COMPLIANCE / ENGINEERING / REMEDIATION

LT Environmental, Inc.
820 Megan Avenue, Unit B
Rifle, Colorado 81650
T 970.285.9985 / F 970.285.2467

March 6, 2012

Mr. Charlie Jensen
EnCana Oil and Gas (USA) Inc.
2717 County Road 215, Suite 100
Parachute, Colorado 81635

RE: Quarterly Operation and Maintenance Report
Passive Soil Vapor Extraction System
COGCC Facility Identification No. 425551
COGCC Remediation No. 6321
EnCana - G29 Well Pad
Garfield County, Colorado

Dear Mr. Jensen:

LT Environmental, Inc. (LTE), under the direction of EnCana Oil & Gas (USA) Inc. (EnCana), conducted corrective action monitoring at the G29 Well Pad (Site) located in Garfield County, Colorado. The legal site description is the southwest quarter of the northeast quarter of Section 29, Township 5 South, and Range 95 West. The Site Location Map is provided as Figure 1.

Site History

On August 16 and 17, 2011, LTE advanced six soil borings at the site to assess total petroleum hydrocarbon (TPH) impact of soil identified during a pit liner removal in June 2010. The pit was constructed prior to April 1, 2009, and was comprised of two lined pits connected by a weir. Upon removal of the pit liners, the pits were backfilled to match the existing grade of the pad. Soil borings were advanced within, cross-gradient, and down-gradient of the former pit locations. Additional information regarding the initial site assessment can be found in the LTE report *Site Investigation Results and Soil Vapor Extraction Pilot Test Work Plan* dated September 12, 2011.

On September 26 through 29, 2011, LTE advanced five additional soil borings that were completed as Soil Vapor Extractions (SVE) wells (G29-SVE01 through G29-SVE05) to further define the vertical and lateral extent of TPH impact to soil in the east pit. The five soil borings were completed as SVE wells in order to evaluate passive and/or active SVE as a possible means of enhancing subsurface biodegradation of residual hydrocarbons. Additionally, an SVE pilot test was conducted to derive the necessary data to design an active SVE system, if warranted.

All soil boring and well locations are provided on Figure 2. Additional information regarding SVE well installation and the additional soil investigation can be found in the LTE report *Soil Vapor Extraction Well Installation & Pilot Test Results Report* dated October 25, 2011.

LTE has initiated monthly field parameter monitoring of a passive soil vapor extraction (SVE) system. Work completed for this report includes activities performed at the Site from November 2011 through January 2012. Work conducted on the remediation program during the reporting period included system installation, operation and maintenance (O&M), and passive SVE field parameter monitoring.

Passive SVE System Installation

LTE installed passive wind turbines atop wells G29-SVE01 through G29-SVE05 on October 10, 2011. The passive wind turbines were installed at an approximate height of four feet above ground surface to maximize their effectiveness. The turbines are activated by wind to induce air flow from the soil subsurface. The induced air flow promotes volatilization of hydrocarbons entrained on soil particles and provides oxygen to indigenous microbes, thereby promoting remediation of affected soils through physical and biological processes.

Passive SVE System Monitoring and Evaluation

On November 10, 2011, LTE initiated monthly O&M activities to monitor the performance of the passive SVE system. Performance parameters such as concentrations of carbon dioxide (CO_2), carbon monoxide (CO), hydrogen sulfide (H_2S), methane (CH_4), volatile organic compounds (VOC's), oxygen (O_2), and flow rate measurements are being documented during each event. Measurements are collected using a Mini-Rae photo-ionization detector (PID), Q-Rae Plus 4-gas meter, RKI Eagle lower explosive limit (LEL) Meter, TSI 9346 Air Velocity Meter, and Dwyer Series 471 thermo-anemometer. Monthly O&M field parameter readings are provided in Table 1.

Field Parameter Evaluation – Hydrocarbon Biodegradation

The passive SVE field monitoring parameters indicate continued biodegradation of subsurface hydrocarbons. During aerobic biodegradation microbes utilize O_2 to oxidize hydrocarbons and produce CO_2 as a byproduct. Thus the presence of CO_2 in passive SVE wells G29-SVE01, G29-SVE02, G29-SVE03 and G29-SVE04 is a key indication of subsurface hydrocarbon degradation.

