



Highlander Environmental Corp.

Midland, Texas

February 17, 2006

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

RE: Assessment Report and Work Plan for the Pogo Producing Company, Cotton Draw Unit #3 Injection Well, Spill Investigation, Located in the NE/4 of Section 16, Township 25 South, Range 32 East, Unit Letter H, Lea County, New Mexico.

Dear Mr. Johnson:

Highlander Environmental Corp. (Highlander) was contacted by Pogo Producing Company (Pogo) to assess a spill on the Cotton Draw Unit #3 Injection Well, located in the NE/4 of Section 16, Township 25 South, Range 32 East, Lea County, New Mexico (Site). The site coordinates are N 32° 07' 53.7", W 103° 40' 23.8". The State of New Mexico C-141 (Initial) is shown in Appendix A. The Site is shown on Figure 1.

Background

According to the State of New Mexico C-141 report, the spill occurred on December 11, 2005, from a leak of an steel injection pipeline. The injection line leak occurred approximately 200' southeast of the injection well #3 in a pasture. The spill released 23 barrels of produced water and none was recovered. In the pasture, the spill affected an area of approximately 90' x 15' (1350) Some produced water migrated onto the lease road measuring 2' to 3' wide by 200' long. (500) 1850 seft

Groundwater and Regulatory

Neither the New Mexico State Engineer Office's database nor USGS database show wells in Section 16, however, one well in Section 32 had reported a depth of 290' below ground surface. In the surrounding Townships and Ranges, most of the wells showed depths to groundwater greater than 200' below surface. The New Mexico State Engineer and USGS 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,

Pogo - 17891

1910 N. Big Spring • Midland, Texas 79705

Incident - nPAC0606128830

(432) 682-4559

Fax (432) 682-3946

application - pPAC0606129062

toluene, ethylbenzene and xylene). Based upon the depth to groundwater, the proposed RRAL for TPH is 5,000 mg/kg.

Corrective Action and Assessment

From January 10 -13, 2006, Highlander supervised the excavation of impacted soils. The impacted area was excavated to a depth of approximated 3.0' below surface. The spill area and excavated area are shown on Figure 2. The excavated soils were transported to Sundance Services, Inc. for disposal. The spill on the lease road was scraped and back dragged with a backhoe. On January 13, 2006, Highlander collected soil samples from the excavated area using a backhoe. A total of four (4) trenches were installed to collected soil samples for analysis of TPH by EPA method 8015 modified, BTEX by EPA method 8021B and chloride by EPA method 300.0. The laboratory report and chain of custody are shown in Appendix C. The results of the sampling are shown in Table 1.

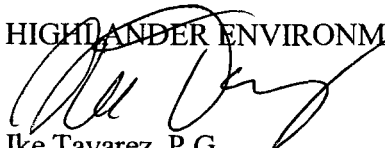
Referring to Table 1, the bottom hole samples (0-1') were below the RRAL for TPH and BTEX. The chloride concentrations ranged from 192 mg/kg (T-2) to 10,100 mg/kg (T-4). Deeper samples were collected using the backhoe in an attempt to define the extents. With the exception of T-3, the areas of T-1, T-2 and T-4 were vertically defined at 3' to 4' below the bottom of the excavation. T-3, located at the source area, showed a chloride concentration of 2,790 mg/kg at 8.0' below bottom of excavation. The area of T-3 will need to be assessed further to define the vertical extent.

Work Plan/Assessment

Highlander personnel will supervise the installation of one (1) soil borings to evaluate the vertical extent of subsurface chloride impact at location T-3. The soil boring will be installed using either an air-rotary type drilling rig or hollow-stem auger rig. Soil samples will be collected at 5 foot intervals during drilling operations. The soil samples will be placed into laboratory supplied containers and delivered to a laboratory under chain-of-custody control for chloride analysis by EPA method 300.0. Soil cuttings from drilling will be stockpiled adjacent to the borehole. Following the completion of the drilling activities, the borehole will be grouted to surface.

Once completed, the results of the assessment along with recommendations for further investigation or remediation, if any, will be submitted to the NMOCD. If you require any additional information or have any questions or comments, please call.

HIGHLANDER ENVIRONMENTAL CORP.



Ike Tavarez, P.G.

Project Manager/Senior Geologist

cc: Don Riggs - Pogo
Pat Ellis - Pogo



Tables

Table 1
Pogo Producing Company
Cotton Draw Unit #3, Injection Line Leak
Lea County, New Mexico

Sample ID	Date Sampled	Sample Depth (ft) (BEB)	TPH (mg/kg)			Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylene (mg/kg)	Chloride (mg/kg)
			C6-C12	C12-C35	Total					
T-1	1/13/2005	0-1	<10	<10	<10	<0.025	<0.025	<0.025	<0.025	1550
T-1	1/13/2005	2	-	-	-	-	-	-	-	46.8
T-1	1/13/2005	3	-	-	-	-	-	-	-	299
T-2	1/13/2005	0-1	<10	<10	<10	<0.025	<0.025	<0.025	0.0282	192
T-2	1/13/2005	2	-	-	-	-	-	-	-	190
T-2	1/13/2005	3	-	-	-	-	-	-	-	270
T-3	1/13/2005	0-1	<10	<10	<10	<0.025	<0.025	<0.025	<0.025	6640
T-3	1/13/2005	2	-	-	-	-	-	-	-	10,600
T-3	1/13/2005	3	-	-	-	-	-	-	-	10,900
T-3	1/13/2005	4.5	-	-	-	-	-	-	-	9,660
T-3	1/13/2005	6	-	-	-	-	-	-	-	6,380
T-3	1/13/2005	8	-	-	-	-	-	-	-	2,790
T-4	1/13/2005	0-1	<10	<10	<10	<0.025	<0.025	<0.025	<0.025	10,100
T-4	1/13/2005	2	-	-	-	-	-	-	-	11,500
T-4	1/13/2005	3	-	-	-	-	-	-	-	2,470
T-4	1/13/2005	4	-	-	-	-	-	-	-	445

