Larson & Associates, Inc.
Environmental Consultants

December 18, 2002

Mr. Rodney G. Bailey
HES Champion
ChevronTexaco Inc.
15 Smith Road
Midland, Texas 79702

RE: Produced Water Spill Investigation Report – Texaco Exploration and Production Inc., Vacuum Grayburg San Andres Unit, Well #140, U.L. H (SE/4, NE/4), Section 2, Township 18 South, Range 34 East, Lea County, New Mexico. API # 30 025 30756 0000

Dear Mr. Bailey:
Texaco Exploration and Production Inc. (Texaco) has retained Larson and Associates, Inc. (LA) to investigate a spill involving produced water from a gathering line located near the Central Vacuum Unit well #140 (Site). The Site is located in Unit Letter H (SE/4, NE/4), Section 2, Township 18 South, Range 34 East, Lea County, New Mexico. The spill occurred approximately 150 feet southwest of well #140, and affected an area measuring approximately 250 x 500 feet (0.35-acre). Figure 1 presents a location map. Figure 2 presents a Site drawing.

Setting
The Site is underlain by indurated caliche and sand. The Ogallala formation (Tertiary) is present beneath the caliche, and consists of poorly to well-cemented sand and sandstone, interbedded with units of clay, silt and gravel. The Chinle formation (Triassic) is comprised of mudstone, shale and sandstone, and is present beneath the Ogallala formation. The Chinle formation is commonly referred to as "red bed".

Groundwater occurs in the Ogallala formation at approximately 125 feet below ground surface (BGS).

Investigation
An electromagnetic (EM) terrain conductivity survey was performed at the Site on October 4, 2002, using an EM-34-3 terrain conductivity meter manufactured by Geonics Limited, Missasauga, Ontario, Canada. The EM-34-3 consists of a transmitter coil, transmitter consol, receiver coil, and receiver consol. The instrument has exploration capabilities from 0 to approximately 200 feet BGS, depending on the distance between the transmitter and receiver coils (coil separation), and coil orientation (i.e., horizontal dipole or vertical dipole). The EM technique is a qualitative method that measures the electrical properties (i.e., conductivity) of soil and rock, as well as the electrical properties of groundwater. The major factor that contributes to the conductivity of soil

ChevronTexaco - 216419
Incident - nPAC0605439451

507 North Marienfeld, Suite 202 ◆ Midland, Texas 79701 ◆ Ph. (915) 687-0901 ◆ Fax (915) 687-0456

Application pPAC0605439522

and rock is the conductivity of the formation water. The conductivity of the formation water depends primarily on the dissolved solids content. The EM induction technique utilizes current flow induced in the subsurface materials by a surface transmitter. An alternating electric current produced by a transmitter coil generates an alternating magnetic field that induces current flow through the earth material. The secondary magnetic field sensed by the receiver coil depends on the strength of the primary magnetic field, current frequency, distance between transmitting and receiving coils, and ground conductivity. The primary magnetic field, current frequency, and coil separation can be accounted for, leaving ground conductivity as the only unknown variable to be measured. The ground conductivity is digitally displayed in millimhos per meter (mmhos/m) at the receiver consol.

The EM-34-3 was operated in the horizontal dipole (HD) and vertical dipole (VD) modes using 10-meter and 20-meter coil separations. The EM-34-3 has exploration capabilities from 0 to about 24.6 feet BGS, and 0 to about 49.2 feet BGS using the 10-meter coil separation in the HD and VD modes, respectively. The EM-34-3 has similar exploration capabilities using the 20-meter coil separation in the HD mode as in the 10-meter coil separation in the VD mode, except that the maximum response occurs earlier in the 10-meter VD mode. The EM-34-3 has exploration capabilities from 0 to approximately 98.4 feet BGS using the 20-meter coil separation in the VD mode.

A Nikon Model DP-310 total station system (TSS) was used to accurately establish sample grids every 100 feet within an area measuring approximately 400 x 600 feet (240,000 feet^2 or approximately 5.5-acres). Figure 2 presents the EM survey stations. Figure 3 and Figure 4 present contoured drawings for the EM-34-3, 10-meter HD and VD surveys, respectively. Figure 5 and Figure 6 present contoured drawings for the EM-34-3, 20-meter HD and VD surveys, respectively. Appendix A presents the EM field sheets.

Referring to Figure 3 (EM-34-3, 10-meter HD survey), an area of elevated terrain conductivity measurements greater than 5 times background was observed in the area of station north 200 north and east 200 east. Elevated conductivity readings were also observed during the EM-34-3, 20-meter HD and VD surveys (Figure 5 and Figure 6) at station 200 north and 200 east. An area of elevated terrain conductivity greater than 10 times background was also observed during the EM-34-3, 10-meter HD survey near stations north 400 and 500 at east 0. This anomaly is linear in shape, and may represent interference from a gathering line. The anomaly was not observed during the EM-34-3, 20-meter HD survey (Figure 5). An anomaly was detected near the junction of several gathering lines near station north 300 and east 300 during the EM-34-3, 10-meter VD survey (Figure 4).

On November 26, 2002, Scarborough Drilling, Inc. used a truck-mounted air rotary rig to drill three borings at the Site. The borings (BH-1, BH-2 and BH-3) were drilled in the

vicinity of the release (BH-1), and area of elevated terrain conductivity located near EM stations 200 north, 200 east (BH-2), and 300 north, 200 east (BH-3). BoringBH-1 was advanced to approximately 40 feet BGS, and borings BH-2 and BH-3 were advanced to approximately 50 feet BGS. Soil samples were collected every 5 feet to approximately 20 feet BGS (i.e., 0 to 2', 5 to 6', 10 to 11', etc.) and every ten feet (i.e., 30 to 31', 40 to 41' and 50 to 51') to total depth (TD). The samples were collected using a split-spoon or jam-tube sampler that was cleaned between each sample using laboratory-grade detergent, and potable water. The drilling rig, rods and bit were washed between locations using a high-pressure hot water sprayer. The soil samples were placed in laboratory jars, labeled, chilled in an ice chest, and delivered under chain-of-custody control to Environmental Lab of Texas, Inc., located in Odessa, Texas. Appendix B presents geologic logs for the borings.

Duplicate samples were collected for headspace analysis using the ambient temperature headspace (ATH) method. The ATH method involves filling a clean glass sample jar approximately 2/3 full with discreet or composite sample media, sealing the top of the jar with a layer of aluminum foil, and replacing the cap. A RAE Instruments, Model 2000 photoionization detector (PID) and 10.3 electron-volt (eV) detector was used to measure the ionization potential of organic compounds in the vapors of the sample headspace. The probe was inserted through the aluminum foil into the headspace, and the ionization potential of organic compounds was displayed in parts per million (ppm). The method provides a qualitative determination as to the presence of organic compounds in soil, and is accepted by the New Mexico Oil Conservation Division (NMOCD) in lieu of laboratory analysis for benzene, toluene, ethylbenzene and xylene (commonly referred to as BTEX) when a PID reading is less than 100 ppm. The PID was calibrated using isobutylene (100 ppm). The headspace measurements of soil samples from boring BH-1, including 0 to 2 feet (603 ppm), 5 to 6 feet (562 ppm), 10 to 11 feet (393 ppm), 15 to 16 feet (344 ppm) and 20 to 21 feet (420 ppm) exceeded 100 ppm. The laboratory analyzed samples from 0 to 2 feet, 10 to 11 feet and 20 to 21 feet for benzene, toluene, ethylbenzene and xylene (collectively referred to as BTEX) using method SW-846-8021B. Several samples, including the samples mentioned above, were analyzed for total petroleum hydrocarbons (TPH) using method SW-846-8015 for gasoline-range (GRO) and diesel-range (DRO) organics, and chloride using EPA method SW-846-9253. Table 1 presents a summary of the PID, BTEX, TPH and chloride analysis. The PID readings are also displayed on the geologic logs. Appendix C presents the laboratory report.

The NMOCD has established recommended remediation action levels (RRALs) for benzene, total BTEX and TPH in soil based on guidance published by the NMOCD (*"Guidelines for Remediation of Leaks, Spills and Releases, August 13, 1993"*). The RRALs for benzene, total BTEX and TPH are based on the following criteria:

Criteria	Result	Ranking Score
Depth-to-Groundwater	50 - 99 Feet	10
Wellhead Protection Area	No	0
Distance to Surface Water Body	>1000 Feet	0
		Total: 10

The following RRALs are assigned to the Site based on the total ranking score:

Benzene	**10 mg/kg**
Total BTEX	**50 mg/kg**
TPH	**1000 mg/kg**

Referring to Table 1, benzene and total BTEX (sum of benzene, toluene, ethylbenzene and xylene) were not reported above the test method detection limits of 0.25 milligrams per kilogram (mg/kg) and 0.125 mg/kg, respectively. The highest TPH value (398.2 mg/kg) was reported in the soil sample from BH-1, 10 to 11 feet, and was below the RRAL. The highest chloride values were reported in the samples from boring BH-2 at 2,870 mg/kg (5 to 6 feet), 1,310 mg/kg (10 to 11 feet) and 195 mg/kg (15 to 16 feet). The location of boring BH-2 coincided with the area of highest conductivity. Please call me at (915) 687-0901 if you have questions.

Sincerely,

Larson and Associates, Inc.

Mark J. Larson, CPG, CGWP
President

Encl.

Permian Business Unit
North America Upstream
15 Smith Road
Midland, TX 79705
Tel (915) 687-7251
Fax (915) 687-7110
bailerg@chevrontexaco.com

Rodney Bailey
HES Champion

ChevronTexaco

Date: January 23, 2003

Oil Conservation Division
1625 N. French Dr.
Hobbs NM 88240
Attn: Paul Sheeley

Re: Vacuum Grayburg San Andres Unit # 140
Unit Letter "H", Sec 2, T-18S, R-34E

Mr. Sheeley

Attached is the produced water spill investigation report on Vacuum Grayburg San Andres Unit # 140. Analysis show all results are within NMOCD guidelines. Chevron request closure on this site. If you have any question or additional information is needed please call me at 915-687-7251.

Sincerely,

Rodney Bailey

Rodney Bailey
ChevronTexaco
HES Champion

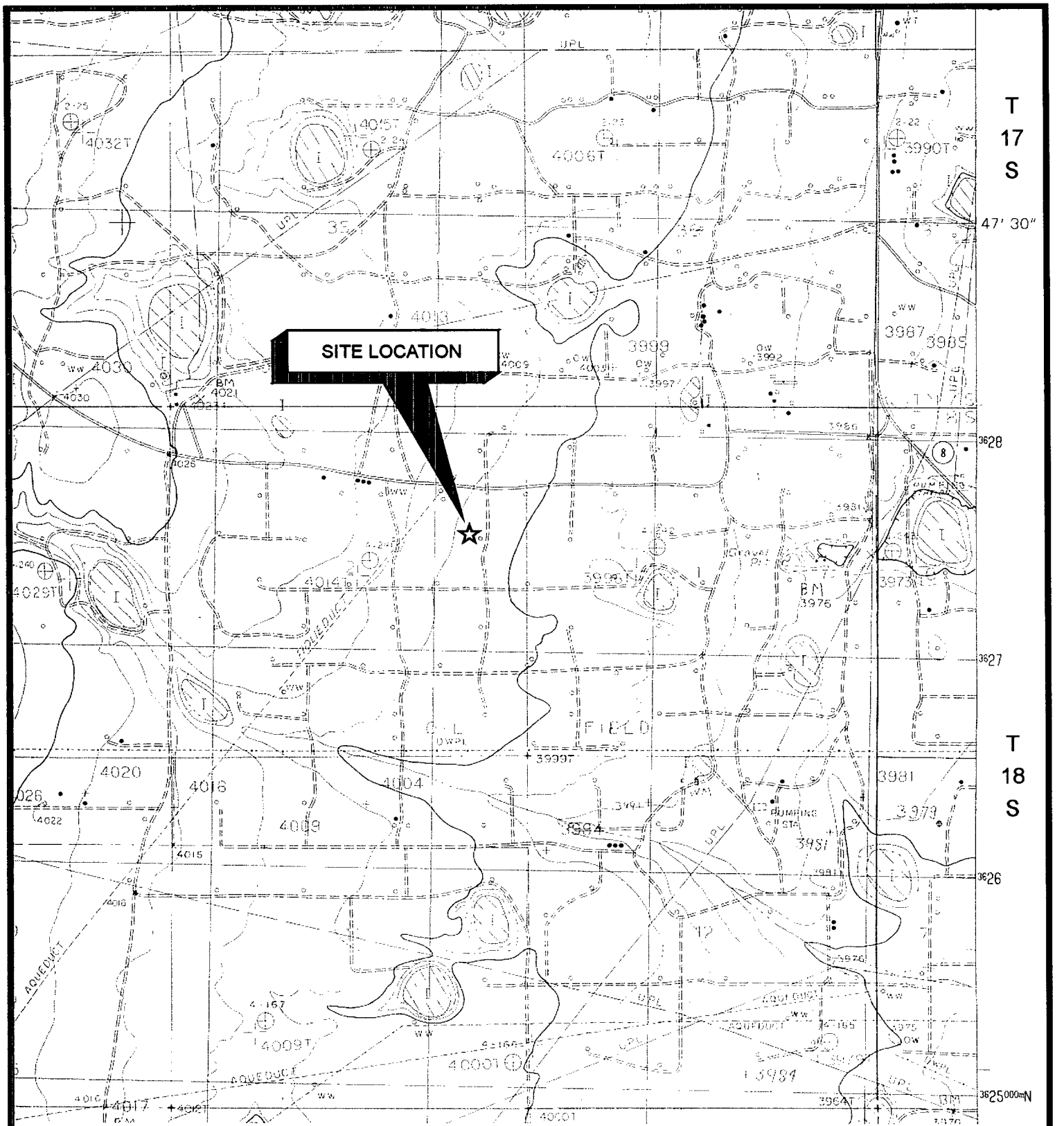
THIS REPORT DOES NOT ADDRESS THE CONTAMINATION ISSUE
Send to OCD
THIS IS A NICE REPORT - NOW WHAT ARE YOU GOING TO DO IN ORDER TO REMEDIATE THE SITE ??
1/24/03 LS