Another indication of aerobic biodegradation in the wells where CO_2 has been observed is a corresponding reduction in observed O_2. The correlation between increased CO_2 concentrations and decreased O_2 concentrations was observed in SVE wells G29-SVE01, G29-SVE02,

G29-SVE03 and G29-SVE04. However, the CO_2 and O_2 correlation was not seen in G29-SVE04 on January 25, 2012.

Additionally, rates of biodegradation of hydrocarbons have been observed to decrease in colder climates. From the temperature field data we find that indeed CO_2 concentrations were lower in G29-SVE03 and G29-SVE04 at temperatures near 29 $^{\circ}$F on December 19, 2011. The next month's temperature readings increased as did the CO_2 concentrations.

Indicators of other metabolic processes other than aerobic biodegradation (CH_4, H_2S, or CO) were not observed in significant quantities during any of the O&M events.

Air Emissions

PID readings and flow rates were collected during O&M activities to determine the physical hydrocarbon removal rate of the passive SVE system. During the 12/19/201 field monitoring event no flow rate was observed in any of the passive SVE wells. Due to low flow rates and low PID concentrations the estimated physical hydrocarbon mass removal was not significant. An estimate of 0.04 pounds of TPH was removed during the period. Emission estimates are provided in Table 2.

Beginning in March 2012 air samples will be collected on a quarterly basis for laboratory analysis. The laboratory analytical results will be used to provide a more accurate physical mass removal rate of hydrocarbons.

Summary and Conclusions

Following site assessment, five SVE wells were converted to a passive SVE system at EnCana's G29 Well Pad. Wells were installed in and around former pit locations to a depth of 45 feet below ground surface. To evaluate the effectiveness of the passive SVE wells LTE personnel conducted monthly O&M and parameter monitoring activities. The O&M parameter monitoring indicate active aerobic biodegradation of hydrocarbons is occurring. The parameter monitoring also indicate that approximately 0.04 pounds of TPH have been removed through enhanced volatilization (Table 2).

Currently the primary remediation mechanism appears to be aerobic biodegradation of the hydrocarbons. An estimate of aerobic biodegradation rates will be determined with additional field data. LTE recommends continued monitoring and evaluation of the passive SVE system at the Site.

LTE appreciates the opportunity to provide environmental services to EnCana. Please call us at 970-285-9985 if you have any questions or comments regarding this report.

Sincerely,

LT ENVIRONMENTAL, INC.

Chris McKisson
Environmental Scientist

Rob Fishburn C.P.G., P.G.
Western Slope Office Manager/Senior Hydrologist

Attachments:

Figure 1 - Site Location Map
Figure 2 - Site Map
Table 1 – Operation and Maintenance Field Parameters
Table 2 – Air Emissions Estimate

