



# Highlander Environmental Corp.

Midland, Texas

August 20, 2007

Mr. Larry Johnson  
Environmental Engineer Specialist  
Oil Conservation Division- District I  
1625 N. French Drive  
Hobbs, New Mexico 88240

RP#1401

**RE: Assessment and Work Plan for the Spill at the Latigo Petroleum Inc. (Pogo Producing Company), Central Corbin Queen Unit #105, Located in Unit Letter J, Section 9, Township 18 South, Range 33 East, Lea County, New Mexico.**

Dear Mr. Johnson:

Highlander Environmental Corp. (Highlander) was contacted by Pogo Producing Company (Pogo) to assess a spill from an injection well at the Central Corbin Queen Unit #105, located in Unit Letter J Section 9, Township 18 South, Range 33 East, Lea County, New Mexico (Site). The spill location coordinates are N 32° 45.661' W 103° 40.036'. The Site is shown on Figure 1.

## **Background**

According to the State of New Mexico C-141 report, the spill occurred on July 8, 2007, when a ¼ inch nipple and valve blew out on the filter housing of the injection well. Approximately 100 barrels of produced water were released and none was recovered. The release impacted an area on the pad approximately 80' x 100' and migrated west off the pad approximately 835', at a width of approximately 2.0'. The State of New Mexico C-141 (Initial) is shown in Appendix D.

As requested by the BLM, a class III culture resources inventory (Archeological Study) was performed by SNMAS, Inc. The survey encountered no culture resources sites in the area. The NMCRIS Investigation Report Abstract Form (NIAF) is shown in Appendix A.

## **Groundwater and Regulatory**

The New Mexico State Engineer's Office database did not show any wells in Section 9, however, wells were found in Section 8 and 17, with a reported depths to water of 100' and 85', respectively. The USGS reports did show one well located in Section 10 with

reported a depth to water at 62' below surface. According to the Geology and Groundwater Conditions in Southern Lea County, Report 6, there is a boundary between the Triassic rocks and saturated Tertiary and Quaternary formations. The depth to water northeast of the boundary shows depths of 36' in Section 14 (published data) and 62' in Section 10 (USGS). The Site is located southwest of the boundary and would appear to have projected depth to water greater than 50.0' below surface. The New Mexico State Engineer and USGS water well reports are shown in Appendix B.

A risk-based evaluation was performed for the Site in accordance with the New Mexico Oil Conservation Division (NMOCD) Guidelines for Remediation of Leaks, Spills, and Releases, dated August 13, 1993. The guidelines require a risk-based evaluation of the site to determine recommended remedial action levels (RRAL) for benzene, toluene, ethylbenzene, and xylene (collectively referred to as BTEX) and total petroleum hydrocarbons (TPH) in soil. The proposed RRAL for benzene was determined to be 10 parts per million (ppm) or milligrams per kilogram (mg/kg) and 50 ppm for total BTEX (sum of benzene, toluene, ethylbenzene, and xylene). Based upon the depth to groundwater, the proposed RRAL for TPH is 1,000 mg/kg.

### **Assessment and Results**

On July 13, 2007, Highlander personnel inspected and sampled the spill area. The release impacted an area on the pad approximately 80' x 100' and migrated west off the pad approximately 835', at a width of approximately 2.0'. A total of eleven (11) auger holes (AH-1 through AH-11) were installed using a stainless steel hand auger to assess the impacted soils. Soil samples were collected at 0.5' to 1.0' foot intervals and submitted for analysis of TPH by EPA method 8015 modified and chloride by EPA method 300.0. Selected samples were analyzed for BTEX by EPA method 8021B. Copies of all of the laboratory analysis and chain-of-custody documentation are included in Appendix C. The auger hole locations are shown on Figure 2. The laboratory results of the sampling are summarized in Table 1.

Referring to Table 1, the laboratory results indicated no TPH or BTEX impact at or above the RRAL. On the well pad, AH-1 showed a chloride high of 1,260 mg/kg at 0-1' and declined to 588 mg/kg at 3.0' below surface. At AH-2, the chloride concentration of 3,280 mg/kg was detected at 0-1' and declined below reporting limit at 1.0' below surface.

