



# Highlander Environmental Corp.

Midland, Texas

October 15, 2002

Mr. Larry Johnson  
Environmental Engineer Specialist  
Oil Conservation Division- District I  
1625 N. French Drive  
P. O. Box 1980  
Hobbs, New Mexico 88240

**RE: Assessment and Closure Report for the Spill from the Pogo Producing Company, E.C. Hill #C-3 Well Location, Section 27, T-23-S, R-37-E, Lea County, New Mexico**

Dear Mr. Johnson:

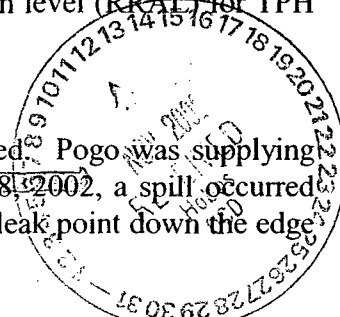
Highlander Environmental Corp. (Highlander) was contacted by Pogo Producing Company (Pogo) to assess a spill, which occurred at the Pogo Hill #C-3 well location in Lea County, New Mexico (Site). The Site is located in Section 27, Township 23 South, Range 37 East. The Site is shown in Figure 1. The State of New Mexico C-141 (Initial) is included in Appendix A.

According to published data, groundwater in the area is greater than 50 feet below surface. The State of New Mexico Well Reports are included in Appendix B. In addition, the New Mexico State Engineers Office has been contacted to confirm the groundwater depth at the Site.

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 on the regional groundwater data, the proposed recommended remedial action level (RRAL) for TPH is 1,000 mg/kg.

## Background

At the time of the spill, the E.C. Hill #C-3 well was being drilled. Pogo was supplying produced water to the drilling rig through a 3" poly line. On August 28, 2002, a spill occurred when a leak formed in the 3" poly line. Produced water flowed from the leak point down the edge



Arch - 962  
incident - nPAC0603748047  
application - nPAC0603748259  
1910 N. Big Spring • Midland, Texas 79705

(915) 682-4559

Fax (915) 682-3946

of the caliche road (east) for a distance of about 500'. At that point, the water began to pool off the north edge of the road near the shut-in Hill B-3 well location. The overall dimensions of the pooled area measured approximately 150' x 50'. An unknown volume of produced water was released and none was recovered. The spill area is shown in Figure 2.

### Corrective Action

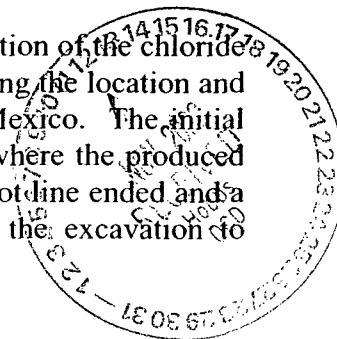
On August 30, 2002, Highlander personnel collected soil samples from the spill area using a stainless steel, bucket type hand auger. A total of eight (8) auger holes (AH) were installed to define the extent of the impact. Five of the auger holes (AH-1 through AH-5) were placed in the pooled area, while the other three (AH-6 through AH-8) were placed in the edge of the caliche road. The spill areas and auger hole locations are shown in Figure 2. No evidence of hydrocarbon staining was observed, however, soil samples were collected from the spill areas for evaluation of Total Petroleum Hydrocarbon (TPH) by method 8015M and chloride by method SW846-9252. The soil samples results are shown in Table 1. The laboratory reports and the chain of custody documentation are included in Appendix C.

**Table 1**  
(Concentrations in mg/kg)

Sample ID	Date Sampled	Depth (ft)	TPH	Chloride
AH-1	08/29/02	0-0.5'	<10	5390
AH-1	08/29/02	1.0'-1.5'	-	3620
AH-2	08/29/02	0-0.5'	-	4960
AH-2	08/29/02	1.0'-1.5'	-	5320
AH-3	08/29/02	0-0.5'	<10	5670
AH-3	08/29/02	1.0'-1.5'	-	5320
AH-4	08/29/02	0-0.5'	-	6030
AH-4	08/29/02	1.0'-1.5'	-	6470
AH-5	08/29/02	0-0.5'	<10	4520
AH-5	08/29/02	1.0'-1.5'	-	5230
AH-6	08/29/02	0-0.5'	-	5140
AH-6	08/29/02	1.0'-1.5'	-	5140
AH-7	08/29/02	0-0.5'	-	4960
AH-7	08/29/02	1.0'-1.5'	-	5050
AH-8	08/29/02	0-0.5'	<10	5320
AH-8	08/29/02	1.0'-1.5'	-	5230

(-) Not Analyzed

Based upon the results of the sampling, it was decided to begin excavation of the chloride impacted soils. On September 19, 2002, Key Energy Services began excavating the location and hauling the excavated soils to Sundance Disposal Facility in Eunice, New Mexico. The initial excavation involved stripping off the first 1.5' to 2.0' of topsoil in the area where the produced water had pooled. At approximately 1.5 to 2.0' below ground surface, the rootline ended and a gravelly caliche layer started. Three backhoe trenches were installed in the excavation to



evaluate chloride impact to deeper soils. The trench locations are shown on Figure 3.

**Table 2**  
(Concentrations in mg/kg)

Sample ID	Date Sampled	Depth (ft)	Actual Depth BGS (ft)*	Chloride
Trench 1	09/20/02	1.0'	2.5'	2760
Trench 1	09/20/02	2.0'	3.5'	2260
Trench 1	09/24/02	3.0'-3.5'	4.0'-4.5'	2020
Trench 2	09/20/02	1.0'	2.5'	5320
Trench 2	09/20/02	2.0'	3.5'	5670
Trench 2	09/24/02	3.0'-3.5'	4.0'-4.5'	3120
Trench 3	09/20/02	1.0'	2.5'	6030
Trench 3	09/20/02	2.0'	3.5'	6470
Trench 3	09/24/02	3.0'-3.5'	4.0'-4.5'	1770
Trench 4	10/01/02	1.0'	5.0'	4790
Trench 4	10/01/02	2.0'	6.0'	2840
Trench 4	10/01/02	3.0'	7.0'	2270
Trench 4	10/15/02	4.0'	8.0'	1740
Trench 4	10/15/02	5.0'	9.0'	744
Trench 4	10/15/02	6.0'	10.0'	106
Trench 5	10/01/02	1.0'	5.0'	514
Trench 5	10/01/02	2.0'	6.0'	<20
Trench 5	10/01/02	3.0'	7.0'	<20
Trench 6	10/01/02	1.0'	5.0'	2690
Trench 6	10/01/02	2.0'	6.0'	177
Trench 6	10/01/02	3.0'	7.0'	<20

(-) Not Analyzed

(\*) BGS – Below Ground Surface

Based upon the results of the initial trench samples, it was decided that an additional 2.0 feet should be removed from the excavation. On September 24, 2002, deeper soil samples (3.0'-3.5') were taken from the three trenches and submitted to the laboratory for analysis of chloride. On September 24-25, 2002, Key Energy Services, Inc. excavated the site to an approximate depth of 4.0 feet below ground surface. To further investigate the vertical chloride impact, fresh trenches were installed near the original trench locations to extract new samples for confirmation. Trenches 4, 5 and 6 are shown on Figure 3.

Trenches 5 and 6 in the center and northern portions of the excavation showed chloride levels decreasing to acceptable levels, while the samples from Trench 4 remained elevated with depth. On October 15, 2002, deeper samples were extracted from trench 4 and showed levels decreasing to background levels within 6' of the bottom of the excavation.

Approximately 1000 cubic yards of impacted soil was removed and disposed at Sundance



Services, Inc. located in Eunice, New Mexico. Considering the fact that the area has been excavated well below the root zone and since chloride levels decrease to background levels within a few feet of the bottom of the excavation, this site should be backfilled with clean fill material and closed.

### Conclusions

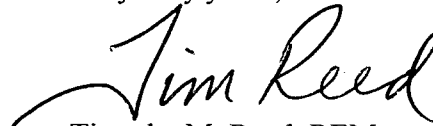
1. According to published data, groundwater in the area is greater than 50 feet below surface. In addition, the New Mexico State Engineers Office has been contacted to confirm the groundwater depth at the Site.
2. The proposed RRAL for benzene was determined to be 10 parts per million (ppm) or milligrams per kilogram (mg/kg) and 50 ppm for total BTEX (sum of benzene, toluene, ethylbenzene and xylene). Based on the regional groundwater data, the proposed RRAL for TPH is 1,000 mg/kg. No detectable levels of TPH were observed.
3. The chloride impacted soil was excavated to an approximate depth of 4.0' below surface. Approximately 1000 cubic yards of impacted soil was removed and disposed at Sundance Services, Inc. located in Eunice, New Mexico.

### Recommendation

1. Based on the fact that the area has been excavated well below the root zone and since chloride levels decrease to background levels within a few feet of the bottom of the excavation, Pogo Producing Company proposes backfilling and closure of the spill area. The State of New Mexico C-141 (Final) is shown in Appendix A.

If you require any additional information or have any questions or comments concerning the assessment report, please call.

Very truly yours,



Timothy M. Reed, REM  
Vice President

cc: Don Riggs – Pogo Producing Co.  
Rex Jasper – Pogo Producing Co.

