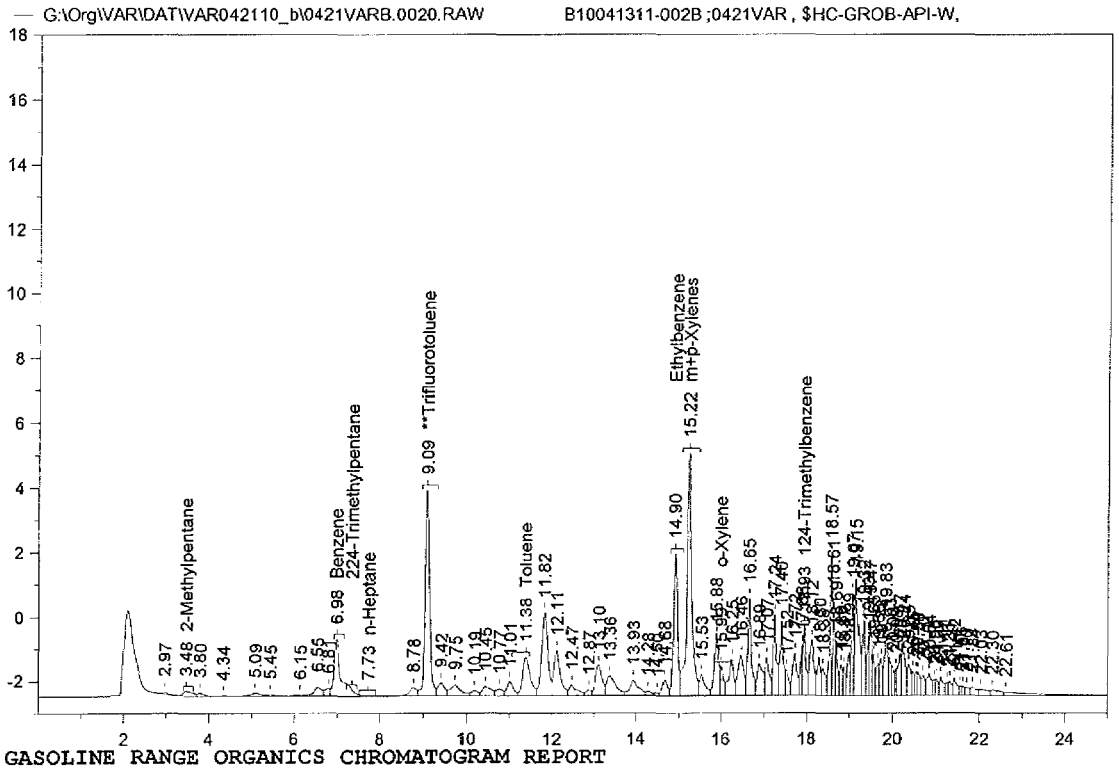
Sample Name: B10041311-001B ;0421VAR , $HC-GROB-API-W,
Raw File: G:\Org\VAR\DAT\VAR042110_b\0421VARB.0017.RAW
Date & Time Acquired: 4/21/2010 6:14:36 PM
Method File: G:\Org\VAR\Methods\0210VARB.MET
Calibration File: G:\Org\VAR\Cals\0210VARb.CAL
Sample Weight: 5 Dilution: 1 S.A.: 1

Mean RF for all calibrated compounds: 241.6774
Rt range for Gasoline Range Organics: 3.408 to 18.047

SURROGATE COMPOUND	RT	ACTUAL	MEASURED	%REC	
**Trifluorotoluene	9.104	50.	46.138	92.28	-

GRO Area:887.0386 GRO Amount: 0.7340682
TPH Area:969.9484 TPH Amount: 0.8026801

TP 42-11 MW2



GASOLINE RANGE ORGANICS CHROMATOGRAM REPORT

Sample Name: B10041311-002B ;0421VAR , $HC-GROB-API-W,
Raw File: G:\Org\VAR\DAT\VAR042110_b\0421VARB.0020.RAW
Date & Time Acquired: 4/21/2010 7:55:58 PM
Method File: G:\Org\VAR\Methods\0210V13112B.MET
Calibration File: G:\Org\VAR\Cals\0210VARb.CAL
Sample Weight: 5 Dilution: 1 S.A.: 1

Mean RF for all calibrated compounds: 241.6774
Rt range for Gasoline Range Organics: 3.408 to 18.047

SURROGATE COMPOUND	RT	ACTUAL	MEASURED	%REC	
**Trifluorotoluene	9.086	50.	47.379	94.76	-

GRO Area:377659.2 GRO Amount: 312.5316
TPH Area:614685.7 TPH Amount: 508.6827

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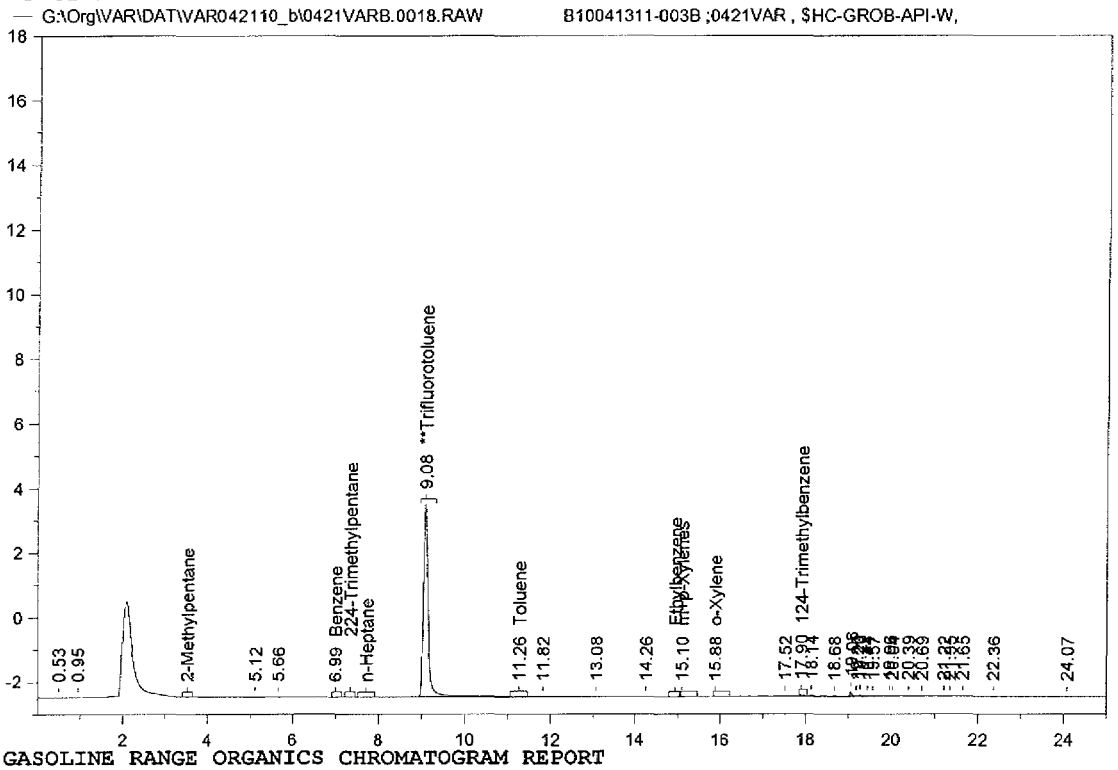
TP 42-11 MW3