(-) Not Analyzed
Sample Depths (ft) - Below Bottom Excavation

Figures

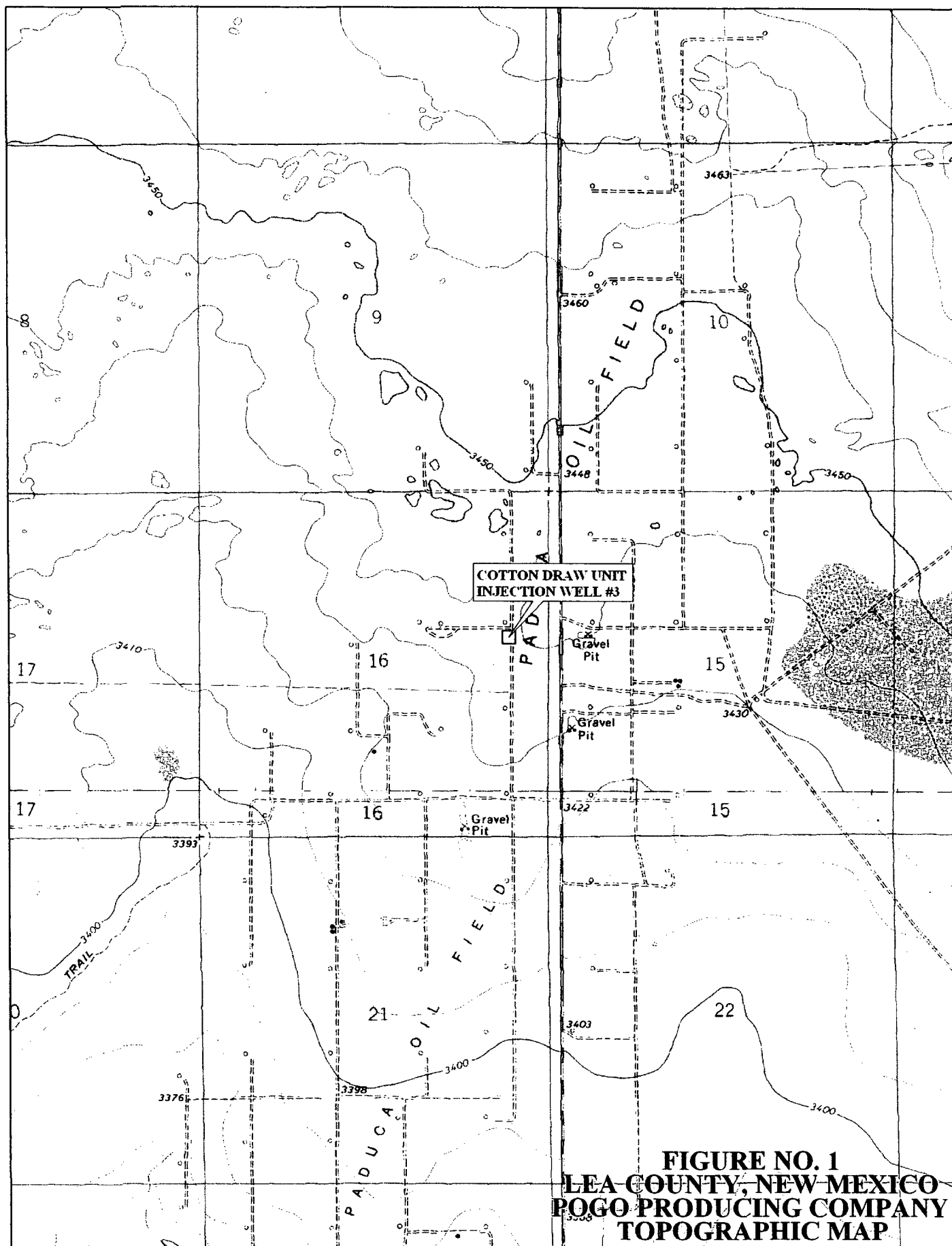


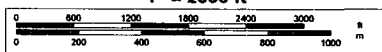
FIGURE NO. 1
LEA COUNTY, NEW MEXICO
POGO PRODUCING COMPANY
TOPOGRAPHIC MAP



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www.delorme.com

Scale 1 : 24,000

1" = 2000 ft





©
#3 COTTON DRAW
INJECTION WELL

LEASE RD.

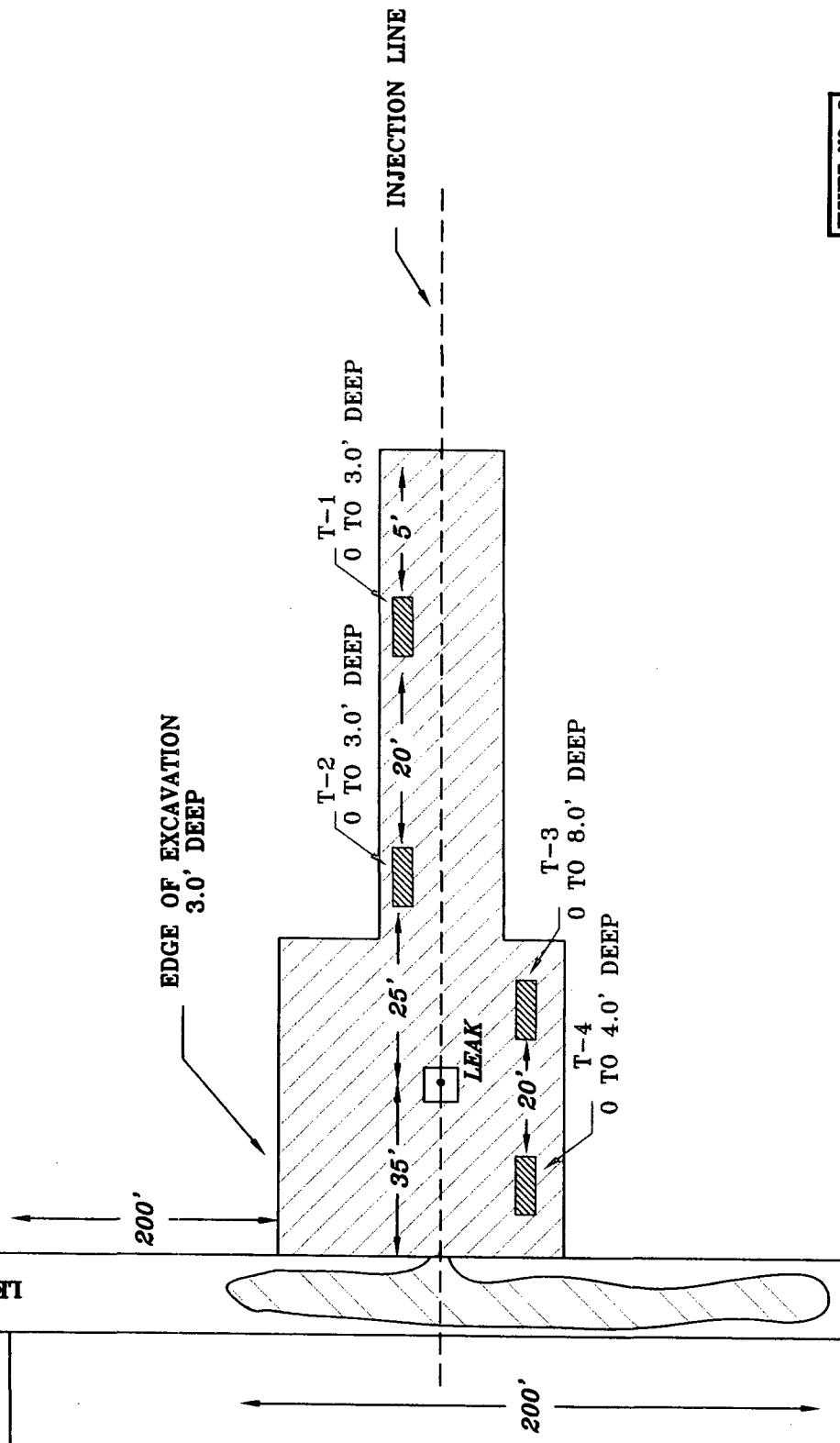


FIGURE NO. 2

LEA COUNTY, NEW MEXICO

POGO PRODUCING COMPANY
COTTON DRAW INJECTION WELL #3

HIGHLANDER ENVIRONMENTAL CORP.
MIDLAND, TEXAS

DATE:	2/20/06
DWN. BY:	JJ
FILE:	6:\Vocals\657\ Cotton Draw

NOT TO SCALE

- TRENCH LOCATIONS
- EXCAVATED AREA
- SPILL AREA ON LEASE RD.

Appendix A

Appendix B

Water Well - Average Depth to Groundwater
Pogo - Cotton Draw Unit #3, Lea County, New Mexico

24 South			31 East		
6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

24 South			32 East		
6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

24 South			33 East		
6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

25 South			31 East		
6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

25 South			32 East		
6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

25 South			33 East		
6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

26 South			31 East		
6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

26 South			32 East		
6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

26 South			33 East		
6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

150 Average depth to groundwater (ft) - New Mexico State Engineer Well Reports

56 Groundwater Depth (ft) - Geology and Groundwater Conditions in Southern Lea County, New Mexico (Report 6)

New Mexico Office of the State Engineer
Well Reports and Downloads

Township: 25S Range: 32E Sections:

NAD27 X: Y: Zone:  Search Radius:

County:  Basin:  Number: Suffix:

Owner Name: (First) (Last) ☐ Non-Domestic ☐ Domestic
☒ All

Well / Surface Data Report

Avg. Depth to Water Report

Water Column Report

Clear Form

WATERS Menu

Help

AVERAGE DEPTH OF WATER REPORT 12/09/2005

Bsn	Tws	Rng	Sec	Zone	X	Y	Wells	(Depth Water in Feet)		
								Min	Max	Avg
L	25S	32E	32				1	290	290	290

Record Count: 1

New Mexico Office of the State Engineer
Well Reports and Downloads

Township: 25S Range: 31E Sections:

NAD27 X: Y: Zone: Search Radius:

County: Basin: Number: Suffix:

Owner Name: (First) (Last) ☐ Non-Domestic ☐ Domestic
☒ All

Well / Surface Data Report

Avg Depth to Water Report

Water Column Report

Clear Form

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Help

AVERAGE DEPTH OF WATER REPORT 12/09/2005

Bsn	Tws	Rng	Sec	Zone	X	Y	Wells	(Depth Water in Feet)		
								Min	Max	Avg
C	25S	31E	21				1	390	390	390

Record Count: 1

New Mexico Office of the State Engineer
Well Reports and Downloads

Township: 26S Range: 33E Sections:

NAD27 X: Y: Zone: ☐ Search Radius:

County: ☐ Basin: ☐ Number: Suffix:

Owner Name: (First) (Last) ☐ Non-Domestic ☐ Domestic
☒ All

Well / Surface Data Report

Avg Depth to Water Report

Water Column Report

Clear Form

WATERS Menu

Help

AVERAGE DEPTH OF WATER REPORT 12/09/2005

Bsn	Tws	Rng	Sec	Zone	X	Y	Wells	(Depth Water in Feet)		
								Min	Max	Avg
C	26S	33E	03				7	160	180	172
C	26S	33E	11				2	135	145	140
C	26S	33E	12				1	200	200	200
C	26S	33E	21				1	120	120	120
C	26S	33E	27				1	125	125	125

Record Count: 12

New Mexico Office of the State Engineer
Well Reports and Downloads

Township: 24S Range: 31E Sections:

NAD27 X: Y: Zone: ☐ Search Radius:

County: ☐ Basin: ☐ Number: Suffix:

