1R - 231

REPORTS

DATE:

1993

FINAL REPORT

ENVIRONMENTAL DUE DILIGENCE ASSESSMENT
NEW MEXICO SWEET SYSTEM AND
NEW MEXICO SOUR SYSTEM

Submitted by:

Roy F. Weston, Inc.
5599 San Felipe, Suite 700
Houston, Texas 77056
(713) 621-1620

AUGUST 1993

SECTION 11

ANDERSON RANCH STATION

11.1 SITE LOCATION AND DESCRIPTION

The Anderson Ranch Station is located approximately 22 miles west of Lovington, Lea County, New Mexico. The site location is shown in Figure 11-1. The Anderson Ranch Station is a former crude oil pumping station and storage facility where oil from gathering lines was pumped into a trunk line. The station is currently idle.

The Anderson Ranch Station layout is shown in Figure 11-2. Above-ground facilities include a 10,000 BBL cone-roof tank (tank 814), former concrete equipment foundations, and a former sump. A second crude oil storage tank was located within the tank dike north of the existing tank. SPLC personnel report that the tank had already been removed 12 years ago when SPLC stopped operating the site. A well, possibly for drinking water or pump cooling water, is located approximately 30 feet inside the east fence near a concrete slab. Light hydrocarbon staining is visible around the former tank location and the concrete pads on the east side of the site. The extent of hydrocarbon staining is depicted in Figure 11-2. An area of scattered solid waste is located due north of the tank near the north fence.

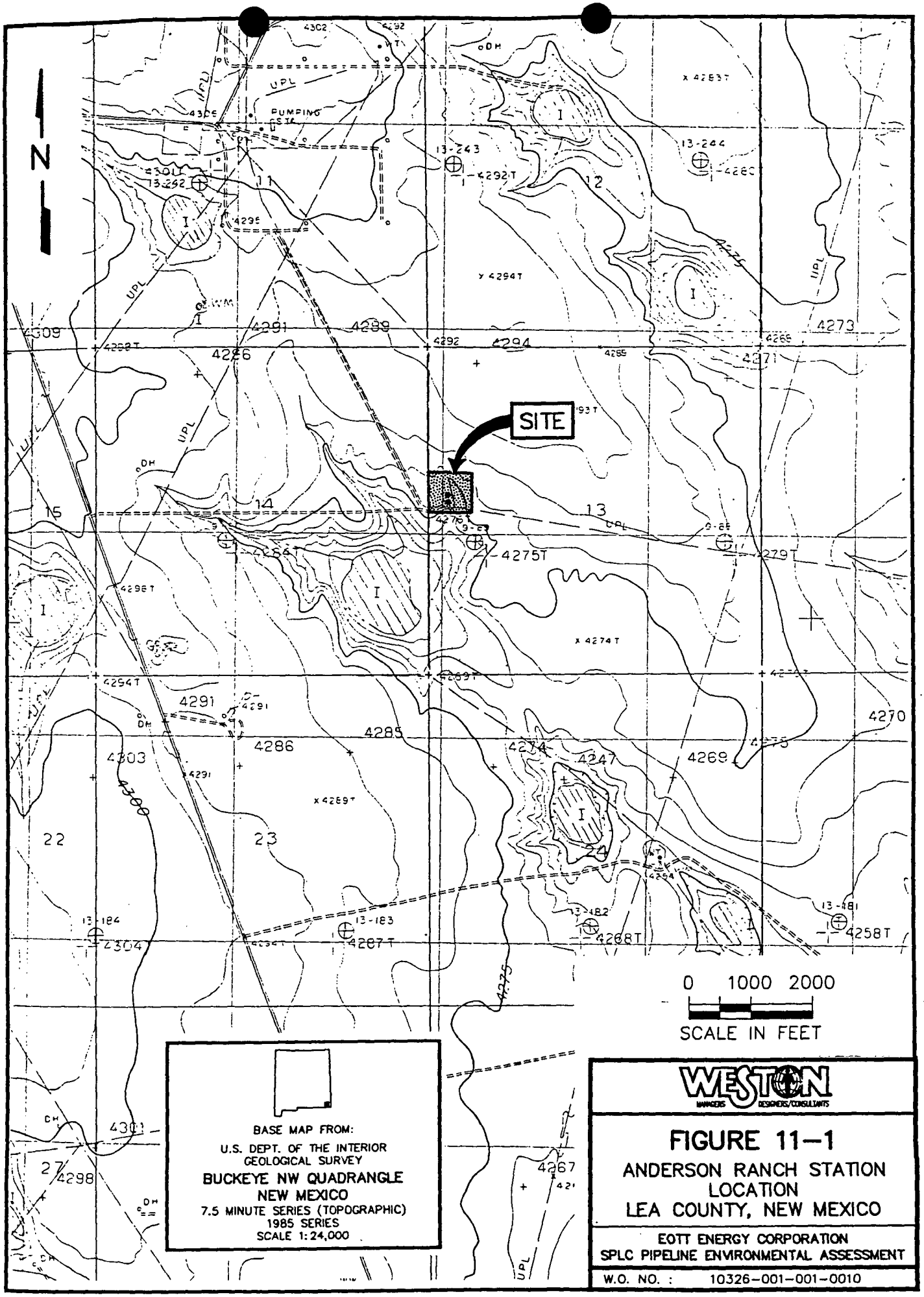
The approximately 10-acre Anderson Ranch Station is located in an oil field. The land surrounding the site is used for ranching. The land is owned by the state of New Mexico.