GASOLINE RANGE ORGANICS CHROMATOGRAM REPORT

Sample Name: B10041311-003B ;0421VAR , $HC-GROB-API-W,
Raw File: G:\Org\VAR\DAT\VAR042110_b\0421VARB.0018.RAW
Date & Time Acquired: 4/21/2010 6:48:40 PM
Method File: G:\Org\VAR\Methods\0210V13113B.MET
Calibration File: G:\Org\VAR\Cals\0210VARb.CAL
Sample Weight: 5 Dilution: 1 S.A.: 1

Mean RF for all calibrated compounds: 241.6774
Rt range for Gasoline Range Organics: 3.408 to 18.047

SURROGATE COMPOUND	RT	ACTUAL	MEASURED	%REC	
**Trifluorotoluene	9.08	50.	44.767	89.53	-

GRO Area:1233.829 GRO Amount: 1.021054
TPH Area:2777.205 TPH Amount: 2.298274

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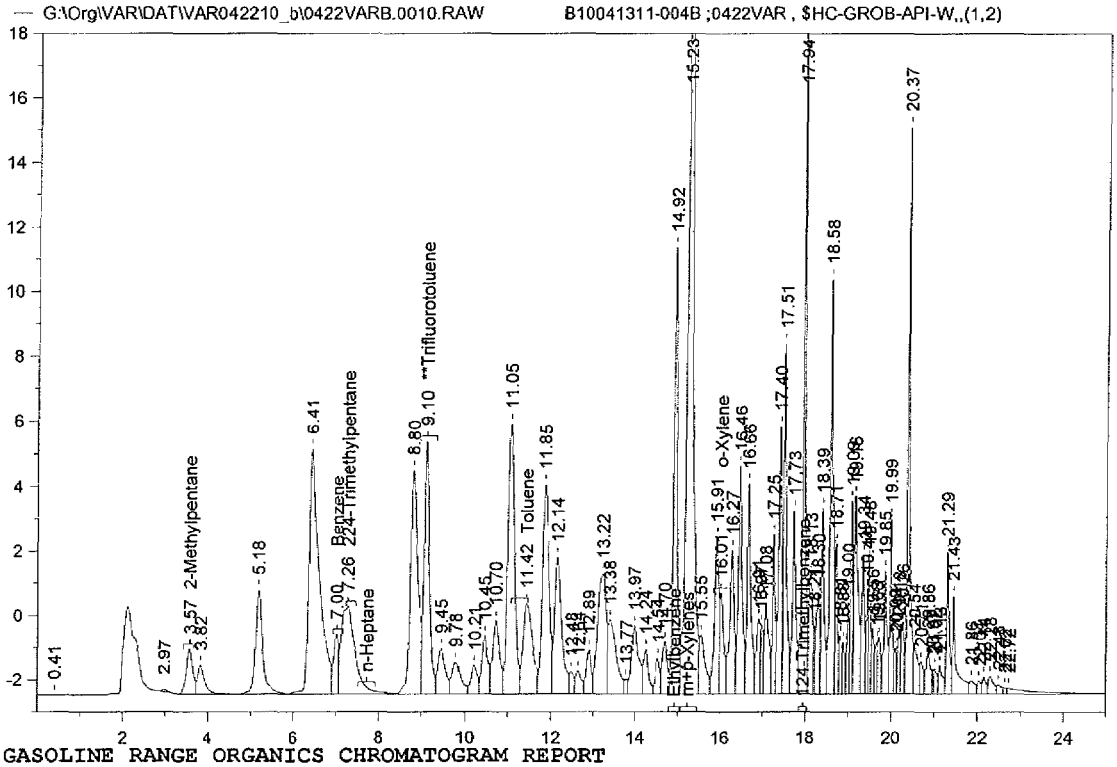
TP 42-11 MW4



GASOLINE RANGE ORGANICS CHROMATOGRAM REPORT

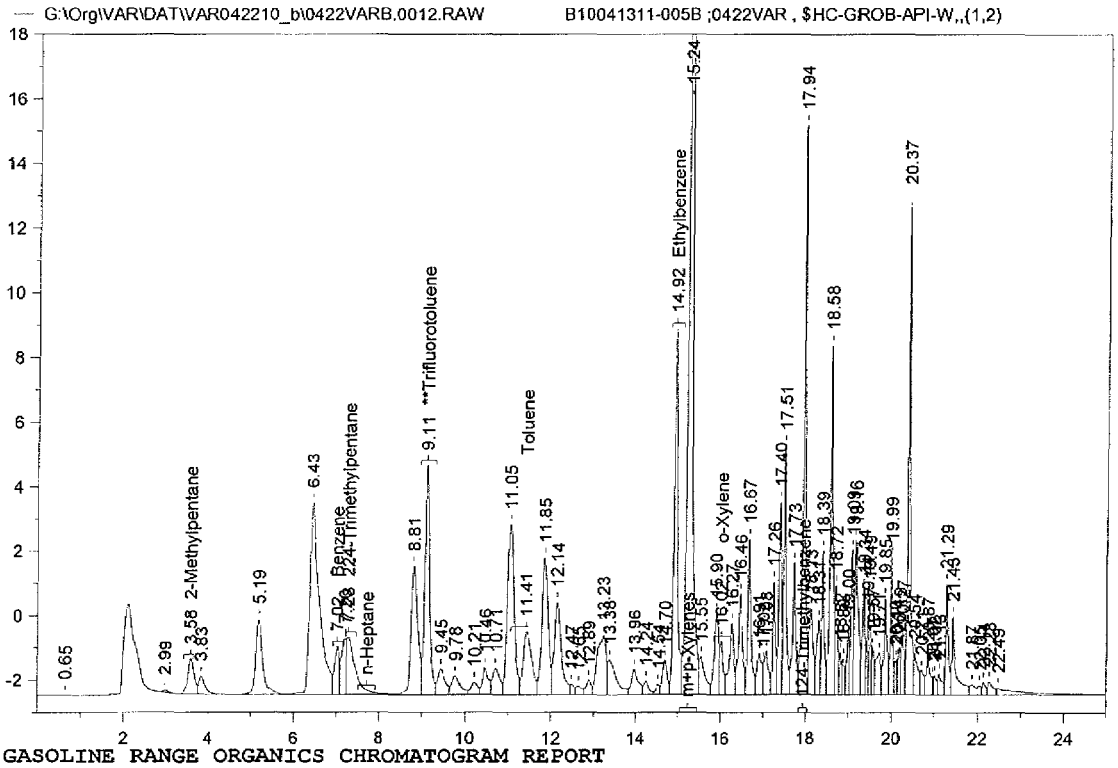
Sample Name: B10041311-004B ;0422VAR , $HC-GROB-API-W,,(1,2)
Raw File: G:\Org\VAR\DAT\VAR042210_b\0422VARB.0010.RAW
Date & Time Acquired: 4/22/2010 5:01:56 PM
Method File: G:\Org\VAR\Methods\0210V13114xB.MET
Calibration File: G:\Org\VAR\Cals\0210VARb.CAL
Sample Weight: 5 Dilution: 2 S.A.: 2