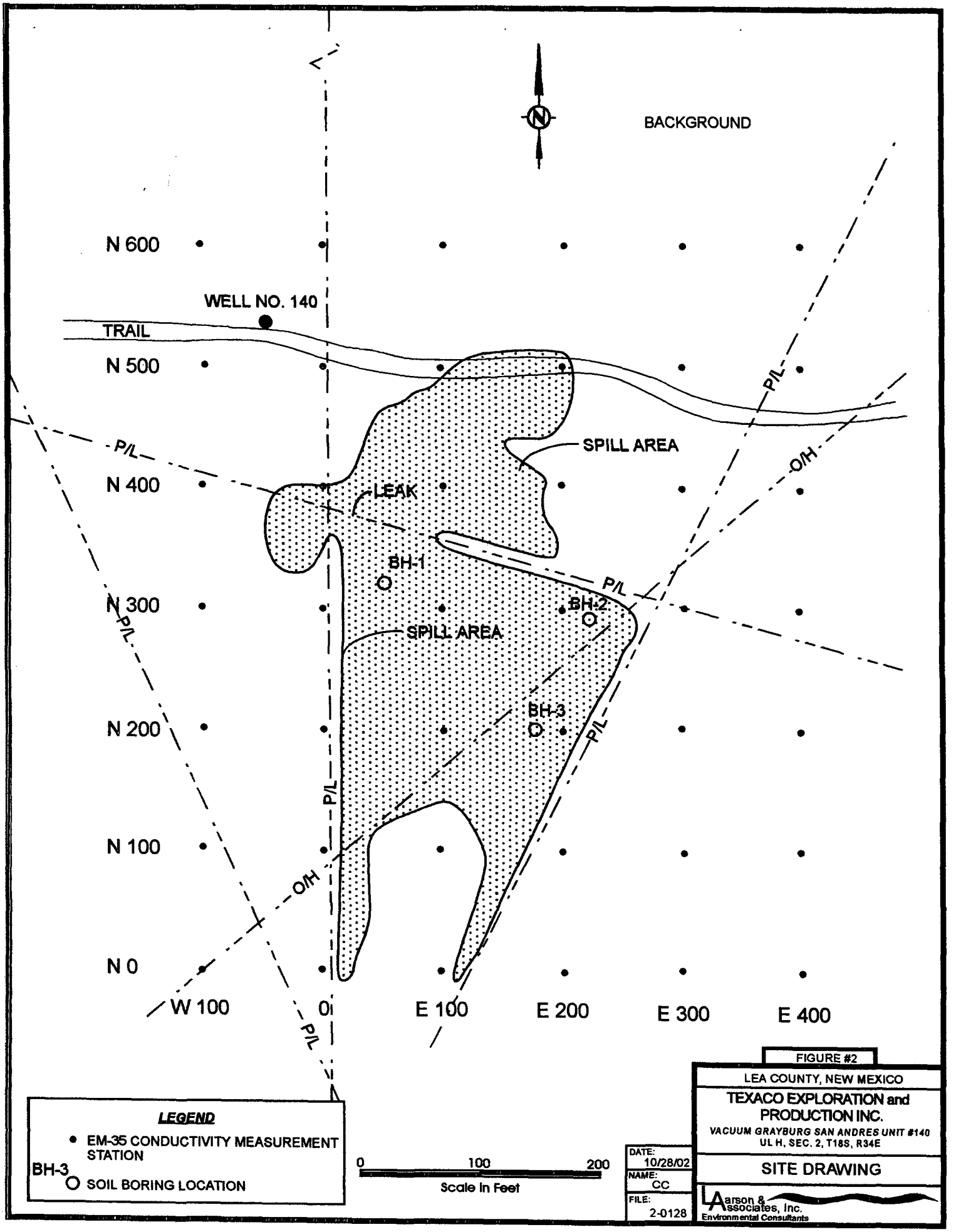
Table 1: **Summary of Headspace and Laboratory Analysis of Soil Samples**
Texaco Vacuum Unit No. 140
SE/4, NE/4, Section 2, Township 18 South, Range 34 East
Lea County, New Mexico

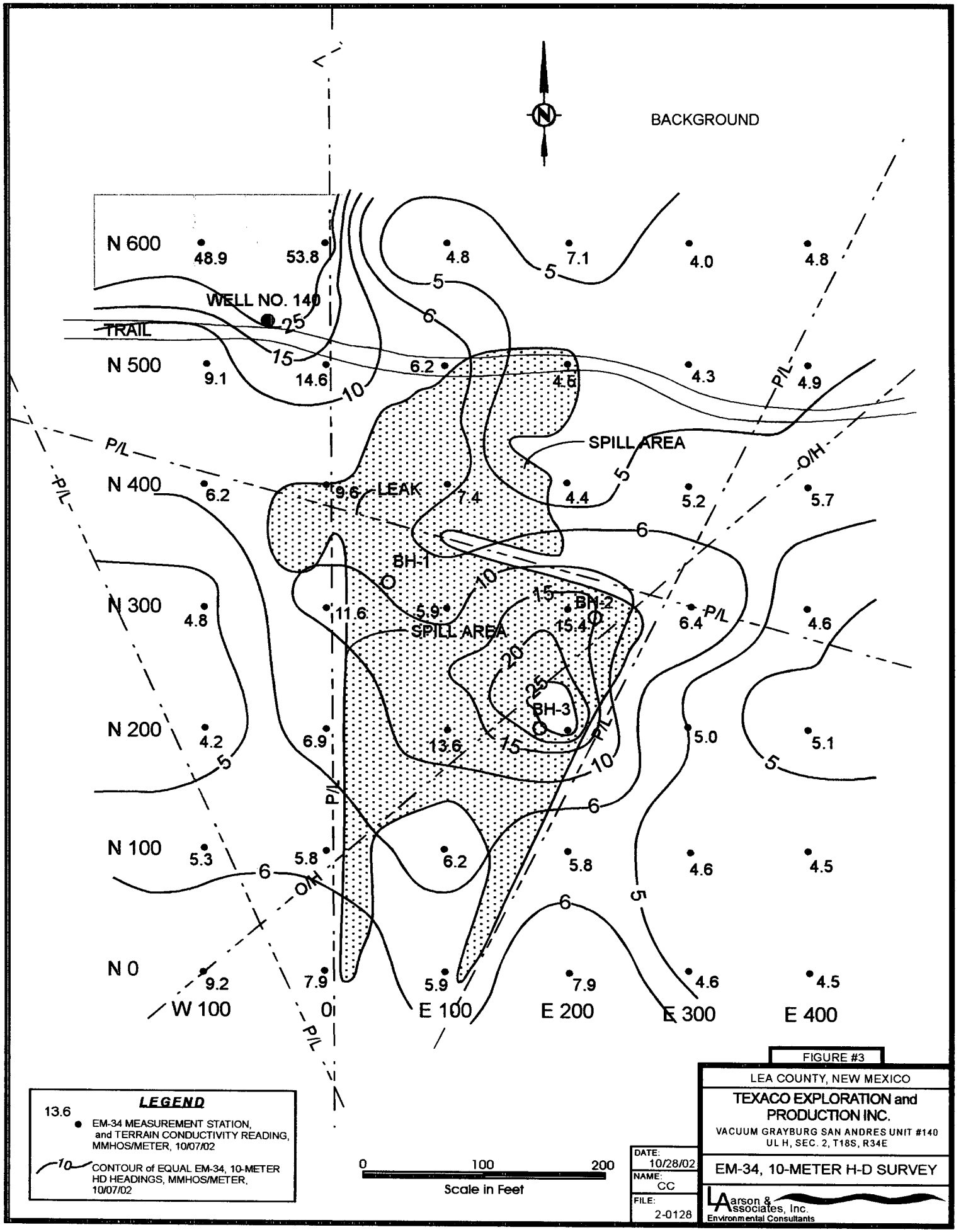
Borehole Number	Sample Date	Sample Depth (feet BGS)	PID (ppm)	Benzene mg/kg	Total BTEX mg/kg	GRO C6 C10 mg/kg	DRO >C10-C28 mg/kg	TPH (C6-C28) mg/kg	Chloride mg/kg
RRAL				10	50			1000	
BH-1	11/26/02	0-2	603	<0.025	<0.125	11.6	186.0	197.6	390
	11/26/02	5-6	562	—	—	—	—	—	1770
	11/26/02	10-11	393	<0.025	<0.125	22.2	376.0	398.2	195
	11/26/02	15-16	344	—	—	—	—	—	35.4
	11/26/02	20-21	420	<0.025	<0.125	<10.0	182.0	<192	35.4
	11/26/02	30-31	23.5	—	—	<10.0	<10.0	<20.0	35.4
	11/26/02	40-41	30.1	—	—	10.3	45.8	56.1	142
BH-2	11/26/02	0-1	3.4	—	—	<10.0	<10.0	<20.0	35.4
	11/26/02	5-6	1.6	—	—	—	—	—	2870
	11/26/02	10-11	5.7	—	—	<10.0	<10.0	<20.0	1310
	11/26/02	15-16	1.6	—	—	—	—	—	195
	11/26/02	20-21	0.6	—	—	<10.0	<10.0	<20.0	35.4
	11/26/02	30-31	1.3	—	—	<10.0	<10.0	<20.0	35.4
	11/26/02	40-41	1.8	—	—	<10.0	<10.0	<20.0	124
	11/26/02	50-51	0.7	—	—	<10.0	<10.0	<20.0	35.4
BH-3	11/26/02	0-1	8.1	—	—	<10.0	<10.0	<20.0	35.4
	11/26/02	5-6	4.9	—	—	—	—	—	142
	11/26/02	10-11	2.9	—	—	<10.0	<10.0	<20.0	35.4
	11/26/02	15-16	2.4	—	—	—	—	—	35.4
	11/26/02	20-21	2.1	—	—	<10.0	<10.0	<20.0	35.4
	11/26/02	30-31	1.1	—	—	<10.0	<10.0	<20.0	35.4
	11/26/02	40-41	1.1	—	—	<10.0	<10.0	<20.0	35.4
	11/26/02	50-51	0.5	—	—	<10.0	<10.0	<20.0	35.4

Notes: All analyses performed by Environmental Lab of Texas I, Ltd., Midland, Texas
1. BGS: Depth in feet below ground surface
2. PID: Photoionization detector
3. ppm: Parts per million
4. GRO: Gasoline-range organics
5. DRO: Diesel-range organics
6. TPH: Total petroleum hydrocarbons (Sum of GRO + DRO)
7. mg/kg Milligrams per kilogram
8. —: No data available
9. <: Below method detection limit
10. RRAL NMOCD Recommended Remediation Action Level