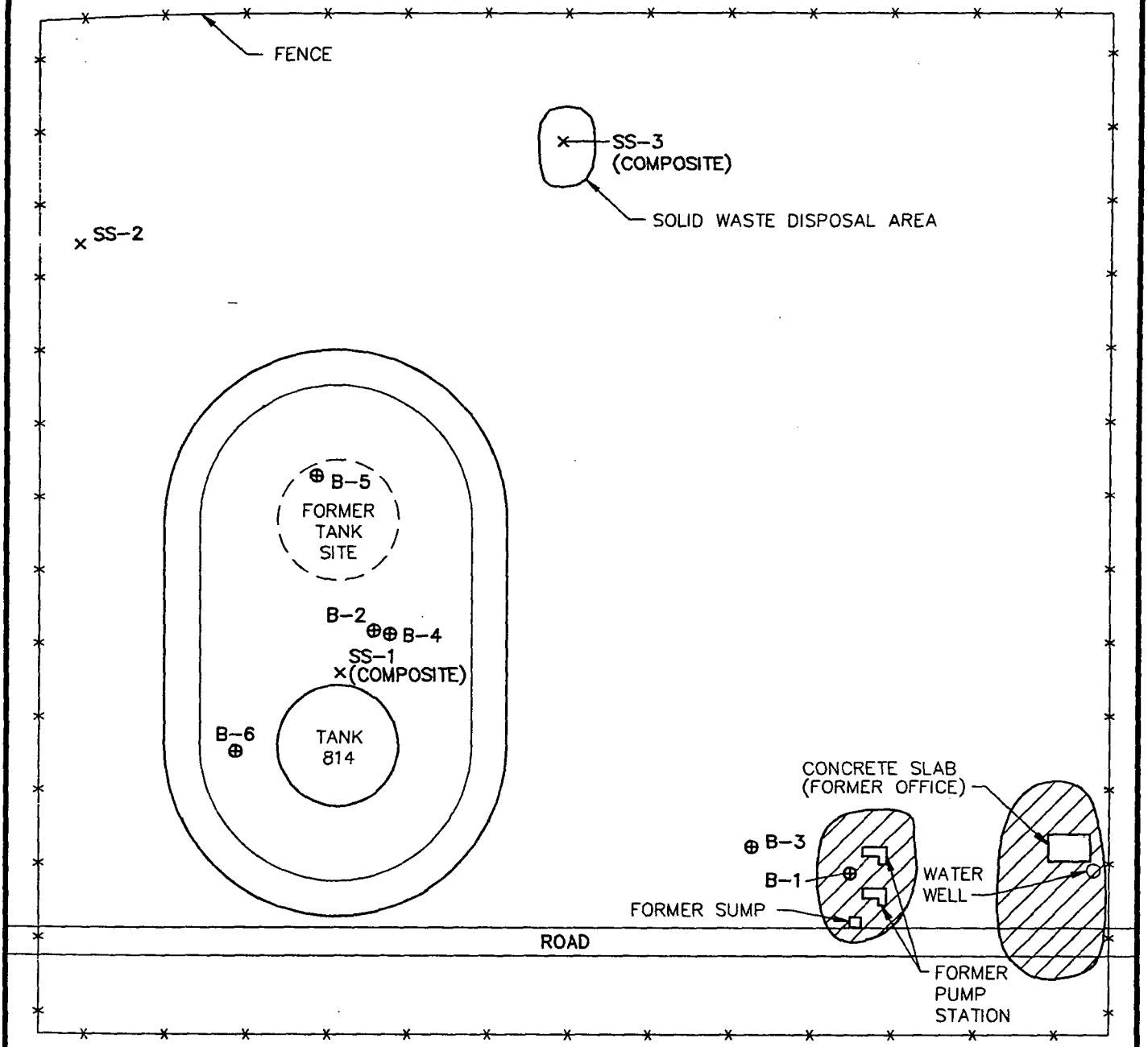
11.2 PREVIOUS INVESTIGATION RESULTS AND CONCLUSIONS

CURA, Inc. performed a baseline assessment of soil and groundwater conditions at Anderson Ranch Station in December, 1992, and a Phase II environmental assessment in February, 1993. CURA advanced a total of six soil borings at locations inside the tank dikes and near the concrete foundations. The CURA boring locations are shown on Figure 11-2. CURA analyzed the soil samples for BTEX and TPH.

BTEX concentrations in soil samples ranged from <0.001 to 0.062 mg/kg. TPH concentrations ranged from <10 to 6,300 mg/kg. Only one sample in the eleven samples analyzed for TPH contained more than 35 mg/kg TPH. The samples containing the highest hydrocarbon concentrations were collected from shallow subsurface soils from a boring inside the tank dike immediately north of tank 814 and a boring near the former pumping station.

CURA estimated that the extent of hydrocarbon soils is limited to an area centered on B-2 with a radius of less than 9 feet and maximum depth of 5 feet. CURA reported that, based on the analytical results and field observations, the crude oil contamination was absorbed by the impacted soils and did not migrate downward to groundwater.


N
SITE
0 1000 2000
SCALE IN FEET
BASE MAP FROM:
U.S. DEPT. OF THE INTERIOR
GEOLOGICAL SURVEY
BUCKEYE NW QUADRANGLE
NEW MEXICO
7.5 MINUTE SERIES (TOPOGRAPHIC)
1985 SERIES
SCALE 1:24,000
WESTON
MANAGERS DESIGNERS/CONSULTANTS
FIGURE 11-1
ANDERSON RANCH STATION
LOCATION
LEA COUNTY, NEW MEXICO
EOTT ENERGY CORPORATION
SPLC PIPELINE ENVIRONMENTAL ASSESSMENT
W.O. NO. : 10326-001-001-0010
H:\DWG\EOTT\SITES1.PB 1=1 07-20-93



N

NOT TO SCALE

LEGEND

⊕ B-1	CURA SOIL BORING LOCATION
× SS-1	SURFACE SOIL SAMPLE LOCATION
⊗ SD-1	SEDIMENT SAMPLE LOCATION
● SB-1	WESTON SOIL BORING LOCATION
▨	HYDROCARBON STAINING

WESTON MANAGERS DESIGNERS/CONSULTANTS

FIGURE 11-2

ANDERSON RANCH STATION SITE PLAN

EOTT ENERGY CORPORATION
SPLC PIPELINE ENVIRONMENTAL ASSESSMENT

W.O. NO. : 10326-001-001-0010

H:\DWG\EOTT\SP3.PB 1=1 07-21-93

11.3 SITE SAMPLING

After the records review, site inspection and CURA report review, WESTON recommended sampling at Anderson Ranch Station to address the following environmental issues:

- potential lead contamination of soil surrounding tank,
- potential metals contamination of soils in the solid waste disposal area, and
- potential metals and hydrocarbon-impacted soil in the solid waste disposal area.

The sample locations are shown on Figure 11-2. Analytical results are provided in Table 11-1.

SS-01 collected from surface soils adjacent to the tank contained 54.7 mg/kg total lead. Background sample SS-02 collected along the west fence contained 11.4 mg/kg lead. Although SS-01 contained a higher lead concentration than the background sample, the magnitude of the lead concentration is sufficiently low that lead contamination of the surface soils around the tank does not warrant further action.

SS-03, a composite sample collected from surface soils in the solid waste disposal area, did not contain any RCRA metals at concentrations warranting additional action.

11.4 COMPLIANCE ISSUES

Air Issues for Tank 814

This tank is currently out of service and is probably no longer grandfathered since it has been inactive for 5 years. Based on the available information, an air permit would not be required for this tank if it is returned to service and operated at a constant crude oil level. The tank appears to be in compliance with other New Mexico and federal air quality regulations.

If the tank is not operated at a constant crude oil level, then an air permit would probably be required if the tank throughput is greater than 90,000 BBLs per year.

11.5 LIABILITY ISSUES

Hydrocarbon Contaminated Soil

The CURA investigation identified an area of hydrocarbon-contaminated soil at the southeast corner of the site near a concrete foundation. The WESTON soil borings and site inspection indicate that there are additional areas of hydrocarbon-stained soil near the foundations and tanks. These areas are shown on Figure 11-2. Based on the CURA data and WESTON observations, the OCD probably would not require remediation of these soils since the potential for groundwater contamination appears to be low.

Groundwater Contamination

The potential for groundwater contamination at the site appears to be low based on the CURA data and WESTON site inspections. However, WESTON recommends that the existing groundwater well at the site be sampled to ascertain the quality of groundwater at the site.