Mean RF for all calibrated compounds: 241.6774
Rt range for Gasoline Range Organics: 3.408 to 18.047

SURROGATE COMPOUND	RT	ACTUAL	MEASURED	%REC
**Trifluorotoluene	9.102	100.	135.202	135.2

GRO Area:1708818 GRO Amount: 2828.262
TPH Area:2245924 TPH Amount: 3717.225

TP 42-11 MW4B



GASOLINE RANGE ORGANICS CHROMATOGRAM REPORT

Sample Name: B10041311-005B ;0422VAR , $HC-GROB-API-W,,(1,2)
Raw File: G:\Org\VAR\DAT\VAR042210_b\0422VARB.0012.RAW
Date & Time Acquired: 4/22/2010 6:08:44 PM
Method File: G:\Org\VAR\Methods\0210V13115xB.MET
Calibration File: G:\Org\VAR\Cals\0210VARb.CAL
Sample Weight: 5 Dilution: 2 S.A.: 2

Mean RF for all calibrated compounds: 241.6774
Rt range for Gasoline Range Organics: 3.408 to 18.047

SURROGATE COMPOUND	RT	ACTUAL	MEASURED	%REC	
**Trifluorotoluene	9.115	100.	112.171	112.17	-

GRO Area:1080195 GRO Amount: 1787.828
TPH Area:1488322 TPH Amount: 2463.32

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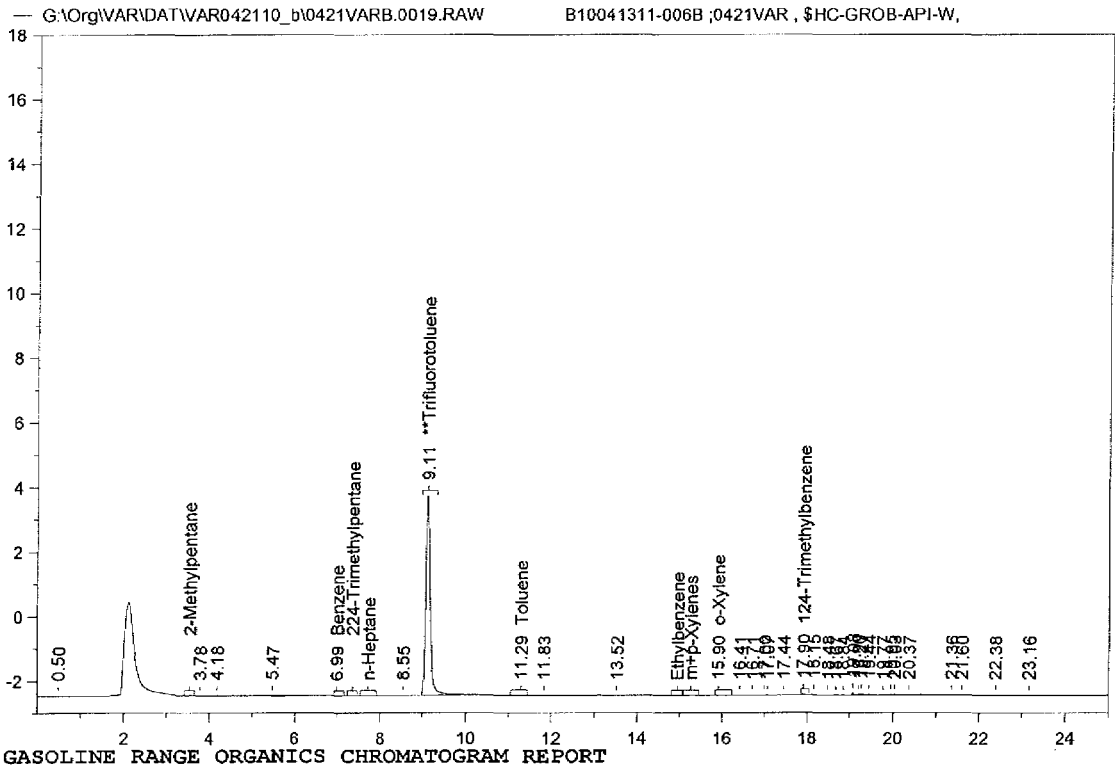
TP 42-11 MW5



GASOLINE RANGE ORGANICS CHROMATOGRAM REPORT

Sample Name: B10041311-006B ;0421VAR , $HC-GROB-API-W,
Raw File: G:\Org\VAR\DAT\VAR042110_b\0421VARB.0019.RAW
Date & Time Acquired: 4/21/2010 7:22:09 PM
Method File: G:\Org\VAR\Methods\0210VARB.MET
Calibration File: G:\Org\VAR\Cals\0210VARb.CAL
Sample Weight: 5 Dilution: 1 S.A.: 1

Mean RF for all calibrated compounds: 241.6774
Rt range for Gasoline Range Organics: 3.408 to 18.047

SURROGATE COMPOUND	RT	ACTUAL	MEASURED	%REC	
**Trifluorotoluene	9.106	50.	45.416	90.83	-

GRO Area:1142.45 GRO Amount: 0.9454337
TPH Area:2673.646 TPH Amount: 2.212574

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QA/QC Summary Report

Client: Encana Oil and Gas USA Inc
Project: Tribal Pavillion 42-11 (VRP)