Owner Name: (First) (Last) ☐ Non-Domestic ☐ Domestic
☒ All

Well / Surface Data Report

Avg Depth to Water Report

Water Column Report

Clear Form

WATERS Menu

Help

AVERAGE DEPTH OF WATER REPORT 12/09/2005

Bsn	Tws	Rng	Sec	Zone	X	Y	Wells	(Depth Water in Feet)		
								Min	Max	Avg
C	24S	31E	02				3	160	212	192

Record Count: 3

New Mexico Office of the State Engineer
Well Reports and Downloads

Township: 26S Range: 31E Sections:

NAD27 X: Y: Zone: Search Radius:

County: Basin: Number: Suffix:

Owner Name: (First) (Last) ☐ Non-Domestic ☐ Domestic
☒ All

Well / Surface Data Report

Avg Depth to Water Report

Water Column Report

Clear Form

WATERS Menu

Help

AVERAGE DEPTH OF WATER REPORT 12/09/2005

Bsn	Tws	Rng	Sec	Zone	X	Y	Wells	(Depth Water in Feet)		
								Min	Max	Avg
C	26S	31E	01				1	335	335	335
C	26S	31E	08				3	292	300	295

Record Count: 4

New Mexico Office of the State Engineer
Well Reports and Downloads

Township: 26S Range: 32E Sections:

NAD27 X: Y: Zone:  Search Radius:

County:  Basin:  Number: Suffix:

Owner Name: (First) (Last) ☐ Non-Domestic ☐ Domestic
☒ All

Well / Surface Data Report

Avg Depth to Water Report

Water Column Report

Clear Form

WATERS Menu

Help

AVERAGE DEPTH OF WATER REPORT 12/09/2005

Bsn	Tws	Rng	Sec	Zone	X	Y	Wells	(Depth Water in Feet)		
								Min	Max	Avg
C	26S	32E	21				2	260	405	333
C	26S	32E	31				1	295	295	295

Record Count: 3

Location No.	Owner	Aquifer	Depth of well (feet)	Altitude of well (feet)	Depth below land surface (feet)	Date measured	Year completed	Surface diameter of wells	Method of lift	Use of water	Remarks
22.37.21.421	—	To(?)	—	3,360	62.0	9- -53	—	4½	N	N	—
22.331	Skelly Oil Co.	To(?)	115±	3,350	69.0	9-29-53	1949	—	Ti	In,D	Skelly Eunice Plant 1, well 12. EY 40 gpm.
23.233	Leo Sims	Qal	77M	3,345	55.0	10-14-53	—	14	N	N	Open and uncased.
23.441	O. I. Boyd	Qal	70±	3,335	55.3	10-12-53	—	—	Lw	S	Dug.
23.441a	do.	Qal	70±	3,335	55.2	10-12-53	—	7½	N	N	—
24.133a	G. Sims	Qal	127M	3,322	59.3	4-21-55	—	10	Li	N	—
24.133b	do.	Qal	80	—	—	—	—	—	Lw	N	Chemical analysis in table 8.
25.313	Marshal Drinkard	Qal	69M	3,300	50.1	10-14-53	1945	13½	N	N	—
27.334b	Skelly Oil Co.	Qal	127M	3,335	54.4	9- -53	—	8½	N	N	Skelly Eunice Plant 1, well 9.
27.410	do.	To?	182	—	—	—	—	7	Te	In,D	EY 25 gpm. Perforations 150-170 feet.
22.37.28.323	Clower Drilling Co.	Qal	—	3,353	66.1	9- -53	—	9¼	N	N	—
34.221	Humble Oil Co.	Qal and Tr	229	3,520	—	—	1938	—	—	In	WBZ 58-61 feet, 138-146 feet, 185-192 feet. EY 22 gpm.
36.141a	Tom Linebury	Qal	40	3,300	32.2	10-12-54	—	—	Lw	S	—
36.141b	do.	Qal	46	3,300	31.1	6- 3-55	—	6	N	N	—
22.38.18.234	The Texas Co.	Tr	386M	3,360	180	10- -53	1953	—	Li	In	WBZ gray sand, 325-380 feet. EY 20 gpm.
19.222	do.	Tr	—	3,365	146.0	10-14-53	—	7	N	N	—
23.32.4.222	C. H. and W. O. James	Tr	550	3,630	—	—	1931	8	Lw	S	EY 10 gpm.
21.222	Frank and Charles James	Tr	550	3,700	500	—	—	8	Li	S	—
23.33.12.322	San Simon Ranch	Tr	400	3,685	—	—	1953	—	Lw	S	WBZ 370-400 feet.
23.33.28.334	Brinninstool	Tr	575	3,675	500	—	—	—	Lw	D,S	EY 2.5 gpm.
23.34.1.444	San Simon Ranch	Qal	144± M	3,360	137.3	11-25-53	—	6	N	N	—
31.340	Continental Oil Co.	Tr	678	3,620	—	—	1953	8	Li	In	EY 47 gpm. Chemical analysis in table 8.
23.35.27.444	—	To	—	3,480	117.2	3- -53	—	7	N	N	—
23.36.15.414	J. E. Matkins	To(?)	230	3,390	148.4	12- 4-53	—	6	Lw	D,S	—
16.343	do.	Tr	1,100	3,465	150	1952	—	—	Lw	S	—
22.434	Texas Pacific Coal and Oil Co.	To	210± M	3,395	188.6	12- 1-53	—	8½	N	N	—
23.111	do.	To	—	3,370	143.6	12- 4-53	—	8	Li	In	—
31.233	J. Combass	To	—	—	—	—	—	—	Lw	S	Chemical analysis in table 8.
23.36.35.211	J. Combass	To	170	3,330	123.0	3- -53	—	6½	N	N	—
36.341	EPNG	To	250	3,330	124	—	—	10¾	Ti	In,D	Jal Plant 4, well 8.
36.342	EPNG	To	261	3,330	120	—	1952	—	Ti	In,D	Jal Plant 4, well 7.
23.37.2.133	—	To	—	3,304	62.8	10-16-53	—	—	N	N	—
2.422	—	Qal	—	3,295	64.1	6- 3-55	—	6	Lw	S	—
3.421	H. O. Sims	To	80	3,295	64.1	10-16-53	—	—	Lw	D,S	—
4.114	—	To	84-M	3,341	81.8	12- 3-53	—	5½	N	N	—
4.211	Skelly Oil Co.	Tr(?)	226	3,340	—	—	1947	10¾	Le	D	H. O. Sims Camp well 1. EY 10 gpm.
6.144	—	To	—	3,375	102.9	12- 3-53	—	6½	Lw	S	—
20.333	Bert Steeler	Qal(?)	177	3,300	117	—	1939	—	Lw	D,S	—
25.132	M. L. Goins	To(?)	—	3,215	28.3	10-15-53	—	7	Lw	S	—
27.441	—	Qal	—	3,270	78.3	3- 4-53	—	5½	Lw	S	—
23.37.31.442	EPNG	To(?)	173	3,300	118	1952	1952	12½	Te	In,D	Jal Plant 4, well 4.
32.122	—	To(?)	—	3,300	99.0	7-23-54	—	6	Lw	S	—
32.331	EPNG	To(?)	173	3,310	—	—	—	20	Te	In,D	Jal Plant 4, well 1. WBZ 115-171 feet. EY 40 gpm.
33.122	—	To(?)	120M	3,310	91.2	3- 4-53	—	9	N	N	—
23.38.5.233	Humble Oil Co.	Tr	400M	3,385	189.8	10-15-53	1943	7½	N	N	W. F. Scarbrough well 1. EY 14 gpm.
8.214	Tom Linebury	Tr	—	3,372	198.3	10-15-53	—	6½	Lw	D,S	—
24.32.3.322	Frank James	Tr	550	3,650	—	—	—	10	Lw	D,S	—
10.344	do.	Qal	60	3,588	31.1	6- 3-55	1910	6	Lw	S	Located in sink.
33.422	Richard Ritz	Tr	367M	3,510	313.4	2-18-58	—	12	Lw	S	EY 0.25 gpm.
24.33.10.113	Carl Johnson	Qal	36± M	3,595	24.6	11-27-53	—	6½	Lw	S	—
24.33.23.311	—	Tr	232M	3,565	208.6	11-27-53	—	9½	N	N	—
24.444	—	Qal	—	3,530	16.9	11-27-53	—	5½	Lw	S	—
33.231	Carl Johnson	Qal	—	3,460	93.2	3-17-54	—	6	Lw	D,S	—
24.34.4.111	—	To	—	3,570	51.3	6- 3-55	—	—	Lw	S	—
5.444	—	To	78(?)	3,590	66.6	4-21-55	—	—	Lw	N	—
10.112	Madera Ranch	To	83M	3,525	71.8	4-27-53	—	6	N	N	—
10.422	do.	To	94M	3,315	63.2	4-27-53	—	7½	N	N	—