Regulatory Database Search

The regulatory database search did not confirm any environmental risk sites within the distances given in Section 2.2.1.

TABLE 11-1
ANDERSON RANCH STATION ANALYTICAL RESULTS
EOTT ENVIRONMENTAL ASSESSMENT OF THE
SPLC ZONE III PIPELINE

SAMPLE NUMBER: LOCATION: DATE COLLECTED:	SS-01 ADJACENT TO TANK 6/25/93	SS-02 BACKGROUND 6/25/93	SS-03 SOLID WASTE DISPOSAL AREA 6/25/93			
ORGANICS (mg/kg):[1]						
Benzene	NA	NA	NA			
Toluene	NA	NA	NA			
Ethylbenzene	NA	NA	NA			
Total Xylenes	NA	NA	NA			
TOTAL BTEX[2]	NA	NA	NA			
TPH[3]	NA	NA	NA			
TOTAL PCBs[4]	NA	NA	NA			
METALS (mg/kg):						
Silver	NA	NA	<3.0			
Arsenic	NA	NA	1.4			
Barium	NA	NA	58.7			
Cadmium	NA	NA	<0.5			
Chromium	NA	NA	9.0			
Mercury	NA	NA	<0.081			
Lead	54.7	11.4	9.4			
Selenium	NA	NA	<0.19			

1 "NA" = not analyzed.
2 "BTEX" = total benzene, toluene, ethylbenzene, and xylenes.
3 "TPH" = total petroleum hydrocarbons.
4 "PCBs" = polychlorinated biphenyls.

CURA, INC.
3001 North Big Spring
Suite 101
Midland, Texas 79705
(915) 570-8408
FAX (915) 570-8409

PHASE II
ENVIRONMENTAL SITE ASSESSMENT

ANDERSON RANCH STATION
LEA COUNTY, NEW MEXICO

CURA PROJECT NO. 15-9256704.3

SHELL PIPE LINE CORPORATION
TWO SHELL PLAZA
P.O. BOX 2099
HOUSTON, TEXAS 77252-2099

March 3, 1993

Prepared By: F. Wesley Root
Environmental Geologist

Reviewed By: Greg C. Walterscheid, R.E.M.
Project Manager

Herbert E. Fry, C.P.G.
Director of Geology/Hydrogeology

CURA

TABLE OF CONTENTS

1.0 REPORT SUMMARY

1.1 EXECUTIVE SUMMARY

The site, Anderson Ranch Station, is located approximately 22 miles west of Lovington in Lea County, New Mexico (Appendix A, Figure 1) and is a former crude oil pipeline pump station.

A review of the analytical results from the Preliminary Site Assessment conducted during December 1992 indicated hydrocarbon-impacted soils (> 100 ppm TPH) at a depth of 2 to 2.5 feet in boring B-2 (6,300 ppm TPH). Based on these analytical results, the tank and associated equipment located in the inactive tank battery were identified as potential sources of the crude oil contamination observed on site.

Based on the findings of the Preliminary Site Assessment, four additional soil borings (B-3 through B-6) were performed on February 8, 1993 to further delineate the horizontal and vertical extent of the hydrocarbon-impacted soils previously identified in boring B-2.

Benzene levels were below method detection limits of 0.001 ppm in the sampled intervals of borings B-3 through B-6. The total BTEX levels ranged from below method detection limits of 0.001 ppm to 0.015 ppm. TPH levels ranged from below method detection limits of 10 ppm to 20 ppm. The current New Mexico Oil Conservation Division (OCD) recommended remediation levels for crude oil impacted soils are 10 ppm benzene, 50 ppm total BTEX, and either 100 ppm, 1,000 ppm, or 5,000 ppm TPH depending upon the risk assessment ranking for the site.

Based on the data obtained, the extent of hydrocarbon-impacted soils is limited to an area centered on boring B-2 with a radius of less than 9 feet and a maximum depth of 5 feet.

Groundwater was not encountered during this subsurface investigation. Based on the analytical data from borings B-1 through B-6 and field observations, the crude oil contamination was absorbed by the impacted soils.

1.2 SCOPE OF SERVICES

The following scope of services was conducted for the Phase II - Environmental Site Assessment:

- Met with Shell Pipe Line Corporation to determine additional boring locations in order to further delineate the extent of hydrocarbon-impacted soils found during the Preliminary Site Assessment conducted in December 1992.

- Conducted a preliminary literature search of the geology and hydrogeology of the site area.

- Performed soil borings and obtained soil samples to aid in classifying subsurface conditions with respect to petroleum hydrocarbons.

- Constructed a soil hydrocarbon concentration map to help delineate the horizontal and vertical extent of hydrocarbon-affected soils.

- Assembled soil profile columns from soil boring logs and reviewed the soil classification for the site area.

- Summarized findings in the Phase II - Environmental Site Assessment Report.

2.0 INTRODUCTION

During December 1992, CURA was contracted by Shell Pipe Line Corporation to conduct a Preliminary Site Assessment prior to a planned site divestment. Based on the discovery of hydrocarbon-impacted soils in boring B-2 the tanks and associated equipment located in the inactive tank battery were identified as potential sources.

A Phase II - Environmental Site Assessment (this report) was performed on February 8, 1992 to further delineate the extent of hydrocarbon-impacted soils near boring B-2 and to provide a more comprehensive assessment of the subsurface soil conditions. The site, Anderson Ranch Station, is located approximately 22 miles west of the city of Lovington in Lea County, New Mexico (Appendix A, Figure 1) and is a former crude oil pipeline pump station.

3.0 SITE DESCRIPTION

When active, Anderson Ranch Station was utilized as a crude oil pipeline pumping station in which subsurface crude oil field lines from various oil field leases were manifolded into a main subsurface discharge pipeline operated by Shell Pipe Line Corporation. A tank battery containing one inactive aboveground crude oil storage tank and a former aboveground tank site is located on the western portion of the site (Appendix A, Figure 2) and is surrounded by an earthen dike. Two concrete pump pads and a concrete building slab are located approximately 200 feet east of the tank battery. When the station was active this portion of the site contained a pumping station, office building and underground sump.

Anderson Ranch Station is situated near the southeast corner of a fenced cattle range. Access to the site is from the south through a locked gate located on the barbed-wire fencing along the range's southern boundary. The site is located in a rural area within the Anderson Ranch Oil Field. No residences, public buildings, surface bodies of water, or water wells were observed within a 1,000 foot radius of the facility.

4.0 SITE HYDROGEOLOGY

The site is located in Lea County, New Mexico, within the High Plains physiographic province of New Mexico and Texas.

The late Miocene to Pliocene age Ogallala Formation is the major water-bearing formation in the area and consists of semiconsolidated fine-grained calcareous sand overlain by a thick layer of caliche. The formation contains some clay, silt, and often a basal gravel. It is a heterogeneous complex of terrestrial sediments deposited over an irregular erosional surface cut into the underlying Cretaceous and Triassic rocks. The Ogallala Formation outcrops in the site area and often forms a continuous aquifer with the underlying rocks.