Report Date: 04/28/10
Work Order: B10041311

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW8015M as D									Batch: 45719
Sample ID: LCS-45719	Laboratory Control Sample				Run: GCFID-FISON-B_100416D				04/18/10 03:56
Diesel Range Organics (DRO)	13.3	mg/L	0.30	89	60	120			
Total Extractable Hydrocarbons	14.0	mg/L	0.30	93	60	120			
Surr: o-Terphenyl			0.0050	84	50	150			
Sample ID: MB-45719	Method Blank				Run: GCFID-FISON-B_100416D				04/18/10 04:42
Diesel Range Organics (DRO)	ND	mg/L	0.30						
Diesel Range Organics as Diesel	ND	mg/L	0.30						
Total Extractable Hydrocarbons	ND	mg/L	0.30						
Surr: o-Terphenyl			0.0050	84	50	150			
Sample ID: LCSD-45719	Laboratory Control Sample Duplicate				Run: GCFID-FISON-B_100416D				04/18/10 05:28
Diesel Range Organics (DRO)	13.3	mg/L	0.30	89	60	120	0.5	20	
Total Extractable Hydrocarbons	13.7	mg/L	0.30	91	60	120	2.5	20	
Surr: o-Terphenyl			0.0050	83	50	150			
Sample ID: B10041415-002AMS	Sample Matrix Spike				Run: GCFID-FISON-B_100416D				04/18/10 07:01
Diesel Range Organics (DRO)	13.4	mg/L	0.30	89	60	120			
Total Extractable Hydrocarbons	14.0	mg/L	0.30	93	60	120			
Surr: o-Terphenyl			0.0050	81	50	150			
Sample ID: B10041415-002AMSD	Sample Matrix Spike Duplicate				Run: GCFID-FISON-B_100416D				04/18/10 07:47
Diesel Range Organics (DRO)	12.9	mg/L	0.30	86	60	120	4	20	
Total Extractable Hydrocarbons	13.5	mg/L	0.30	90	60	120	3.9	20	
Surr: o-Terphenyl			0.0050	79	50	150			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

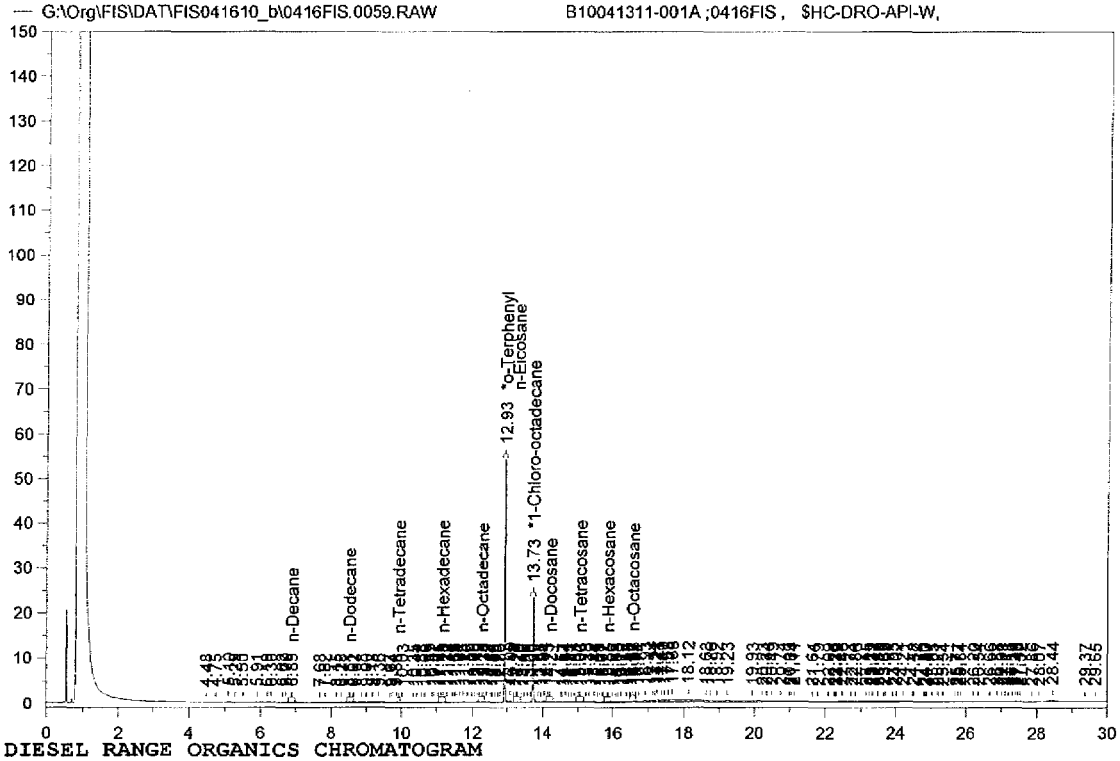
Client: Encana Oil and Gas USA Inc
Project: Tribal Pavillion 42-11 (VRP)

Report Date: 04/28/10
Work Order: B10041311

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW8015M as D								Analytical Run: R146349	
Sample ID: CCV_0416FIS47r-W	Continuing Calibration Verification Standard							04/18/10 00:04	
n-Decane	0.225	mg/L	0.0050	113	75	125			
n-Dodecane	0.212	mg/L	0.0050	106	75	125			
n-Tetradecane	0.199	mg/L	0.0050	100	75	125			
n-Hexadecane	0.201	mg/L	0.0050	101	75	125			
n-Octadecane	0.204	mg/L	0.0050	102	75	125			
n-Eicosane	0.206	mg/L	0.0050	103	75	125			
n-Docosane	0.216	mg/L	0.0050	108	75	125			
n-Tetracosane	0.227	mg/L	0.0050	113	75	125			
n-Hexacosane	0.223	mg/L	0.0050	111	75	125			
n-Octacosane	0.221	mg/L	0.0050	110	75	125			
Total DRO	2.13	mg/L		97	75	125			
Surr: o-Terphenyl			0.0050	99	75	125			
Sample ID: CCV_0416FIS62r-W	Continuing Calibration Verification Standard							04/18/10 11:38	
n-Decane	0.215	mg/L	0.0050	108	75	125			
n-Dodecane	0.203	mg/L	0.0050	101	75	125			
n-Tetradecane	0.192	mg/L	0.0050	96	75	125			
n-Hexadecane	0.193	mg/L	0.0050	96	75	125			
n-Octadecane	0.195	mg/L	0.0050	98	75	125			
n-Eicosane	0.197	mg/L	0.0050	99	75	125			
n-Docosane	0.203	mg/L	0.0050	101	75	125			
n-Tetracosane	0.207	mg/L	0.0050	104	75	125			
n-Hexacosane	0.206	mg/L	0.0050	103	75	125			
n-Octacosane	0.205	mg/L	0.0050	103	75	125			
Total DRO	2.02	mg/L		92	75	125			
Surr: o-Terphenyl			0.0050	95	75	125			

Qualifiers:
RL - Analyte reporting limit.
ND - Not detected at the reporting limit.