FIGURES

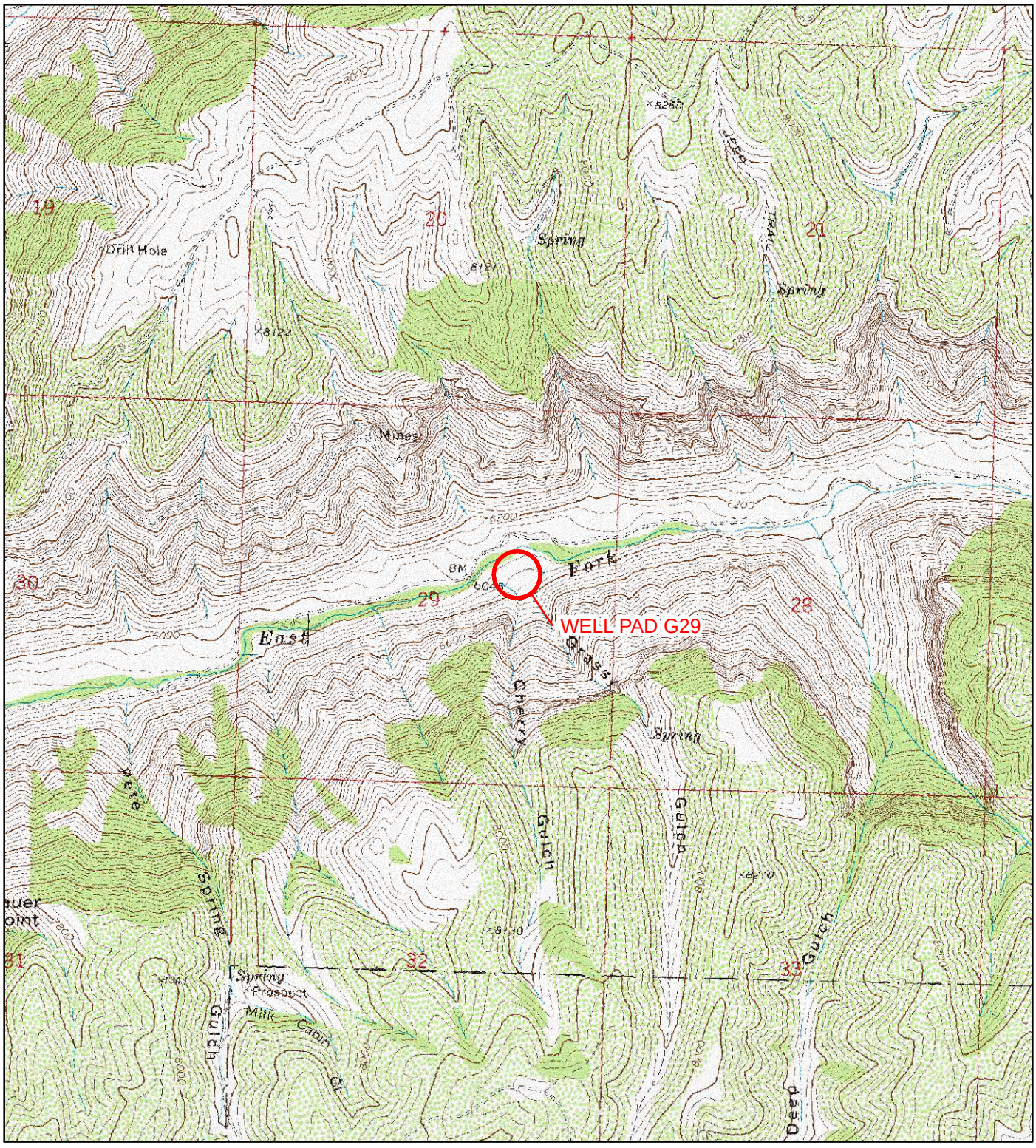

IMAGE COURTESY OF USDA/NRCS, VARIOUS DATES

LEGEND

SITE LOCATION

0 2,000 4,000

Feet

N

FIGURE 1
SITE LOCATION MAP
WELL PAD G29
SWNE 29 5S 95W
GARFIELD COUNTY, COLORADO
ENCANA OIL AND GAS (USA) INC.