According to published data (Nicholson, 1961), there were no water wells observed within a 1,000 foot radius of the site. The closest known water well is located approximately 1.3 miles southeast of the site based on the U.S.G.S. Buckeye NW, New Mexico, topographic quadrangle (1985). The current status and construction data on this well is unknown.

According to the U.S.G.S. Buckeye NW, New Mexico, topographic quadrangle, the site is approximately 4,275 feet above mean sea level (Figure 4). The general trend of the local topography and surface drainage of the site area is to the south-southeast towards a playa lake approximately 1,500 feet south of the site.

The soils on site belong to the Kimbrough Series consisting of well-drained, loam and gravelly loams formed in wind-deposited and water-deposited, sediments on uplands. Typically, the surface layer is dark gray-brown gravelly loam containing caliche fragments about 6 inches thick underlain by white indurated caliche that is fragmental and indurated to a depth of about 30 inches. This competent layer grades

into a weakly cemented, white caliche with depth. The soils described in the soil survey are generally consistent with the observed soil on site.

Subsurface conditions were similar for borings B-1 through B-6. The soils consisted of 2 feet to 4 feet of dark gray-brown to buff sandy loam and large indurated caliche fragments, underlain by buff-pink calcareous sand (caliche) to a depth of approximately 22 feet (maximum boring depth). The underlying caliche contained several hard streaks within the upper 1 to 4 feet. Approximately 2 feet of the loam and indurated caliche surface soils were not present in the borings located inside the tank battery wall due to removal during construction. The soil boring logs included in Appendix B provide a more detailed description of the subsurface conditions.

Currently, the groundwater in the site area is not used as a drinking water source. The drinking water in Lovington, the nearest municipality, is supplied from a well field located approximately 3 miles south of the city and 23 miles east of the site that produces from the Ogallala Formation at a depth of 80 to 210 feet.

A field survey of the site and surrounding area was conducted during the Preliminary Site Assessment to identify potential receptors (residences, public buildings, water supply wells, and surface bodies of water) in the site vicinity. No residences, public buildings, or water supply wells were identified within a 1000 foot radius of the site. A playa lake is located approximately 1,500 feet south of the site.

5.0 HYDROGEOLOGICAL INVESTIGATION AND FINDINGS

5.1 SOIL INVESTIGATION

5.1.1 SOIL BORING LOCATIONS

The locations of borings B-3 through B-6 were chosen based on the discovery of hydrocarbon-impacted soils in boring B-2 and the inadequate depth of penetration (2.5 feet) attained using a hand auger and pickaxe during the Preliminary Site Assessment. The potential source of the crude oil contamination identified by B-2 is the tanks and associated equipment within the earthen dike of the tank battery.

Boring B-3 was located approximately 45 feet west of B-1 and downgradient with respect to the observed local surface drainage (west) from the former sump/pumping station on the east side of the site. Boring B-4 was located 9 feet east of boring B-2 near the center of the tank battery. Borings B-5 and B-6 were placed in the northern and southeastern portions, respectfully of the tank battery to complete the delineation of the impacted area. Regional surface drainage is to the southeast, but on site drainage is controlled by a south-southwest flowing re-entrant that bisects the site between the tank battery and the former sump/pumping station.

5.1.2 SOIL SAMPLING OPERATIONS

Soil samples were retrieved from the borings to be analyzed for benzene, toluene, ethylbenzene, xylenes (BTEX) and total petroleum hydrocarbons (TPH). Samples were obtained at five foot intervals in each boring using a split spoon sampling device. The soil sample

obtained from each interval was split into two separate containers. One sample was placed into a glass jar with teflon-lined lids and zero head space and preserved at 4°C in accordance with EPA protocol for shipment to the laboratory. The other soil sample from each interval was placed in a sample jar and field-screened (head space analysis) with a flame ionization detector (FID) Century 128 Organic Vapor Analyzer (OVA). The OVA detects volatile petroleum and non-petroleum organic compounds in parts per million (ppm) methane equivalent.

5.1.2 SOIL SAMPLE ANALYTICAL RESULTS

OVA readings ranged from <1 ppm in a majority of the sampled intervals of borings B-3 through B-6 to 2 ppm in the 20 to 22 foot sample interval of boring B-3 and the 5 to 7 foot interval of B-4. Two samples from each boring were submitted for laboratory analyses. The sample with the highest relative OVA reading and the sample at the total depth of each boring unless noted otherwise were submitted to the laboratory for BTEX and TPH analyses using EPA-approved analytical methods (EPA Method 8020 and EPA Method 418.1, respectively). Complete OVA readings and a listing of those samples submitted to the laboratory are presented in Table 1. No hydrocarbon staining or odors were observed during sampling operations.

TABLE 1
SOIL SAMPLE ANALYTICAL RESULTS

Boring	Date Sampled	Sample Interval (feet)	OVA	Benzene	Toluene	Ethyl-benzene	Xylenes	Total BTEX	TPH
B-1	12-11-92	0 - 1	<1	<0.001	0.009	0.005	0.033	0.047	35
B-2	12-11-92	2 - 2.5	800	<0.001	<0.001	0.038	0.024	0.062	6,300
B-3	12-08-92	1 - 3	<1	<0.001	0.001	0.005	0.009	0.015	<10
		5 - 7	<1						
		10 - 12	<1						
		15 -17	<1						
		20 - 22	2	<0.001	<0.001	<0.001	0.001	0.001	<10
B-4	12-08-92	2 - 4	<1						
		5 - 7	2	<0.001	0.001	<0.001	0.002	0.002	10
		10 - 12	<1						
		15 - 17	<1						
		20 - 22	<1	<0.001	<0.001	<0.001	<0.001	<0.001	10
B-5	02-08-93	2 - 4	<1						
		5 - 7	<1	<0.001	<0.001	<0.001	0.002	0.002	<10
		10 - 12	<1						
		15 - 17	<1	<0.001	<0.001	<0.001	<0.001	<0.001	20
B-6	02-08-93	1 - 3	<1						
		5 - 7	<1	<0.001	<0.001	<0.001	0.002	0.002	10
		10 - 12	<1						
		15 - 17	1	<0.001	<0.001	<0.001	0.001	0.001	10
		20 - 22	<1	<0.001	<0.001	<0.001	0.001	0.001	10

OVA results listed in parts per million (ppm) equivalent methane.
BTEX results in mg/kg (parts per million; ppm) with method detection limits in Appendix D.
TPH results in mg/kg (parts per million; ppm) with method detection limits in Appendix D.
Analyses were conducted using EPA Method 8020 (BTEX) and EPA Method 418.1 (TPH) by SPL Environmental Laboratories.

A review of the analytical results from the Preliminary Site Assessment conducted during December 1992 indicated hydrocarbon-impacted soils (> 100 ppm TPH) at a depth of 2 to 2.5 feet in boring B-2 (6,300 ppm TPH).

