



May 29, 2009

Mr. John Nussbaumer  
Petroleum Development Corporation  
1775 Sherman Street, Suite 3000  
Denver, Colorado 80203

RE: Leclerg 31-22 Release  
API # 05-123-20341  
Weld County, Colorado

Dear Mr. Nussbaumer:

LT Environmental, Inc. (LTE) was contracted by Petroleum Development Corporation (PDC) to conduct remedial activities at the Leclerg 31-22 tank battery (Site) located in Weld County, Colorado (Figure 1). Remedial activities were conducted at the Site due to a leak in the dump lines that impacted soil and groundwater.

### **Source Identification**

On September 12, 2008, PDC discovered petroleum hydrocarbon impacted soil while conducting routine maintenance activities on the dump lines. Once the source of the release was identified, PDC shut in the adjacent wells, removed the dump lines and tank battery equipment, and began excavating petroleum hydrocarbon impacted soils above the Colorado Oil and Gas Conservation Commission (COGCC) allowable level (Table 910-1 prior to 4/1/09).

### **Source Removal**

On September 10 and 11, 2008, LTE conducted excavation oversight, field screening, and soil and groundwater sampling activities at the Site. Petroleum hydrocarbon impacted soil above the COGCC sensitive area allowable level was excavated to a depth of 4.5 feet below ground surface (bgs) and transported off-site to the Waste Management landfill in Ault, Colorado. The excavation crew encountered a visible layer of condensate on the groundwater table at 4.5 feet bgs and ceased removing saturated soils. LTE collected seven soil samples from the extent of the excavation above the groundwater table and submitted the samples for analysis of Total Petroleum Hydrocarbons (TPH) by Environmental Protection Agency (EPA) Modified Method 8015. LTE also collected a sample of groundwater entering the excavation and submitted the sample for analysis of benzene, toluene, ethylbenzene, and xylenes (BTEX) by EPA Method 8260B. Analytical results indicated soil samples were below the COGCC sensitive area allowable level for TPH of 1,000 milligrams per kilogram (mg/kg). However, analytical results confirmed groundwater exceeded the Colorado Department of Public Health and Environment (CDPHE) Water Quality Control Commission (WQCC) Regulation 41- The Basic Standard for



Groundwater of 5 micrograms per liter ( $\mu\text{g/L}$ ). LTE, on behalf of PDC, submitted a Form 19 on September 25, 2008 (To fulfill COGCC spill/release reporting requirements). Before backfilling the excavation, activated carbon was applied to the groundwater and exposed smear zone soils.

### **Groundwater Monitoring Well Installation**

In September 2008, LTE contracted Site Services Drilling of Golden, Colorado to install three point of compliance (POC) wells to the south-southwest of the former excavation. The groundwater monitoring wells were gauged and sampled for two consecutive quarters. On January 5, 2009, LTE measured top of casing elevations and surveyed monitoring wells MW01 through MW03. Based on the survey data and depth to groundwater, LTE determined the groundwater flow direction is to the east-northeast. LTE concluded wells MW01 through MW03 were not sufficient to define groundwater impacts since they were located to the west-southwest of the release. As a result of insufficient data, groundwater monitoring wells MW01 through MW03 have been abandoned.

On March 3, 2009, LTE installed three additional POC monitoring wells to the east-northeast of the release area. Following installation, each of the wells was developed and purged. Groundwater samples were collected from each of the wells and submitted for laboratory analysis of BTEX by EPA Method 8260B on March 4, 2009. Analytical results indicated BTEX levels in groundwater samples collected from all of the wells were not detected above the laboratory reporting limit of 1  $\mu\text{g/L}$ .

### **Summary and Conclusions**

PDC discovered historic petroleum hydrocarbon impacted soil while conducting routine maintenance activities on the dump lines at the Leclerg 31-22 tank battery site. PDC quickly responded to the historic release by removing the dump lines and tank battery equipment, and excavating petroleum hydrocarbon impacted soils.

Petroleum hydrocarbon impacted soil above the COGCC sensitive area allowable level was excavated to a depth of 4.5 feet bgs. Soil samples collected above the groundwater table indicated TPH concentrations were below the COGCC sensitive area allowable level. Groundwater entering the excavation exceeded the Basic Standard for Groundwater for benzene.