P:\Encana\GIS\MXD\0334_11031_G29\033411031_G29_FIG01_SL_MAP.mxd

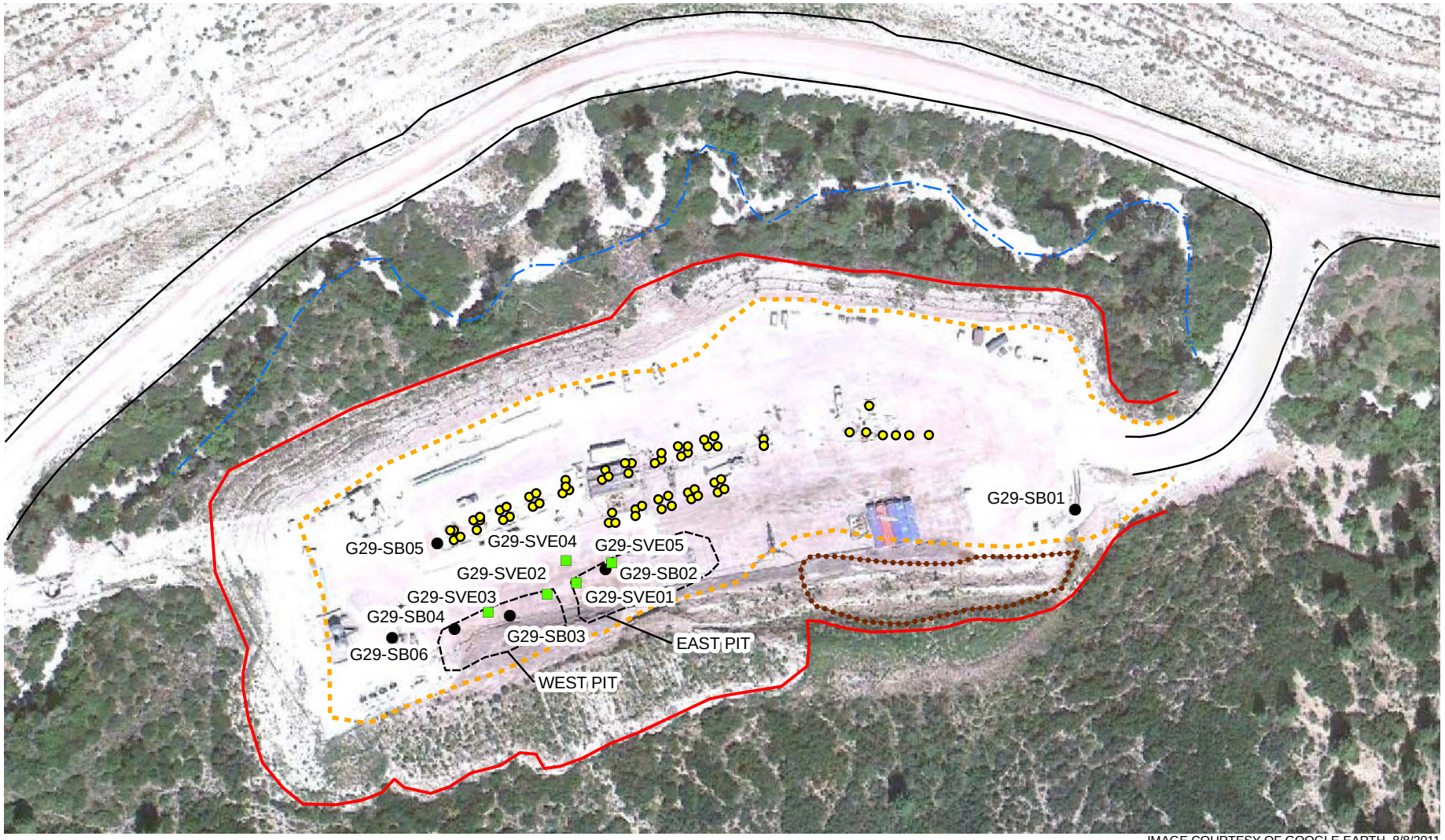

IMAGE COURTESY OF GOOGLE EARTH, 8/8/2011

LEGEND

- OIL AND GAS WELL
- SOIL BORING
- SOIL VAPOR EXTRACTION WELL
- PIT BOUNDARY
- CUTTINGS STOCK PILE
- EDGE OF WORKING SURFACE AND PERIMETER CONTROLS
- EDGE OF DISTURBANCE
- EAST FORK PARACHUTE CREEK
- ACCESS ROAD

0 150 300
Feet

N

FIGURE 2
SITE MAP
WELL PAD G29
SWNE 29 5S 95W
GARFIELD COUNTY, COLORADO
ENCANA OIL AND GAS (USA) INC.

P:\Encana\GIS\MXD\0334_11031_G29\033411031_G29_FIG02_SITE_MAP.mxd

TABLES

TABLE 1

OPERATION AND MAINTENANCE FIELD PARAMETERS
G29 WELL PAD
GARFIELD COUNTY, COLORADO
ENCANA OIL AND GAS (USA) INC.