FIGURES


SITE LOCATION
T 17 S
T 18 S
47' 30"
3628
3627
3626
3625000mN
R-34-E
TAKEN FROM U.S.G.S.
BUCKEYE, NEW MEXICO 1985
7.5' QUADRANGLES
SCALE: 1"=2000'
FIGURE #1
LEA COUNTY, NEW MEXICO
TEXACO EXPLORATION and PRODUCTION INC.
VACUUM GRAYBURG SAN ANDRES UNIT WELL #140
UL-H, SEC 2, T18S, R34E
TOPOGRAPHIC MAP
DATE: 07/18/02
NAME: CC
FILE: 2-0102
Larson & Associates, Inc.
Environmental Consultants


BACKGROUND
N 600
WELL NO. 140
TRAIL
N 500
P/L
SPILL AREA
O/H
N 400
LEAK
BH-1
P/L
N 300
BH-2
SPILL AREA
BH-3
N 200
P/L
N 100
O/H
N 0
W 100
0
E 100
E 200
E 300
E 400
LEGEND
EM-35 CONDUCTIVITY MEASUREMENT STATION
BH-3
SOIL BORING LOCATION
0
100
200
Scale In Feet
FIGURE #2
LEA COUNTY, NEW MEXICO
TEXACO EXPLORATION and PRODUCTION INC.
VACUUM GRAYBURG SAN ANDRES UNIT #140
UL H, SEC. 2, T18S, R34E
SITE DRAWING
DATE: 10/28/02
NAME: CC
FILE: 2-0128
Larson & Associates, Inc.
Environmental Consultants


BACKGROUND
N 600
N 500
N 400
N 300
N 200
N 100
N 0
W 100
0
E 100
E 200
E 300
E 400
WELL NO. 140
TRAIL
P/L
O/H
SPILL AREA
LEAK
BH-1
BH-2
BH-3
48.9
53.8
4.8
7.1
4.0
4.8
9.1
14.6
6.2
4.5
4.3
4.9
6.2
9.6
7.4
4.4
5.2
5.7
4.8
11.6
5.9
15.4
6.4
4.6
4.2
6.9
13.6
5.0
5.1
5.3
5.8
6.2
5.8
4.6
4.5
9.2
7.9
5.9
7.9
4.6
4.5
5
6
10
15
20
25
LEGEND
13.6 EM-34 MEASUREMENT STATION, and TERRAIN CONDUCTIVITY READING, MMHOS/METER, 10/07/02
10 CONTOUR of EQUAL EM-34, 10-METER HD HEADINGS, MMHOS/METER, 10/07/02
0 100 200
Scale in Feet
FIGURE #3
LEA COUNTY, NEW MEXICO
TEXACO EXPLORATION and PRODUCTION INC.
VACUUM GRAYBURG SAN ANDRES UNIT #140
UL H, SEC. 2, T18S, R34E
EM-34, 10-METER H-D SURVEY
DATE: 10/28/02
NAME: CC
FILE: 2-0128
Larson & Associates, Inc.
Environmental Consultants

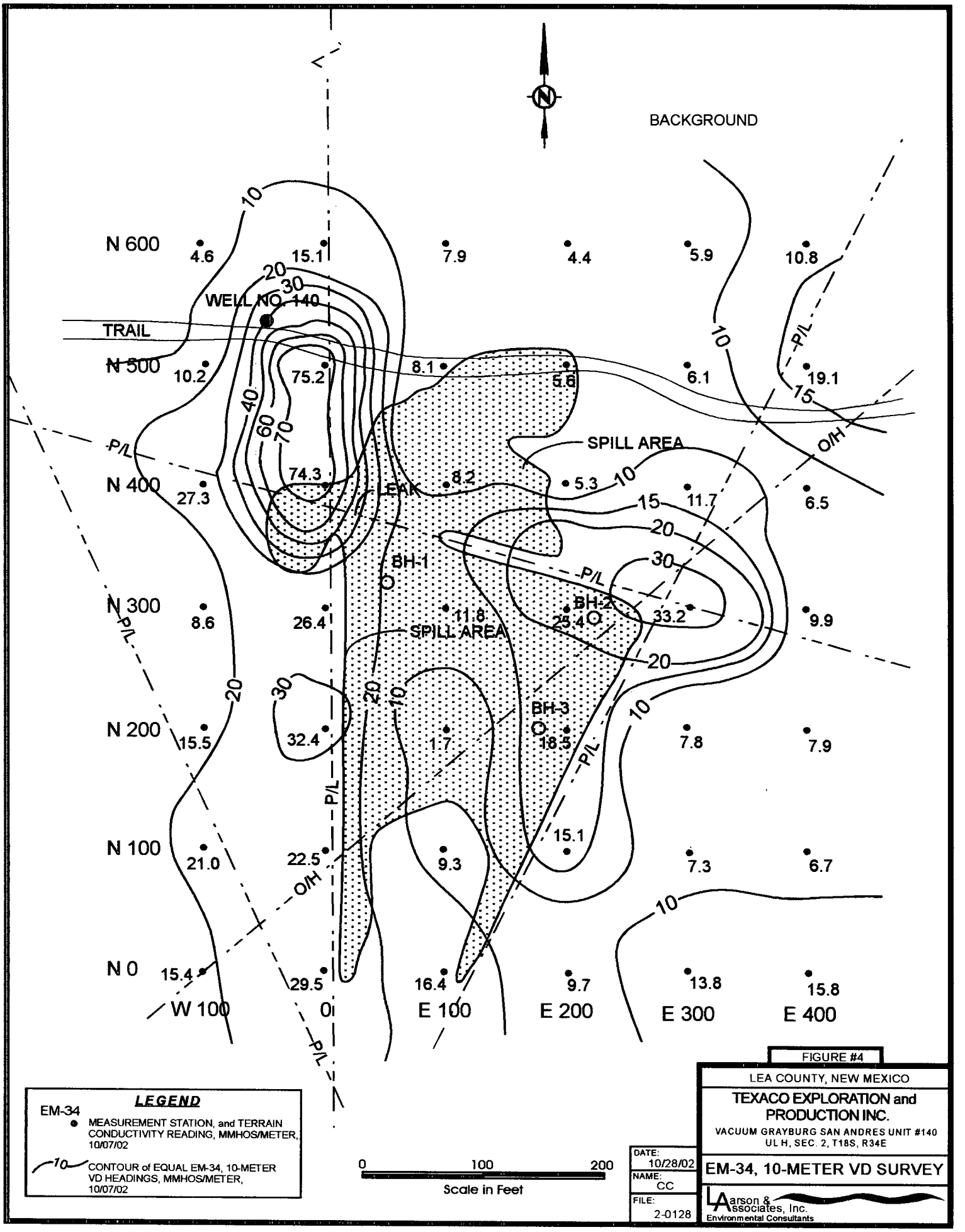


FIGURE #4

LEA COUNTY, NEW MEXICO

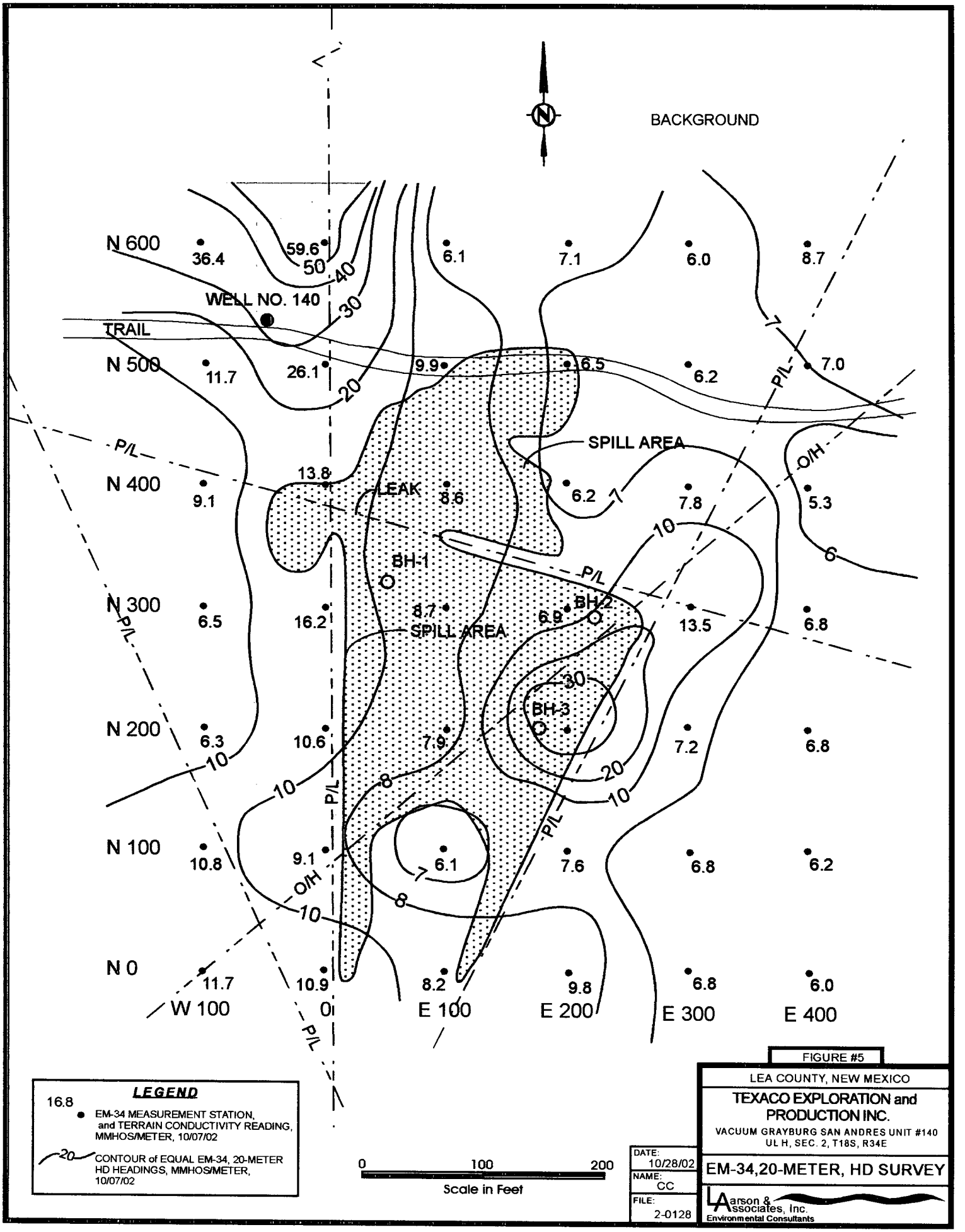
TEXACO EXPLORATION and PRODUCTION INC.

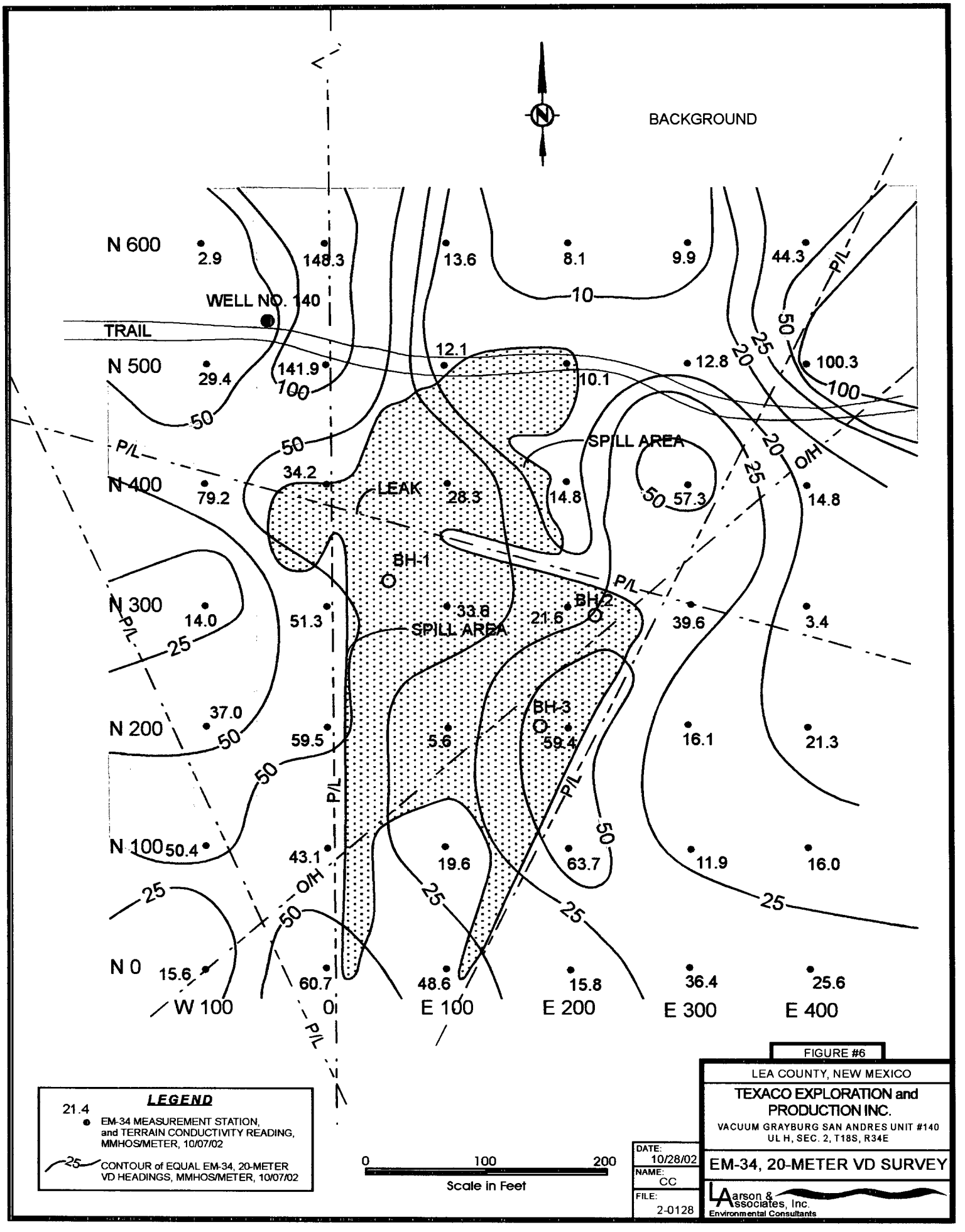
VACUUM GRAYBURG SAN ANDRES UNIT #140
UL H, SEC. 2, T18S, R34E