Analytical results indicate the downgradient extent of groundwater impacts has been defined to the east. Monitoring wells MW04, MW05 and MW06 are considered POC wells. Monitoring wells MW04, MW05 and MW06 will continue to be sampled until four consecutive quarters of analytical results are below the Basic Standards for Groundwater for BTEX.



LTE appreciates the opportunity to provide environmental services to PDC. Please call us at (303) 433-9788 if you have any questions regarding this letter report or require additional information.

Sincerely,

LT ENVIRONMENTAL, INC.

A handwritten signature in black ink, appearing to read 'Asher'.

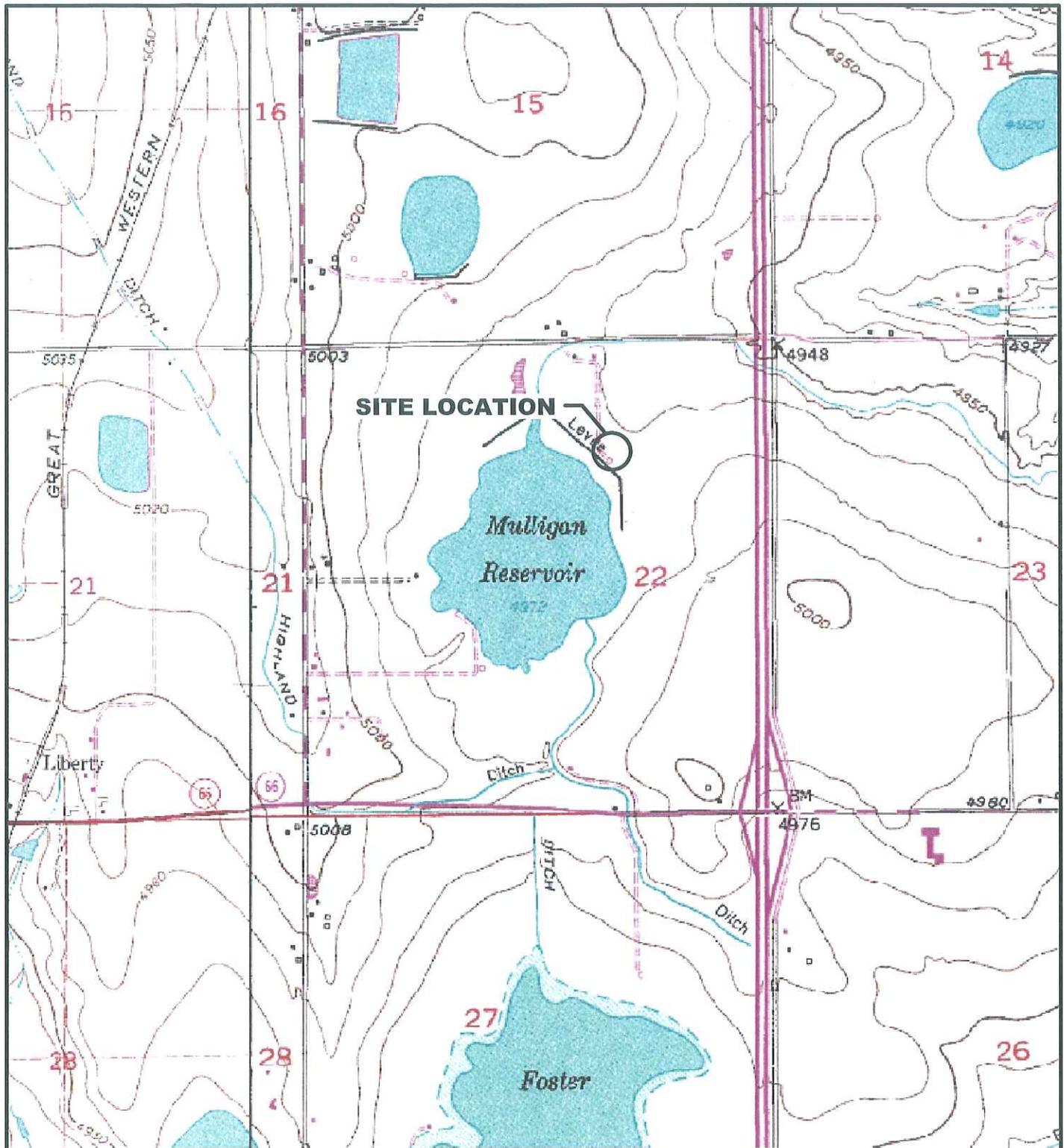
Asher Weinberg  
Staff Environmental Scientist

A handwritten signature in black ink, appearing to read 'John D. Peterson'.