The area west of the pad did show a chloride impact to the soils. The detectable chloride concentrations ranged from 53.1 mg/kg to 5,230 mg/kg. Auger holes (AH-3, AH-4, AH-6 and AH-11) were not vertically defined with bottom hole samples of 2,050 mg/kg (4.0'), 4,170 mg/kg (1.0'), 4,020 mg/kg (1.0') and 980 mg/kg at (4.0'), respectively. These areas were not defined due to a dense formation encountered during the assessment. The remaining areas of AH-5, AH-7, AH-8, AH-9 and AH-10 were vertically defined at depths from 2.0' to 4.0' below surface.

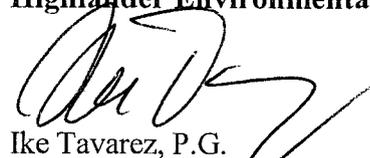


## Work Plan

Based on the results, the spill area does have elevated chloride concentrations in the narrow spill area west of the pad. Some of the areas were vertically defined to a depth of 2.0' to 4.0' below surface. In order to remove the impacted chloride concentrations, Pogo proposes to excavate the spill area. The impacted soil will be stockpiled on the well pad and then transported to proper disposal. If accessible, the chloride impact at the pad will be scraped to a depth of 1.0'. The area west of the pad will be excavated to depth from 2.0' to 4.0' below surface. Once the excavation is completed, confirmation bottom hole samples will be collected for chloride evaluation. If additional delineation is required, the backhoe will be used to define the extent of the remaining chloride impact.

Once completed, the results of the assessment, along with recommendations for further investigation or remediation of the Site will be submitted to the NMOCD and the BLM for approval. If you have any question or comments concerning the proposed activities or the assessment performed at the Site, please call me at (432) 682-4559.

**Highlander Environmental Corp.**



Ike Tavarez, P.G.  
Senior Geologist/Project Manager

cc: Don Riggs – Pogo Producing  
Pat Ellis – Pogo Producing  
Trishia C. Bad Bear – BLM, Hobbs, NM



**Table 1**  
**Pogo Producing**  
**Central Corbin Queen Unit # 105 Injection Well**  
**Lea County, New Mexico**

Sample ID	Date Sampled	Sample Depth (ft)	TPH (mg/kg)			Benzene (mg/kg)	Toluene (mg/kg)	Ethlybenzene (mg/kg)	Xylene (mg/kg)	Chloride (mg/kg)
			DRO	GRO	Total					
AH-1	7/13/2007	0-1.0'	<50.0	<1.00	<50.0	<0.01	<0.01	<0.01	0.0345	1260
AH-1	7/13/2007	1'-1.5'	-	-	-	-	-	-	-	891
AH-1	7/13/2007	2'-2.5	-	-	-	-	-	-	-	910
AH-1	7/13/2007	3'-3.5'	-	-	-	-	-	-	-	588
AH-2	7/13/2007	0-1.0'	<50.0	1.01	1.01	<0.01	<0.01	<0.01	0.0315	3280
AH-2	7/13/2007	1'-1.5'	-	-	-	-	-	-	-	<50.0
AH-2	7/13/2007	2'-2.5	-	-	-	-	-	-	-	250
AH-3	7/13/2007	0-1.0'	<50.0	<1.00	<50.0	-	-	-	-	4660
AH-3	7/13/2007	1'-1.5'	-	-	-	-	-	-	-	4730
AH-3	7/13/2007	2'-2.5	-	-	-	-	-	-	-	4390
AH-3	7/13/2007	4'-4.5'	-	-	-	-	-	-	-	2050
AH-4	7/13/2007	0-1.0'	<50.0	<1.00	<50.0	<0.01	<0.01	<0.01	<0.01	4300
AH-4	7/13/2007	1'-1.5'	-	-	-	-	-	-	-	4170
AH-5	7/13/2007	0-1.0'	<50.0	<1.00	<50.0	-	-	-	-	4910
AH-5	7/13/2007	1'-1.5'	-	-	-	-	-	-	-	4410
AH-5	7/13/2007	2'-2.5	-	-	-	-	-	-	-	3170
AH-5	7/13/2007	4'-4.5'	-	-	-	-	-	-	-	122
AH-6	7/13/2007	0-1.0'	<50.0	<1.00	<50.0	<0.01	<0.01	<0.01	<0.01	3690
AH-6	7/13/2007	1'-1.5'	-	-	-	-	-	-	-	4020
AH-7	7/13/2007	0-1.0'	<50.0	<1.00	<50.0	-	-	-	-	4130