EM-34, 10-METER VD SURVEY

DATE: 10/28/02
NAME: CC
FILE: 2-0128

Larson & Associates, Inc.
Environmental Consultants


BACKGROUND
N 600
N 500
N 400
N 300
N 200
N 100
N 0
W 100
0
E 100
E 200
E 300
E 400
36.4
59.6
6.1
7.1
6.0
8.7
WELL NO. 140
TRAIL
11.7
26.1
9.9
6.5
6.2
7.0
P/L
SPILL AREA
O/H
13.8
LEAK
9.1
8.6
6.2
7.8
5.3
BH-1
BH-2
BH-3
6.5
16.2
8.7
6.9
13.5
6.8
SPILL AREA
6.3
10.6
7.9
7.2
6.8
10.8
9.1
6.1
7.6
6.8
6.2
11.7
10.9
8.2
9.8
6.8
6.0
50
40
30
20
10
8
7
6
LEGEND
16.8
EM-34 MEASUREMENT STATION, and TERRAIN CONDUCTIVITY READING, MMHOS/METER, 10/07/02
20
CONTOUR of EQUAL EM-34, 20-METER HD HEADINGS, MMHOS/METER, 10/07/02
0
100
200
Scale in Feet
FIGURE #5
LEA COUNTY, NEW MEXICO
TEXACO EXPLORATION and PRODUCTION INC.
VACUUM GRAYBURG SAN ANDRES UNIT #140
UL H, SEC. 2, T18S, R34E
EM-34,20-METER, HD SURVEY
DATE: 10/28/02
NAME: CC
FILE: 2-0128
LAarson & Associates, Inc.
Environmental Consultants


BACKGROUND
N 600
N 500
N 400
N 300
N 200
N 100
N 0
W 100
0
E 100
E 200
E 300
E 400
WELL NO. 140
TRAIL
P/L
O/H
LEAK
SPILL AREA
SPILL AREA
BH-1
BH-2
BH-3
2.9
148.3
13.6
8.1
9.9
44.3
29.4
141.9
12.1
10.1
12.8
100.3
79.2
34.2
28.3
14.8
57.3
14.8
14.0
51.3
33.8
21.6
39.6
3.4
37.0
59.5
5.6
59.4
16.1
21.3
50.4
43.1
19.6
63.7
11.9
16.0
15.6
60.7
48.6
15.8
36.4
25.6
10
50
25
20
100
LEGEND
21.4 EM-34 MEASUREMENT STATION, and TERRAIN CONDUCTIVITY READING, MMHOS/METER, 10/07/02
25 CONTOUR of EQUAL EM-34, 20-METER VD HEADINGS, MMHOS/METER, 10/07/02
0 100 200
Scale in Feet
FIGURE #6
LEA COUNTY, NEW MEXICO
TEXACO EXPLORATION and PRODUCTION INC.
VACUUM GRAYBURG SAN ANDRES UNIT #140
UL H, SEC. 2, T18S, R34E
EM-34, 20-METER VD SURVEY
DATE: 10/28/02
NAME: CC
FILE: 2-0128
Larson & Associates, Inc.
Environmental Consultants

APPENDIX A

EM Field Sheets

Texaco Exploration and Production Inc.
Vacuum Unit Well #140
EM-34 Survey

Profile:	0 West	**Date:**	04-Oct-02
Spacing:	100 Feet	**Start:**	1340
Direction:	S - N	**Stop:**	1400

STATION	10-Meter HD (mmhos/meter)	10-Meter VD (mmhos/meter)	20-Meter HD (mmhos/meter)	20-Meter VD (mmhos/meter)	NOTES
0 North	7.8	29.5	10.9	60.7	See notes
100 North	5.8	22.5	9.1	43.1	
200 North	6.9	32.4	10.6	59.5	
300 North	11.6	26.4	16.2	51.5	
400 North	9.6	74.3	13.8	34.2	
500 North	14.6	75.2	26.1	141.9	
600 North	53.8	15.1	59.6	148.3	

Notes:
Two (2) pipelines (north to south) located at station. Moved point approximately 20' west and 10' north.

Texaco Exploration and Production Inc.
Vacuum Unit Well #140
EM-34 Survey

Profile:	100 West	**Date:**	04-Oct-02
Spacing:	100 Feet	**Start:**	1220
Direction:	N - S	**Stop:**	1238

STATION	10-Meter HD (mmhos/meter)	10-Meter VD (mmhos/meter)	20-Meter HD (mmhos/meter)	20-Meter VD (mmhos/meter)	NOTES
0 North	9.2	15.4	11.7	15.6	
100 North	5.3	21.0	10.8	50.4	Pipeline (NW - SE) 10' north
200 North	4.2	15.5	6.3	37.0	Pipeline (NW - SE) 10' south
300 North	4.8	8.6	6.5	14.0	
400 North	6.2	27.3	9.1	79.2	Pipeline (E - W) 15' north
500 North	9.1	10.2	11.7	29.4	
600 North	48.9	4.6	36.4	2.9	
Background	4.6	6.0	6.0	9.2	1215

Notes:

Texaco Exploration and Production Inc.
Vacuum Unit Well #140
EM-34 Survey

Profile:	100 East	**Date:**	07-Oct-02
Spacing:	100 Feet	**Start:**	1220
Direction:	N - S	**Stop:**	1238

STATION	10-Meter HD (mmhos/meter)	10-Meter VD (mmhos/meter)	20-Meter HD (mmhos/meter)	20-Meter VD (mmhos/meter)	NOTES
0 North	5.9	16.4	8.2	48.6	Pipeline 20 ' east
100 North	6.2	9.3	6.1	19.6	
200 North	13.6	1.7	7.9	5.6	
300 North	5.9	11.8	8.7	33.6	
400 North	7.4	8.2	8.6	28.3	
500 North	6.2	8.1	9.9	12.1	
600 North	4.8	7.9	6.1	13.6	

Notes:

Texaco Exploration and Production Inc.
Vacuum Unit Well #140
EM-34 Survey

Profile:	200 East	**Date:**	07-Oct-02
Spacing:	100 Feet	**Start:**	1240
Direction:	S - N	**Stop:**	1300

STATION	10-Meter HD (mmhos/meter)	10-Meter VD (mmhos/meter)	20-Meter HD (mmhos/meter)	20-Meter VD (mmhos/meter)	NOTES
0 North	7.9	9.7	9.8	15.8	
100 North	5.8	15.1	7.6	63.7	
200 North	27.3	18.5	37.5	59.4	
300 North	15.4	25.9	6.9	I	See note
400 North	4.4	5.3	6.2	14.8	
500 North	4.5	5.6	6.5	10.1	
600 North	7.1	4.4	7.1	8.1	

Notes:
Pipeline at station. Measurement taken 10 feet north.
I: Interference

Texaco Exploration and Production Inc.
Vacuum Unit Well #140
EM-34 Survey

Profile:	300 East	**Date:**	07-Oct-02
Spacing:	100 Feet	**Start:**	1305
Direction:	N - S	**Stop:**	1322

STATION	10-Meter HD (mmhos/meter)	10-Meter VD (mmhos/meter)	20-Meter HD (mmhos/meter)	20-Meter VD (mmhos/meter)	NOTES
0 North	4.6	13.8	6.8	36.4	East to west reading
100 North	4.6	7.3	6.8	11.9	
200 North	5.0	7.8	7.2	16.1	
300 North	6.4	33.2	13.5	39.6	Reading taken 10' south.
400 North	5.2	11.7	7.8	57.3	
500 North	4.3	6.1	6.2	12.8	
600 North	4.0	5.9	6.0	9.9	

Notes:

Texaco Exploration and Production Inc.
Vacuum Unit Well #140
EM-34 Survey

Profile:	400 East	**Date:**	07-Oct-02
Spacing:	100 Feet	**Start:**	1325
Direction:	S - N	**Stop:**	1342

STATION	10-Meter HD (mmhos/meter)	10-Meter VD (mmhos/meter)	20-Meter HD (mmhos/meter)	20-Meter VD (mmhos/meter)	NOTES
0 North	4.5	15.8	6.0	I	Pipeline 15' north
100 North	4.5	6.7	6.2	16.0	
200 North	5.1	7.9	6.8	21.3	
300 North	4.6	9.9	6.8	3.4	Pipeline 5' south
400 North	5.9	6.5	5.3	14.8	Overhead electric
500 North	4.9	19.1	7.0	100.3	Pipeline 20' west
600 North	4.8	10.8	8.7	44.3	Pipeline 5' southeast
Background	4.7	6.0	7.4	9.5	1345