TABLE 6. RECORDS OF WELLS IN SOUTHERN LEA COUNTY, N. MEX. (continued)

Location No.	Owner	Aquifer	Depth of well (feet)	Altitude of well (feet)	Water level		Year completed	Surface diameter of wells	Method of lift	Use of water	Remarks
					Depth below land surface (feet)	Date measured					
24.34.35.122	do.	Tr	258M	3,410	223.9	3-29-53	—	6	Lw	S	—
24.35.30.341	do.	Tr	150 ± M	3,320	139.6	11-27-53	—	6	Lw	S	—
24.36.3.111	—	To	—	3,400	181.1	3-12-53	—	7½	N	N	—
3.333	Charles Whitten	To(?)	190 ± M	3,390	181.1	3-12-53	—	11½	N	N	—
9.133	do.	To	230	3,395	195.0	3-6-53	1948	7	N	N	—
13.314	Humble Oil Co.	To	160	—	—	—	1941	—	—	—	WBZ sand, 138-158 feet. EY 10 gpm.
24.36.15.222	Canmex Oil Co.	To	200	3,370	181.3	3-12-53	1937	7	Lw	D	—
22.220	Continental Oil Co.	Tr	692	3,340	—	—	—	8¼	Li	D	A. H. Meyers "A" well 1. Intake set at about 475 feet. Maximum yield 6 gpm.
23.222	—	To	—	3,345	147.9	3-6-53	—	6¼	Lw	I	Measurement made inside pipe column.
27.221	J. R. Wilson	To	—	3,320	122.9	3-6-53	—	10	N	N	—
24.37.5.111	EPNG	To	173	3,275	111	9-8-52	1952	10¾	Te	In,D	Jal Plant 4, well 6.
7.431	Fowler Hair	To	132M	3,300	119.9	3-6-53	—	6¼	N	N	—
10.123	Trinity Production Co.	Tr	747	3,260	120	2-53	1953	—	Li	In	EY 42 gpm. Chemical analysis in table 8.
14.211	Fowler Hair	To(?)	72M	3,205	64.5	3-3-53	—	5	N	N	—
24.37.16.342	—	To	106M	3,235	67.7	3-11-53	—	9	N	N	—
16.423	Humble Oil Co.	To	150	3,240	—	—	1951	6¾	Te	D	Fowler-Ellenburger Camp well 1. WBZ 90-150 feet.
17.422	Fowler Hair	To	92M	3,260	86.5	3-4-53	—	7½	N	N	—
19.234	—	To	124M	3,290	117.4	3-5-53	—	10	Lw	S	—
21.444	Dollarhide Water Co.	To	74M	3,210	69.6	3-2-53	—	7½	N	N	—
25.322	Fowler Hair	To	—	3,136	76.1	3-3-53	—	6½	Lw	D,S	—
34.320	Plains Production Co.	To	75 ± M	3,160	56.8	3-2-53	—	12	N	N	—
25.33.20.443	—	Tr	—	3,395	200-250	8-18-58	—	6	Lw	D,S	—
31.244	Nick Ritz	Tr	320	3,400	257.5	7-26-54	—	8	Lw	S	—
25.34.1.132	Madera Ranch	Tr	300+	3,385	231.0	4-15-53	—	6	N	N	—

25.34.15.242	—	Tr	168	3,335	164.9	7-23-54	—	10	Lw	S	—
25.35.10.223	Georgia Bryant	To	83M	3,180	76.9	4-2-53	—	9	Lw	S	—
21.122	—	Tr	—	3,230	173.3	4-2-53	—	8½	N	N	—
25.36.10.313	W. D. Dinwiddie	Tr	512	3,130	300	—	—	—	Lw	S	—
15.111	do.	Tr(?)	140	3,125	120.2	3-53	1951	—	N	N	—
23.234	—	Qal	65M	3,070	53.7	3-31-53	—	6½	Lw	S	—
24.112	Humble Oil Co.	Tr	455	3,115	292.4	4-15-53	—	—	N	N	—
25.37.1.340	Pure Oil Co.	To	217	3,108	60	—	—	20	Te	In,D	—
2.332	Richmond Drilling Co.	To	112M	3,140	98.8	3-29-53	—	7	Lw	D	—
9.333	Stanolind Oil Co.	Tr	502	3,140	—	—	1938	—	Lw	D	WBZ 470-502 feet.
10.412	EPNG	To	270	3,120	50	12-20-49	1949	12	Te	In,D	Jal Plant 3, well 2.
10.433	M. B. Owens	To	—	3,100	54.3	2-26-53	—	7½	Lw	S	MWP
13.312a	City of Jal	To	152	3,080	73	6-54	1954	12	Te	P	New city well. EY 750 gpm. Chemical analysis in table 8.
25.37.15.221	J. M. Owens	To	—	3,100	59.2	2-26-53	—	—	Ti	In	EY 30 gpm. PR.
15.223	Sun Oil Co.	To	—	3,090	—	—	—	—	Lw	D	Chemical analysis in table 8.
15.411	—	Qal	85M	3,070	31.1	2-26-53	—	6½	N	N	—
17.114	—	Qal	—	3,105	62.8	3-5-53	—	—	Lw	S	MWP
19.211	—	To	—	3,088	62.3	5-30-55	—	6	Je	D	—
19.221	City of Jal	Tr	500	3,110	284.0	11-11-54	1948	10	N	N	Chemical analysis in table 8.
19.240	do.	Tr	450	3,040	65	1942	—	—	—	—	Old public-supply well. WBZ 70-450 feet. EY (1942) 50 gpm. Chemical analysis in table 8.
20.310	do.	Qal	70	3,035	65	1-18-42	—	6×6 ft.	—	—	Dug. WBZ "clayey sand" 65-70 feet. EY 50 gpm. Chemical analysis in table 8.
25.37.20.413	EPNG	Tr	419	—	—	—	—	10¾	Je	In,D	Jal General Camp well 1.
21.411	G. B. Hadfield	To	46M	3,050	38.2	2-12-53	—	6	Lw	S	EY 1 gpm.
24.211	—	To	—	3,071	58.4	2-12-53	—	6	N	N	—
24.422	—	To	—	3,050	60.2	2-12-53	—	8	N	N	—
25.411	—	To	62M	3,055	56.4	2-12-53	—	6	N	N	—
33.114	Olsen Oil Co.	Qal	105	3,000	87.4	2-16-53	—	12	N	N	—
36.244	—	To	120	3,035	74.2	2-13-53	—	10	N	N	—
25.38.6.122	Fowler Hair	To	65M	3,100	60.5	3-3-53	—	6½	Lw	S	—
6.134	—	To	—	3,095	53.1	2-25-53	—	3	N	N	Cased shothole.
9.343	—	To	—	3,130	95.7	2-25-53	—	6½	Lw	D,S	EY 30 gpm.

TABLE 6. RECORDS OF WELLS IN SOUTHERN LEA COUNTY, N. MEX. (continued)