Well ID	Date	Velocity (fpm)	Flow (cfm)	Temperature (degrees Fahrenheit)	PID (ppm)	O_2 (%)	H_2S (ppm)	CO (ppm)	CO_2 (ppm)	CH_4 (%)
G29 SVE-01	11/10/2011	0.0	NM	42.9	32.6	14.1	0.0	2.0	>5,000	14.0*
	12/19/2011	0.0	0.0	29.4	11.1	20.9	0.0	0.0	4,900	1.0
	1/25/2012	0.0	0.0	36.1	3.6	14.8	0.0	0.0	>10,000	0.0
G29 SVE-02	11/10/2011	0.0	NM	44.1	2.1	13.0	0.0	0.0	>5,000	12.0*
	12/19/2011	0.0	0.0	29.8	0.0	16.6	0.0	0.0	>5,000	0.0
	1/25/2012	0.0	0.013	34.5	0.2	17.4	0.0	0.0	>10,000	0.0
G29 SVE-03	11/10/2011	58	NM	44.7	0.3	12.5	0.0	0.0	>5,000	11.0*
	12/19/2011	0.0	0.0	29.1	0.0	20.9	0.0	0.0	0.0	0.0
	1/25/2012	0.0	0.795	33.0	0.0	19.1	0.0	0.0	>10,000	0.0
G29 SVE-04	11/10/2011	0.0	NM	42.7	0.1	18.4	0.0	2.0	>5,000	12.0*
	12/19/2011	0.0	0.0	29.6	0.4	20.9	0.0	0.0	0.0	0.0
	1/25/2012	0.0	0.0	37.2	0.0	20.9	0.0	0.0	>10,000	0.0
G29 SVE-05	11/10/2011	0.0	NM	42.6	0.1	19.9	0.0	0.0	0.0	12.0*
	12/19/2011	0.0	0.0	29.2	0.4	20.9	0.0	0.0	0.0	0.0
	1/25/2012	0.0	0.930	33.2	0.0	20.9	0.0	0.0	0.0	0.0

Notes:
fpm - feet per minute
cfm - cubic feet per minute
PID - photoionization detector
ppm - parts per million
O_2 - oxygen
% - percent
H_2S - hydrogen sulfide
CO - carbon monoxide
CO_2 - carbon dioxide
CH_4 - methane
NM - not measured
* - Reading not accurate due to methane sensor error.

TABLE 2

EMISSIONS ESTIMATE
G29 WELL PAD
GARFIELD COUNTY, COLORADO
ENCANA OIL AND GAS (USA) INC.

Well ID	Date	Flow (cfm)	Hours	PID (ppm)	TPH (mg/L)	Total TPH (pounds)
G29 SVE-01	11/10/2011	0.0	744	32.6	0.12	0.00
	12/19/2011	0.0	936	11.1	0.04	0.00
	1/25/2012	0.0	888	3.6	0.01	0.00
G29 SVE-02	11/10/2011	0.0	744	2.1	0.01	0.00
	12/19/2011	0.0	936	0.0	0.0	0.00
	1/25/2012	0.013	888	0.2	0.01	0.0004
G29 SVE-03	11/10/2011	1.27	744	0.3	0.01	0.04
	12/19/2011	0.0	936	0.0	0.0	0.00
	1/25/2012	0.795	888	0.0	0.0	0.00
G29 SVE-04	11/10/2011	0.0	744	0.1	0.01	0.00
	12/19/2011	0.0	936	0.4	0.01	0.00
	1/25/2012	0.0	888	0.0	0.0	0.00
G29 SVE-05	11/10/2011	0.0	744	0.1	0.01	0.00
	12/19/2011	0.0	936	0.4	0.01	0.00
	1/25/2012	0.930	888	0.0	0.0	0.00
					TOTAL	**0.04**

Notes:
fpm - feet per minute
cfm - cubic feet per minute
PID - photoionization detector
ppm - parts per million
TPH - total petroleum hydrocarbons
mg/L - milligrams per liter
Passive SVE bagan operation on 10/10/11
TPH is estimated based on PID ppm readings