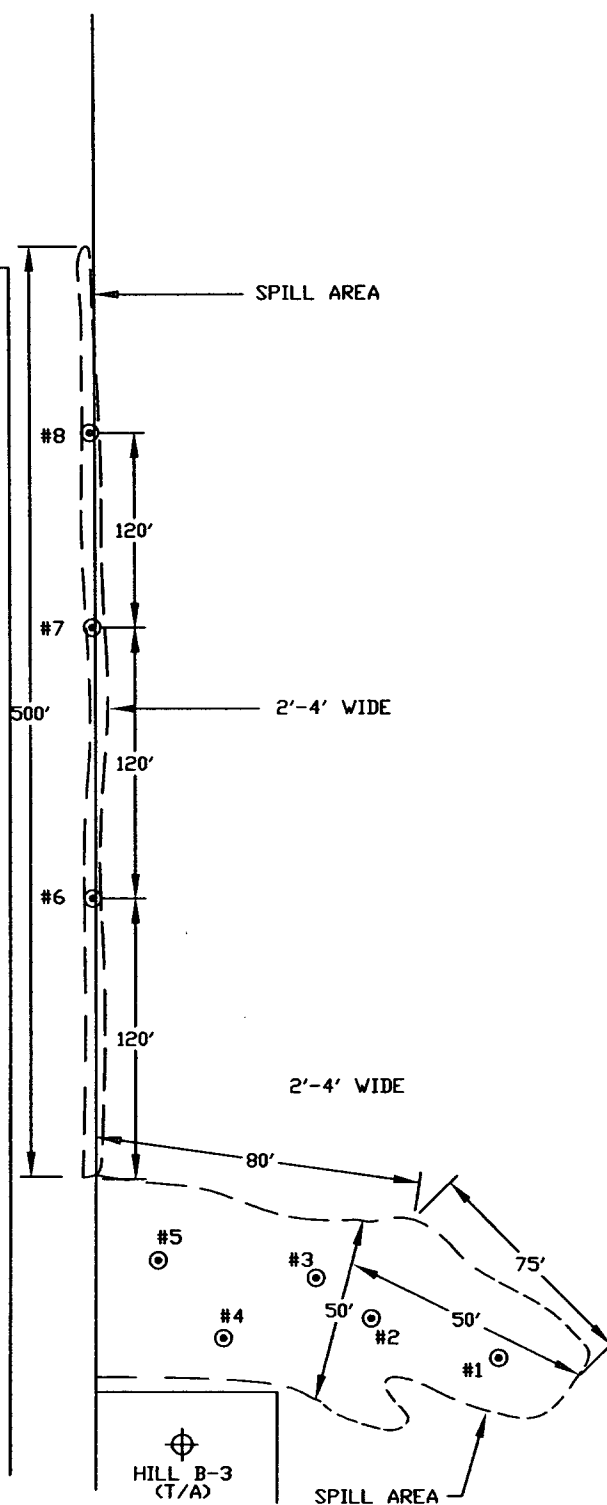


## FIGURES





○  
DRILLING RIG



**LEGEND**

○ AUGERHOLE LOCATION

NOT TO SCALE

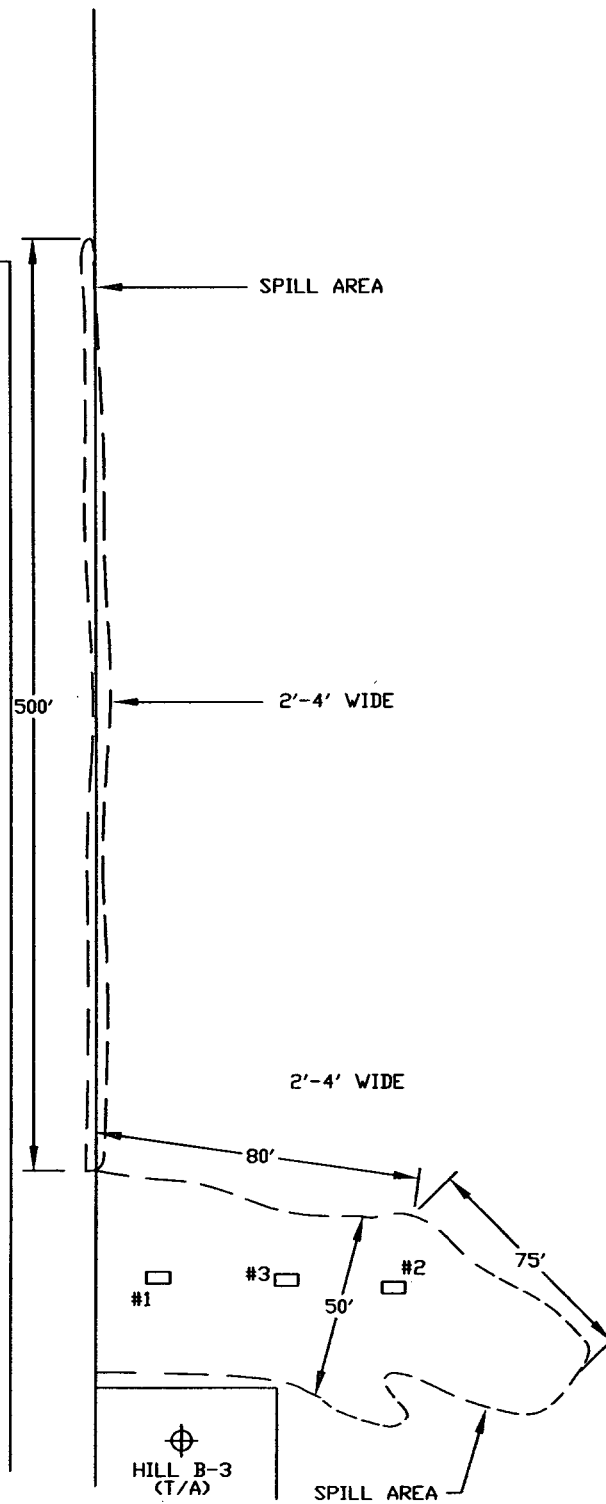
**FIGURE NO. 2**

DATE:  
9/10/02  
OWN. BY:  
JDA  
FILE:  
C:\p000\1877\  
SITE

LEA COUNTY, NEW MEXICO  
POGO PRODUCING COMPANY  
E.C. HILL C-3 SPILL AREA  
HIGHLANDER ENVIRONMENTAL CORP.  
MIDLAND, TEXAS



○  
DRILLING RIG



**LEGEND**

□ TRENCH LOCATION

NOT TO SCALE

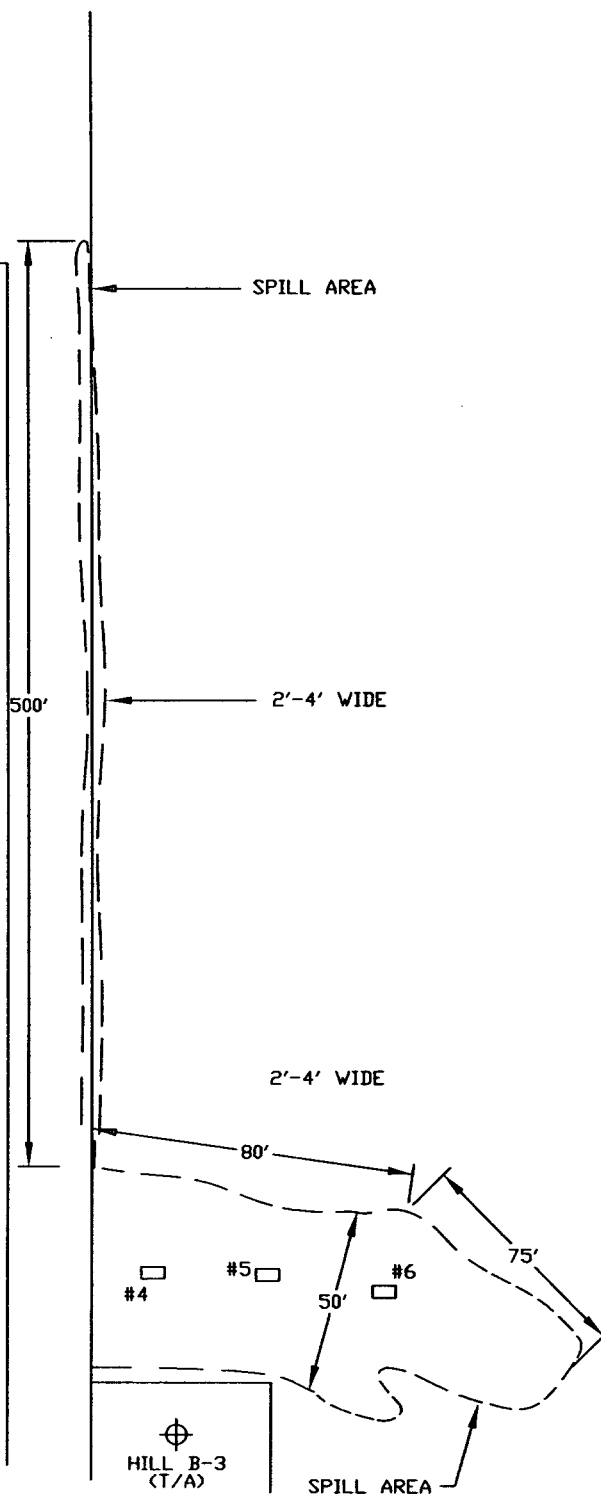
**FIGURE NO. 3**

LEA COUNTY, NEW MEXICO	
POGO PRODUCING COMPANY	
E.C. HILL C-3 SPILL AREA TRENCH 1-3 LOCATIONS	
HIGHLANDER ENVIRONMENTAL CORP. MIDLAND, TEXAS	

DATE:  
9/10/02  
DWN. BY:  
JDA  
FILE:  
C:\P000\1877\  
FIG-3



○  
DRILLING RIG



**LEGEND**

□ TRENCH LOCATION

NOT TO SCALE

**FIGURE NO. 4**

LEA COUNTY, NEW MEXICO

POGO PRODUCING COMPANY

E.C. HILL C-3 SPILL AREA  
TRENCH 4-6 LOCATIONS

HIGHLANDER ENVIRONMENTAL CORP.  
MIDLAND, TEXAS

DATE:  
9/10/02  
DWG. BY:  
JDA  
FILE:  
C:\P000\1077\A  
FIG-4

## APPENDIX A

District I - (505) 393-6161  
 P.O. Box 1980  
 Hobbs, NM 88241-1930  
 District II - (505) 748-1283  
 811 South First  
 Artesia, NM 88210  
 District III - (505) 334-6178  
 1000 Rio Brazos Road  
 Aztec, NM 87410  
 District IV - (505) 627-7131

State of New Mexico  
 Energy Minerals and Natural Resources Department  
 Oil Conservation Division  
 2040 South Pacheco Street  
 Santa Fe, New Mexico 87505  
 (505) 827-7131

Form C-141  
 Originated 2/13/97

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	ARCH PET INC.	Contact	GARY WELLS
Address	EUNICE N.M.	Telephone No.	915-631-0134
Facility Name	EC Hill C-3	Facility Type	Producing well
Surface Owner	D.K. BOYD	Mineral Owner	
		Lease No.	