John D. Peterson, PG  
Principal/Senior Geologist

Attachments:

- Table 1 – Soil Sample Analytical Data
- Table 2 – Groundwater Sample Analytical Data
- Figure 1 – Site Location Map
- Figure 2 – Site Map
- Attachment 1 – Soil Analytical Reports
- Attachment 2 – Groundwater Analytical Reports



**LEGEND**

○ SITE LOCATION

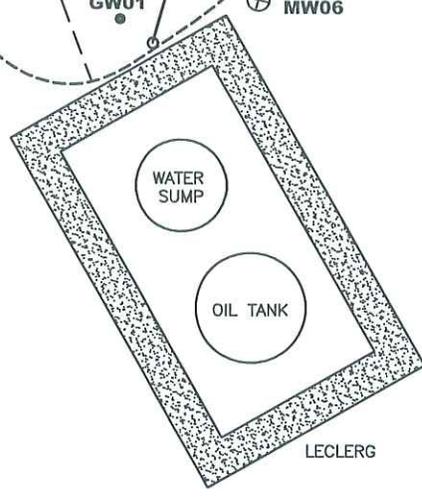
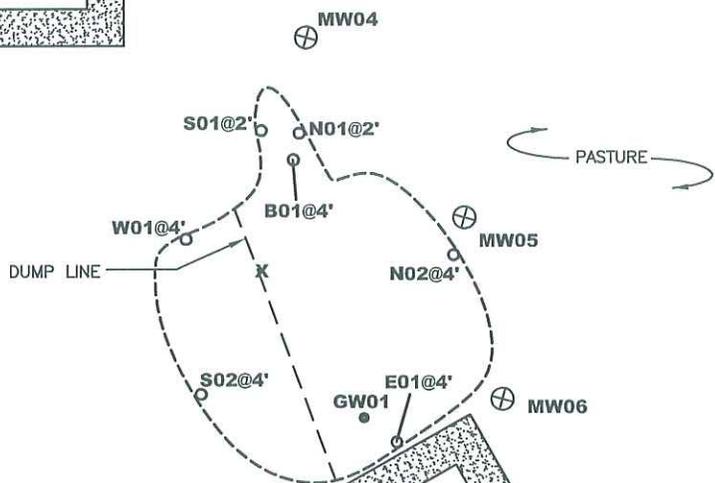
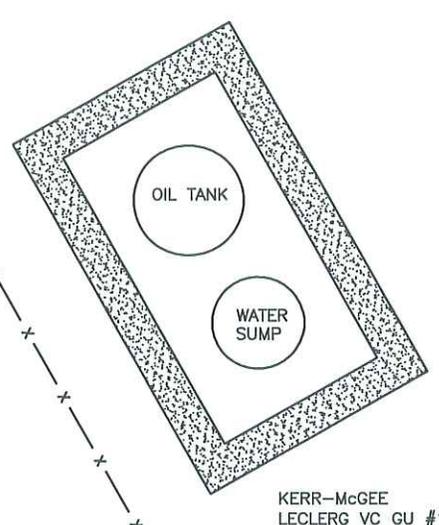
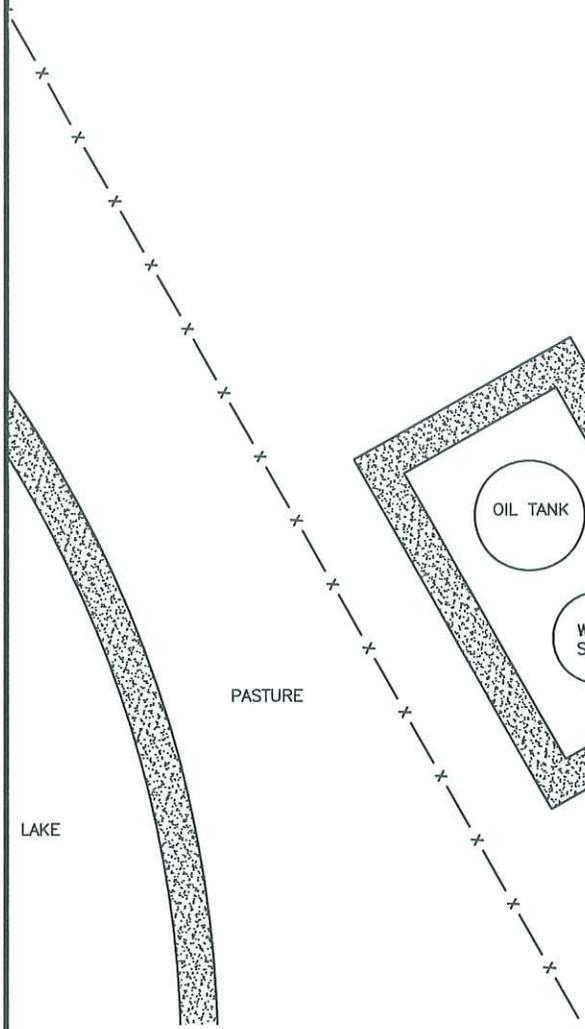
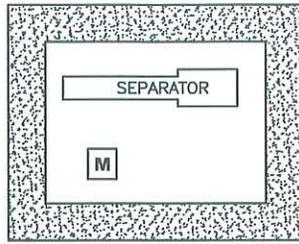