Results from this phase of the investigation recorded benzene levels below method detection limits of 0.001 ppm in the sampled intervals of Borings B-5 through B-6. The total BTEX (benzene, toluene, ethylbenzene, xylenes) levels ranged from below method detection limits of 0.001 ppm in the 20 to 22 foot interval of boring B-4 and the 15 to 17 foot interval of B-5 to 0.015 ppm in the 5 to 7 foot interval of boring B-3. TPH (total petroleum hydrocarbons) levels ranged from below method detection limits of 10 ppm in the sampled intervals of several borings to 20 ppm in the 15 to 17 foot interval of boring B-5. Hydrocarbon concentrations are illustrated on the site map (Appendix B, Figure 2) to indicate soil sample depths and the corresponding hydrocarbon concentration levels.

A summary of the analytical results is presented in Table 1. Laboratory reports and the chain-of-custody are included in Appendix C.

5.2 GROUNDWATER ASSESSMENT

Groundwater was not expected or encountered during drilling operations. Based on the analytical data, OVA readings, and visual observations noted during sampling operations, the crude oil contamination was absorbed by the impacted soils and did not migrate downward to groundwater. Monitor wells were not installed on site.

6.0 CONCLUSIONS

1. No potential receptors were identified within a 1,000 foot radius of the site.

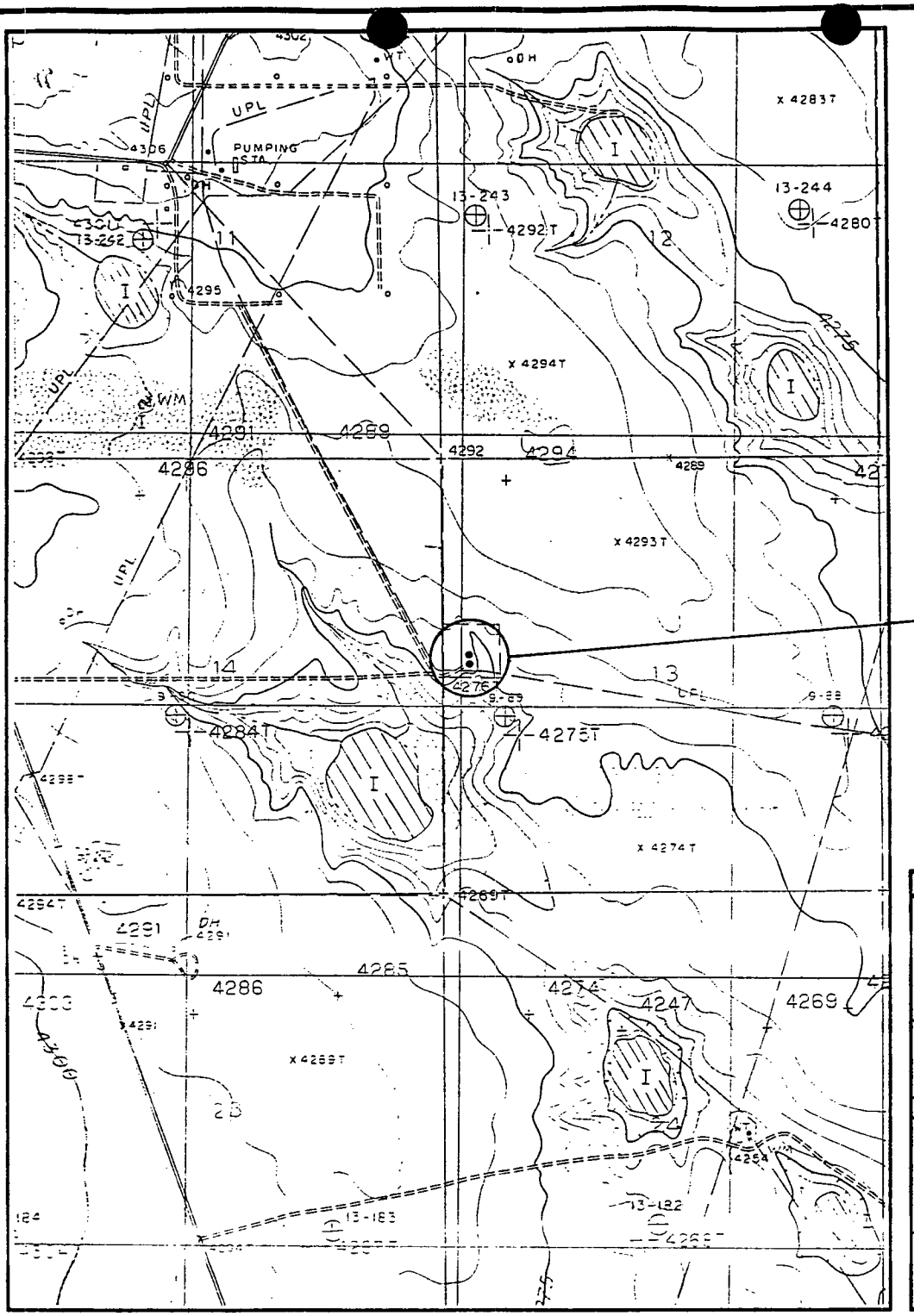
2. Based on the data obtained, the extent of hydrocarbon-impacted soils is limited to an area centered on boring B-2 with a radius of less than 9 feet and a maximum depth of 5 feet.

4. Groundwater was not encountered during this investigation. Based on the analytical results and field observations, the crude oil contamination was absorbed by the impacted soils and did not migrate downward to groundwater.