TP 42-11 MW1 Batch ID: 45719



DIESEL RANGE ORGANICS CHROMATOGRAM

Sample Name: B10041311-001A ;0416FIS , $HC-DRO-API-W,
Raw File: G:\Org\FIS\DAT\FIS041610_b\0416FIS.0059.RAW
Date & Time Acquired: 4/18/2010 9:20:09 AM
Method File: g:\org\Fis\Methods\D3000TM%.met
Calibration File: G:\Org\FIS\Cals\DR090901TM.CAL
Sample Weight: 1000 Dilution: 1 S.A.: 1

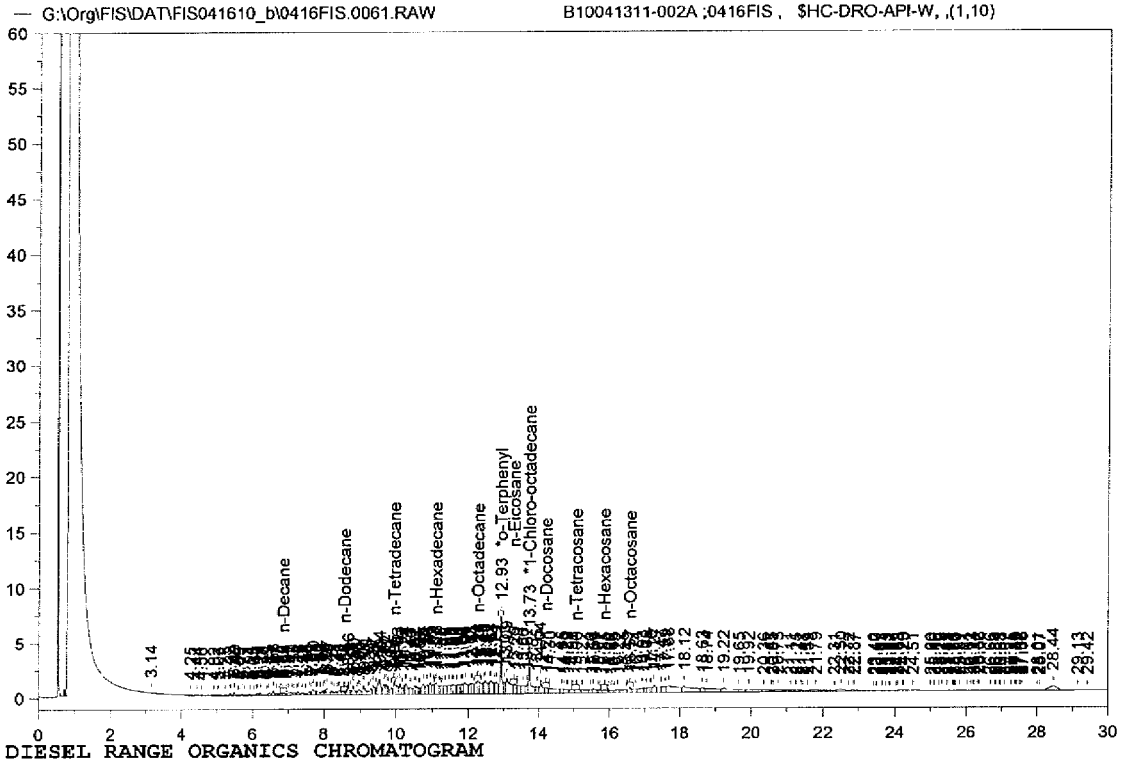
Mean RF for Total Extractable Hydrocarbons: 572.5435
Rt range for Diesel Range Organics (C10 to C28): 6.77 to 16.67

SURROGATE COMPOUND	RT	ACTUAL	MEASURED	%REC	
*o-Terphenyl	12.932	.2	.136	67.79	-
*1-Chloro-octadecane	13.732	.2	.086	43.04	-

DRO Area:24533.58 DRO AMOUNT: 4.285017E-02
TEH Area:139736 TEH AMOUNT: 0.2440618

TP 42-11 MW2 Batch ID: 45719

— G:\Org\FIS\DAT\FIS041610_b\0416FIS.0061.RAW B10041311-002A ;0416FIS , $HC-DRO-API-W, ,(1,10)



DIESEL RANGE ORGANICS CHROMATOGRAM

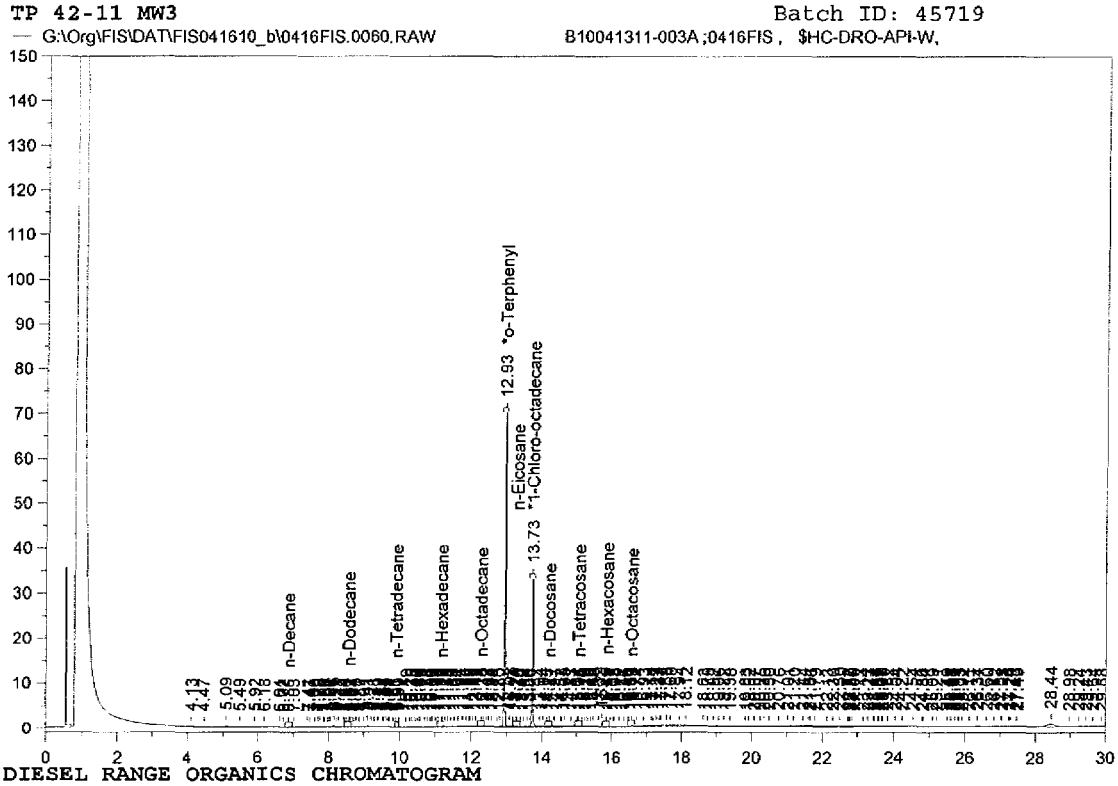
Sample Name: B10041311-002A ;0416FIS , $HC-DRO-API-W, ,(1,10)
Raw File: G:\Org\FIS\DAT\FIS041610_b\0416FIS.0061.RAW
Date & Time Acquired: 4/18/2010 10:52:14 AM
Method File: g:\org\Fis\Methods\DR041661TM%.met
Calibration File: G:\Org\FIS\Cals\DR090901TM.CAL
Sample Weight: 1000 Dilution: 10 S.A.: 1