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FEET

SOURCE: TOPOZONE.COM  
USGS 7.5' QUADRANGLE  
(NAD27)

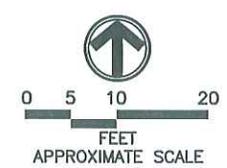
**FIGURE 1**  
**SITE LOCATION MAP**  
 LECLERG 31-22  
 NWNE 22 3N 68W  
 WELD COUNTY, CO  
 PETROLEUM DEVELOPMENT CORPORATION





**LEGEND**

- MW04 ⊗ MONITORING WELL LOCATION
- N01@2' ○ SOIL SAMPLE LOCATION
- GW01 ● WATER SAMPLE LOCATION
- M METER HOUSE
- ▭ BERM
- X RELEASE LOCATION
- - - - - EXTENT OF EXCAVATION
- x - FENCE
- ➔ ESTIMATED GROUNDWATER FLOW DIRECTION



**FIGURE 2**  
**SITE MAP**  
 LECLERG 31-22  
 NWNE 22 3N 68W  
 WELD COUNTY, CO  
 PETROLEUM DEVELOPMENT CORPORATION



**TABLE 1**  
**SOIL SAMPLE ANALYTICAL DATA**  
**LECLERG 31-22**  
**WELD COUNTY, COLORADO**  
**PETROLEUM DEVELOPMENT CORPORATION**

<b>SAMPLE ID</b>	<b>DATE</b>	<b>DEPTH (feet bgs)</b>	<b>TPH (mg/kg)</b>
N01@2'	9/10/2008	2	< 50
S01@2'	9/10/2008	2	< 50
B01@4'	9/10/2008	4	< 50
W01@4'	9/11/2008	4	< 50
E01@4'	9/11/2008	4	< 50
N02@4'	9/11/2008	4	< 50
S02@4'	9/11/2008	4	< 50
COGCC Sensitive Area Allowable Level*			<b>1,000</b>
COGCC Allowable Level**			<b>500</b>

< - less than stated laboratory reporting limit

TPH - Total Petroleum Hydrocarbons (C6-C36)

mg/kg - milligrams per kilogram

bgs - below ground surface

COGCC-Colorado Oil and Gas Conservation Commission

\* effective prior to April 1, 2009

\*\* effective as of April 1, 2009



TABLE 2  
GROUNDWATER SAMPLE ANALYTICAL DATA  
LECLERG 31-22  
WELD COUNTY, COLORADO  
PETROLEUM DEVELOPMENT CORPORATION

SAMPLE ID	SAMPLE DATE	BENZENE (ug/L)	TOLUENE (ug/L)	ETHYLBENZENE (ug/L)	XYLENES (ug/L)
GW01	9/11/2008	<b>580</b>	<b>810</b>	140	1,200
MW04	3/4/2009	< 1.0	< 1.0	< 1.0	< 1.0
MW05	3/4/2009	< 1.0	< 1.0	< 1.0	< 1.0
MW06	3/4/2009	< 1.0	< 1.0	< 1.0	< 1.0
The Basic Standards for Groundwater		<b>5</b>	<b>560</b>	<b>700</b>	<b>1,400</b>

ug/L - Micrograms per liter

< - Less than stated laboratory reporting limits

Results noted in bold exceed Colorado Department of Public Health and Environment (CDPHE)-Water Quality Control Commission (WQCC) Regulation 41-The Basic Standards for Groundwater