7.0 APPENDICES

APPENDIX A

FIGURES



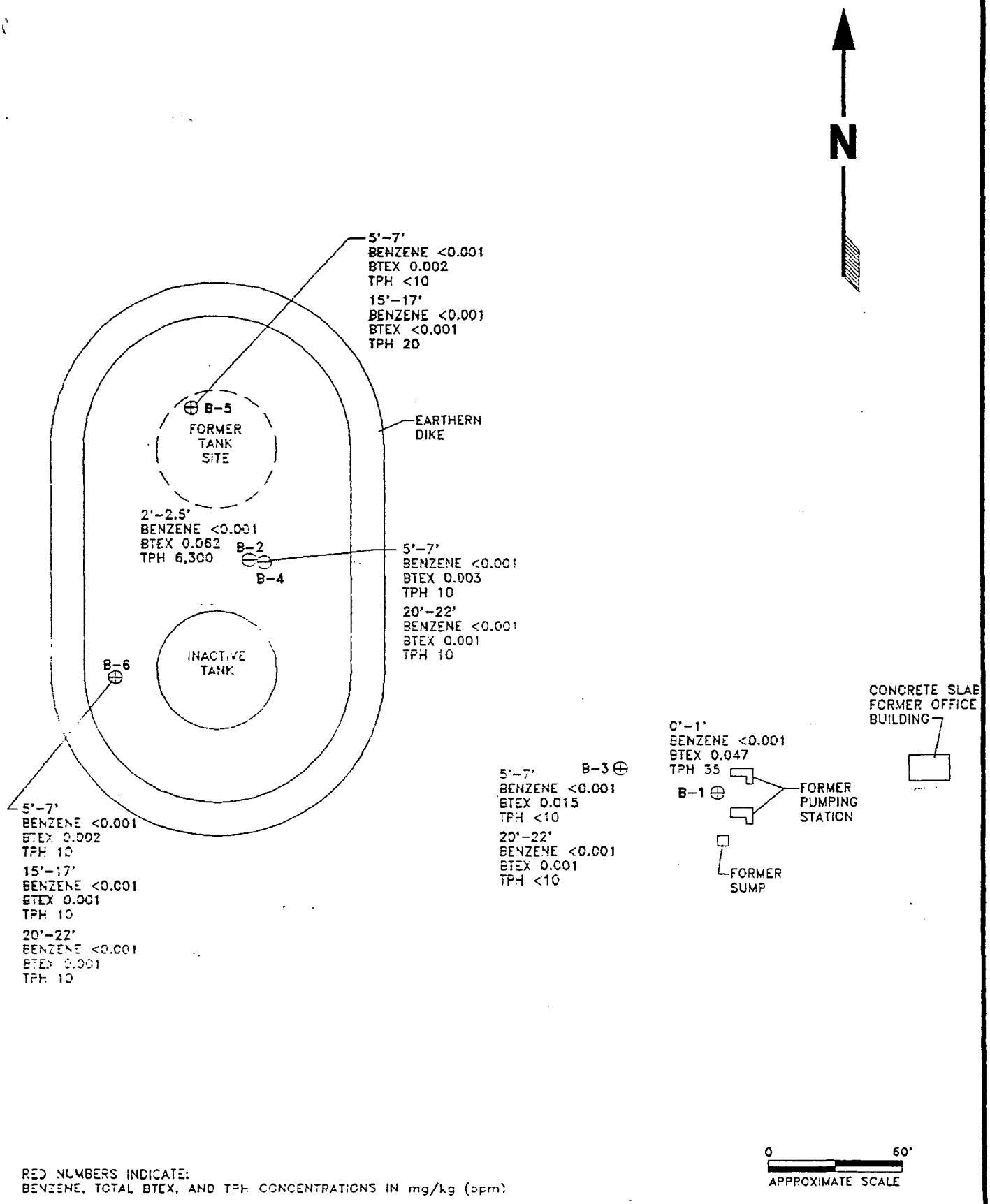
SITE LOCATION MAP

REF: USGS BUCKEYE NW, NEW MEXICO TOPOGRAPHIC QUADRANGLE (1985)

CURA INC.
2735 VILLA CREEK DRIVE - TWO METRO SQUARE
BLDG. C - SUITE 250 - DALLAS, TX 75234
620-7107 FAX - 620-8219

ANDERSON RANCH STATION
SHELL PIPE LINE CORPORATION
LEA COUNTY, NEW MEXICO

DATE:	SCALE:
MAR 1993	1"≃ 2000'
PROJECT NO.	FIGURE NO.
15-92567	1



RED NUMBERS INDICATE:
BENZENE, TOTAL BTEX, AND TPH CONCENTRATIONS IN mg/kg (ppm)

CURA INC.
2735 VILLA CREEK DRIVE - TWO METRO SQUARE
BLDG C - SUITE 250 - DALLAS, TX 75234
620-7710 FAX - 620-8219

ANDERSON RANCH STATION
SHELL PIPE LINE CORPORATION
LEA COUNTY, NEW MEXICO

DATE:	SCALE:
MAR 1993	SEE ABOVE
PROJECT NO.	FIGURE NO.
15-92567	1

APPENDIX B

BORING/WELL LOGS

CURA INC.
2735 VILLA CREEK DRIVE - TWO METRO SQUARE
BLDG. C - SUITE 250 - DALLAS, TX 75234
620-7117 FAX - 620-8219

RECORD OF SUBSURFACE EXPLORATION

Project No.: 15-92567
Project: ANDERSON RANCH STATION
LEA COUNTY, NEW MEXICO
Drilling Co: CURA
Driller: F.W.R.
Drilling Method: HAND AUGER

Well/Boring #: B-1
Depth of Boring: 1 FOOT
Depth of Well: -
Length of Screen: -
Length of Casing: -
Logged By: F.W.R.

Date Drilled: 12/11/92
Diameter of Boring: 4 INCHES
Diameter of Screen: -
Diameter of Casing: -
Slot Size: -
Well Material: NATIVE SOIL

DEPTH FEET	SOIL DESCRIPTION	SAMPLE NUMBER	SAMPLE TYPE	OVA (PPM)	WELL DESIGN	REMARKS
0	Fractured CALICHE & sandy loam	1		<1	■	Benzene <0.001 mg/kg BTEX=0.047 mg/kg TPH=35 mg/kg
	Bottom of boring @ 1.0 foot					

0, 2.5, 5.0, 7.5, 10.0, 12.5, 15.0, 17.5, 20.0, 22.5, 25.0, 27.5, 30.0

SS-Driven Split Spoon
ST-Pressed Shelby Tube
CA-Continuous Flight Auger
RC-Rock Core
THD-Texas Highway Department Cone
CT-5' Continuous Sampler

ABBREVIATIONS AND SYMBOLS

HSA-Hollow Stem Augers
CFA-Continuous Flight Augers
DC-Driving Casing
MD-Mud Drilling

WATER LEVEL
▽ At Completion
▼ After Hours
● Water on Rods

■ Sample submitted to lab
Bottom Cap
Factory-Slotted Well Screen
Sand Pack
Well Casing
Bentonite Seal
Voloclay Grout Seal

CURA INC.
2735 VILLA CREEK DRIVE - TWO METRO SQUARE
BLDG. C - SUITE 250 - DALLAS, TX 75234
620-7117 FAX - 620-8219

RECORD OF SUBSURFACE EXPLORATION

Project No.: 15-92567
Project: ANDERSON RANCH STATION
LEA COUNTY, NEW MEXICO
-
Drilling Co: CURA
Driller: F.W.R.
Drilling Method: HAND AUGER

Well/Boring #: B-2
Depth of Boring: 2.5 FEET
Depth of Well: -
Length of Screen: -
Length of Casing: -
Logged By: F.W.R.