Mean RF for Total Extractable Hydrocarbons: 572.5435
Rt range for Diesel Range Organics (C10 to C28): 6.77 to 16.67

SURROGATE COMPOUND	RT	ACTUAL	MEASURED	%REC	
*o-Terphenyl	12.928	.2	.27	134.76	-
*1-Chloro-octadecane	13.729	.2	.307	153.57	-

DRO Area:318051.5 DRO AMOUNT: 5.555062
TEH Area:461299.8 TEH AMOUNT: 8.057027

TP 42-11 MW3 Batch ID: 45719



DIESEL RANGE ORGANICS CHROMATOGRAM

Sample Name: B10041311-003A ;0416FIS , $HC-DRO-API-W,
Raw File: G:\Org\FIS\DAT\FIS041610_b\0416FIS.0060.RAW
Date & Time Acquired: 4/18/2010 10:05:59 AM
Method File: g:\org\Fis\Methods\D3000TM%.met
Calibration File: G:\Org\FIS\Cals\DR090901TM.CAL
Sample Weight: 1000 Dilution: 1 S.A.: 1

Mean RF for Total Extractable Hydrocarbons: 572.5435
Rt range for Diesel Range Organics (C10 to C28): 6.77 to 16.67

SURROGATE COMPOUND	RT	ACTUAL	MEASURED	%REC	
*o-Terphenyl	12.933	.2	.176	87.98	-
*1-Chloro-octadecane	13.731	.2	.125	62.67	-

DRO Area:48938.3 DRO AMOUNT: 8.547525E-02
TEH Area:153777 TEH AMOUNT: 0.2685857

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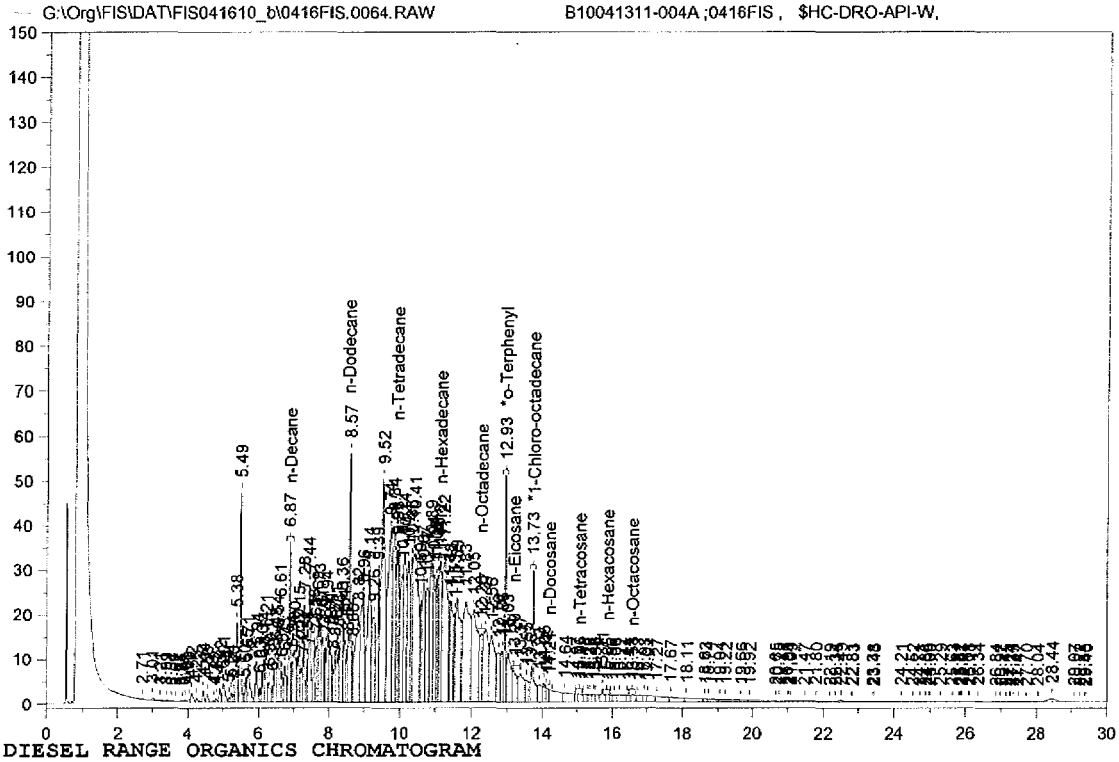
TP 42-11 MW4 Batch ID: 45719

G:\Org\FIS\DAT\FIS041610_b\0416FIS.0064.RAW B10041311-004A ;0416FIS , $HC-DRO-API-W,



DIESEL RANGE ORGANICS CHROMATOGRAM

Sample Name: B10041311-004A ;0416FIS , $HC-DRO-API-W,
Raw File: G:\Org\FIS\DAT\FIS041610_b\0416FIS.0064.RAW
Date & Time Acquired: 4/18/2010 1:11:10 PM
Method File: g:\org\Fis\Methods\D3000TM%.met
Calibration File: G:\Org\FIS\Cals\DR090901TM.CAL
Sample Weight: 1000 Dilution: 1 S.A.: 1

Mean RF for Total Extractable Hydrocarbons: 572.5435
Rt range for Diesel Range Organics (C10 to C28): 6.77 to 16.67

SURROGATE COMPOUND	RT	ACTUAL	MEASURED	%REC	
*o-Terphenyl	12.934	.2	.17	85.03	-
*1-Chloro-octadecane	13.729	.2	.179	89.38	-