## LOCATION OF RELEASE

Line Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
	27	23S	37E	1950	S	990	W	LEA

## NATURE OF RELEASE

Type of Release	PRODUCED WATER	Volume of Release	UNKNOWN	Volume Recovered	- 0 -
Source of Release	3" POLY LINE	Date and Hour of Occurrence	8/28/02	Date and Hour of Discovery	8/28/02 6:00 AM
Was Immediate Notice Given?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Not Required	If YES, To Whom?			
By Whom?	Date and Hour 8/28/02 12:45 AM				
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 (Attach Additional Sheets if Necessary)

Describe Cause of Problem and Remedial Action Taken (Attach Additional Sheets if Necessary)

REPAIR 3" LINE

SPLIT IN 3" POLY LINE RUNNING TO RIG FOR WATER SUPPLY

Describe Area Affected and Cleanup Action Taken (Attach Additional Sheets if Necessary)

RUN DOWN SIDE OF MAIN ROAD AND INTO PASTURE. TURNED INTO OR  
 ENVIRONMENTALIST WAITING ON INSTRUCTIONS FOR CLEANUP

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>Gary Wells</i>	OIL CONSERVATION DIVISION	
Printed Name	GARY WELLS	Approved by	District Supervisor
Title	Field Supervisor	Approval Date	Expiration Date
Date	8/28/02	Phone	915-631-0134
Conditions of Approval		Noted <input type="checkbox"/>	

## APPENDIX B

*New Mexico Office of the State Engineer*  
**Well Reports and Downloads**

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Township:	<input type="text" value="23S"/>	Range:	<input type="text" value="37E"/>	Sections:	<input type="text"/>
NAD27 X:	<input type="text"/>	Y:	<input type="text"/>	Zone:	<input type="text" value="▼"/>
Search Radius:	<input type="text"/>				
County:	<input type="text" value="▼"/>	Basin:	<input type="text" value="▼"/>	Number:	<input type="text"/>
Suffix:	<input type="text"/>				
Owner Name: (First)	<input type="text"/>	(Last)	<input type="text"/>	<input type="radio"/> Non-Domestic <input type="radio"/> Domestic <input checked="" type="radio"/> All	
Well / Surface Data Report			Avg Depth to Water Report		
Water Column Report					
Clear Form		WATERS Menu		Help	

---

AVERAGE DEPTH OF WATER REPORT 11/05/2002

Bsn	Tws	Rng	Sec	Zone	X	Y	Wells	(Depth Water in Feet)		
								Min	Max	Avg
CP	23S	37E	09				1	100	100	100
CP	23S	37E	16				1	115	115	115
CP	23S	37E	32				1	106	106	106

Record Count: 3

**New Mexico Office of the State Engineer  
Well Reports and Downloads**

---

Township:  Range:  Sections:

NAD27 X:  Y:  Zone:  ☒ Search Radius:

County:  ☒ Basin:  ☒ Number:  Suffix:

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

---

**WATER COLUMN REPORT 11/05/2002**

(quarters are 1=NW 2=NE 3=SW 4=SE)  
(quarters are biggest to smallest)

Well Number	Tws	Rng	Sec	q	q	q	Zone	X	Y	Depth Well	Depth Water	Water (in feet) Column
CP 00762	23S	37E	09	1	1					185	100	85
CP 00423	23S	37E	16	4	3					175	115	60
CP 00037 SRW1	23S	37E	32	3	4					180	106	74

Record Count: 3

## APPENDIX C

# ANALYTICAL REPORT

## Prepared for:

**TIM REED  
HIGHLANDER ENVIRONMENTAL CORP.  
1910 N. BIG SPRING STREET  
MIDLAND, TX 79705**

**Project:** Pogo/ E.C. Hill C-3 Area

**PO#:**

**Order#:** G0204410

**Report Date:** 09/04/2002

## Certificates

**US EPA Laboratory Code TX00158**

# ENVIRONMENTAL LAB OF TEXAS

## SAMPLE WORK LIST

HIGHLANDER ENVIRONMENTAL CORP.  
1910 N. BIG SPRING STREET  
MIDLAND, TX 79705  
915-682-3946

Order#: G0204410  
Project: 1877  
Project Name: Pogo/ E.C. Hill C-3 Area  
Location: Lea Co., NM

The samples listed below were submitted to Environmental Lab of Texas and were received under chain of custody. Environmental Lab of Texas makes no representation or certification as to the method of sample collection, sample identification, or transportation/handling procedures used prior to the receipt of samples by Environmental Lab of Texas, unless otherwise noted.

<u>Lab ID:</u>	<u>Sample :</u>	<u>Matrix:</u>	<u>Date / Time</u>	<u>Date / Time</u>	<u>Container</u>	<u>Preservative</u>
			<u>Collected</u>	<u>Received</u>		
0204410-01	AH-1 (0-0.5')	SOIL	8/29/02 12:30	8/30/02 14:50	4 oz glass	Ice
	<u>Lab Testing:</u> 8015M Chloride	Rejected: No		Temp: 5.0 C		
0204410-02	AH-1 (1.0'-1.5')	SOIL	8/29/02 12:40	8/30/02 14:50	4 oz glass	Ice
	<u>Lab Testing:</u> Chloride	Rejected: No		Temp: 5.0 C		
0204410-03	AH-2 (0-0.5')	SOIL	8/29/02 12:45	8/30/02 14:50	4 oz glass	Ice
	<u>Lab Testing:</u> Chloride	Rejected: No		Temp: 5.0 C		
0204410-04	AH-2 (1.0'-1.5')	SOIL	8/29/02 12:50	8/30/02 14:50	4 oz glass	Ice
	<u>Lab Testing:</u> Chloride	Rejected: No		Temp: 5.0 C		
0204410-05	AH-3 (0-0.5')	SOIL	8/29/02 13:00	8/30/02 14:50	4 oz glass	Ice
	<u>Lab Testing:</u> 8015M Chloride	Rejected: No		Temp: 5.0 C		
0204410-06	AH-3 (1.0'-1.5')	SOIL	8/29/02 13:05	8/30/02 14:50	4 oz glass	Ice
	<u>Lab Testing:</u> Chloride	Rejected: No		Temp: 5.0 C		
0204410-07	AH-4 (0-0.5')	SOIL	8/29/02 13:10	8/30/02 14:50	4 oz glass	Ice
	<u>Lab Testing:</u> Chloride	Rejected: No		Temp: 5.0 C		
0204410-08	AH-4 (1.0'-1.5')	SOIL	8/29/02 13:15	8/30/02 14:50	4 oz glass	Ice
	<u>Lab Testing:</u>	Rejected: No		Temp: 5.0 C		

# ENVIRONMENTAL LAB OF TEXAS

## SAMPLE WORK LIST

HIGHLANDER ENVIRONMENTAL CORP.  
1910 N. BIG SPRING STREET  
MIDLAND, TX 79705  
915-682-3946

Order#: G0204410  
Project: 1877  
Project Name: Pogo/ E.C. Hill C-3 Area  
Location: Lea Co., NM

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<u>Lab ID:</u>	<u>Sample :</u>	<u>Matrix:</u>	<u>Date / Time</u> <u>Collected</u>	<u>Date / Time</u> <u>Received</u>	<u>Container</u>	<u>Preservative</u>
	Chloride					
0204410-09	AH-5 (0-0.5')	SOIL	8/29/02 13:25	8/30/02 14:50	4 oz glass	Ice
	<u>Lab Testing:</u>	Rejected: No		Temp: 5.0 C		
	8015M Chloride					
0204410-10	AH-5 (1.0'-1.5')	SOIL	8/29/02 13:30	8/30/02 14:50	4 oz glass	Ice
	<u>Lab Testing:</u>	Rejected: No		Temp: 5.0 C		
	Chloride					
0204410-11	AH-6 (0-0.5')	SOIL	8/29/02 14:20	8/30/02 14:50	4 oz glass	Ice
	<u>Lab Testing:</u>	Rejected: No		Temp: 5.0 C		
	Chloride					
0204410-12	AH-6 (1.0'-1.5')	SOIL	8/29/02 14:25	8/30/02 14:50	4 oz glass	Ice
	<u>Lab Testing:</u>	Rejected: No		Temp: 5.0 C		
	Chloride					
0204410-13	AH-7 (0-0.5')	SOIL	8/29/02 14:05	8/30/02 14:50	4 oz glass	Ice
	<u>Lab Testing:</u>	Rejected: No		Temp: 5.0 C		
	Chloride					
0204410-14	AH-7 (1.0'-1.5')	SOIL	8/29/02 14:10	8/30/02 14:50	4 oz glass	Ice
	<u>Lab Testing:</u>	Rejected: No		Temp: 5.0 C		
	Chloride					
0204410-15	AH-8 (0-0.5')	SOIL	8/29/02 13:45	8/30/02 14:50	4 oz glass	Ice
	<u>Lab Testing:</u>	Rejected: No		Temp: 5.0 C		
	8015M Chloride					