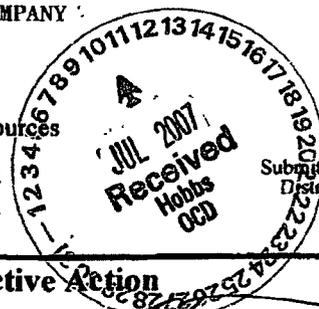
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			DRO	GRO	Total					
AH-7	7/13/2007	1'-1.5'	-	-	-	-	-	-	-	4240
AH-7	7/13/2007	2'-2.5'	-	-	-	-	-	-	-	1900
AH-7	7/13/2007	4'-4.5'	-	-	-	-	-	-	-	348
AH-8	7/13/2007	0-1.0'	<50.0	<1.00	<50.0	<0.01	<0.01	<0.01	<0.01	3780
AH-8	7/13/2007	1'-1.5'	-	-	-	-	-	-	-	2420
AH-8	7/13/2007	2'-2.5'	-	-	-	-	-	-	-	4150
AH-8	7/13/2007	4'-4.5'	-	-	-	-	-	-	-	2800
AH-8	7/13/2007	4.5'-5'	-	-	-	-	-	-	-	53.1
AH-9	7/13/2007	0-1.0'	<50.0	<1.00	<50.0	-	-	-	-	3160
AH-9	7/13/2007	1'-1.5'	-	-	-	-	-	-	-	4070
AH-9	7/13/2007	2'-2.5'	-	-	-	-	-	-	-	<50.0
AH-10	7/13/2007	0-1.0'	<50.0	<1.00	<50.0	<0.01	<0.01	<0.01	<0.01	3550
AH-10	7/13/2007	1'-1.5'	-	-	-	-	-	-	-	4230
AH-10	7/13/2007	2'-2.5'	-	-	-	-	-	-	-	2380
AH-10	7/13/2007	3'-3.5'	-	-	-	-	-	-	-	<50.0
AH-11	7/13/2007	0-1.0'	<50.0	<1.00	<50.0	-	-	-	-	3140
AH-11	7/13/2007	1'-1.5'	-	-	-	-	-	-	-	4260
AH-11	7/13/2007	2'-2.5'	-	-	-	-	-	-	-	5230
AH-11	7/13/2007	4'-4.5'	-	-	-	-	-	-	-	980

(-) Not Analyzed

District I  
1625 N French Dr., Hobbs, NM 88240  
District II  
1301 W. Grand Avenue, Artesia, NM 88210  
District III  
1000 Rio Brazos Road, Aztec, NM 87410  
District IV  
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico  
Energy Minerals and Natural Resources  
Oil Conservation Division  
1220 South St. Francis Dr.  
Santa Fe, NM 87505



Form C-141  
Revised October 10, 2003  
Submit 2 Copies to appropriate District Office in accordance with Rule 116 on back side of form

**Release Notification and Corrective Action**

**OPERATOR**

Initial Report  Final Report

Name of Company <i>Latigo Petroleum, Inc</i>	Contact <i>PATRICK ELLIS</i>
Address <i>P.O. Box 10340 Midland, TX 79702</i>	Telephone No. <i>(432) 685-8148</i>
Facility Name <i>CENTRAL CORBIN QUEEN UNIT # 105</i>	Facility Type <i>Inj well</i>

Surface Owner	Mineral Owner	Lease No. <i>NMLL 029489A</i>
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**LOCATION OF RELEASE** *API# 30025298980000*

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
<i>J</i>	<i>9</i>	<i>18S</i>	<i>33E</i>	<i>2310</i>	<i>FSL</i>	<i>2310</i>	<i>FEL</i>	<i>LEA</i>

Latitude \_\_\_\_\_ Longitude \_\_\_\_\_

**NATURE OF RELEASE**

Type of Release <i>Produced water</i>	Volume of Release <i>100 BBL</i>	Volume Recovered <i>0</i>
Source of Release <i>injection well</i>	Date and Hour of Occurrence	Date and Hour of Discovery
Was Immediate Notice Given? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Required	If YES, To Whom? <i>1:00pm 7-9-07 10:00AM 7-9-07 LARRY Johnson NMOCD, Trish Badbear BLM</i>	
By Whom? <i>PATRICK ELLIS</i>	Date and Hour <i>4:00pm 7-9-07</i>	
Was a Watercourse Reached? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If YES, Volume Impacting the Watercourse.	