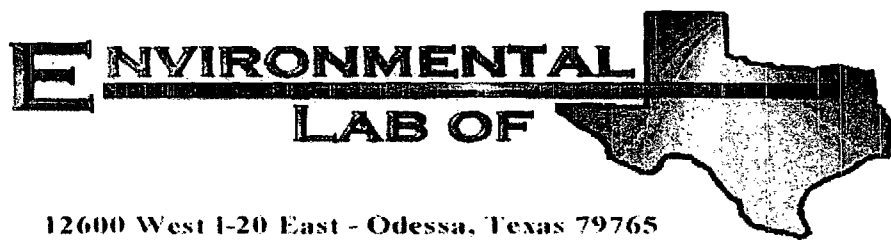
Location No.	Owner	Aquifer	Depth of well (feet)	Altitude of well (feet)	Water level		Year completed	Surface diameter of wells	Method of lift	Use of water	Remarks
					Depth below land surface (feet)	Date measured					
25.38.19.342	Pure Oil Co.	To(?)	133	3,061	68	1952	—	—	—	In	Dollarhide Gasoline Plant well 2.
21.121	Tom Linebury	To	110	3,103	87.7	2-12-53	—	7	Lw	S	—
29.131	—	Qal	—	3,040	69.9	2-15-53	—	6	Lw	N	—
26.32.21.322	Battle Ax Ranch	Tr(?)	253	3,140	180	7-23-54	—	—	Li	D,S	—
26.33.3.444	W. D. Dinwiddie	Qal	180	3,315	102.8	7-23-54	—	6	N	N	—
3.444a	do.	Qal	—	3,315	—	—	—	6(?)	Lw	S	Chemical analysis in table 8. Located 50 feet west of 26.33.3.444.
9.443	—	Qal(?)	—	3,280	106.6	7-26-54	—	—	Lw	S	—
22.433	Battle Ax Ranch	Qal	200(?)	3,270	79.7	7-26-54	—	6	Lw	S	—
26.34.6.213	—	Tr	360	3,330	141.9	7-23-54	—	8	Lw	S	—
26.35.13.222	—	Qal	—	2,990	229.1	12-12-58	—	7	Lw	S	Chemical analysis in table 8.
26.36.9.440	Frank Anthneys	Qal	184M	2,940	177.8	12-12-58	—	7	Lw	D,S	MWP
18.311	City of Jal	Qal	559	2,981	220.8	3-17-60	1960	24	Te(?)	P	Yield 453 gpm. Gravel packed. WBZ 275-300, 400-465, 500-530 feet.
19.233	do.	Qal	700	2,950	198.0	—	1960	24	Te(?)	P	Yield 408 gpm. Gravel packed. WBZ 270-280, 400-480, 550-600, 670-680 feet.
21.443	—	—	137(?)	2,900	Dry	12-11-58	—	11	N	N	—
26.37.2.133	Clyde Cooper	Qal(?)	119	3,000	103.4	2-16-53	1937	8	Lw	S	—
7.331	EPNG	Tr	476	2,960	—	—	1937	8½	Te	In,D	Jal Plant I, well I.
12.314	—	Qal	—	3,010	102.3	2-16-53	—	9½	N	N	—
12.331	—	Qal	103 ± M	3,000	99.9	2-17-53	—	3	N	N	Cased shothole.
12.441	Humble Oil Co.	Qal	175	—	—	—	1944	—	—	—	WBZ 125-150 feet. EY 68 gpm.
14.122	—	Qal	131M	2,985	100.6	2-17-53	—	3	N	N	Cased shothole.
26.38.7.244	Tom Linebury	Qal	73	3,000	57.1	2-24-53	—	8½	N	N	—
8.444	do.	Qal	66	3,000	64.5	2-24-53	—	6½	Lw	S	—
17.414	do.	Qal	—	2,975	39.4	2-24-53	—	5½	Lw	S	—
21.344	do.	Qal	—	2,955	29.0	2-13-53	—	3	N	N	Cased shothole.
32.141	do.	Tr(?)	—	2,950	142.4	2-13-53	—	26	N	N	—

TABLE 7. RECORDS OF SELECTED WELLS IN TEXAS ADJACENT TO SOUTHERN LEA COUNTY, N. MEX.

Explanations of symbols are included in the headnotes of Table 6.

Location No.	Owner	Aquifer	Depth of well (feet)	Altitude of well (feet)	Water level		Year completed	Surface diam-eter of wells	Method of lift	Use of water	Remarks
					Depth be-low land surface (feet)	Date measured					
Gaines County Tex.											
A-12.25.341	—	To	50(?)	3,545	40.8	12- 9-53	—	6	Lw	N	—
A-28.3.413	Greenwood	—	—	3,485	35.1	12- 9-53	—	—	Lw	S	—
Andrews County, Tex.											
A-29.17.320	H. O. Sims	To(?)	82	3,510	79.4	7-28-40	—	—	Lw	S	—
A-39.4.420	do.	To	81	3,478	72.4	10- 9-53	—	6½	Lw	S	—
A-39.14.111	Humble Oil Co.	—	215	3,410	Dry	—	—	—	—	—	—
A-40.16.330	M. L. Goins	To	80	3,305	74.1	10-15-53	—	—	Lw	D,S	—
Winkler County, Tex.											
C-22.6	Tom Linebury	Qal	—	2,940	45.0	2-13-53	—	6	N	N	—

Appendix C



12600 West I-20 East - Odessa, Texas 79765

Analytical Report

Prepared for:

Ike Tavaréz

Highlander Environmental Corp.

1910 N. Big Spring St.

Midland, TX 79705

Project: Pogo/ Cotton Draw Unit IW #3

Project Number: 2527

Location: Lea County, NM

Lab Order Number: 6A17011

Report Date: 01/25/06

Highlander Environmental Corp.
1910 N. Big Spring St.
Midland TX, 79705

Project: Pogo/ Cotton Draw Unit IW #3
Project Number: 2527
Project Manager: Ike Tavaréz

Fax: (432) 682-3946

Reported:
01/25/06 14:45

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
T-1 (0-1.0) BEB	6A17011-01	Soil	01/13/06 00:00	01/17/06 11:30
T-1 (2.0) BEB	6A17011-02	Soil	01/13/06 00:00	01/17/06 11:30
T-1 (3.0) BEB	6A17011-03	Soil	01/13/06 00:00	01/17/06 11:30
T-2 (0-1.0) BEB	6A17011-04	Soil	01/13/06 00:00	01/17/06 11:30
T-2 (2.0) BEB	6A17011-05	Soil	01/13/06 00:00	01/17/06 11:30
T-2 (3.0) BEB	6A17011-06	Soil	01/13/06 00:00	01/17/06 11:30
T-3 (0-1.0) BEB	6A17011-07	Soil	01/13/06 00:00	01/17/06 11:30
T-3 (2.0) BEB	6A17011-08	Soil	01/13/06 00:00	01/17/06 11:30
T-3 (3.0) BEB	6A17011-09	Soil	01/13/06 00:00	01/17/06 11:30
T-3 (4.5) BEB	6A17011-10	Soil	01/13/06 00:00	01/17/06 11:30
T-3 (6.0) BEB	6A17011-11	Soil	01/13/06 00:00	01/17/06 11:30
T-3 (8.0) BEB	6A17011-12	Soil	01/13/06 00:00	01/17/06 11:30
T-4 (0-1.0) BEB	6A17011-13	Soil	01/13/06 00:00	01/17/06 11:30
T-4 (2.0) BEB	6A17011-14	Soil	01/13/06 00:00	01/17/06 11:30
T-4 (3.0) BEB	6A17011-15	Soil	01/13/06 00:00	01/17/06 11:30
T-4 (4.0) BEB	6A17011-16	Soil	01/13/06 00:00	01/17/06 11:30

Highlander Environmental Corp.
1910 N. Big Spring St.
Midland TX, 79705

Project: Pogo/ Cotton Draw Unit IW #3
Project Number: 2527
Project Manager: Ike Tavaréz

Fax: (432) 682-3946

Reported:
01/25/06 14:45

Organics by GC
Environmental Lab of Texas

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
T-1 (0-1.0) BEB (6A17011-01) Soil									
Benzene	ND	0.0250	mg/kg dry	25	EA61804	01/18/06	01/19/06	EPA 8021B	
Toluene	ND	0.0250	"	"	"	"	"	"	
Ethylbenzene	ND	0.0250	"	"	"	"	"	"	
Xylene (p/m)	ND	0.0250	"	"	"	"	"	"	
Xylene (o)	ND	0.0250	"	"	"	"	"	"	
Surrogate: <i>a,a,a</i> -Trifluorotoluene		99.8 %	80-120		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		90.2 %	80-120		"	"	"	"	
Gasoline Range Organics C6-C12	ND	10.0	mg/kg dry	1	EA61710	01/17/06	01/18/06	EPA 8015M	
Diesel Range Organics >C12-C35	ND	10.0	"	"	"	"	"	"	
Total Hydrocarbon C6-C35	ND	10.0	"	"	"	"	"	"	
Surrogate: 1-Chlorooctane		109 %	70-130		"	"	"	"	
Surrogate: 1-Chlorooctadecane		96.0 %	70-130		"	"	"	"	
T-2 (0-1.0) BEB (6A17011-04) Soil									
Benzene	ND	0.0250	mg/kg dry	25	EA61902	01/19/06	01/19/06	EPA 8021B	
Toluene	ND	0.0250	"	"	"	"	"	"	
Ethylbenzene	ND	0.0250	"	"	"	"	"	"	
Xylene (p/m)	0.0282	0.0250	"	"	"	"	"	"	
Xylene (o)	ND	0.0250	"	"	"	"	"	"	
Surrogate: <i>a,a,a</i> -Trifluorotoluene		95.0 %	80-120		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		87.0 %	80-120		"	"	"	"	
Gasoline Range Organics C6-C12	ND	10.0	mg/kg dry	1	EA61710	01/17/06	01/18/06	EPA 8015M	
Diesel Range Organics >C12-C35	ND	10.0	"	"	"	"	"	"	
Total Hydrocarbon C6-C35	ND	10.0	"	"	"	"	"	"	
Surrogate: 1-Chlorooctane		114 %	70-130		"	"	"	"	
Surrogate: 1-Chlorooctadecane		100 %	70-130		"	"	"	"	
T-3 (0-1.0) BEB (6A17011-07) Soil									
Benzene	ND	0.0250	mg/kg dry	25	EA61902	01/19/06	01/20/06	EPA 8021B	
Toluene	ND	0.0250	"	"	"	"	"	"	
Ethylbenzene	ND	0.0250	"	"	"	"	"	"	
Xylene (p/m)	ND	0.0250	"	"	"	"	"	"	
Xylene (o)	ND	0.0250	"	"	"	"	"	"	
Surrogate: <i>a,a,a</i> -Trifluorotoluene		97.5 %	80-120		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		92.5 %	80-120		"	"	"	"	
Gasoline Range Organics C6-C12	ND	10.0	mg/kg dry	1	EA61710	01/17/06	01/18/06	EPA 8015M	
Diesel Range Organics >C12-C35	ND	10.0	"	"	"	"	"	"	
Total Hydrocarbon C6-C35	ND	10.0	"	"	"	"	"	"	