# ENVIRONMENTAL LAB OF TEXAS

## SAMPLE WORK LIST

HIGHLANDER ENVIRONMENTAL CORP.  
1910 N. BIG SPRING STREET  
MIDLAND, TX 79705  
915-682-3946

Order#: G0204410  
Project: 1877  
Project Name: Pogo/ E.C. Hill C-3 Area  
Location: Lea Co., NM

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<u>Lab ID:</u>	<u>Sample :</u>	<u>Matrix:</u>	<u>Date / Time</u> <u>Collected</u>	<u>Date / Time</u> <u>Received</u>	<u>Container</u>	<u>Preservative</u>
0204410-16	AH-8 (1.0-1.5')	SOIL	8/29/02 13:50	8/30/02 14:50	4 oz glass	Ice
<u>Lab Testing:</u>		Rejected: No	Temp:	5.0 C		
Chloride						

# ENVIRONMENTAL LAB OF TEXAS

## ANALYTICAL REPORT

TIM REED  
HIGHLANDER ENVIRONMENTAL CORP.  
1910 N. BIG SPRING STREET  
MIDLAND, TX 79705

Order#: G0204410  
Project: 1877  
Project Name: Pogo/ E.C. Hill C-3 Area  
Location: Lea Co., NM

Lab ID: 0204410-01  
Sample ID: AH-1 (0-0.5')

**8015M**

<u>Method</u> <u>Blank</u>	<u>Date</u> <u>Prepared</u>	<u>Date</u> <u>Analyzed</u>	<u>Sample</u> <u>Amount</u>	<u>Dilution</u> <u>Factor</u>	<u>Analyst</u>	<u>Method</u>
		9/3/02	1	1	CK	8015M

Parameter	Result mg/kg	RL
GRO, C6-C12	<10.0	10.0
DRO, >C12-C35	<10.0	10.0
TOTAL, C6-C35	<10.0	10.0

Lab ID: 0204410-05  
Sample ID: AH-3 (0-0.5')

**8015M**

<u>Method</u> <u>Blank</u>	<u>Date</u> <u>Prepared</u>	<u>Date</u> <u>Analyzed</u>	<u>Sample</u> <u>Amount</u>	<u>Dilution</u> <u>Factor</u>	<u>Analyst</u>	<u>Method</u>
		9/3/02	1	1	CK	8015M

Parameter	Result mg/kg	RL
GRO, C6-C12	<10.0	10.0
DRO, >C12-C35	<10.0	10.0
TOTAL, C6-C35	<10.0	10.0

# ENVIRONMENTAL LAB OF TEXAS

## ANALYTICAL REPORT

TIM REED  
HIGHLANDER ENVIRONMENTAL CORP.  
1910 N. BIG SPRING STREET  
MIDLAND, TX 79705

Order#: G0204410  
Project: 1877  
Project Name: Pogo/ E.C. Hill C-3 Area  
Location: Lea Co., NM

Lab ID: 0204410-09  
Sample ID: AH-5 (0-0.5')

8015M

<u>Method</u> <u>Blank</u>	<u>Date</u> <u>Prepared</u>	<u>Date</u> <u>Analyzed</u>	<u>Sample</u> <u>Amount</u>	<u>Dilution</u> <u>Factor</u>	<u>Analyst</u>	<u>Method</u>
		9/3/02	1	1	CK	8015M

Parameter	Result mg/kg	RL
GRO, C6-C12	<10.0	10.0
DRO, >C12-C35	<10.0	10.0
TOTAL, C6-C35	<10.0	10.0

Lab ID: 0204410-15  
Sample ID: AH-8 (0-0.5')

8015M

<u>Method</u> <u>Blank</u>	<u>Date</u> <u>Prepared</u>	<u>Date</u> <u>Analyzed</u>	<u>Sample</u> <u>Amount</u>	<u>Dilution</u> <u>Factor</u>	<u>Analyst</u>	<u>Method</u>
		9/3/02	1	1	CK	8015M

Parameter	Result mg/kg	RL
GRO, C6-C12	<10.0	10.0
DRO, >C12-C35	<10.0	10.0
TOTAL, C6-C35	<10.0	10.0

Approval:

Raland K. Tuttle, Lab Director, QA Officer  
Celey D. Keene, Org. Tech. Director  
Jeanne McMurrey, Inorg. Tech. Director  
Sandra Biezugbe, Lab Tech.  
Sara Molina, Lab Tech.

Date

N/A = Not Applicable RL = Reporting Limit

Page 2 of 2

# ENVIRONMENTAL LAB OF TEXAS

## ANALYTICAL REPORT

TIM REED  
HIGHLANDER ENVIRONMENTAL CORP.  
1910 N. BIG SPRING STREET  
MIDLAND, TX 79705

Order#: G0204410  
Project: 1877  
Project Name: Pogo/ E.C. Hill C-3 Area  
Location: Lea Co., NM

Lab ID: 0204410-01  
Sample ID: AH-1 (0-0.5')

### Test Parameters

<u>Parameter</u>	<u>Result</u>	<u>Units</u>	<u>Dilution Factor</u>	<u>RL</u>	<u>Method</u>	<u>Date Analyzed</u>	<u>Analyst</u>
Chloride	5390	mg/kg	1	20	9253	9/4/02	SB

Lab ID: 0204410-02  
Sample ID: AH-1 (1.0'-1.5')

### Test Parameters

<u>Parameter</u>	<u>Result</u>	<u>Units</u>	<u>Dilution Factor</u>	<u>RL</u>	<u>Method</u>	<u>Date Analyzed</u>	<u>Analyst</u>
Chloride	3620	mg/kg	1	20	9253	9/4/02	SB

Lab ID: 0204410-03  
Sample ID: AH-2 (0-0.5')

### Test Parameters

<u>Parameter</u>	<u>Result</u>	<u>Units</u>	<u>Dilution Factor</u>	<u>RL</u>	<u>Method</u>	<u>Date Analyzed</u>	<u>Analyst</u>
Chloride	4960	mg/kg	1	20	9253	9/4/02	SB

Lab ID: 0204410-04  
Sample ID: AH-2 (1.0'-1.5')

### Test Parameters

<u>Parameter</u>	<u>Result</u>	<u>Units</u>	<u>Dilution Factor</u>	<u>RL</u>	<u>Method</u>	<u>Date Analyzed</u>	<u>Analyst</u>
Chloride	5320	mg/kg	1	20	9253	9/4/02	SB

Lab ID: 0204410-05  
Sample ID: AH-3 (0-0.5')

### Test Parameters

<u>Parameter</u>	<u>Result</u>	<u>Units</u>	<u>Dilution Factor</u>	<u>RL</u>	<u>Method</u>	<u>Date Analyzed</u>	<u>Analyst</u>
Chloride	5670	mg/kg	1	20	9253	9/4/02	SB

Lab ID: 0204410-06  
Sample ID: AH-3 (1.0'-1.5')

### Test Parameters

<u>Parameter</u>	<u>Result</u>	<u>Units</u>	<u>Dilution Factor</u>	<u>RL</u>	<u>Method</u>	<u>Date Analyzed</u>	<u>Analyst</u>
Chloride	5320	mg/kg	1	20	9253	9/4/02	SB

RL = Reporting Limit    N/A = Not Applicable

Page 1 of 3

# ENVIRONMENTAL LAB OF TEXAS

## ANALYTICAL REPORT

TIM REED  
HIGHLANDER ENVIRONMENTAL CORP.  
1910 N. BIG SPRING STREET  
MIDLAND, TX 79705

Order#: G0204410  
Project: 1877  
Project Name: Pogo/ E.C. Hill C-3 Area  
Location: Lea Co., NM

Lab ID: 0204410-07  
Sample ID: AH-4 (0-0.5')

### Test Parameters

<u>Parameter</u>	<u>Result</u>	<u>Units</u>	<u>Dilution Factor</u>	<u>RL</u>	<u>Method</u>	<u>Date Analyzed</u>	<u>Analyst</u>
Chloride	6030	mg/kg	1	20	9253	9/4/02	SB

Lab ID: 0204410-08  
Sample ID: AH-4 (1.0'-1.5')

### Test Parameters

<u>Parameter</u>	<u>Result</u>	<u>Units</u>	<u>Dilution Factor</u>	<u>RL</u>	<u>Method</u>	<u>Date Analyzed</u>	<u>Analyst</u>
Chloride	6470	mg/kg	1	20	9253	9/4/02	SB

Lab ID: 0204410-09  
Sample ID: AH-5 (0-0.5')

### Test Parameters

<u>Parameter</u>	<u>Result</u>	<u>Units</u>	<u>Dilution Factor</u>	<u>RL</u>	<u>Method</u>	<u>Date Analyzed</u>	<u>Analyst</u>
Chloride	4520	mg/kg	1	20	9253	9/4/02	SB

Lab ID: 0204410-10  
Sample ID: AH-5 (1.0'-1.5')

### Test Parameters

<u>Parameter</u>	<u>Result</u>	<u>Units</u>	<u>Dilution Factor</u>	<u>RL</u>	<u>Method</u>	<u>Date Analyzed</u>	<u>Analyst</u>
Chloride	5230	mg/kg	1	20	9253	9/4/02	SB

Lab ID: 0204410-11  
Sample ID: AH-6 (0-0.5')

### Test Parameters

<u>Parameter</u>	<u>Result</u>	<u>Units</u>	<u>Dilution Factor</u>	<u>RL</u>	<u>Method</u>	<u>Date Analyzed</u>	<u>Analyst</u>
Chloride	5140	mg/kg	1	20	9253	9/4/02	SB