Date Drilled: 12/11/92
Diameter of Boring: 4 INCHES
Diameter of Screen: -
Diameter of Casing: -
Slot Size: -
Well Material: NATIVE SOIL

DEPTH FEET	SOIL DESCRIPTION	SAMPLE NUMBER	SAMPLE TYPE	OVA (PPM)	WELL DESIGN	REMARKS
0	Fractured CALICHE & sand					
	Buff-white calcareous SAND (caliche)	1		800	■	Benzene <0.001 mg/kg BTEX=0.062 mg/kg TPH=6,300 mg/kg
2.5	Bottom of boring @ 2.5 feet					

0, 2.5, 5.0, 7.5, 10.0, 12.5, 15.0, 17.5, 20.0, 22.5, 25.0, 27.5, 30.0

SS-Driven Split Spoon
ST-Pressed Shelby Tube
CA-Continuous Flight Auger
RC-Rock Core
THD-Texas Highway Department Cone
CT-5' Continuous Sampler

ABBREVIATIONS AND SYMBOLS

HSA-Hollow Stem Augers
CFA-Continuous Flight Augers
DC-Driving Casing
MD-Mud Drilling

WATER LEVEL
▽ At Completion
▼ After Hours
● Water on Rock

■ Sample submitted to lab
Bottom Cap
Factory-Slotted Well Screen
Sand Pack
Well Casing
Bentonite Seal
Voloclay Grout Seal

CURA INC.
2735 VILLA CREEK DRIVE - TWO METRO SQUARE
BLDG. C - SUITE 250 - DALLAS, TX 75234
620-7117 FAX - 620-8219

RECORD OF SUBSURFACE EXPLORATION

Project No: 15-92567
Project: ANDERSON RANCH STATION
LEA COUNTY, NEW MEXICO
-
Drilling Co: HI PLAINS DRILLING
Driller: B.S.
Drilling Method: AIR ROTARY

Well/Boring #: B-3
Depth of Boring: 22 FEET
Depth of Well: -
Length of Screen: -
Length of Casing: -
Logged By: F.W.R.

Date Drilled: 02/08/93
Diameter of Boring: 5 1/8 INCHES
Diameter of Screen: -
Diameter of Casing: -
Slot Size: -
Well Material: GROUT

DEPTH FEET	SOIL DESCRIPTION	SAMPLE NUMBER	SAMPLE TYPE	OVA (PPM)	WELL DESIGN	REMARKS
0	Brown sandy loam & caliche rubble					
2.5		1	SS	<1		
5.0	Buff-pink fine-grained calcareous SAND (caliche)	2	SS	<1	■	Benzene <0.001 mg/kg BTEX=0.015 mg/kg TPH <10 mg/kg
7.5						
10.0		3	SS	<1		
12.5						
15.0		4	SS	<1		
17.5						
20.0		5	SS	2	■	Benzene <0.001 mg/kg BTEX=0.001 mg/kg TPH <10 mg/kg
22.5	Bottom of boring @ 22.0 feet					
25.0						
27.5						
30.0						

SS-Driven Split Spoon
ST-Pressed Shelby Tube
CA-Continuous Flight Auger
RC-Rock Core
THD-Texas Highway Department Cone
CT-5' Continuous Sampler

ABBREVIATIONS AND SYMBOLS

HSA-Hollow Stem Augers
CFA-Continuous Flight Augers
DC-Driving Casing
MD-Mud Drilling

WATER LEVEL
▽ At Completion
▼ After Hours
● Water on Rods

■ Sample submitted to lab
Bottom Cap
Sand Pack
Bentonite Seal
Factory-Slotted Well Screen
Well Casing
Volaclay Grout Seal

CURA INC.
2735 VILLA CREEK DRIVE - TWO METRO SQUARE
BLDG. C - SUITE 250 - DALLAS, TX 75234
620-7117 FAX - 620-8219

RECORD OF SUBSURFACE EXPLORATION

Project No.: 15-92567
Project: ANDERSON RANCH STATION
LEA COUNTY, NEW MEXICO
-
Drilling Co: HI PLAINS DRILLING
Driller: B.S.
Drilling Method: AIR ROTARY

Well/Boring #: B-4
Depth of Boring: 22 FEET
Depth of Well: -
Length of Screen: -
Length of Casing: -
Logged By: F.W.R.

Date Drilled: 02/08/93
Diameter of Boring: 5 1/8 INCHES
Diameter of Screen: -
Diameter of Casing: -
Slot Size: -
Well Material: GROUT

DEPTH FEET	SOIL DESCRIPTION	SAMPLE NUMBER	SAMPLE TYPE	OVA (PPM)	WELL DESIGN	REMARKS
0	Buff-pink fine-grained calcareous SAND & caliche rubble					
2.5	Buff-pink fine-grained calcareous SAND (claiche)	1	SS	<1		
5.0		2	SS	2	■	Benzene <0.001 mg/kg BTEX=0.003 mg/kg TPH=10 mg/kg
7.5						
10.0		3	SS	<1		
12.5						
15.0		4	SS	<1		
17.5						
20.0		5	SS	<1	■	Benzene <0.001 mg/kg BTEX <0.001 mg/kg TPH=10 mg/kg
22.5	Bottom of boring @ 22.0 feet					
25.0						
27.5						
30.0						

SS-Driven Split Spoon
ST-Pressed Shelby Tube
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CT-5' Continuous Sampler

ABBREVIATIONS AND SYMBOLS

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DC-Driving Casing
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WATER LEVEL
▽ At Completion
▼ After Hours
● Water on Rods

■ Sample submitted to lab
Bottom Cap
Sand Pack
Bentonite Seal
Factory-Slotted Well Screen
Well Casing
Voloclay Grout Seal

CRA INC.
2735 VILLA CREEK DRIVE - TWO METRO SQUARE
BLDG. C - SUITE 250 - DALLAS, TX 75234
620-7117 FAX - 620-8219

RECORD OF SUBSURFACE EXPLORATION

Project No.: 15-92567
Project: ANDERSON RANCH STATION
LEA COUNTY, NEW MEXICO
-
Drilling Co: HI PLAINS DRILLING
Driller: B.S.
Drilling Method: AIR ROTARY

Well/Boring #: B-5
Depth of Boring: 17 FEET
Depth of Well: -
Length of Screen: -
Length of Casing: -
Logged By: F.W.R.

Date Drilled: 02/08/93
Diameter of Boring: 5 1/8 INCHES
Diameter of Screen: -
Diameter of Casing: -
Slot Size: -
Well Material: GROUT

DEPTH FEET	SOIL DESCRIPTION	SAMPLE NUMBER	SAMPLE TYPE	OVA (PPM)	WELL DESIGN	REMARKS
0	Buff-pink fine-grained calcareous SAND & caliche rubble					
2.5	Buff-pink fine-grained calcareous SAND (claiche)	1	SS	<1		
5.0		2	SS	<1	■	Benzene <0.001 mg/kg BTEX=0.002 mg/kg TPH <10 mg/kg
7.5						
10.0		3	SS	<1		
12.5						
15.0		4	SS	<1	■	Benzene <0.001 mg/kg BTEX <0.001 mg/kg TPH=20 mg/kg
17.5	Bottom of boring @ 17.0 feet					
20.0						
22.5						
25.0						
27.5						
30.0						

SS-Driven Split Spoon
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ABBREVIATIONS AND SYMBOLS

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WATER LEVEL
▽ At Completion
▼ After Hours
● Water on Rods

■ Sample submitted to lab
Bottom Cap
Sand Pack
Bentonite Seal
Factory-Slotted Well Screen
Well Casing
Volaclay Grout Seal

CURA INC.
2735 VILLA CREEK DRIVE - TWO METRO SQUARE
BLDG. C - SUITE 250 - DALLAS, TX 75234
620-7117 FAX - 620-8219

RECORD OF SUBSURFACE EXPLORATION

Project No.: 15-92567
Project: ANDERSON RANCH STATION
LEA COUNTY, NEW MEXICO
-
Drilling Co: HI PLAINS DRILLING
Driller: B.S.
Drilling Method: AIR ROTARY

Well/Boring #: B-6
Depth of Boring: 22 FEET
Depth of Well: -
Length of Screen: -
Length of Casing: -
Logged By: F.W.R.