Environmental Lab of Texas

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Highlander Environmental Corp.
1910 N. Big Spring St.
Midland TX, 79705

Project: Pogo/ Cotton Draw Unit IW #3
Project Number: 2527
Project Manager: Ike Tavaréz

Fax: (432) 682-3946

Reported:
01/25/06 14:45

Organics by GC
Environmental Lab of Texas

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
T-3 (0-1.0) BEB (6A17011-07) Soil									
Surrogate: 1-Chlorooctane		116 %	70-130		EA61710	01/17/06	01/18/06	EPA 8015M	
Surrogate: 1-Chlorooctadecane		103 %	70-130		"	"	"	"	
T-4 (0-1.0) BEB (6A17011-13) Soil									
Benzene	ND	0.0250	mg/kg dry	25	EA61902	01/19/06	01/20/06	EPA 8021B	
Toluene	ND	0.0250	"	"	"	"	"	"	
Ethylbenzene	ND	0.0250	"	"	"	"	"	"	
Xylene (p/m)	ND	0.0250	"	"	"	"	"	"	
Xylene (o)	ND	0.0250	"	"	"	"	"	"	
Surrogate: a,a,a-Trifluorotoluene		94.8 %	80-120		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		83.0 %	80-120		"	"	"	"	
Gasoline Range Organics C6-C12	ND	10.0	mg/kg dry	1	EA61710	01/17/06	01/18/06	EPA 8015M	
Diesel Range Organics >C12-C35	ND	10.0	"	"	"	"	"	"	
Total Hydrocarbon C6-C35	ND	10.0	"	"	"	"	"	"	
Surrogate: 1-Chlorooctane		127 %	70-130		"	"	"	"	
Surrogate: 1-Chlorooctadecane		113 %	70-130		"	"	"	"	

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Reported:
01/25/06 14:45

General Chemistry Parameters by EPA / Standard Methods
Environmental Lab of Texas

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
T-1 (0-1.0) BEB (6A17011-01) Soil									
Chloride	1550	25.0	mg/kg	50	EA62016	01/19/06	01/20/06	EPA 300.0	
% Moisture	6.8	0.1	%	1	EA61801	01/17/06	01/18/06	% calculation	
T-1 (2.0) BEB (6A17011-02) Soil									
Chloride	46.8	5.00	mg/kg	10	EA62016	01/19/06	01/20/06	EPA 300.0	
T-1 (3.0) BEB (6A17011-03) Soil									
Chloride	299	10.0	mg/kg	20	EA62017	01/19/06	01/20/06	EPA 300.0	
T-2 (0-1.0) BEB (6A17011-04) Soil									
Chloride	192	10.0	mg/kg	20	EA62017	01/19/06	01/20/06	EPA 300.0	
% Moisture	14.2	0.1	%	1	EA61801	01/17/06	01/18/06	% calculation	
T-2 (2.0) BEB (6A17011-05) Soil									
Chloride	190	25.0	mg/kg	50	EA62017	01/19/06	01/20/06	EPA 300.0	
T-2 (3.0) BEB (6A17011-06) Soil									
Chloride	270	25.0	mg/kg	50	EA62017	01/19/06	01/20/06	EPA 300.0	
T-3 (0-1.0) BEB (6A17011-07) Soil									
Chloride	6640	200	mg/kg	400	EA62017	01/19/06	01/20/06	EPA 300.0	
% Moisture	12.1	0.1	%	1	EA61801	01/17/06	01/18/06	% calculation	
T-3 (2.0) BEB (6A17011-08) Soil									
Chloride	10600	200	mg/kg	400	EA62017	01/19/06	01/20/06	EPA 300.0	
T-3 (3.0) BEB (6A17011-09) Soil									
Chloride	10900	200	mg/kg	400	EA62017	01/19/06	01/20/06	EPA 300.0	
T-3 (4.5) BEB (6A17011-10) Soil									
Chloride	9660	200	mg/kg	400	EA62017	01/19/06	01/20/06	EPA 300.0	

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Highlander Environmental Corp.
1910 N. Big Spring St.
Midland TX, 79705

Project: Pogo/ Cotton Draw Unit IW #3
Project Number: 2527
Project Manager: Ike Tavarez

Fax: (432) 682-3946

Reported:
01/25/06 14:45

General Chemistry Parameters by EPA / Standard Methods
Environmental Lab of Texas

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
T-3 (6.0) BEB (6A17011-11) Soil									
Chloride	6380	200	mg/kg	400	EA62017	01/19/06	01/20/06	EPA 300.0	
T-3 (8.0) BEB (6A17011-12) Soil									
Chloride	2790	50.0	mg/kg	100	EA62017	01/19/06	01/20/06	EPA 300.0	
T-4 (0-1.0) BEB (6A17011-13) Soil									
Chloride	10100	200	mg/kg	400	EA62017	01/19/06	01/20/06	EPA 300.0	
% Moisture	13.6	0.1	%	1	EA61801	01/17/06	01/18/06	% calculation	
T-4 (2.0) BEB (6A17011-14) Soil									
Chloride	11500	200	mg/kg	400	EA62017	01/19/06	01/20/06	EPA 300.0	
T-4 (3.0) BEB (6A17011-15) Soil									
Chloride	2470	50.0	mg/kg	100	EA62017	01/19/06	01/20/06	EPA 300.0	
T-4 (4.0) BEB (6A17011-16) Soil									
Chloride	445	10.0	mg/kg	20	EA62017	01/19/06	01/20/06	EPA 300.0	

Environmental Lab of Texas

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Page 5 of 12

Highlander Environmental Corp.
1910 N. Big Spring St.
Midland TX, 79705

Project: Pogo/ Cotton Draw Unit IW #3
Project Number: 2527
Project Manager: Ike Tavaréz

Fax: (432) 682-3946

Reported:
01/25/06 14:45

Organics by GC - Quality Control
Environmental Lab of Texas

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch EA61710 - Solvent Extraction (GC)

Blank (EA61710-BLK1)

Prepared: 01/17/06 Analyzed: 01/18/06

Gasoline Range Organics C6-C12	ND	10.0	mg/kg wet							
Diesel Range Organics >C12-C35	ND	10.0	"							
Total Hydrocarbon C6-C35	ND	10.0	"							
Surrogate: 1-Chlorooctane	56.8		mg/kg	50.0		114	70-130			
Surrogate: 1-Chlorooctadecane	51.9		"	50.0		104	70-130			

LCS (EA61710-BS1)

Prepared: 01/17/06 Analyzed: 01/18/06

Gasoline Range Organics C6-C12	450	10.0	mg/kg wet	500		90.0	75-125			
Diesel Range Organics >C12-C35	547	10.0	"	500		109	75-125			
Total Hydrocarbon C6-C35	997	10.0	"	1000		99.7	75-125			
Surrogate: 1-Chlorooctane	52.7		mg/kg	50.0		105	70-130			
Surrogate: 1-Chlorooctadecane	42.1		"	50.0		84.2	70-130			

Calibration Check (EA61710-CCV1)

Prepared: 01/17/06 Analyzed: 01/18/06

Gasoline Range Organics C6-C12	475		mg/kg	500		95.0	80-120			
Diesel Range Organics >C12-C35	540		"	500		108	80-120			
Total Hydrocarbon C6-C35	1020		"	1000		102	80-120			
Surrogate: 1-Chlorooctane	58.5		"	50.0		117	70-130			
Surrogate: 1-Chlorooctadecane	47.5		"	50.0		95.0	70-130			

Matrix Spike (EA61710-MS1)

Source: 6A17011-13

Prepared: 01/17/06 Analyzed: 01/18/06

Gasoline Range Organics C6-C12	531	10.0	mg/kg dry	579	ND	91.7	75-125			
Diesel Range Organics >C12-C35	637	10.0	"	579	ND	110	75-125			
Total Hydrocarbon C6-C35	1170	10.0	"	1160	ND	101	75-125			
Surrogate: 1-Chlorooctane	60.9		mg/kg	50.0		122	70-130			
Surrogate: 1-Chlorooctadecane	52.3		"	50.0		105	70-130			

Matrix Spike Dup (EA61710-MSD1)