Lab ID: 0204410-12  
Sample ID: AH-6 (1.0'-1.5')

### Test Parameters

<u>Parameter</u>	<u>Result</u>	<u>Units</u>	<u>Dilution Factor</u>	<u>RL</u>	<u>Method</u>	<u>Date Analyzed</u>	<u>Analyst</u>
Chloride	5140	mg/kg	1	20	9253	9/4/02	SB

# ENVIRONMENTAL LAB OF TEXAS

## ANALYTICAL REPORT

TIM REED  
HIGHLANDER ENVIRONMENTAL CORP.  
1910 N. BIG SPRING STREET  
MIDLAND, TX 79705

Order#: G0204410  
Project: 1877  
Project Name: Pogo/ E.C. Hill C-3 Area  
Location: Lea Co., NM

Lab ID: 0204410-13  
Sample ID: AH-7 (0-0.5')

### Test Parameters

<u>Parameter</u>	<u>Result</u>	<u>Units</u>	<u>Dilution Factor</u>	<u>RL</u>	<u>Method</u>	<u>Date Analyzed</u>	<u>Analyst</u>
Chloride	4960	mg/kg	1	20	9253	9/4/02	SB

Lab ID: 0204410-14  
Sample ID: AH-7 (1.0'-1.5')

### Test Parameters

<u>Parameter</u>	<u>Result</u>	<u>Units</u>	<u>Dilution Factor</u>	<u>RL</u>	<u>Method</u>	<u>Date Analyzed</u>	<u>Analyst</u>
Chloride	5050	mg/kg	1	20	9253	9/4/02	SB

Lab ID: 0204410-15  
Sample ID: AH-8 (0-0.5')

### Test Parameters

<u>Parameter</u>	<u>Result</u>	<u>Units</u>	<u>Dilution Factor</u>	<u>RL</u>	<u>Method</u>	<u>Date Analyzed</u>	<u>Analyst</u>
Chloride	5320	mg/kg	1	20	9253	9/4/02	SB

Lab ID: 0204410-16  
Sample ID: AH-8 (1.0-1.5')

### Test Parameters

<u>Parameter</u>	<u>Result</u>	<u>Units</u>	<u>Dilution Factor</u>	<u>RL</u>	<u>Method</u>	<u>Date Analyzed</u>	<u>Analyst</u>
Chloride	5230	mg/kg	1	20	9253	9/4/02	SB

Approval:

*Celey D. Keene* 9/5/02  
Raland K. Tuttle, Lab Director, QA Officer  
Celey D. Keene, Org. Tech. Director  
Jeanne McMurrey, Inorg. Tech. Director  
Sandra Biezugbe, Lab Tech.  
Sara Molina, Lab Tech.

Date

# ENVIRONMENTAL LAB OF TEXAS

## QUALITY CONTROL REPORT

8015M

Order#: G0204410

<b>BLANK</b>	SOIL	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
TOTAL, C6-C35-mg/kg		0003048-02			<10.0		
<b>CONTROL</b>	SOIL	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
TOTAL, C6-C35-mg/kg		0003048-03		952	1003	105.4%	
<b>CONTROL DUP</b>	SOIL	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
TOTAL, C6-C35-mg/kg		0003048-04		952	992	104.2%	1.1%
<b>SRM</b>	SOIL	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
TOTAL, C6-C35-mg/kg		0003048-05		1000	1040	104.0%	

# ENVIRONMENTAL LAB OF TEXAS

## QUALITY CONTROL REPORT

### Test Parameters

Order#: G0204410

<b>BLANK</b>	SOIL	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
Chloride-mg/kg		0003049-01			<20.0		
Chloride-mg/kg		0003050-01			<20.0		
<b>MS</b>	SOIL	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
Chloride-mg/kg		0204401-01	94.5	667	756	99.2%	
Chloride-mg/kg		0204410-15	5320	5000	10300	99.6%	
<b>MSD</b>	SOIL	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
Chloride-mg/kg		0204401-01	94.5	667	744	97.4%	1.6%
Chloride-mg/kg		0204410-15	5320	5000	10200	97.6%	1.0%
<b>SRM</b>	SOIL	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
Chloride-mg/kg		0003049-04		5000	4960	99.2%	
Chloride-mg/kg		0003050-04		5000	4960	99.2%	

# Analysis Request and Chain of Custody Record

## HIGHLANDER ENVIRONMENTAL CORP.

1910 N. Big Spring St.  
Midland, Texas 79705

(915) 682-4559

Fax (915) 682-3946

PAGE: 1 OF: 2

### ANALYSIS REQUEST (Circle or Specify Method No.)

CLIENT NAME: PO 60 SITE MANAGER: Tim Reed

PROJECT NO.: 1877 PROJECT NAME: EC Hill C-3  
Leg (C.N.M) Spill area

LAB I.D. NUMBER	DATE	TIME	MATRIX	COMP.	GRAB	SAMPLE IDENTIFICATION	NUMBER OF CONTAINERS	FILTERED (Y/N)	HCL	HNO3	ICE	NONE	PRESERVATIVE METHOD
-----------------	------	------	--------	-------	------	-----------------------	----------------------	----------------	-----	------	-----	------	---------------------

410-01	8/29/02	12:30	S	X		AH-1 (0-0.5')	1	N			X		
62		12:40	S	X		AH-1 (1.0'-1.5')	1	N			X		
03		12:45	S	X		AH-2 (0-0.5')	1	N			X		
04		12:50	S	X		AH-2 (1.0'-1.5')	1	N			X		
05		13:00	S	X		AH-3 (0-0.5')	1	N			X		
06		13:05	S	X		AH-3 (1.0'-1.5')	1	N			X		
07		13:10	S	X		AH-4 (0-0.5')	1	N			X		
08		13:15	S	X		AH-4 (1.0'-1.5')	1	N			X		
09		13:25	S	X		AH-5 (0-0.5')	1	N			X		
10		13:30	S	X		AH-5 (1.0'-1.5')	1	N			X		

BTX 8020/803	MTBE 8030/808	TPH 418.1	PAH 8270	RCRA Metals Ag As Ba Cd Cr Pb Hg Se	TCLP Metals Ag As Ba Cd Cr Pb Hg Se	TCLP Volatiles	TCLP Semi Volatiles	ECI	GC-MS Vol. 8240/8260/824	GC-MS Semi. Vol. 8270/825	PCB's 8090/806	Pest. 809/808	BOD, TSS, pH, TDS, Chloride	Gamma Spec.	Alpha Beta (Air)	PLM (Asbestos)	Chloride
		X															X
																	X
																	X
																	X
		X															X
																	X
																	X
																	X
		X															X

RELINQUISHED BY: (Signature) Ray P. Miller Date: 8-30-02  
Time: 2:50

RECEIVED BY: (Signature) Tim Reed Date: 8/30/02  
Time: 14:50

SAMPLED BY: (Print & Sign) Tim Reed Date: 8/30/02  
Time: 14:20

RELINQUISHED BY: (Signature) \_\_\_\_\_ Date: \_\_\_\_\_  
Time: \_\_\_\_\_

RECEIVED BY: (Signature) \_\_\_\_\_ Date: \_\_\_\_\_  
Time: \_\_\_\_\_

SAMPLE SHIPPED BY: (Circle)  
FEDEX BUS AIRBILL # \_\_\_\_\_  
HAND DELIVERED UPS OTHER: \_\_\_\_\_

RELINQUISHED BY: (Signature) \_\_\_\_\_ Date: \_\_\_\_\_  
Time: \_\_\_\_\_

RECEIVED BY: (Signature) \_\_\_\_\_ Date: \_\_\_\_\_  
Time: \_\_\_\_\_

HIGHLANDER CONTACT PERSON: \_\_\_\_\_ Results by: \_\_\_\_\_

RECEIVING LABORATORY: Environmental Lab of Texas  
ADDRESS: 12600 W F-20  
CITY: Odessa STATE: TX ZIP: 79705  
CONTACT: \_\_\_\_\_ PHONE: \_\_\_\_\_ DATE: \_\_\_\_\_ TIME: \_\_\_\_\_

RECEIVED BY: (Signature) \_\_\_\_\_

Tim Reed / Ike Tavares  
RUSH Charges Authorized: \_\_\_\_\_  
Yes No

SAMPLE CONDITION WHEN RECEIVED:  
5.0°C

MATRIX: W-Water A-Air SD-Solid  
S-Soil SL-Sludge O-Other

REMARKS: Hold Extra samples for possible additional TPH



# ANALYTICAL REPORT

## Prepared for:

**TIM REED  
HIGHLANDER ENVIRONMENTAL CORP.  
1910 N. BIG SPRING STREET  
MIDLAND, TX 79705**

**Project:** Pogo E.C. Hill #C-3

**PO#:**

**Order#:** G0204569

**Report Date:** 09/21/2002

### Certificates

**US EPA Laboratory Code TX00158**

# ENVIRONMENTAL LAB OF TEXAS

## SAMPLE WORK LIST

HIGHLANDER ENVIRONMENTAL CORP.  
1910 N. BIG SPRING STREET  
MIDLAND, TX 79705  
915-682-3946

Order#: G0204569  
Project: 1877  
Project Name: Pogo E.C. Hill #C-3  
Location: Lea County, New Mexico

The samples listed below were submitted to Environmental Lab of Texas and were received under chain of custody. Environmental Lab of Texas makes no representation or certification as to the method of sample collection, sample identification, or transportation/handling procedures used prior to the receipt of samples by Environmental Lab of Texas, unless otherwise noted.