If a Watercourse was Impacted, Describe Fully.\*  
*N/A*

Describe Cause of Problem and Remedial Action Taken.\*  
*A 1/4" nipple and valve blew out on filter housing of injection well. Equipment was replaced.*

Describe Area Affected and Cleanup Action Taken.\*  
*The spill affected an area 80' x 100' on side of pad near wellhead. An area off the pad was affected measuring approx. 2' wide by 110' long. Highlander Environmental was contacted to sample area and evaluate for workplan.*

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to NMOCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the NMOCD marked as "Final Report" does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to ground water, surface water, human health or the environment. In addition, NMOCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.

Signature: <i>Patrick L. Ellis</i>	<b>OIL CONSERVATION DIVISION</b>	
Printed Name: <i>PATRICK ELLIS</i>	Approved by District Supervisor: <i>[Signature]</i>	
Title: <i>EH+S Supervisor</i>	Approval Date: <i>7-11-07</i>	Expiration Date: <i>8-17-07</i>
E-mail Address: <i>ellis@pogo-producing.com</i>	Conditions of Approval: <i>SUBMITTAL OF WORKPLAN BY</i>	
Date: <i>7-10-07</i> Phone: <i>(432) 770-0763</i>	Attached <input type="checkbox"/>	

\* Attach Additional Sheets If Necessary

RE: AUG 20, 2007 SUBMITTAL

WORKPLAN ADDENDUM APPROVED 9.17.07

- ① NOTE ALL STOCKPILED CONTAMINATION IS TO BE PLACED ON PLASTIC W/ INFLOW/OUTFLOW BERM TO PREVENT SPREAD OF CONTAMINATION APPROVAL EXPIRES 12.3.07

*RP# 1401*

## SITE INFORMATION

### Type of Report: Work Plan

#### General Site Information

Site:	Central Corbin Queen Unit 105 Injection Well
Company:	Latigo Petroleum, Inc./Pogo Producing Company
Section, Township and Range	Section 9, T18S, R33E
Unit Letter:	C
Lease Number:	NMLC 029489A
County:	Lea
GPS:	32° 45.661 , 103° 40.036
Surface Owner:	
Mineral Owner:	
Directions:	West of Hobbs, New Mexico, from the intersection of 529 and 62/180, go west on 529 for 18.6 miles, turn left (south) go 0.8 miles into lease road, turn left and go 0.2 miles, turn right (south) go 0.5 miles on main lease road, take another right for 0.1 miles to well location

#### Release Data

Date Released:	7/8/2007
Type Release:	Produced water
Source of Contamination:	injection well
Fluid Released:	100 barrels
Fluids Recovered:	0 barrels

#### Official Communication

Name:	Pat Ellis	Don Riggs	Ike Tavarez
Company:	Pogo Producing Company	Pogo Producing Company	Highlander Environmental Corp.
Address:	300 N. Marienfeld St.	5 Greenway Plaza, Suite 2700	1910 N. Big Spring
P.O. Box	Box 10340		
City:	Midland Texas, 79701-7340	Houston, Texas 77046	Midland, Texas
Phone number:	(432) 685-8100	(713) 297-5045	(432) 682- 4559
Email:	EllisP@pogoproducing.com	riggsd@pogoproducing.com	itavarez@hec-enviro.com

#### Ranking Criteria

Depth to Groundwater:	Ranking Score	Site Data
<50 ft	20	
50-99 ft	10	Average Depth >50 BS
>100 ft.	0	

Wellhead Protection:	Ranking Score	Site Data
Water Source <1,000 ft., Private <200 ft.	20	None
Water Source >1,000 ft., Private >200 ft.	0	

Surface Body of Water:	Ranking Score	Site Data
<200 ft.	20	None
200 ft - 1,000 ft.	10	None
>1,000 ft.	0	

<b>Total Ranking Score:</b>	<b>10</b>
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Acceptable Soil RRAL (mg/kg)		
Benzene	Total BTEX	TPH
10	50	1,000