Source: 6A17011-13

Prepared: 01/17/06 Analyzed: 01/18/06

Gasoline Range Organics C6-C12	537	10.0	mg/kg dry	579	ND	92.7	75-125	1.12	20	
Diesel Range Organics >C12-C35	643	10.0	"	579	ND	111	75-125	0.938	20	
Total Hydrocarbon C6-C35	1180	10.0	"	1160	ND	102	75-125	0.851	20	
Surrogate: 1-Chlorooctane	61.4		mg/kg	50.0		123	70-130			
Surrogate: 1-Chlorooctadecane	52.8		"	50.0		106	70-130			

Environmental Lab of Texas

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Highlander Environmental Corp.
1910 N. Big Spring St.
Midland TX, 79705

Project: Pogo/ Cotton Draw Unit IW #3
Project Number: 2527
Project Manager: Ike Tavaréz

Fax: (432) 682-3946

Reported:
01/25/06 14:45

Organics by GC - Quality Control
Environmental Lab of Texas

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch EA61804 - EPA 5030C (GC)

Blank (EA61804-BLK1)

Prepared: 01/18/06 Analyzed: 01/19/06

Benzene	ND	0.00100	mg/kg wet							
Toluene	ND	0.00100	"							
Ethylbenzene	ND	0.00100	"							
Xylene (p/m)	ND	0.00100	"							
Xylene (o)	ND	0.00100	"							
Surrogate: a,a,a-Trifluorotoluene	35.8		ug/kg	40.0		89.5	80-120			
Surrogate: 4-Bromofluorobenzene	37.5		"	40.0		93.8	80-120			

LCS (EA61804-BS1)

Prepared & Analyzed: 01/18/06

Benzene	1.37	0.0250	mg/kg wet	1.25		110	80-120			
Toluene	1.34	0.0250	"	1.25		107	80-120			
Ethylbenzene	1.26	0.0250	"	1.25		101	80-120			
Xylene (p/m)	2.43	0.0250	"	2.50		97.2	80-120			
Xylene (o)	1.37	0.0250	"	1.25		110	80-120			
Surrogate: a,a,a-Trifluorotoluene	40.7		ug/kg	40.0		102	80-120			
Surrogate: 4-Bromofluorobenzene	42.5		"	40.0		106	80-120			

Calibration Check (EA61804-CCV1)

Prepared: 01/18/06 Analyzed: 01/19/06

Benzene	50.3		ug/kg	50.0		101	80-120			
Toluene	51.9		"	50.0		104	80-120			
Ethylbenzene	53.2		"	50.0		106	80-120			
Xylene (p/m)	103		"	100		103	80-120			
Xylene (o)	59.8		"	50.0		120	80-120			
Surrogate: a,a,a-Trifluorotoluene	39.3		"	40.0		98.2	80-120			
Surrogate: 4-Bromofluorobenzene	32.4		"	40.0		81.0	80-120			

Matrix Spike (EA61804-MS1)

Source: 6A13014-02

Prepared: 01/18/06 Analyzed: 01/19/06

Benzene	1.53	0.0250	mg/kg dry	1.43	ND	107	80-120			
Toluene	1.52	0.0250	"	1.43	ND	106	80-120			
Ethylbenzene	1.42	0.0250	"	1.43	ND	99.3	80-120			
Xylene (p/m)	2.73	0.0250	"	2.86	ND	95.5	80-120			
Xylene (o)	1.52	0.0250	"	1.43	ND	106	80-120			
Surrogate: a,a,a-Trifluorotoluene	39.0		ug/kg	40.0		97.5	80-120			
Surrogate: 4-Bromofluorobenzene	37.5		"	40.0		93.8	80-120			

Environmental Lab of Texas

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Highlander Environmental Corp.
1910 N. Big Spring St.
Midland TX, 79705

Project: Pogo/ Cotton Draw Unit IW #3
Project Number: 2527
Project Manager: Ike Tavaréz

Fax: (432) 682-3946

Reported:
01/25/06 14:45

Organics by GC - Quality Control
Environmental Lab of Texas

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch EA61804 - EPA 5030C (GC)

Matrix Spike Dup (EA61804-MSD1)

Source: 6A13014-02

Prepared: 01/18/06 Analyzed: 01/20/06

Benzene	1.47	0.0250	mg/kg dry	1.43	ND	103	80-120	3.81	20	
Toluene	1.47	0.0250	"	1.43	ND	103	80-120	2.87	20	
Ethylbenzene	1.40	0.0250	"	1.43	ND	97.9	80-120	1.42	20	
Xylene (p/m)	2.72	0.0250	"	2.86	ND	95.1	80-120	0.420	20	
Xylene (o)	1.50	0.0250	"	1.43	ND	105	80-120	0.948	20	
Surrogate: a,a,a-Trifluorotoluene	39.4		ug/kg	40.0		98.5	80-120			
Surrogate: 4-Bromofluorobenzene	37.7		"	40.0		94.2	80-120			

Batch EA61902 - EPA 5030C (GC)

Blank (EA61902-BLK1)

Prepared & Analyzed: 01/19/06

Benzene	ND	0.0250	mg/kg wet							
Toluene	ND	0.0250	"							
Ethylbenzene	ND	0.0250	"							
Xylene (p/m)	ND	0.0250	"							
Xylene (o)	ND	0.0250	"							
Surrogate: a,a,a-Trifluorotoluene	36.7		ug/kg	40.0		91.8	80-120			
Surrogate: 4-Bromofluorobenzene	35.7		"	40.0		89.2	80-120			

LCS (EA61902-BS1)

Prepared: 01/19/06 Analyzed: 01/20/06

Benzene	1.28	0.0250	mg/kg wet	1.25		102	80-120			
Toluene	1.29	0.0250	"	1.25		103	80-120			
Ethylbenzene	1.23	0.0250	"	1.25		98.4	80-120			
Xylene (p/m)	2.38	0.0250	"	2.50		95.2	80-120			
Xylene (o)	1.33	0.0250	"	1.25		106	80-120			
Surrogate: a,a,a-Trifluorotoluene	38.4		ug/kg	40.0		96.0	80-120			
Surrogate: 4-Bromofluorobenzene	38.3		"	40.0		95.8	80-120			

Environmental Lab of Texas

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Highlander Environmental Corp.
1910 N. Big Spring St.
Midland TX, 79705

Project: Pogo/ Cotton Draw Unit IW #3
Project Number: 2527
Project Manager: Ike Tavarez

Fax: (432) 682-3946

Reported:
01/25/06 14:45

Organics by GC - Quality Control
Environmental Lab of Texas

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch EA61902 - EPA 5030C (GC)

Calibration Check (EA61902-CCV1)

Prepared: 01/19/06 Analyzed: 01/21/06

Benzene	46.4		ug/kg	50.0		92.8	80-120			
Toluene	46.1		"	50.0		92.2	80-120			
Ethylbenzene	43.4		"	50.0		86.8	80-120			
Xylene (p/m)	84.5		"	100		84.5	80-120			
Xylene (o)	47.6		"	50.0		95.2	80-120			
Surrogate: a,a,a-Trifluorotoluene	34.7		"	40.0		86.8	80-120			
Surrogate: 4-Bromofluorobenzene	36.2		"	40.0		90.5	80-120			

Matrix Spike (EA61902-MS1)

Source: 6A17011-04

Prepared: 01/19/06 Analyzed: 01/21/06

Benzene	1.41	0.0250	mg/kg dry	1.46	ND	96.6	80-120			
Toluene	1.38	0.0250	"	1.46	ND	94.5	80-120			
Ethylbenzene	1.29	0.0250	"	1.46	ND	88.4	80-120			
Xylene (p/m)	2.48	0.0250	"	2.91	0.0282	84.3	80-120			
Xylene (o)	1.40	0.0250	"	1.46	ND	95.9	80-120			
Surrogate: a,a,a-Trifluorotoluene	34.5		ug/kg	40.0		86.2	80-120			
Surrogate: 4-Bromofluorobenzene	35.1		"	40.0		87.8	80-120			

Matrix Spike Dup (EA61902-MSD1)

Source: 6A17011-04

Prepared: 01/19/06 Analyzed: 01/21/06

Benzene	1.37	0.0250	mg/kg dry	1.46	ND	93.8	80-120	2.94	20	
Toluene	1.38	0.0250	"	1.46	ND	94.5	80-120	0.00	20	
Ethylbenzene	1.30	0.0250	"	1.46	ND	89.0	80-120	0.676	20	
Xylene (p/m)	2.51	0.0250	"	2.91	0.0282	85.3	80-120	1.18	20	
Xylene (o)	1.41	0.0250	"	1.46	ND	96.6	80-120	0.727	20	
Surrogate: a,a,a-Trifluorotoluene	33.5		ug/kg	40.0		83.8	80-120			
Surrogate: 4-Bromofluorobenzene	35.2		"	40.0		88.0	80-120			

Environmental Lab of Texas

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Highlander Environmental Corp.
1910 N. Big Spring St.
Midland TX, 79705