Notes:
I: Interference

APPENDIX B

Boring Logs

Client: Texaco E&P

Project: Vacuum Unit No. 140

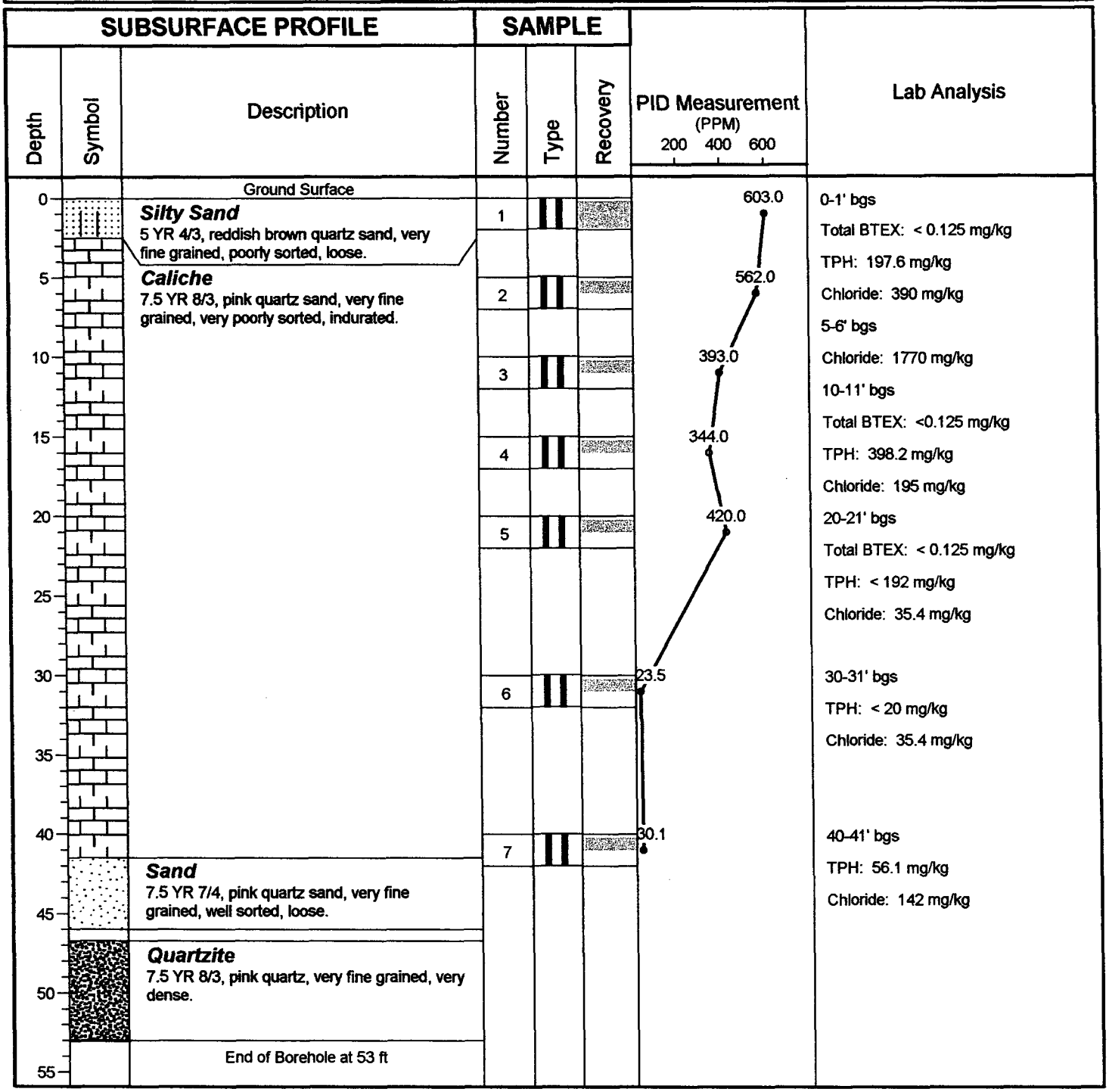
Project No: 2-0128

Location: SE/4, NE/4, Sec. 2, T18S, R34E, Lea Co., NM

Log of Borehole: BH-1

Geologist: Cindy K. Crain

Page: 1 of 1



Drilling Method: Air Rotary

Date Drilled: 11/26/02

Hole Size: 5 5/8"

Larson and Associates, Inc.
507 North Marienfeld St., Ste. 202
Midland, Texas 79701
(915) 687-0901

Checked by: CKC

Drilled by: Scarborough Drilling, Inc.

Client: Texaco E&P

Project: Vacuum Unit No. 140

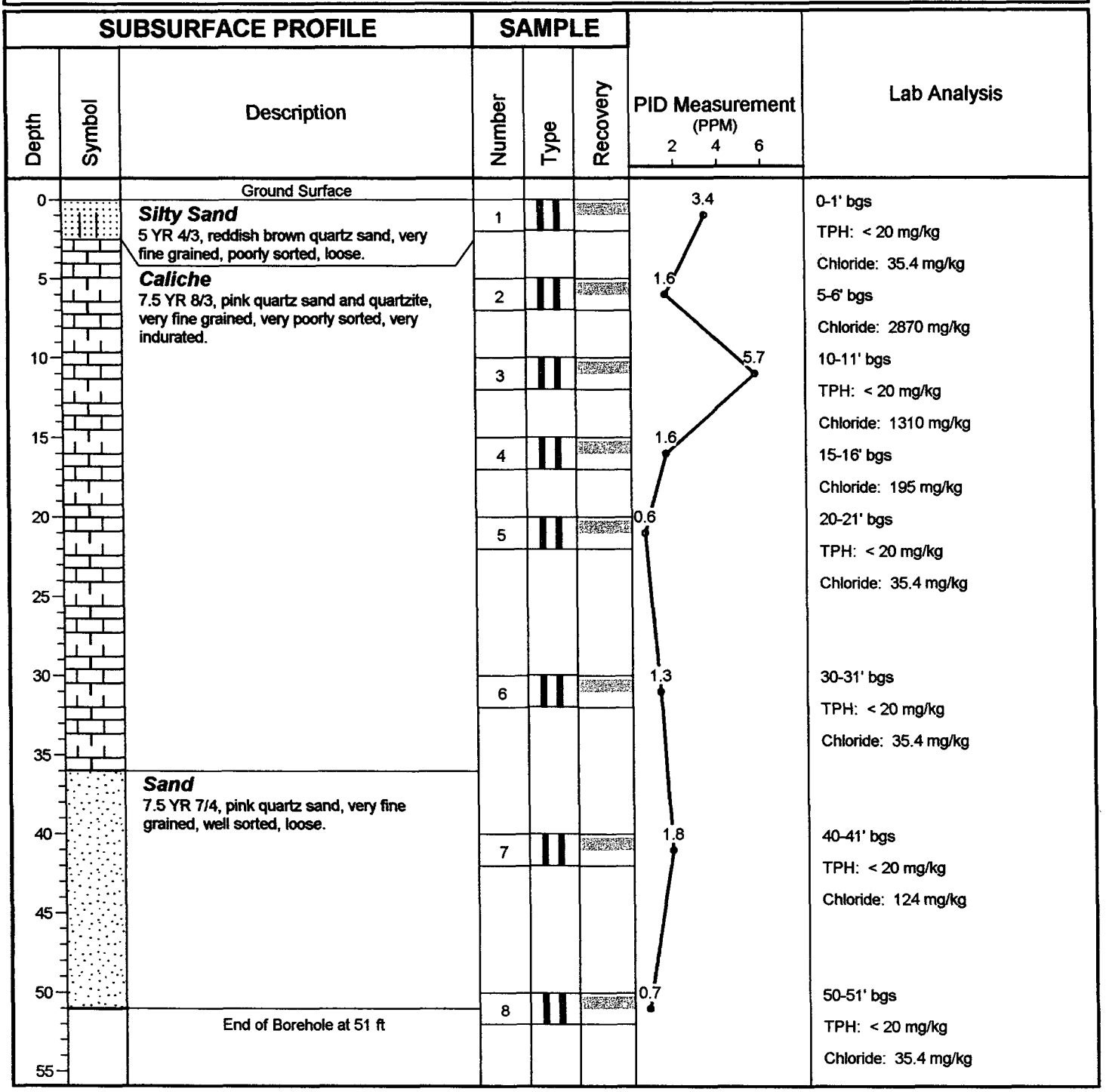
Project No: 2-0128

Location: SE/4, NE/4, Sec. 2, T18S, R34E, Lea Co., NM

Log of Borehole: BH-2

Geologist: Cindy K. Crain

Page: 1 of 1



Drilling Method: Air Rotary

Date Drilled: 11/26/02

Hole Size: 5 5/8"

Larson and Associates, Inc.
507 North Marienfeld St., Ste. 202
Midland, Texas 79701
(915) 687-0901

Checked by: CKC

Drilled by: Scarborough Drilling, Inc.

Client: Texaco E&P

Project: Vacuum Unit No. 140

Project No: 2-0128

Location: SE/4, NE/4, Sec. 2, T18S, R34E, Lea Co., NM

Log of Borehole: BH-3

Geologist: Cindy K. Crain

Page: 1 of 1

SUBSURFACE PROFILE			SAMPLE				
Depth	Symbol	Description	Number	Type	Recovery	PID Measurement (PPM) 2 4 6 8	Lab Analysis
0		Ground Surface					
0		***Silty Sand*** 5 YR 4/3, reddish brown quartz sand, very fine grained, poorly sorted, loose.	1			8.1	0-1' bgs TPH: <20 mg/kg Chloride: 35.4 mg/kg
5		***Caliche*** 7.5 YR 8/3, pink quartz sand, very fine grained, very poorly sorted, indurated.	2			4.9	5-6' bgs Chloride: 142 mg/kg
10			3			2.9	10-11' bgs TPH: < 20 mg/kg Chloride: 35.4 mg/kg
15			4			2.4	15-16' bgs Chloride: 35.4 mg/kg
20			5			2.1	20-21' bgs TPH: < 20 mg/kg Chloride: 35.4 mg/kg
25							
30			6			1.1	30-31' bgs TPH: < 20 mg/kg Chloride: 35.4 mg/kg
35		***Sand*** 7.5 YR 7/4, pink quartz sand, very fine grained, well sorted, loose.					
40			7			1.1	40-41' bgs TPH: < 20 mg/kg Chloride: 35.4 mg/kg
45							
50			8			0.5	50-51' bgs TPH: < 20 mg/kg Chloride: 35.4 mg/kg
55		End of Borehole at 51 ft					

Drilling Method: Air Rotary

Date Drilled: 11/26/02

Hole Size: 5 5/8"

Larson and Associates, Inc.
507 North Marienfeld St., Ste. 202
Midland, Texas 79701
(915) 687-0901

Checked by: CKC

Drilled by: Scarborough Drilling, Inc.

APPENDIX C

Laboratory Reports

ANALYTICAL REPORT

Prepared for:

CINDY CRAIN
LARSON AND ASSOCIATES, INC.
P.O. BOX 50685
MIDLAND, TX 79710

Project:	Texaco/ Vacuum Unit #140
PO#:	
Order#:	G0205140
Report Date:	12/10/2002

Certificates
US EPA Laboratory Code TX00158

CASE NARRATIVE

ENVIRONMENTAL LAB OF TEXAS

Prepared for:

LARSON AND ASSOCIATES, INC.
P.O. BOX 50685
MIDLAND, TX 79710

Order#: G0205140

Project: Texaco/ Vacuum Unit #140

The following samples were received as indicated below and on the attached Chain of Custody record. All analyses were performed within the holding time and with acceptable quality control results unless otherwise noted.

SAMPLE ID	LAB ID	MATRIX	Date Collected	Date Received
BH-1 (0-2')	0205140-01	SOIL	11/26/2002	11/27/2002
BH-1 (5-6')	0205140-02	SOIL	11/26/2002	11/27/2002
BH-1 (10-11')	0205140-03	SOIL	11/26/2002	11/27/2002
BH-1 (15-16')	0205140-04	SOIL	11/26/2002	11/27/2002
BH-1 (20-21')	0205140-05	SOIL	11/26/2002	11/27/2002
BH-1 (30-31')	0205140-06	SOIL	11/26/2002	11/27/2002
BH-1 (40-41')	0205140-07	SOIL	11/26/2002	11/27/2002
BH-3 (0-1')	0205140-08	SOIL	11/26/2002	11/27/2002
BH-3 (5-6')	0205140-09	SOIL	11/26/2002	11/27/2002
BH-3 (10-11')	0205140-10	SOIL	11/26/2002	11/27/2002
BH-3 (15-16')	0205140-11	SOIL	11/26/2002	11/27/2002
BH-3 (20-21')	0205140-12	SOIL	11/26/2002	11/27/2002
BH-3 (30-31')	0205140-13	SOIL	11/26/2002	11/27/2002
BH-3 (40-41')	0205140-14	SOIL	11/26/2002	11/27/2002
BH-3 (50-51')	0205140-15	SOIL	11/26/2002	11/27/2002
BH-2 (0-1')	0205140-16	SOIL	11/26/2002	11/27/2002
BH-2 (5-6')	0205140-17	SOIL	11/26/2002	11/27/2002
BH-2 (10-11')	0205140-18	SOIL	11/26/2002	11/27/2002
BH-2 (15-16')	0205140-19	SOIL	11/26/2002	11/27/2002
BH-2 (20-21')	0205140-20	SOIL	11/26/2002	11/27/2002
BH-2 (30-31')	0205140-21	SOIL	11/26/2002	11/27/2002
BH-2 (40-41')	0205140-22	SOIL	11/26/2002	11/27/2002
BH-2 (50-51')	0205140-23	SOIL	11/26/2002	11/27/2002

Surrogate recoveries on the 1005 TPH are outside control limits due to matrix interference from coeluting compounds. (0205140-03)

CASE NARRATIVE

ENVIRONMENTAL LAB OF TEXAS

Prepared for:

LARSON AND ASSOCIATES, INC.
P.O. BOX 50685
MIDLAND, TX 79710

Order#: **G0205140**

Project: **Texaco/ Vacuum Unit #140**

The following samples were received as indicated below and on the attached Chain of Custody record. All analyses were performed within the holding time and with acceptable quality control results unless otherwise noted.

The enclosed results of analyses are representative of the samples as received by the laboratory. Environmental Lab of Texas makes no representations or certifications as to the methods of sample collection, sample identification, or transportation handling procedures used prior to our receipt of samples. To the best of my knowledge, the information contained in this report is accurate and complete.

Approved By: Jeanne McMurrey Date: 12-10-02

Environmental Lab of Texas I, Ltd.