<u>Lab ID:</u>	<u>Sample :</u>	<u>Matrix:</u>	<u>Date / Time</u>	<u>Date / Time</u>	<u>Container</u>	<u>Preservative</u>
			<u>Collected</u>	<u>Received</u>		
0204569-01	Trench 1 1.0'	SOIL	9/20/02 10:10	9/20/02 14:10	4 oz glass	None
	<u>Lab Testing:</u> Chloride	Rejected: No		Temp: 24.0 C		
0204569-02	Trench 1 2.0'	SOIL	9/20/02 10:15	9/20/02 14:10	4 oz glass	None
	<u>Lab Testing:</u> Chloride	Rejected: No		Temp: 24.0 C		
0204569-03	Trench 2 1.0'	SOIL	9/20/02 10:20	9/20/02 14:10	4 oz glass	None
	<u>Lab Testing:</u> Chloride	Rejected: No		Temp: 24.0 C		
0204569-04	Trench 2 2.0'	SOIL	9/20/02 10:22	9/20/02 14:10	4 oz glass	None
	<u>Lab Testing:</u> Chloride	Rejected: No		Temp: 24.0 C		
0204569-05	Trench 3 1.0'	SOIL	9/20/02 10:27	9/20/02 14:10	4 oz glass	None
	<u>Lab Testing:</u> Chloride	Rejected: No		Temp: 24.0 C		
0204569-06	Trench 3 2.0'	SOIL	9/20/02 10:30	9/20/02 14:10	4 oz glass	None
	<u>Lab Testing:</u> Chloride	Rejected: No		Temp: 24.0 C		

# ENVIRONMENTAL LAB OF TEXAS

## ANALYTICAL REPORT

TIM REED  
HIGHLANDER ENVIRONMENTAL CORP.  
1910 N. BIG SPRING STREET  
MIDLAND, TX 79705

Order#: G0204569  
Project: 1877  
Project Name: Pogo E.C. Hill #C-3  
Location: Lea County, New Mexico

Lab ID: 0204569-01  
Sample ID: Trench 1 1.0'

### Test Parameters

<u>Parameter</u>	<u>Result</u>	<u>Units</u>	<u>Dilution Factor</u>	<u>RL</u>	<u>Method</u>	<u>Date Analyzed</u>	<u>Analyst</u>
Chloride	2760	mg/kg	1	20.0	9253	9/20/02	CK

Lab ID: 0204569-02  
Sample ID: Trench 1 2.0'

### Test Parameters

<u>Parameter</u>	<u>Result</u>	<u>Units</u>	<u>Dilution Factor</u>	<u>RL</u>	<u>Method</u>	<u>Date Analyzed</u>	<u>Analyst</u>
Chloride	2260	mg/kg	1	20.0	9253	9/20/02	CK

Lab ID: 0204569-03  
Sample ID: Trench 2 1.0'

### Test Parameters

<u>Parameter</u>	<u>Result</u>	<u>Units</u>	<u>Dilution Factor</u>	<u>RL</u>	<u>Method</u>	<u>Date Analyzed</u>	<u>Analyst</u>
Chloride	2530	mg/kg	1	20.0	9253	9/20/02	CK

Lab ID: 0204569-04  
Sample ID: Trench 2 2.0'

### Test Parameters

<u>Parameter</u>	<u>Result</u>	<u>Units</u>	<u>Dilution Factor</u>	<u>RL</u>	<u>Method</u>	<u>Date Analyzed</u>	<u>Analyst</u>
Chloride	3100	mg/kg	1	20.0	9253	9/20/02	CK

Lab ID: 0204569-05  
Sample ID: Trench 3 1.0'

### Test Parameters

<u>Parameter</u>	<u>Result</u>	<u>Units</u>	<u>Dilution Factor</u>	<u>RL</u>	<u>Method</u>	<u>Date Analyzed</u>	<u>Analyst</u>
Chloride	2820	mg/kg	1	20.0	9253	9/20/02	CK

Lab ID: 0204569-06  
Sample ID: Trench 3 2.0'

### Test Parameters

<u>Parameter</u>	<u>Result</u>	<u>Units</u>	<u>Dilution Factor</u>	<u>RL</u>	<u>Method</u>	<u>Date Analyzed</u>	<u>Analyst</u>
Chloride	3230	mg/kg	1	20.0	9253	9/20/02	CK

# ENVIRONMENTAL LAB OF TEXAS

## ANALYTICAL REPORT

TIM REED  
HIGHLANDER ENVIRONMENTAL CORP.  
1910 N. BIG SPRING STREET  
MIDLAND, TX 79705

Order#: G0204569  
Project: 1877  
Project Name: Pogo E.C. Hill #C-3  
Location: Lea County, New Mexico

Approval:

*Raland K Tuttle* 9-21-02  
Date

Raland K. Tuttle, Lab Director, QA Officer  
Celey D. Keene, Org. Tech. Director  
Jeanne McMurrey, Inorg. Tech. Director  
Sandra Biezugbe, Lab Tech.  
Sara Molina, Lab Tech.

# ENVIRONMENTAL LAB OF TEXAS

## QUALITY CONTROL REPORT

### Test Parameters

Order#: G0204569

<b>BLANK</b>	SOIL	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
Chloride-mg/kg		0003189-01			<20.0		
<b>MS</b>	SOIL	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
Chloride-mg/kg		0204538-01	19500	10000	28000	85.0%	
<b>MSD</b>	SOIL	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
Chloride-mg/kg		0204538-01	19500	10000	28500	90.0%	1.8%
<b>SRM</b>	SOIL	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
Chloride-mg/kg		0003189-04		5000	4960	99.2%	

### CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST

LAB # (lab use only)		FIELD CODE	Date Sampled	Time Sampled	No. of Containers	Preservative								Matrix			Analyze For:														RUSH TAT (Pre-Schedule)	Standard TAT	
						Ice	HNO <sub>3</sub>	HCl	NaOH	H <sub>2</sub> SO <sub>4</sub>	None	Other (Specify)	Water	Sludge	Soil	Other (specify):	TPH: 418.1 8015M 1005 1006	Cations (Ca, Mg, Na, K)	Anions (Cl, SO <sub>4</sub> , CO <sub>3</sub> , HCO <sub>3</sub> )	SAR / ESP / DEC	Metals: As Ag Ba Cd Cr Pb Hg Se	Volatiles	Semivolatiles	BTX 8021B/5030	PCl	N.O.M.	Total Gamma	Chloride					
01	Trench 1	1.0'	9/20/02	1010	1						X				X																	X	
02	Trench 1	2.0'		1015	1						X				X																	X	
03	Trench 2	1.0'		1020	1						X				✓																	X	
04	Trench 2	2.0		1022	1						X				✓																	X	
05	Trench 3	1.0		1027	1						X				✓																	X	
06	Trench 3	2.0		1030	1						X				X																	X	
Special Instructions						Sample Containers Intact? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N														Temperature Upon Receipt: <input checked="" type="checkbox"/> 24.0°C						Laboratory Comments:							
Relinquished by:		Date	Time	Received by:		Date		Time																									
Relinquished by:		Date	Time	Received by:		Date		Time																									

# ANALYTICAL REPORT

## Prepared for:

**TIM REED  
HIGHLANDER ENVIRONMENTAL CORP.  
1910 N. BIG SPRING STREET  
MIDLAND, TX 79705**

**Project:** Pogo Producing Company/ Hill C-3  
Spill

**PO#:**

**Order#:** G0204619

**Report Date:** 09/30/2002

## Certificates

**US EPA Laboratory Code TX00158**

# ENVIRONMENTAL LAB OF TEXAS

## SAMPLE WORK LIST

HIGHLANDER ENVIRONMENTAL CORP.  
1910 N. BIG SPRING STREET  
MIDLAND, TX 79705  
915-682-3946

Order#: G0204619  
Project: 1877  
Project Name: Pogo Producing Company/ Hill C-3 Spill  
Location: Lea County

The samples listed below were submitted to Environmental Lab of Texas and were received under chain of custody. Environmental Lab of Texas makes no representation or certification as to the method of sample collection, sample identification, or transportation/handling procedures used prior to the receipt of samples by Environmental Lab of Texas, unless otherwise noted.

<u>Lab ID:</u>	<u>Sample :</u>	<u>Matrix:</u>	<u>Date / Time</u>	<u>Date / Time</u>	<u>Container</u>	<u>Preservative</u>
			<u>Collected</u>	<u>Received</u>		
0204619-01	Trench 1 3.0'-3.5'	SOIL	9/24/02	9/25/02	plastic bag	Ice
			9:20	16:40		
	<u>Lab Testing:</u>	Rejected: No		Temp: 6.5 C		
	Chloride					
0204619-02	Trench 2 3.0'-3.5'	SOIL	9/24/02	9/25/02	plastic bag	Ice
			9:10	16:40		
	<u>Lab Testing:</u>	Rejected: No		Temp: 6.5 C		
	Chloride					
0204619-03	Trench 3 3.0'-3.5'	SOIL	9/24/02	9/25/02	plastic bag	Ice
			9:15	16:40		
	<u>Lab Testing:</u>	Rejected: No		Temp: 6.5 C		
	Chloride					

# ENVIRONMENTAL LAB OF TEXAS

## ANALYTICAL REPORT

TIM REED  
HIGHLANDER ENVIRONMENTAL CORP.  
1910 N. BIG SPRING STREET  
MIDLAND, TX 79705

Order#: G0204619  
Project: 1877  
Project Name: Pogo Producing Company/ Hill C-3 Spill  
Location: Lea County

Lab ID: 0204619-01  
Sample ID: Trench 1 3.0'-3.5'

### Test Parameters

<u>Parameter</u>	<u>Result</u>	<u>Units</u>	<u>Dilution Factor</u>	<u>RL</u>	<u>Method</u>	<u>Date Analyzed</u>	<u>Analyst</u>
Chloride	2020	mg/kg	1	20	9253	9/27/02	SB

Lab ID: 0204619-02  
Sample ID: Trench 2 3.0'-3.5'

### Test Parameters

<u>Parameter</u>	<u>Result</u>	<u>Units</u>	<u>Dilution Factor</u>	<u>RL</u>	<u>Method</u>	<u>Date Analyzed</u>	<u>Analyst</u>
Chloride	3120	mg/kg	1	20	9253	9/27/02	SB

Lab ID: 0204619-03  
Sample ID: Trench 3 3.0'-3.5'

### Test Parameters

<u>Parameter</u>	<u>Result</u>	<u>Units</u>	<u>Dilution Factor</u>	<u>RL</u>	<u>Method</u>	<u>Date Analyzed</u>	<u>Analyst</u>
Chloride	1770	mg/kg	1	20	9253	9/27/02	SB

Approval:

*Raland K Tuttle* 9-30-02

Raland K. Tuttle, Lab Director, QA Officer

Date

Celey D. Keene, Org. Tech. Director

Jeanne McMurrey, Inorg. Tech. Director

Sandra Biezugbe, Lab Tech.