Project: Pogo/ Cotton Draw Unit IW #3
Project Number: 2527
Project Manager: Ike Tavaréz

Fax: (432) 682-3946
Reported:
01/25/06 14:45

General Chemistry Parameters by EPA / Standard Methods - Quality Control
Environmental Lab of Texas

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC Limits	RPD	RPD Limit	Notes
Batch EA61801 - General Preparation (Prep)									
Blank (EA61801-BLK1)				Prepared: 01/17/06 Analyzed: 01/18/06					
% Solids	100		%						
Duplicate (EA61801-DUP1)				Source: 6A17001-02		Prepared: 01/17/06 Analyzed: 01/18/06			
% Solids	95.2		%		95.1		0.105	20	
Duplicate (EA61801-DUP2)				Source: 6A17009-01		Prepared: 01/17/06 Analyzed: 01/18/06			
% Moisture	13.9	0.1	%		12.1		13.8	20	
Batch EA62016 - Water Extraction									
Blank (EA62016-BLK1)				Prepared: 01/19/06 Analyzed: 01/20/06					
Chloride	ND	0.500	mg/kg						
LCS (EA62016-BS1)				Prepared: 01/19/06 Analyzed: 01/20/06					
Chloride	8.84		mg/L	10.0		88.4	80-120		
Calibration Check (EA62016-CCV1)				Prepared: 01/19/06 Analyzed: 01/20/06					
Chloride	9.30		mg/L	10.0		93.0	80-120		
Duplicate (EA62016-DUP1)				Source: 6A17007-33		Prepared: 01/19/06 Analyzed: 01/20/06			
Chloride	6870	200	mg/kg		6780		1.32	20	
Batch EA62017 - Water Extraction									
Blank (EA62017-BLK1)				Prepared: 01/19/06 Analyzed: 01/20/06					
Chloride	ND	0.500	mg/kg						

Environmental Lab of Texas

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Highlander Environmental Corp.
1910 N. Big Spring St.
Midland TX, 79705

Project: Pogo/ Cotton Draw Unit IW #3
Project Number: 2527
Project Manager: Ike Tavaréz

Fax: (432) 682-3946
Reported:
01/25/06 14:45

General Chemistry Parameters by EPA / Standard Methods - Quality Control
Environmental Lab of Texas

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch EA62017 - Water Extraction

LCS (EA62017-BS1)

Prepared: 01/19/06 Analyzed: 01/20/06

Chloride	8.61		mg/L	10.0		86.1	80-120			
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Calibration Check (EA62017-CCV1)

Prepared: 01/19/06 Analyzed: 01/20/06

Chloride	8.82		mg/L	10.0		88.2	80-120			
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Duplicate (EA62017-DUP1)

Source: 6A17011-03

Prepared: 01/19/06 Analyzed: 01/20/06

Chloride	312	10.0	mg/kg		299			4.26	20	
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Environmental Lab of Texas

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Highlander Environmental Corp.
1910 N. Big Spring St.
Midland TX, 79705

Project: Pogo/ Cotton Draw Unit IW #3
Project Number: 2527
Project Manager: Ike Tavaraz

Fax: (432) 682-3946

Reported:
01/25/06 14:45

Notes and Definitions

DET Analyte DETECTED
ND Analyte NOT DETECTED at or above the reporting limit
NR Not Reported
dry Sample results reported on a dry weight basis
RPD Relative Percent Difference
LCS Laboratory Control Spike
MS Matrix Spike
Dup Duplicate

Report Approved By:

Raland K. Tuttle

Date:

1/25/2006

Raland K. Tuttle, Lab Manager
Celey D. Keene, Lab Director, Org. Tech Director
Peggy Allen, QA Officer

Jeanne Mc Murrey, Inorg. Tech Director
LaTasha Cornish, Chemist
Sandra Sanchez, Lab Tech.

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If you have received this material in error, please notify us immediately at 432-563-1800.

Environmental Lab of Texas

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Environmental Lab of Texas Variance / Corrective Action Report – Sample Log-In

Client: Highlander

Date/Time: 1/17/06 11:30

Order #: 6A17011

Initials: CK

Sample Receipt Checklist

Temperature of container/cooler?	Yes	No	1.5	C
Shipping container/cooler in good condition?	<u>Yes</u>	No		
Custody Seals intact on shipping container/cooler?	Yes	No	<u>Not present</u>	
Custody Seals intact on sample bottles?	Yes	No	<u>Not present</u>	
Chain of custody present?	<u>Yes</u>	No		
Sample Instructions complete on Chain of Custody?	<u>Yes</u>	No		
Chain of Custody signed when relinquished and received?	<u>Yes</u>	No		
Chain of custody agrees with sample label(s)	<u>Yes</u>	No		
Container labels legible and intact?	<u>Yes</u>	No		
Sample Matrix and properties same as on chain of custody?	<u>Yes</u>	No		
Samples in proper container/bottle?	<u>Yes</u>	No		
Samples properly preserved?	<u>Yes</u>	No		
Sample bottles intact?	<u>Yes</u>	No		
Preservations documented on Chain of Custody?	<u>Yes</u>	No		
Containers documented on Chain of Custody?	<u>Yes</u>	No		
Sufficient sample amount for indicated test?	<u>Yes</u>	No		
All samples received within sufficient hold time?	<u>Yes</u>	No		
VOC samples have zero headspace?	<u>Yes</u>	No	<u>Not Applicable</u>	

Other observations:

for TPH

for chlorides

Variance Documentation:

Contact Person: _____ Date/Time: _____ Contacted by: _____
Regarding: _____

Corrective Action Taken: _____

SITE INFORMATION

Report Type: ASSESSMENT AND WORK PLAN

General Site Information:

Site:	Cotton Draw Unit, Injection Well #3
Company:	Pogo Producing Company
Section, Township and Range	Section 16, T25S, R32 E
Unit Letter:	H
Lease Number:	E-5009
County:	Lea
GPS:	32° 07' 53.7", 103° 40' 23.8"
Surface Owner:	State land
Mineral Owner:	State land
Directions:	From Jal NM intersection of 18 and 128, go west 29.5 miles, turn left on CR 1, go south 5.2 miles and turn right (west) into lease road, go 0.1 miles road will turn to south, at Y, go 0.3 miles south to Cotton Draw Injection Well #3 on right side of road. Spill is located 200' southeast of well.

Release Data:

Date Released:	12/11/2005
Type Release:	Produced water
Source of Contamination:	Line leak
Fluid Released:	23
Fluids Recovered:	0 barrels

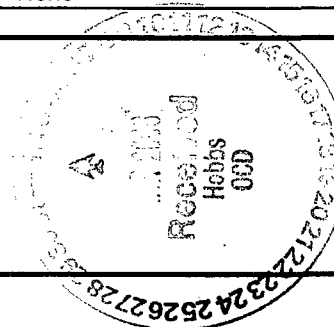
Official Communication:

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	
>100 ft.	0	Average Depth >100 BS
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	
Total Ranking Score:	0	

Acceptable Soil RRAL (mg/kg)		
Benzene	Total BTEX	TPH
10	50	5,000



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	PDGD Producing	Contact	PAT Ellis
Address	P.O. Box 10340 Midland, TX 79702	Telephone No.	432 685-8148
Facility Name	Cotton Draw Unit #3 INT	Facility Type	Injection line
Surface Owner		Mineral Owner	New Mexico
		Lease No.	E-5009

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
H	16	25-S	32 E	1980	N	660	E	Lea

Latitude 32-07-53.7 Longitude 103-40-23.8

NATURE OF RELEASE

Type of Release	Produced water	Volume of Release	2.3 BBLs	Volume Recovered	0
Source of Release	Injection line leak	Date and Hour of Occurrence		Date and Hour of Discovery	
Was Immediate Notice Given?	☒ Yes ☐ No ☐ Not Required	If YES, To Whom?	12-11-05 LARRY JOHNSON	12-12-05	
By Whom?	PAT Ellis	Date and Hour	12-12-05	2:00 pm	
Was a Watercourse Reached?	☐ Yes ☒ No	If YES, Volume Impacting the Watercourse.			

If a Watercourse was Impacted, Describe Fully.*

Describe Cause of Problem and Remedial Action Taken.*

Injection line leak near well. Line will be replaced and/or repaired.

Describe Area Affected and Cleanup Action Taken.*

Spill affected pasture and lease road. Area about 12' x 200'. Contacted Highlander Environmental to assess and take samples. Will send in remediation plan for approval.

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.

OIL CONSERVATION DIVISION

Signature: Patrick L. Ellis

Printed Name: PATRICK L. ELLIS

Title: EHS Supervisor

E-mail Address: ellisp@pogoproducing.com

Date: 12-15-05

Phone: (432) 685-8148

Approved by District Supervisor:

Approval Date:

Expiration Date:

Conditions of Approval:

Attached ☐

* Attach Additional Sheets If Necessary