ENVIRONMENTAL LAB OF TEXAS

SAMPLE WORK LIST

LARSON AND ASSOCIATES, INC.
P.O. BOX 50685
MIDLAND, TX 79710
915-687-0456

Order#: G0205140
Project: 2-0128
Project Name: Texaco/ Vacuum Unit #140
Location: None Given

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.

Lab ID:	Sample :	Matrix:	Date / Time Collected	Date / Time Received	Container	Preservative
0205140-01	BH-1 (0-2')	SOIL	11/26/02 10:52	11/27/02 10:40	4 oz Glass	Ice
	Lab Testing: 8015M, 8021B/5030 BTEX, Chloride	**Rejected:** No		**Temp:** 0.5 C		
0205140-02	BH-1 (5-6')	SOIL	11/26/02 11:02	11/27/02 10:40	4 oz Glass	Ice
	Lab Testing: Chloride	**Rejected:** No		**Temp:** 0.5 C		
0205140-03	BH-1 (10-11')	SOIL	11/26/02 11:10	11/27/02 10:40	4 oz Glass	Ice
	Lab Testing: 8015M, 8021B/5030 BTEX, Chloride	**Rejected:** No		**Temp:** 0.5 C		
0205140-04	BH-1 (15-16')	SOIL	11/26/02 11:20	11/27/02 10:40	4 oz Glass	Ice
	Lab Testing: Chloride	**Rejected:** No		**Temp:** 0.5 C		
0205140-05	BH-1 (20-21')	SOIL	11/26/02 11:27	11/27/02 10:40	4 oz Glass	Ice
	Lab Testing: 8015M, 8021B/5030 BTEX, Chloride	**Rejected:** No		**Temp:** 0.5 C		
0205140-06	BH-1 (30-31')	SOIL	11/26/02 11:40	11/27/02 10:40	4 oz Glass	Ice
	Lab Testing: 8015M, Chloride	**Rejected:** No		**Temp:** 0.5 C		

ENVIRONMENTAL LAB OF TEXAS

SAMPLE WORK LIST

LARSON AND ASSOCIATES, INC.
P.O. BOX 50685
MIDLAND, TX 79710
915-687-0456

Order#: G0205140
Project: 2-0128
Project Name: Texaco/ Vacuum Unit #140
Location: None Given

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.

Lab ID:	Sample :	Matrix:	Date / Time Collected	Date / Time Received	Container	Preservative
0205140-07	BH-1 (40-41')	SOIL	11/26/02 11:55	11/27/02 10:40	4 oz Glass	Ice
	Lab Testing: 8015M Chloride	**Rejected:** No		**Temp:** 0.5 C		
0205140-08	BH-3 (0-1')	SOIL	11/26/02 12:45	11/27/02 10:40	4 oz Glass	Ice
	Lab Testing: 8015M Chloride	**Rejected:** No		**Temp:** 0.5 C		
0205140-09	BH-3 (5-6')	SOIL	11/26/02 12:53	11/27/02 10:40	4 oz Glass	Ice
	Lab Testing: Chloride	**Rejected:** No		**Temp:** 0.5 C		
0205140-10	BH-3 (10-11')	SOIL	11/26/02 12:59	11/27/02 10:40	4 oz Glass	Ice
	Lab Testing: 8015M Chloride	**Rejected:** No		**Temp:** 0.5 C		
0205140-11	BH-3 (15-16')	SOIL	11/26/02 13:08	11/27/02 10:40	4 oz Glass	Ice
	Lab Testing: Chloride	**Rejected:** No		**Temp:** 0.5 C		
0205140-12	BH-3 (20-21')	SOIL	11/26/02 13:18	11/27/02 10:40	4 oz Glass	Ice
	Lab Testing: 8015M Chloride	**Rejected:** No		**Temp:** 0.5 C		
0205140-13	BH-3 (30-31')	SOIL	11/26/02 14:00	11/27/02 10:40	4 oz Glass	Ice
	Lab Testing: 8015M Chloride	**Rejected:** No		**Temp:** 0.5 C		

ENVIRONMENTAL LAB OF TEXAS

SAMPLE WORK LIST

LARSON AND ASSOCIATES, INC.
P.O. BOX 50685
MIDLAND, TX 79710
915-687-0456

Order#: G0205140
Project: 2-0128
Project Name: Texaco/ Vacuum Unit #140
Location: None Given

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.

Lab ID:	Sample :	Matrix:	Date / Time Collected	Date / Time Received	Container	Preservative
0205140-14	BH-3 (40-41')	SOIL	11/26/02 14:07	11/27/02 10:40	4 oz Glass	Ice
	Lab Testing: 8015M Chloride	**Rejected:** No		**Temp:** 0.5 C		
0205140-15	BH-3 (50-51')	SOIL	11/26/02 14:20	11/27/02 10:40	4 oz Glass	Ice
	Lab Testing: 8015M Chloride	**Rejected:** No		**Temp:** 0.5 C		
0205140-16	BH-2 (0-1')	SOIL	11/26/02 14:45	11/27/02 10:40	4 oz Glass	Ice
	Lab Testing: 8015M Chloride	**Rejected:** No		**Temp:** 0.5 C		
0205140-17	BH-2 (5-6')	SOIL	11/26/02 14:51	11/27/02 10:40	4 oz Glass	Ice
	Lab Testing: Chloride	**Rejected:** No		**Temp:** 0.5 C		
0205140-18	BH-2 (10-11')	SOIL	11/26/02 15:20	11/27/02 10:40	4 oz Glass	Ice
	Lab Testing: 8015M Chloride	**Rejected:** No		**Temp:** 0.5 C		
0205140-19	BH-2 (15-16')	SOIL	11/26/02 15:37	11/27/02 10:40	4 oz Glass	Ice
	Lab Testing: Chloride	**Rejected:** No		**Temp:** 0.5 C		
0205140-20	BH-2 (20-21')	SOIL	11/26/02 16:12	11/27/02 10:40	4 oz Glass	Ice
	Lab Testing: 8015M Chloride	**Rejected:** No		**Temp:** 0.5 C		

ENVIRONMENTAL LAB OF TEXAS

SAMPLE WORK LIST

LARSON AND ASSOCIATES, INC.
P.O. BOX 50685
MIDLAND, TX 79710
915-687-0456

Order#: G0205140
Project: 2-0128
Project Name: Texaco/ Vacuum Unit #140
Location: None Given

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.

Lab ID:	Sample :	Matrix:	Date / Time Collected	Date / Time Received	Container	Preservative
0205140-21	BH-2 (30-31')	SOIL	11/26/02 16:24	11/27/02 10:40	4 oz Glass	Ice
	Lab Testing: 8015M Chloride	**Rejected:** No		**Temp:** 0.5 C		
0205140-22	BH-2 (40-41')	SOIL	11/26/02 16:36	11/27/02 10:40	4 oz Glass	Ice
	Lab Testing: 8015M Chloride	**Rejected:** No		**Temp:** 0.5 C		
0205140-23	BH-2 (50-51')	SOIL	11/26/02 16:45	11/27/02 10:40	4 oz Glass	Ice
	Lab Testing: 8015M Chloride	**Rejected:** No		**Temp:** 0.5 C		

ENVIRONMENTAL LAB OF TEXAS

ANALYTICAL REPORT

CINDY CRAIN
LARSON AND ASSOCIATES, INC.
P.O. BOX 50685
MIDLAND, TX 79710

Order#: G0205140
Project: 2-0128
Project Name: Texaco/ Vacuum Unit #140
Location: None Given

Lab ID: 0205140-01
Sample ID: BH-1 (0-2')

8015M

Method Blank	Date Prepared	Date Analyzed	Sample Amount	Dilution Factor	Analyst	Method
		11/29/02	1	1	CK	8015M

Parameter	Result mg/kg	RL
GRO, C6-C12	11.6	10.0
DRO, >C12-C35	186	10.0
TOTAL, C6-C35	198	10.0

Surrogates	% Recovered	QC Limits (%)	
1-Chlorooctane	112%	70	130
1-Chlorooctadecane	103%	70	130

8021B/5030 BTEX

Method Blank	Date Prepared	Date Analyzed	Sample Amount	Dilution Factor	Analyst	Method
0003919-02		11/29/02 20:25	1	25	CK	8021B

Parameter	Result mg/kg	RL
Benzene	<0.025	0.025
Ethylbenzene	<0.025	0.025
Toluene	<0.025	0.025
p/m-Xylene	<0.025	0.025
o-Xylene	<0.025	0.025

Surrogates	% Recovered	QC Limits (%)	
aaa-Toluene	96%	80	120
Bromofluorobenzene	101%	80	120

DL = Diluted out N/A = Not Applicable RL = Reporting Limit

ENVIRONMENTAL LAB OF TEXAS

ANALYTICAL REPORT

CINDY CRAIN
LARSON AND ASSOCIATES, INC.
P.O. BOX 50685
MIDLAND, TX 79710

Order#: G0205140
Project: 2-0128
Project Name: Texaco/ Vacuum Unit #140
Location: None Given

Lab ID: 0205140-03
Sample ID: BH-1 (10-11')

8015M

Method Blank	Date Prepared	Date Analyzed	Sample Amount	Dilution Factor	Analyst	Method
		11/29/02	1	1	CK	8015M

Parameter	Result mg/kg	RL
GRO, C6-C12	22.2	10.0
DRO, >C12-C35	376	10.0
TOTAL, C6-C35	398	10.0

Surrogates	% Recovered	QC Limits (%)	
1-Chlorooctane	146%	70	130
1-Chlorooctadecane	136%	70	130

8021B/5030 BTEX

Method Blank	Date Prepared	Date Analyzed	Sample Amount	Dilution Factor	Analyst	Method
0003919-02		11/29/02 20:44	1	25	CK	8021B

Parameter	Result mg/kg	RL
Benzene	<0.025	0.025
Ethylbenzene	<0.025	0.025
Toluene	<0.025	0.025
p/m-Xylene	<0.025	0.025
o-Xylene	<0.025	0.025

Surrogates	% Recovered	QC Limits (%)	
aaa-Toluene	90%	80	120
Bromofluorobenzene	96%	80	120

DL = Diluted out N/A = Not Applicable RL = Reporting Limit

ENVIRONMENTAL LAB OF TEXAS

ANALYTICAL REPORT

CINDY CRAIN
LARSON AND ASSOCIATES, INC.
P.O. BOX 50685
MIDLAND, TX 79710

Order#: G0205140
Project: 2-0128
Project Name: Texaco/ Vacuum Unit #140
Location: None Given

Lab ID: 0205140-05
Sample ID: BH-1 (20-21')

8015M

Method Blank	Date Prepared	Date Analyzed	Sample Amount	Dilution Factor	Analyst	Method
		11/29/02	1	1	CK	8015M

Parameter	Result mg/kg	RL
GRO, C6-C12	<10.0	10.0
DRO, >C12-C35	182	10.0
TOTAL, C6-C35	182	10.0

Surrogates	% Recovered	QC Limits (%)	
1-Chlorooctane	94%	70	130
1-Chlorooctadecane	84%	70	130

8021B/5030 BTEX

Method Blank	Date Prepared	Date Analyzed	Sample Amount	Dilution Factor	Analyst	Method
0003919-02		11/29/02 21:03	1	25	CK	8021B

Parameter	Result mg/kg	RL
Benzene	<0.025	0.025
Ethylbenzene	<0.025	0.025
Toluene	<0.025	0.025
p/m-Xylene	<0.025	0.025
o-Xylene	<0.025	0.025

Surrogates	% Recovered	QC Limits (%)	
aaa-Toluene	91%	80	120
Bromofluorobenzene	89%	80	120

DL = Diluted out N/A = Not Applicable RL = Reporting Limit

ENVIRONMENTAL LAB OF TEXAS

ANALYTICAL REPORT

CINDY CRAIN
LARSON AND ASSOCIATES, INC.
P.O. BOX 50685
MIDLAND, TX 79710

Order#: G0205140
Project: 2-0128
Project Name: Texaco/ Vacuum Unit #140
Location: None Given

Lab ID: 0205140-06
Sample ID: BH-1 (30-31')

8015M

Method Blank	Date Prepared	Date Analyzed	Sample Amount	Dilution Factor	Analyst	Method
		12/2/02 17:26	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

Surrogates	% Recovered	QC Limits (%)	
1-Chlorooctane	86%	70	130
1-Chlorooctadecane	74%	70	130

Lab ID: 0205140-07
Sample ID: BH-1 (40-41')