DRO Area:7672960 DRO AMOUNT: 13.40153
TEH Area:8549810 TEH AMOUNT: 14.93303

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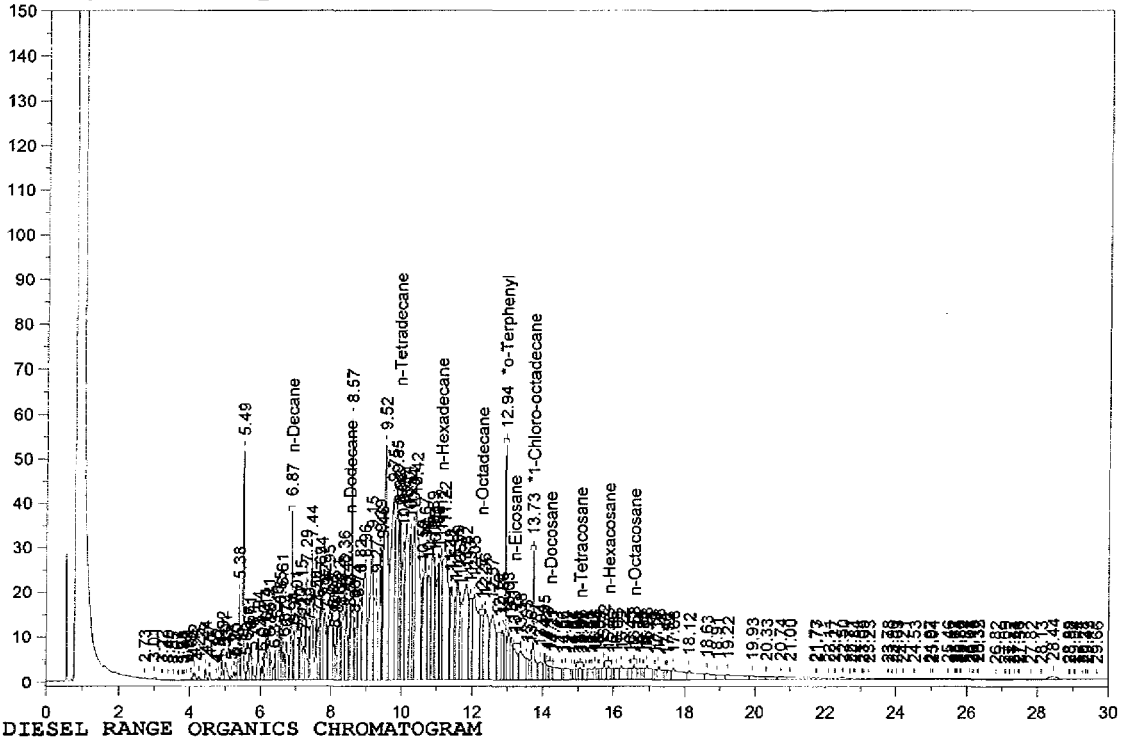
TP 42-11 MW4B Batch ID: 45719

— G:\Org\FIS\DAT\FIS041610_b\0416FIS.0065.RAW B10041311-005A ;0416FIS , $HC-DRO-API-W,



DIESEL RANGE ORGANICS CHROMATOGRAM

Sample Name: B10041311-005A ;0416FIS , $HC-DRO-API-W,
Raw File: G:\Org\FIS\DAT\FIS041610_b\0416FIS.0065.RAW
Date & Time Acquired: 4/18/2010 1:57:26 PM
Method File: g:\org\Fis\Methods\D3000TM%.met
Calibration File: G:\Org\FIS\Cals\DR090901TM.CAL
Sample Weight: 1000 Dilution: 1 S.A.: 1

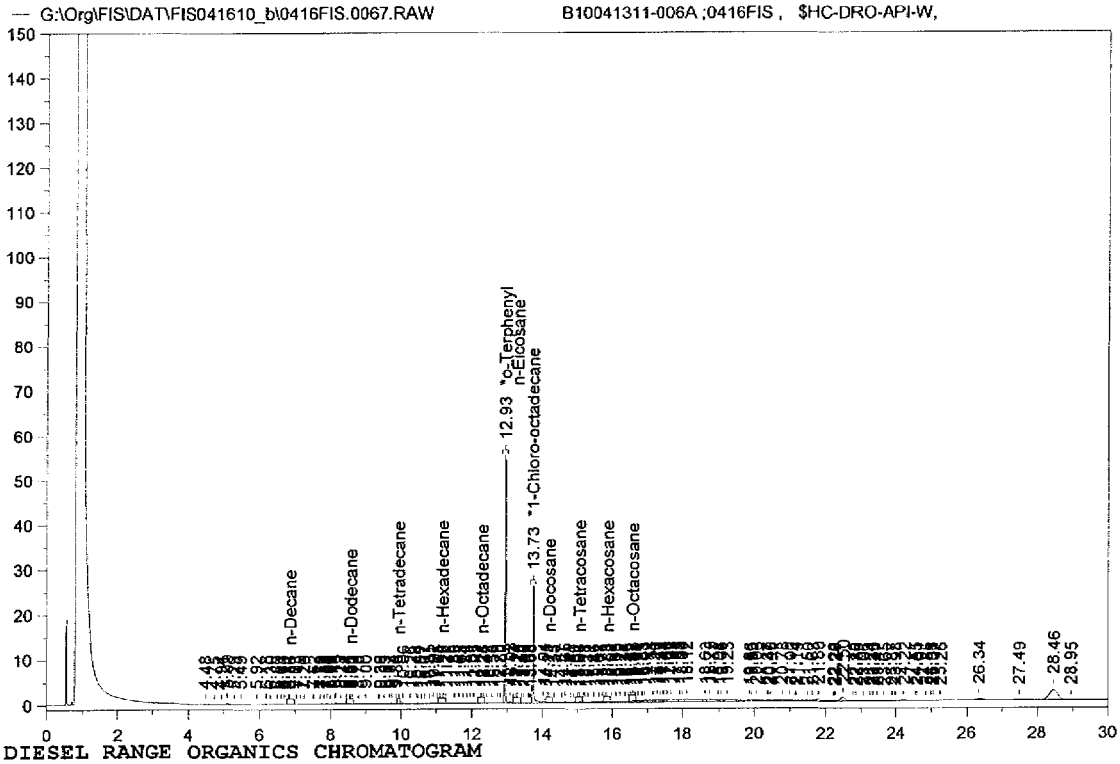
Mean RF for Total Extractable Hydrocarbons: 572.5435
Rt range for Diesel Range Organics (C10 to C28): 6.77 to 16.67

SURROGATE COMPOUND	RT	ACTUAL	MEASURED	%REC	
*o-Terphenyl	12.937	.2	.174	86.77	-
*1-Chloro-octadecane	13.732	.2	.178	89.04	-