Sara Molina, Lab Tech.

# ENVIRONMENTAL LAB OF TEXAS

## QUALITY CONTROL REPORT

### Test Parameters

Order#: G0204619

<b>BLANK</b>	SOIL	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
Chloride-mg/kg		0003244-01			<20.0		
<b>MS</b>	SOIL	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
Chloride-mg/kg		0204605-01	1350	1000	2340	99.0%	
<b>MSD</b>	SOIL	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
Chloride-mg/kg		0204605-01	1350	1000	2320	97.0%	0.9%
<b>SRM</b>	SOIL	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
Chloride-mg/kg		0003244-04		5000	4960	99.2%	

# Analysis Request and Chain of Custody Record

## HIGHLANDER ENVIRONMENTAL CORP.

1910 N. Big Spring St.

Midland, Texas 79705

(915) 682-4559

Fax (915) 682-3946

CLIENT NAME:

*Pogo Producing Company*

SITE MANAGER:

*Tim Reed*

PROJECT NO.:

*1877*

PROJECT NAME:

*Lee County Hill C-3 grill*

LAB I.D. NUMBER

DATE

TIME

MATRIX

COMP.

GRAB

SAMPLE IDENTIFICATION

NUMBER OF CONTAINERS

FILTERED (Y/N)

PRESERVATIVE METHOD

HCL

HNO3

ICE

NONE

BTEX 8020/802

MTBE 8030/802

TPH 418.1 8015 MOD. TX1005

PAH 8270

RCRA Metals Ag As Ba Cd Cr Pb Hg Se

TCLP Metals Ag As Ba Cd Cr Pb Hg Se

TCLP Volatiles

TCLP Semi Volatiles

RCI

GC/MS Vol. 8240/8260/824

GC/MS Semi. Vol. 8270/825

PCB's 8080/808

Pest. 808/808

BOD, TSS, pH, TDS, Chloride

Gamma Spec.

Alpha Beta (Air)

PLM (Asbestos)

*Chloride*

*4 - south*

*5 - middle*

*6 - north*

RELINQUISHED BY: (Signature)

Date:

Time:

RELINQUISHED BY: (Signature)

Date:

Time:

RELINQUISHED BY: (Signature)

Date:

Time:

RECEIVING LABORATORY:

ADDRESS:

CITY:

CONTACT:

STATE:

ZIP:

PHONE:

RECEIVED BY: (Signature)

Date:

Time:

RECEIVED BY: (Signature)

Date:

Time:

RECEIVED BY: (Signature)

Date:

Time:

RECEIVED BY: (Signature)

DATE:

TIME:

SAMPLED BY: (Print & Sign)

Date:

Time:

SAMPLE SHIPPED BY: (Circle)

FEDEX

BUS

AIRBILL #

HAND DELIVERED

UPS

OTHER:

HIGHLANDER CONTACT PERSON:

*Tim Reed*

Results by:

RUSH Charges

Authorized:

☒ Yes ☐ No

SAMPLE CONDITION WHEN RECEIVED:

*Plastic bags 6.5°C*

MATRIX:

☒ W-Water  
☒ S-Soil

☐ A-Air  
☐ SL-Sludge

☐ SD-Solid  
☐ O-Other

REMARKS:

# ANALYTICAL REPORT

## Prepared for:

**TIM REED  
HIGHLANDER ENVIRONMENTAL CORP.  
1910 N. BIG SPRING STREET  
MIDLAND, TX 79705**

**Project:** Pogo Producing/E.C. Hill #C-3 Spill

**PO#:**

**Order#:** G0204683

**Report Date:** 10/04/2002

## Certificates

**US EPA Laboratory Code TX00158**

# ENVIRONMENTAL LAB OF TEXAS

## SAMPLE WORK LIST

HIGHLANDER ENVIRONMENTAL CORP.  
1910 N. BIG SPRING STREET  
MIDLAND, TX 79705  
915-682-3946

Order#: G0204683  
Project: 1877  
Project Name: Pogo Producing/E.C. Hill #C-3 Spill  
Location: Lea County

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<u>Lab ID:</u>	<u>Sample :</u>	<u>Matrix:</u>	<u>Date / Time</u>	<u>Date / Time</u>	<u>Container</u>	<u>Preservative</u>
			<u>Collected</u>	<u>Received</u>		
0204683-01	Trench 4 1.0'	SOIL	10/1/02 9:30	10/1/02 14:15	Plastic Bag	None
	<u>Lab Testing:</u> Chloride	Rejected: No		Temp: 32.5 C		
0204683-02	Trench 4 2.0'	SOIL	10/1/02 9:35	10/1/02 14:15	Plastic Bag	None
	<u>Lab Testing:</u> Chloride	Rejected: No		Temp: 32.5 C		
0204683-03	Trench 4 3.0'	SOIL	10/1/02 9:40	10/1/02 14:15	Plastic Bag	None
	<u>Lab Testing:</u> Chloride	Rejected: No		Temp: 32.5 C		
0204683-04	Trench 5 1.0'	SOIL	10/1/02 9:50	10/1/02 14:15	Plastic Bag	None
	<u>Lab Testing:</u> Chloride	Rejected: No		Temp: 32.5 C		
0204683-05	Trench 5 2.0'	SOIL	10/1/02 9:55	10/1/02 14:15	Plastic Bag	None
	<u>Lab Testing:</u> Chloride	Rejected: No		Temp: 32.5 C		
0204683-06	Trench 5 3.0'	SOIL	10/1/02 10:00	10/1/02 14:15	Plastic Bag	None
	<u>Lab Testing:</u> Chloride	Rejected: No		Temp: 32.5 C		
0204683-07	Trench 6 1.0'	SOIL	10/1/02 10:05	10/1/02 14:15	Plastic Bag	None
	<u>Lab Testing:</u> Chloride	Rejected: No		Temp: 32.5 C		
0204683-08	Trench 6 2.0'	SOIL	10/1/02 10:10	10/1/02 14:15	Plastic Bag	None
	<u>Lab Testing:</u> Chloride	Rejected: No		Temp: 32.5 C		

# ENVIRONMENTAL LAB OF TEXAS

## SAMPLE WORK LIST

HIGHLANDER ENVIRONMENTAL CORP.  
1910 N. BIG SPRING STREET  
MIDLAND, TX 79705  
915-682-3946

Order#: G0204683  
Project: 1877  
Project Name: Pogo Producing/E.C. Hill #C-3 Spill  
Location: Lea County

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<u>Lab ID:</u>	<u>Sample :</u>	<u>Matrix:</u>	<u>Date / Time</u> <u>Collected</u>	<u>Date / Time</u> <u>Received</u>	<u>Container</u>	<u>Preservative</u>
0204683-09	Trench 6 3.0'	SOIL	10/1/02 10:15	10/1/02 14:15	Plastic Bag	None
<u>Lab Testing:</u>		Rejected: No	Temp: 32.5 C			
Chloride						

# ENVIRONMENTAL LAB OF TEXAS

## ANALYTICAL REPORT

TIM REED  
HIGHLANDER ENVIRONMENTAL CORP.  
1910 N. BIG SPRING STREET  
MIDLAND, TX 79705

Order#: G0204683  
Project: 1877  
Project Name: Pogo Producing/E.C. Hill #C-3 Spill  
Location: Lea County

Lab ID: 0204683-01  
Sample ID: Trench 4 1.0'

### Test Parameters

<u>Parameter</u>	<u>Result</u>	<u>Units</u>	<u>Dilution Factor</u>	<u>RL</u>	<u>Method</u>	<u>Date Analyzed</u>	<u>Analyst</u>
Chloride	4790	mg/kg	1	20	9253	10/4/02	SB

Lab ID: 0204683-02  
Sample ID: Trench 4 2.0'

### Test Parameters

<u>Parameter</u>	<u>Result</u>	<u>Units</u>	<u>Dilution Factor</u>	<u>RL</u>	<u>Method</u>	<u>Date Analyzed</u>	<u>Analyst</u>
Chloride	2840	mg/kg	1	20	9253	10/4/02	SB

Lab ID: 0204683-03  
Sample ID: Trench 4 3.0'

### Test Parameters

<u>Parameter</u>	<u>Result</u>	<u>Units</u>	<u>Dilution Factor</u>	<u>RL</u>	<u>Method</u>	<u>Date Analyzed</u>	<u>Analyst</u>
Chloride	2270	mg/kg	1	20	9253	10/4/02	SB

Lab ID: 0204683-04  
Sample ID: Trench 5 1.0'

### Test Parameters

<u>Parameter</u>	<u>Result</u>	<u>Units</u>	<u>Dilution Factor</u>	<u>RL</u>	<u>Method</u>	<u>Date Analyzed</u>	<u>Analyst</u>
Chloride	514	mg/kg	1	20	9253	10/4/02	SB