8015M

Method Blank	Date Prepared	Date Analyzed	Sample Amount	Dilution Factor	Analyst	Method
		12/2/02 17:26	1	1	CK	8015M

Parameter	Result mg/kg	RL
GRO, C6-C12	10.3	10.0
DRO, >C12-C35	45.8	10.0
TOTAL, C6-C35	56.1	10.0

Surrogates	% Recovered	QC Limits (%)	
1-Chlorooctane	112%	70	130
1-Chlorooctadecane	106%	70	130

DL = Diluted out N/A = Not Applicable RL = Reporting Limit

ENVIRONMENTAL LAB OF TEXAS

ANALYTICAL REPORT

CINDY CRAIN
LARSON AND ASSOCIATES, INC.
P.O. BOX 50685
MIDLAND, TX 79710

Order#: G0205140
Project: 2-0128
Project Name: Texaco/ Vacuum Unit #140
Location: None Given

Lab ID: 0205140-08
Sample ID: BH-3 (0-1')

8015M

Method Blank	Date Prepared	Date Analyzed	Sample Amount	Dilution Factor	Analyst	Method
		12/2/02 17:26	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

Surrogates	% Recovered	QC Limits (%)	
1-Chlorooctane	83%	70	130
1-Chlorooctadecane	72%	70	130

Lab ID: 0205140-10
Sample ID: BH-3 (10-11')

8015M

Method Blank	Date Prepared	Date Analyzed	Sample Amount	Dilution Factor	Analyst	Method
		12/2/02 17:26	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

Surrogates	% Recovered	QC Limits (%)	
1-Chlorooctane	132%	70	130
1-Chlorooctadecane	124%	70	130

DL = Diluted out N/A = Not Applicable RL = Reporting Limit

ENVIRONMENTAL LAB OF TEXAS

ANALYTICAL REPORT

CINDY CRAIN
LARSON AND ASSOCIATES, INC.
P.O. BOX 50685
MIDLAND, TX 79710

Order#: G0205140
Project: 2-0128
Project Name: Texaco/ Vacuum Unit #140
Location: None Given

Lab ID: 0205140-12
Sample ID: BH-3 (20-21')

8015M

Method Blank	Date Prepared	Date Analyzed	Sample Amount	Dilution Factor	Analyst	Method
		12/2/02 17:26	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

Surrogates	% Recovered	QC Limits (%)	
1-Chlorooctane	113%	70	130
1-Chlorooctadecane	102%	70	130

Lab ID: 0205140-13
Sample ID: BH-3 (30-31')

8015M

Method Blank	Date Prepared	Date Analyzed	Sample Amount	Dilution Factor	Analyst	Method
		12/2/02 17:26	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

Surrogates	% Recovered	QC Limits (%)	
1-Chlorooctane	140%	70	130
1-Chlorooctadecane	129%	70	130

DL = Diluted out N/A = Not Applicable RL = Reporting Limit

ENVIRONMENTAL LAB OF TEXAS

ANALYTICAL REPORT

CINDY CRAIN
LARSON AND ASSOCIATES, INC.
P.O. BOX 50685
MIDLAND, TX 79710

Order#: G0205140
Project: 2-0128
Project Name: Texaco/ Vacuum Unit #140
Location: None Given

Lab ID: 0205140-14
Sample ID: BH-3 (40-41')

8015M

Method Blank	Date Prepared	Date Analyzed	Sample Amount	Dilution Factor	Analyst	Method
		12/2/02 17:26	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

Surrogates	% Recovered	QC Limits (%)	
1-Chlorooctane	125%	70	130
1-Chlorooctadecane	112%	70	130

Lab ID: 0205140-15
Sample ID: BH-3 (50-51')

8015M

Method Blank	Date Prepared	Date Analyzed	Sample Amount	Dilution Factor	Analyst	Method
		12/2/02 17:26	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

Surrogates	% Recovered	QC Limits (%)	
1-Chlorooctane	114%	70	130
1-Chlorooctadecane	95%	70	130

DL = Diluted out N/A = Not Applicable RL = Reporting Limit

ENVIRONMENTAL LAB OF TEXAS

ANALYTICAL REPORT

CINDY CRAIN
LARSON AND ASSOCIATES, INC.
P.O. BOX 50685
MIDLAND, TX 79710

Order#: G0205140
Project: 2-0128
Project Name: Texaco/ Vacuum Unit #140
Location: None Given

Lab ID: 0205140-16
Sample ID: BH-2 (0-1')

8015M

Method Blank	Date Prepared	Date Analyzed	Sample Amount	Dilution Factor	Analyst	Method
		12/2/02 17:26	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

Surrogates	% Recovered	QC Limits (%)	
1-Chlorooctane	112%	70	130
1-Chlorooctadecane	98%	70	130

Lab ID: 0205140-18
Sample ID: BH-2 (10-11')

8015M

Method Blank	Date Prepared	Date Analyzed	Sample Amount	Dilution Factor	Analyst	Method
		12/2/02 17:26	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

Surrogates	% Recovered	QC Limits (%)	
1-Chlorooctane	127%	70	130
1-Chlorooctadecane	115%	70	130

DL = Diluted out N/A = Not Applicable RL = Reporting Limit

ENVIRONMENTAL LAB OF TEXAS

ANALYTICAL REPORT

CINDY CRAIN
LARSON AND ASSOCIATES, INC.
P.O. BOX 50685
MIDLAND, TX 79710

Order#: G0205140
Project: 2-0128
Project Name: Texaco/ Vacuum Unit #140
Location: None Given

Lab ID: 0205140-20
Sample ID: BH-2 (20-21')

8015M

Method Blank	Date Prepared	Date Analyzed	Sample Amount	Dilution Factor	Analyst	Method
		12/2/02 17:26	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

Surrogates	% Recovered	QC Limits (%)	
1-Chlorooctane	95%	70	130
1-Chlorooctadecane	84%	70	130

Lab ID: 0205140-21
Sample ID: BH-2 (30-31')

8015M

Method Blank	Date Prepared	Date Analyzed	Sample Amount	Dilution Factor	Analyst	Method
		12/2/02 17:26	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

Surrogates	% Recovered	QC Limits (%)	
1-Chlorooctane	113%	70	130
1-Chlorooctadecane	99%	70	130

DL = Diluted out N/A = Not Applicable RL = Reporting Limit

ENVIRONMENTAL LAB OF TEXAS

ANALYTICAL REPORT

CINDY CRAIN
LARSON AND ASSOCIATES, INC.
P.O. BOX 50685
MIDLAND, TX 79710

Order#: G0205140
Project: 2-0128
Project Name: Texaco/ Vacuum Unit #140
Location: None Given

Lab ID: 0205140-22
Sample ID: BH-2 (40-41')

8015M

Method Blank	Date Prepared	Date Analyzed	Sample Amount	Dilution Factor	Analyst	Method
		12/2/02 17:26	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

Surrogates	% Recovered	QC Limits (%)	
1-Chlorooctane	106%	70	130
1-Chlorooctadecane	90%	70	130

Lab ID: 0205140-23
Sample ID: BH-2 (50-51')

8015M

Method Blank	Date Prepared	Date Analyzed	Sample Amount	Dilution Factor	Analyst	Method
		12/2/02 17:26	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

Surrogates	% Recovered	QC Limits (%)	
1-Chlorooctane	116%	70	130
1-Chlorooctadecane	100%	70	130

Approval: Jeanne McMurrey 12-10-02
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.

DL = Diluted out N/A = Not Applicable RL = Reporting Limit

ENVIRONMENTAL LAB OF TEXAS

ANALYTICAL REPORT

CINDY CRAIN		Order#:	G0205140
LARSON AND ASSOCIATES, INC.		Project:	2-0128
P.O. BOX 50685		Project Name:	Texaco/ Vacuum Unit #140
MIDLAND, TX 79710		Location:	None Given

Lab ID: 0205140-01
Sample ID: BH-1 (0-2')

Test Parameters

Parameter	Result	Units	Dilution Factor	RL	Method	Date Analyzed	Analyst
Chloride	390	mg/kg	1	20	9253	12/2/02	SB

Lab ID: 0205140-02
Sample ID: BH-1 (5-6')

Test Parameters

Parameter	Result	Units	Dilution Factor	RL	Method	Date Analyzed	Analyst
Chloride	1770	mg/kg	1	20	9253	12/2/02	SB

Lab ID: 0205140-03
Sample ID: BH-1 (10-11')

Test Parameters

Parameter	Result	Units	Dilution Factor	RL	Method	Date Analyzed	Analyst
Chloride	195	mg/kg	1	20	9253	12/2/02	SB

Lab ID: 0205140-04
Sample ID: BH-1 (15-16')

Test Parameters

Parameter	Result	Units	Dilution Factor	RL	Method	Date Analyzed	Analyst
Chloride	35.4	mg/kg	1	20	9253	12/2/02	SB

Lab ID: 0205140-05
Sample ID: BH-1 (20-21')

Test Parameters

Parameter	Result	Units	Dilution Factor	RL	Method	Date Analyzed	Analyst
Chloride	35.4	mg/kg	1	20	9253	12/2/02	SB

Lab ID: 0205140-06
Sample ID: BH-1 (30-31')

Test Parameters

Parameter	Result	Units	Dilution Factor	RL	Method	Date Analyzed	Analyst
Chloride	35.4	mg/kg	1	20	9253	12/2/02	SB

RL = Reporting Limit N/A = Not Applicable

ENVIRONMENTAL LAB OF TEXAS

ANALYTICAL REPORT

CINDY CRAIN
LARSON AND ASSOCIATES, INC.
P.O. BOX 50685
MIDLAND, TX 79710

Order#: G0205140
Project: 2-0128
Project Name: Texaco/ Vacuum Unit #140
Location: None Given

Lab ID: 0205140-07
Sample ID: BH-1 (40-41')

Test Parameters

Parameter	Result	Units	Dilution Factor	RL	Method	Date Analyzed	Analyst
Chloride	142	mg/kg	1	20	9253	12/2/02	SB

Lab ID: 0205140-08
Sample ID: BH-3 (0-1')

Test Parameters

Parameter	Result	Units	Dilution Factor	RL	Method	Date Analyzed	Analyst
Chloride	4130	mg/kg	1	20	9253	12/2/02	SB

Lab ID: 0205140-09
Sample ID: BH-3 (5-6')

Test Parameters

Parameter	Result	Units	Dilution Factor	RL	Method	Date Analyzed	Analyst
Chloride	142	mg/kg	1	20	9253	12/2/02	SB

Lab ID: 0205140-10
Sample ID: BH-3 (10-11')

Test Parameters

Parameter	Result	Units	Dilution Factor	RL	Method	Date Analyzed	Analyst
Chloride	35.4	mg/kg	1	20	9253	12/2/02	SB

Lab ID: 0205140-11
Sample ID: BH-3 (15-16')

Test Parameters

Parameter	Result	Units	Dilution Factor	RL	Method	Date Analyzed	Analyst
Chloride	35.4	mg/kg	1	20	9253	12/2/02	SB

Lab ID: 0205140-12
Sample ID: BH-3 (20-21')

Test Parameters

Parameter	Result	Units	Dilution Factor	RL	Method	Date Analyzed	Analyst
Chloride	35.4	mg/kg	1	20	9253	12/2/02	SB

RL = Reporting Limit N/A = Not Applicable

ENVIRONMENTAL LAB OF TEXAS

ANALYTICAL REPORT

CINDY CRAIN
LARSON AND ASSOCIATES, INC.
P.O. BOX 50685
MIDLAND, TX 79710

Order#: G0205140
Project: 2-0128
Project Name: Texaco/ Vacuum Unit #140
Location: None Given

Lab ID: 0205140-13
Sample ID: BH-3 (30-31')

Test Parameters

Parameter	Result	Units	Dilution Factor	RL	Method	Date Analyzed	Analyst
Chloride	35.4	mg/kg	1	20	9253	12/2/02	SB

Lab ID: 0205140-14
Sample ID: BH-3 (40-41')

Test Parameters

Parameter	Result	Units	Dilution Factor	RL	Method	Date Analyzed	Analyst
Chloride	35.4	mg/kg	1	20	9253	12/2/02	SB

Lab ID: 0205140-15
Sample ID: BH-3 (50-51')

Test Parameters

Parameter	Result	Units	Dilution Factor	RL	Method	Date Analyzed	Analyst
Chloride	35.4	mg/kg	1	20	9253	12/2/02	SB

Lab ID: 0205140-16
Sample ID: BH-2 (0-1')