DRO Area:7703855 DRO AMOUNT: 13.45549
TEH Area:8772904 TEH AMOUNT: 15.32269

TP 42-11 MW5 Batch ID: 45719

— G:\Org\FIS\DAT\FIS041610_b\0416FIS.0067.RAW B10041311-006A ;0416FIS , $HC-DRO-API-W,



DIESEL RANGE ORGANICS CHROMATOGRAM

Sample Name: B10041311-006A ;0416FIS , $HC-DRO-API-W,
Raw File: G:\Org\FIS\DAT\FIS041610_b\0416FIS.0067.RAW
Date & Time Acquired: 4/18/2010 3:29:53 PM
Method File: g:\org\Fis\Methods\DR041667TM%.met
Calibration File: G:\Org\FIS\Cals\DR090901TM.CAL
Sample Weight: 1000 Dilution: 1 S.A.: 1

Mean RF for Total Extractable Hydrocarbons: 572.5435
Rt range for Diesel Range Organics (C10 to C28): 6.77 to 16.67

SURROGATE COMPOUND	RT	ACTUAL	MEASURED	%REC	
*o-Terphenyl	12.93	.2	.141	70.53	-
*1-Chloro-octadecane	13.729	.2	.112	55.92	-

DRO Area:37398.06 DRO AMOUNT: 6.531917E-02
TEH Area:207974.5 TEH AMOUNT: 0.3632466

Shipping container/cooler in good condition?	Yes	No
Custody seals intact on shipping container/cooler?	Yes	No
Custody seals intact on sample bottles?	Yes	No
Chain of custody present?	Yes	No
Chain of custody signed when relinquished and received?	Yes	No
Chain of custody agrees with sample labels?	Yes	No
Samples in proper container/bottle?	Yes	No
Sample containers intact?	Yes	No
Sufficient sample volume for indicated test?	Yes	No
All samples received within holding time?	Yes	No
Container/Temp Blank temperature:		
Water - VOA vials have zero headspace?	Yes	No
Water - pH acceptable upon receipt?	Yes	No

Chain of Custody and Analytical Request Record

PLEASE PRINT (Provide as much information as possible.)

Company Name:	Project Name, PWS, Permit, Etc.	Sample Origin	EPA/State Compliance:
EnCana Oil & Gas (USA) Inc.	Tribal Pavillion 42-11 (VRP)	State: WY	Yes ☐ No ☐
Report Mail Address:	**Contact Name:**	**Phone/Fax:**	**Email:** / **Sampler: (Please Print)**
Att: Brandon Kintzler	Mike Larson	406-579-9585	mlarson@kbarvey.com
Invoice Address:	**Invoice Contact & Phone:**	**Purchase Order:**	**Quote/Bottle Order:**
P.O. Box 1177 Riverton, WY. 82501	Brandon Kintzler 307-850-4217	Please call	

Special Report/Formats:

☐ DW
☐ POTW/WWTP
☐ State: _____
☐ Other: _____
☐ EDD/EDT (Electronic Data) Format: _____
☐ LEVEL IV
☐ NELAC

ANALYSIS REQUESTED

Contact ELI prior to **RUSH** sample submittal for charges and scheduling – See Instruction Page

Comments: 20% Discount

Shipped by: Riten UPS Grnd

Cooler ID(s):

Receipt Temp: 5 °C

On Ice: (Y) N

Custody Seal: On Bottle (Y) N; On Cooler (Y) N

Intact: (Y) N

Signature Match: (Y) N

#	SAMPLE IDENTIFICATION (Name, Location, Interval, etc.)	Collection Date	Collection Time	MATRIX (Number of Containers; Sample Type: A W S V B O DW; Air Water Soils/Solids Vegetation Bioassay Other DW - Drinking Water)	See bottle order	SEE ATTACHED	Standard Turnaround (TAT)	RUSH	Comments	LABORATORY USE ONLY
1	TP 42-11 MW 1	4-12-10	15:20	4 W	X		X		Same sample	1041311-001
2	MW 2		17:30				X		bottles may	-002
3	MW 3		16:20				X		repeat	-003
4	MW 4		[illegible]				X		"TPH-42-11"	-004
5	MW 4B		[illegible]				X		this is incorrect	-005
6	MW 5	4-13-10	9:15				X		and should	-006
7	NOTB for cooler #1								read	
8	TB 2 TS 0246	3-23-10							"TP 42-11"	-007
9										
10										

Custody Record MUST be Signed

Relinquished by (print):	Date/Time:	Signature:	Received by (print):	Date/Time:	Signature:
Mike Larson	4/13/10	5:00 pm			
Relinquished by (print):	Date/Time:	Signature:	Received by (print):	Date/Time:	Signature:
			Received by Laboratory:	4-15-10 9:00	Lisa Lancaster

Sample Disposal: Return to Client: _____ Lab Disposal: _____

In certain circumstances, samples submitted to Energy Laboratories, Inc. may be subcontracted to other certified laboratories in order to complete the analysis requested. This serves as notice of this possibility. All sub-contract data will be clearly notated on your analytical report. Visit our web site at www.energylab.com for additional information, downloadable fee schedule, forms, and links.

ENERGY LABORATORIES, INC. * 1120 S 27th St * PO Box 30916 * Billings, MT 59107-0916
Toll Free 800.735.4489 * 406.252.6325 * FAX 406.252.6069 * eli@energylab.com

BOTTLE ORDER 39787

SHIPPED TO: KC Harvey Inc

Contact: Shane
376 Gallatin Park Drive
Bozeman MT 57915

Phone:

Project:

Order Created by: gmccartney

Ship Date: 4/6/2010

VIA: Ground

Bottle Size/Type	Bottles Per Samp	Method	Tests	Critical Hold Time	Preservative	Notes	Num of Samp
40 mL Clear Glass VOA	3	SW8260B	8260-Volatile Organic Compounds-Short List		■ HCL		25
1 Liter Amber Glass Narrow Mouth	2	SW8015B	Diesel Range Organics		■ H2SO4		25
40 mL Clear Glass VOA	3	SW8015B	Gasoline Range Organics		■ HCL		25

Comments

If you need the VOC-8260 with a different analyte list that short, please let us know.

■ HNO3 - Nitric Acid ■ H2SO4 - Sulfuric Acid ■ NaOH - Sodium Hydroxide
■ ZnAc - Zinc Acetate ■ HCl - Hydrochloric Acid ☐ H3PO4 - Phosphoric Acid

We strongly suggest that the samples are shipped the same day as they are collected.

Material Safety Data Sheets(MSDS) Available @ EnergyLab.com ->Services -> MSDS Sheets

Corrosive Chemicals: Nitric, Sulfuric, Phosphoric, Hydrochloric Acids and Sodium Hydroxide. Zinc Acetate is a skin irritant.

Subcontracting of sample analyses to an outside laboratory may be required. If so, Energy Laboratories will utilize its branch laboratories or qualified contract laboratories for this service. Any such laboratories will be indicated within the Laboratory Analytical Report.