Lab ID: 0204683-05  
Sample ID: Trench 5 2.0'

### Test Parameters

<u>Parameter</u>	<u>Result</u>	<u>Units</u>	<u>Dilution Factor</u>	<u>RL</u>	<u>Method</u>	<u>Date Analyzed</u>	<u>Analyst</u>
Chloride	<20.0	mg/kg	1	20	9253	10/4/02	SB

Lab ID: 0204683-06  
Sample ID: Trench 5 3.0'

### Test Parameters

<u>Parameter</u>	<u>Result</u>	<u>Units</u>	<u>Dilution Factor</u>	<u>RL</u>	<u>Method</u>	<u>Date Analyzed</u>	<u>Analyst</u>
Chloride	<20.0	mg/kg	1	20	9253	10/4/02	SB

# ENVIRONMENTAL LAB OF TEXAS

## ANALYTICAL REPORT

TIM REED  
HIGHLANDER ENVIRONMENTAL CORP.  
1910 N. BIG SPRING STREET  
MIDLAND, TX 79705

Order#: G0204683  
Project: 1877  
Project Name: Pogo Producing/E.C. Hill #C-3 Spill  
Location: Lea County

Lab ID: 0204683-07  
Sample ID: Trench 6 1.0'

### Test Parameters

<u>Parameter</u>	<u>Result</u>	<u>Units</u>	<u>Dilution Factor</u>	<u>RL</u>	<u>Method</u>	<u>Date Analyzed</u>	<u>Analyst</u>
Chloride	2690	mg/kg	1	20	9253	10/4/02	SB

Lab ID: 0204683-08  
Sample ID: Trench 6 2.0'

### Test Parameters

<u>Parameter</u>	<u>Result</u>	<u>Units</u>	<u>Dilution Factor</u>	<u>RL</u>	<u>Method</u>	<u>Date Analyzed</u>	<u>Analyst</u>
Chloride	177	mg/kg	1	20	9253	10/4/02	SB

Lab ID: 0204683-09  
Sample ID: Trench 6 3.0'

### Test Parameters

<u>Parameter</u>	<u>Result</u>	<u>Units</u>	<u>Dilution Factor</u>	<u>RL</u>	<u>Method</u>	<u>Date Analyzed</u>	<u>Analyst</u>
Chloride	<20.0	mg/kg	1	20	9253	10/4/02	SB

Approval: Jeanne McMurrey 10-07-02  
Raland K. Tuttle, Lab Director, QA Officer Date  
Celey D. Keene, Org. Tech. Director  
Jeanne McMurrey, Inorg. Tech. Director  
Sandra Biezugbe, Lab Tech.  
Sara Molina, Lab Tech.

# ENVIRONMENTAL LAB OF TEXAS

## QUALITY CONTROL REPORT

### Test Parameters

Order#: G0204683

<b>BLANK</b>	SOIL	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
Chloride-mg/kg		0003347-01			<20.0		
<b>MS</b>	SOIL	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
Chloride-mg/kg		0204661-01	354	1000	1350	99.6%	
<b>MSD</b>	SOIL	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
Chloride-mg/kg		0204661-01	354	1000	1330	97.6%	1.5%
<b>SRM</b>	SOIL	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
Chloride-mg/kg		0003347-04		5000	4960	99.2%	

# ANALYTICAL REPORT

## Prepared for:

IKE TAVAREZ  
HIGHLANDER ENVIRONMENTAL CORP.  
1910 N. BIG SPRING STREET  
MIDLAND, TX 79705

**Project:** Pogo / E.C. Hill #C-3 Spill

**PO#:**

**Order#:** G0204771

**Report Date:** 10/16/2002

## Certificates

US EPA Laboratory Code TX00158

# ENVIRONMENTAL LAB OF TEXAS

## SAMPLE WORK LIST

HIGHLANDER ENVIRONMENTAL CORP.  
1910 N. BIG SPRING STREET  
MIDLAND, TX 79705  
682-3946

Order#: G0204771  
Project: 1877  
Project Name: Pogo / E.C. Hill #C-3 Spill  
Location: Lea County, NM

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<u>Lab ID:</u>	<u>Sample :</u>	<u>Matrix:</u>	<u>Date / Time</u> <u>Collected</u>	<u>Date / Time</u> <u>Received</u>	<u>Container</u>	<u>Preservative</u>
0204771-01	Trench #4 (4.0')	SOIL	10/15/02	10/15/02 14:50	4 oz Glass	Ice
	<u>Lab Testing:</u> Chloride	Rejected: No		Temp: 3 C		
0204771-02	Trench #4 (5.0')	SOIL	10/15/02	10/15/02 14:50	4 oz Glass	Ice
	<u>Lab Testing:</u> Chloride	Rejected: No		Temp: 3 C		
0204771-03	Trench #4 (6.0')	SOIL	10/15/02	10/15/02 14:50	4 oz Glass	Ice
	<u>Lab Testing:</u> Chloride	Rejected: No		Temp: 3 C		

# ENVIRONMENTAL LAB OF TEXAS

## ANALYTICAL REPORT

IKE TAVAREZ  
HIGHLANDER ENVIRONMENTAL CORP.  
1910 N. BIG SPRING STREET  
MIDLAND, TX 79705

Order#: G0204771  
Project: 1877  
Project Name: Pogo / E.C. Hill #C-3 Spill  
Location: Lea County, NM

Lab ID: 0204771-01  
Sample ID: Trench #4 (4.0')

### Test Parameters

Parameter	Result	Units	Dilution Factor	RL	Method	Date Analyzed	Analyst
Chloride	1740	mg/kg	1	20	9253	10/16/02	SB

Lab ID: 0204771-02  
Sample ID: Trench #4 (5.0')

### Test Parameters

Parameter	Result	Units	Dilution Factor	RL	Method	Date Analyzed	Analyst
Chloride	744	mg/kg	1	20	9253	10/16/02	SB

Lab ID: 0204771-03  
Sample ID: Trench #4 (6.0')

### Test Parameters

Parameter	Result	Units	Dilution Factor	RL	Method	Date Analyzed	Analyst
Chloride	106	mg/kg	1	20	9253	10/16/02	SB

Approval: *Jeanna McMurrey* 10-16-02  
 Ralene K. Tuttle, Lab Director, QA Officer Date  
 Celey D. Keene, Org. Tech. Director  
 Jeanna McMurrey, Inorg. Tech. Director  
 Sandra Biezugbe, Lab Tech.  
 Sara Molina, Lab Tech.

RL = Reporting Limit N/A = Not Applicable

Page 1 of 1

ENVIRONMENTAL LAB OF TEXAS I, LTD. 12600 West I-20 East, Odessa, TX 79765 Ph: 915-563-1800

# ENVIRONMENTAL LAB OF TEXAS

## QUALITY CONTROL REPORT

### Test Parameters

Order#: G0204771

<b>BLANK</b>	SOIL	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
Chloride-mg/kg		0003445-01			<20.0		
<b>MS</b>	SOIL	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
Chloride-mg/kg		0204771-01	1740	1000	2730	95.9%	
<b>MSD</b>	SOIL	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
Chloride-mg/kg		0204771-01	1740	1000	2710	97.3%	0.7%
<b>SRM</b>	SOIL	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
Chloride-mg/kg		0003445-04		5000	4960	99.2%	



District I  
1625 N. French Dr., Hobbs, NM 88240  
District II  
811 South First, Artesia, NM 88210  
District III  
1000 Rio Brazos Road, Aztec, NM 87410  
District IV  
2040 South Pacheco, Santa Fe, NM 87505

State of New Mexico  
Energy Minerals and Natural Resources

Oil Conservation Division  
2040 South Pacheco  
Santa Fe, NM 87505

Form C-141  
Revised March 17, 1999

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 : Arch/Pogo Producing Company	Contact: Rex Jasper	
Address: 300 N. Marienfeld St. Midland, Tx	Telephone No.: (915) 685-8100	
Facility Name: E.C. Hill C-3	Facility Type: Producing Well	
Surface Owner: D.K. Boyd	Mineral Owner:	Lease No.

LOCATION OF RELEASE

API 30 02 S 3536 S 004

Unit Letter K	Section 27	Township 23S	Range 37E	Feet from the 1950	North/South Line S	Feet from the 990	East/West Line W	County Lea County
------------------	---------------	-----------------	--------------	-----------------------	-----------------------	----------------------	---------------------	----------------------

NATURE OF RELEASE

Type of Release: Produced Water	Volume of Release: Unknown	Volume Recovered: 0 bbls
Source of Release: 3" Poly Line	Date and Hour of Occurrence: 8/28/02	Date and Hour of Discovery: 8/28/02 6:00 A.M.
Was Immediate Notice Given? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Not Required	If YES, To Whom? NMOCD -	
By Whom?	Date and Hour: 8/28/02 12:45 A.M.	
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.* NA		
Describe Cause of Problem and Remedial Action Taken.* A split in a 3" poly line occurred while supplying water to a drilling rig. Produced water ran down side of main road and into a pasture.		
Describe Area Affected and Cleanup Action Taken.* The affected area is described in the assessment and closure report. The impacted material was excavated and hauled to a proper disposal facility and samples were taken to confirm proper clean up levels were obtained.		
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: <u>Tim Reed (Agent for Pogo)</u>	OIL CONSERVATION DIVISION	
Printed Name: <u>Tim Reed</u>	Approved by District Supervisor:	
Title: <u>Vice President - Highlander Enviro.</u>	Approval Date:	Expiration Date:
Date: <u>11/01/02</u>	Phone: <u>915-682-4559</u>	Conditions of Approval:
		Attached <input type="checkbox"/>

\* Attach Additional Sheets If Necessary