Test Parameters

Parameter	Result	Units	Dilution Factor	RL	Method	Date Analyzed	Analyst
Chloride	2870	mg/kg	1	20	9253	12/2/02	SB

Lab ID: 0205140-17
Sample ID: BH-2 (5-6')

Test Parameters

Parameter	Result	Units	Dilution Factor	RL	Method	Date Analyzed	Analyst
Chloride	1310	mg/kg	1	20	9253	12/2/02	SB

Lab ID: 0205140-18
Sample ID: BH-2 (10-11')

Test Parameters

Parameter	Result	Units	Dilution Factor	RL	Method	Date Analyzed	Analyst
Chloride	195	mg/kg	1	20	9253	12/2/02	SB

RL = Reporting Limit N/A = Not Applicable

ENVIRONMENTAL LAB OF TEXAS

ANALYTICAL REPORT

CINDY CRAIN
LARSON AND ASSOCIATES, INC.
P.O. BOX 50685
MIDLAND, TX 79710

Order#: G0205140
Project: 2-0128
Project Name: Texaco/ Vacuum Unit #140
Location: None Given

Lab ID: 0205140-19
Sample ID: BH-2 (15-16')

Test Parameters

Parameter	Result	Units	Dilution Factor	RL	Method	Date Analyzed	Analyst
Chloride	35.4	mg/kg	1	20	9253	12/2/02	SB

Lab ID: 0205140-20
Sample ID: BH-2 (20-21')

Test Parameters

Parameter	Result	Units	Dilution Factor	RL	Method	Date Analyzed	Analyst
Chloride	35.4	mg/kg	1	20	9253	12/2/02	SB

Lab ID: 0205140-21
Sample ID: BH-2 (30-31')

Test Parameters

Parameter	Result	Units	Dilution Factor	RL	Method	Date Analyzed	Analyst
Chloride	124	mg/kg	1	20	9253	12/2/02	SB

Lab ID: 0205140-22
Sample ID: BH-2 (40-41')

Test Parameters

Parameter	Result	Units	Dilution Factor	RL	Method	Date Analyzed	Analyst
Chloride	35.4	mg/kg	1	20	9253	12/2/02	SB

Lab ID: 0205140-23
Sample ID: BH-2 (50-51')

Test Parameters

Parameter	Result	Units	Dilution Factor	RL	Method	Date Analyzed	Analyst
Chloride	35.4	mg/kg	1	20	9253	12/2/02	SB

Approval: Jeanne McMurrey 12-10-02
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.

RL = Reporting Limit N/A = Not Applicable

ENVIRONMENTAL LAB OF TEXAS

QUALITY CONTROL REPORT

8015M

Order#: G0205140

BLANK SOIL	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
TOTAL, C6-C35-mg/kg	0003925-02			<10.0		
TOTAL, C6-C35-mg/kg	0003927-02			<10.0		
CONTROL SOIL	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
TOTAL, C6-C35-mg/kg	0003927-03		952	936	98.3%	
CONTROL DUP SOIL	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
TOTAL, C6-C35-mg/kg	0003927-04		952	976	102.5%	4.2%
MS SOIL	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
TOTAL, C6-C35-mg/kg	0205127-01	0	952	799	83.9%	
MSD SOIL	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
TOTAL, C6-C35-mg/kg	0205127-01	0	952	945	99.3%	16.7%
SRM SOIL	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
TOTAL, C6-C35-mg/kg	0003925-05		1000	1060	106.%	
TOTAL, C6-C35-mg/kg	0003927-05		1000	1110	111.%	

ENVIRONMENTAL LAB OF TEXAS

QUALITY CONTROL REPORT

8021B/5030 BTEX

Order#: G0205140

BLANK SOIL	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
Benzene-mg/kg	0003919-02			<0.025		
Ethylbenzene-mg/kg	0003919-02			<0.025		
Toluene-mg/kg	0003919-02			<0.025		
p/m-Xylene-mg/kg	0003919-02			<0.025		
o-Xylene-mg/kg	0003919-02			<0.025		
MS SOIL	**LAB-ID #**	**Sample Concentr.**	**Spike Concentr.**	**QC Test Result**	**Pct (%) Recovery**	**RPD**
Benzene-mg/kg	0205140-05	0	0.1	0.093	93.%	
Ethylbenzene-mg/kg	0205140-05	0	0.1	0.097	97.%	
Toluene-mg/kg	0205140-05	0	0.1	0.096	96.%	
p/m-Xylene-mg/kg	0205140-05	0	0.2	0.202	101.%	
o-Xylene-mg/kg	0205140-05	0	0.1	0.096	96.%	
MSD SOIL	**LAB-ID #**	**Sample Concentr.**	**Spike Concentr.**	**QC Test Result**	**Pct (%) Recovery**	**RPD**
Benzene-mg/kg	0205140-05	0	0.1	0.099	99.%	6.3%
Ethylbenzene-mg/kg	0205140-05	0	0.1	0.102	102.%	5.%
Toluene-mg/kg	0205140-05	0	0.1	0.101	101.%	5.1%
p/m-Xylene-mg/kg	0205140-05	0	0.2	0.211	105.5%	4.4%
o-Xylene-mg/kg	0205140-05	0	0.1	0.101	101.%	5.1%
SRM SOIL	**LAB-ID #**	**Sample Concentr.**	**Spike Concentr.**	**QC Test Result**	**Pct (%) Recovery**	**RPD**
Benzene-mg/kg	0003919-05		0.1	0.101	101.%	
Ethylbenzene-mg/kg	0003919-05		0.1	0.102	102.%	
Toluene-mg/kg	0003919-05		0.1	0.103	103.%	
p/m-Xylene-mg/kg	0003919-05		0.2	0.213	106.5%	
o-Xylene-mg/kg	0003919-05		0.1	0.102	102.%	

ENVIRONMENTAL LAB OF TEXAS

QUALITY CONTROL REPORT

Test Parameters

Order#: G0205140

BLANK SOIL	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
Chloride-mg/kg	0003940-01			<20.0		
Chloride-mg/kg	0003943-01			<20.0		
MS SOIL	**LAB-ID #**	**Sample Concentr.**	**Spike Concentr.**	**QC Test Result**	**Pct (%) Recovery**	**RPD**
Chloride-mg/kg	0205133-01	29100	10000	38800	97.%	
Chloride-mg/kg	0205140-19	35.4	1000	1030	99.5%	
MSD SOIL	**LAB-ID #**	**Sample Concentr.**	**Spike Concentr.**	**QC Test Result**	**Pct (%) Recovery**	**RPD**
Chloride-mg/kg	0205133-01	29100	10000	39000	99.%	0.5%
Chloride-mg/kg	0205140-19	35.4	1000	1030	99.5%	0.%
SRM SOIL	**LAB-ID #**	**Sample Concentr.**	**Spike Concentr.**	**QC Test Result**	**Pct (%) Recovery**	**RPD**
Chloride-mg/kg	0003940-04		5000	4960	99.2%	
Chloride-mg/kg	0003943-04		5000	4960	99.2%	

CHAIN—OF—CUSTODY RECORD

Larson & Associates, Inc.
Environmental Consultants
Fax: 915-687-0456
915-687-0901
507 N. Marienfeld, Ste. 202 • Midland, TX 79701

CLIENT NAME: Texaco

SITE MANAGER: Cindy Crain

PROJECT NO.: 2-0128

PROJECT NAME: Vacuum Unit #140

PAGE 1 OF 2

LAB. PO #

SAMPLE IDENTIFICATION 0205140

DATE	TIME	WATER	SOIL	OTHER	SAMPLE IDENTIFICATION	NUMBER OF CONTAINERS	PARAMETERS/METHOD NUMBER: TPH 8015 M	BTEX 8021B	Chlorides	LAB. I.D. NUMBER (LAB USE ONLY)	REMARKS (I.E., FILTERED, UNFILTERED, PRESERVED, UNPRESERVED, GRAB COMPOSITE)
11/26/02	1052		✓		BH-1 (0-2') 01	1	✓	✓	✓		
"	1102		✓		" (5-6') 02	1			✓		
"	1110		✓		" (10-11') 03	1	✓	✓	✓		
"	1120		✓		" (15-16') 04	1			✓		
"	1127		✓		" (20-21') 05	1	✓	✓	✓		
"	1140		✓		" (30-31') 06	1	✓		✓		
"	1155		✓		" (40-41') 07	1	✓		✓		
"	1245		✓		BH-3 (0-1') 08	1	✓		✓		
"	1253		✓		" (5-6') 09	1			✓		
"	1259		✓		" (10-11') 10	1	✓		✓		
"	1308		✓		" (15-16') 11	1			✓		
"	1318		✓		" (20-21') 12	1	✓		✓		
"	1400		✓		" (30-31') 13	1	✓		✓		
"	1407		✓		" (40-41') 14	1	✓		✓		
"	1420		✓		" (50-51') 15	1	✓		✓		
"	1445		✓		BH-2 (0-1') 16	1	✓		✓		
"	1451		✓		" (5-6') 17	1			✓		
"	1520		✓		" (10-11') 18	1	✓		✓		

SAMPLED BY: (Signature) Cindy Crain — DATE: 11/26/02 TIME: 1700

RELINQUISHED BY: (Signature) — DATE: ____ TIME: ____

RECEIVED BY: (Signature) — DATE: ____ TIME: ____

RELINQUISHED BY: (Signature) Cindy Crain — DATE: 11/27/02 TIME: 1035

RECEIVED BY: (Signature) — DATE: ____ TIME: ____

SAMPLE SHIPPED BY: (Circle)

FEDEX BUS AIRBILL #: ____

HAND DELIVERED UPS OTHER: ____

COMMENTS:

TURNAROUND TIME NEEDED

WHITE – RECEIVING LAB
YELLOW – RECEIVING LAB (TO BE RETURNED TO LA AFTER RECEIPT)
PINK – PROJECT MANAGER
GOLD – QA/QC COORDINATOR

RECEIVING LABORATORY: ELAB

ADDRESS: ____

CITY: ____ STATE: ____ ZIP: ____

CONTACT: ____ PHONE: ____

RECEIVED BY: (Signature) Nawal Candill

DATE: 11/27/02 TIME: 1040

SAMPLE CONDITION WHEN RECEIVED:

LA CONTACT PERSON:

SAMPLE TYPE: Soil 0.5C 4oz GLASS

CHAIN—OF—CUSTODY RECORD

LA Larson & Associates, Inc.
Environmental Consultants
Fax: 915-687-0456
915-687-0901
507 N. Marienfeld, Ste. 202 • Midland, TX 79701

CLIENT NAME: Texaco

SITE MANAGER: Cindy Crain

PROJECT NO.: 2-0128

PROJECT NAME: Vacuum Unit #140

PAGE 2 OF 2

LAB. PO #

DATE	TIME	WATER	SOIL	OTHER	SAMPLE IDENTIFICATION	NUMBER OF CONTAINERS	PARAMETERS/METHOD NUMBER: TPH 8015M	PARAMETERS/METHOD NUMBER: Chlorides	LAB. I.D. NUMBER (LAB USE ONLY)	REMARKS (I.E., FILTERED, UNFILTERED, PRESERVED, UNPRESERVED, GRAB COMPOSITE)
					0205140					
11/26/02	1537		✓		BH-2 (15-16') 19	1		✓		
"	1612		✓		" (20-21') 20	1	✓	✓		
"	1624		✓		" (30-31') 21	1	✓	✓		
"	1636		✓		" (40-41') 22	1	✓	✓		
"	1645		✓		" (50-51') 23	1	✓	✓		

SAMPLED BY: (Signature) Cindy Crain
DATE: 11/26/02
TIME: 1700

RELINQUISHED BY: (Signature) Cindy Crain
DATE: 11/27/02
TIME: 1035

RELINQUISHED BY: (Signature)
DATE:
TIME:

RECEIVED BY: (Signature)
DATE:
TIME:

RECEIVED BY: (Signature)
DATE:
TIME:

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

COMMENTS:

TURNAROUND TIME NEEDED

RECEIVING LABORATORY: ELAB
ADDRESS:
CITY: STATE: ZIP:
CONTACT: PHONE:

RECEIVED BY: (Signature) Dawn M. Caudill
DATE: 11/27/02 TIME: 1040

WHITE – RECEIVING LAB
YELLOW – RECEIVING LAB (TO BE RETURNED TO LA AFTER RECEIPT)
PINK – PROJECT MANAGER
GOLD – QA/QC COORDINATOR

SAMPLE CONDITION WHEN RECEIVED:

LA CONTACT PERSON:

SAMPLE TYPE: Soil 0.5C 4oz GLASS