Date Drilled: 02/08/93
Diameter of Boring: 5 1/8 INCHES
Diameter of Screen: -
Diameter of Casing: -
Slot Size: -
Well Material: GROUT

DEPTH FEET	SOIL DESCRIPTION	SAMPLE NUMBER	SAMPLE TYPE	OVA (PPM)	WELL DESIGN	REMARKS
0	Buff-pink fine-grained calcareous SAND (claiche)					
2.5		1	SS	<1		
5.0		2	SS	<1	■	Benzene <0.001 mg/kg BTEX=0.002 mg/kg TPH=10 mg/kg
7.5						
10.0		3	SS	<1		
12.5						
15.0		4	SS	1	■	Benzene <0.001 mg/kg BTEX=0.001 mg/kg TPH=10 mg/kg
17.5						
20.0		5	SS	<1	■	Benzene <0.001 mg/kg BTEX=0.001 mg/kg TPH=10 mg/kg
22.5	Bottom of boring @ 22.0 feet					
25.0						
27.5						
30.0						

ABBREVIATIONS AND SYMBOLS

SS-Driven Split Spoon
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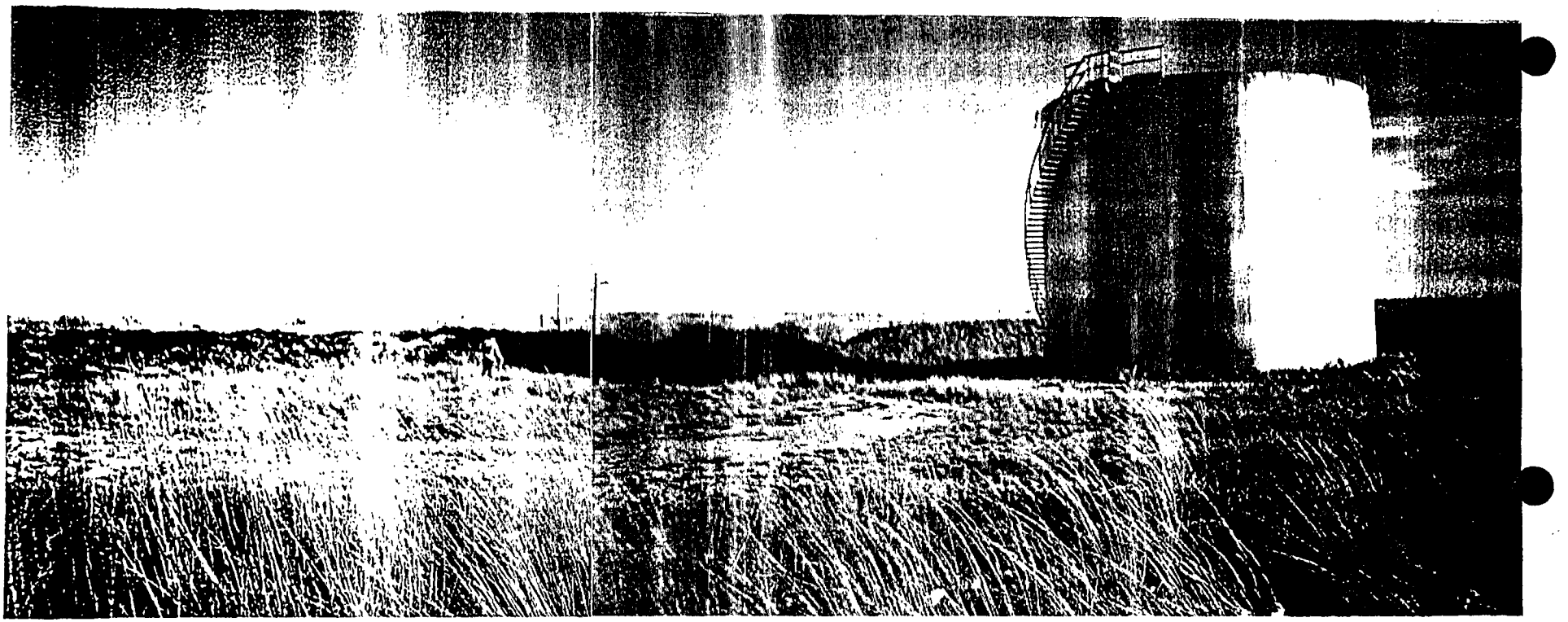
WATER LEVEL
▽ At Completion
▼ After Hours
● Water on Rods

■ Sample submitted to lab
Bottom Cap
Sand Pack
Bentonite Seal
Factory-Slotted Well Screen
Well Casing
Volaclay Grout Seal



Photograph 1: View of Anderson Ranch Station Tank Battery with former tank pad on the left and inactive tank on the right.

10.0 REFERENCES

Code of Federal Regulations, Title 40 §§ 280 and 281.

Groat, C. G., 1976. Geologic Atlas of Texas (Hobbs Sheet). Bureau of Economic Geology, The University of Texas at Austin. Austin, Texas.

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Oil Conservation Division, Environmental Regulations, 1992. Energy, Minerals and Resources Department, Santa Fe, New Mexico.

Turner, M.T., et al., 1974. Soil Survey of Lea County, New Mexico. United States Department of Agriculture Soil Conservation Service, in cooperation with the New Mexico Agricultural Experiment Station. U.S. Publishing Office: Washington, D.C.

USGS Topographic Survey Map. Buckeye NW, New Mexico, Quadrangle. 1985.

Shell Oil Company

Two Shell Plaza
P.O. Box 2099
Houston, TX 77252

January 21, 1993

New Mexico Oil Conservation Commission
Environmental Bureau
ATTN Mr. Bill Olson
P. O. Box 2088
Santa Fe, NM 87504-2008

Gentlemen:

SUBJECT: SHELL PIPE LINE CORPORATION - SITE ASSESSMENTS OF FIVE CRUDE OIL GATHERING AND TRANSPORTATION LOCATIONS - HOBBS AREA

I contacted Mr. Jerry Sexton of your Hobbs office on December 7, 1992 to advise that we would be conducting site assessments on five locations that we plan to sell in the Hobbs area. These locations are:

Denton Station
Hugh Station
Lea Station
Dublin Station
Anderson Ranch Station

We have completed the initial phase of the site assessments. Contamination was found at each site and we are planning to do additional assessment work to determine the extent of the contamination and other site data. We encountered groundwater at the Lea Station in one boring and installed a monitoring well.

The TPH values of the soil at the five locations ranged between N.D and 15,000 ppm. Benzene concentrations were all less than .001 ppm. The analytical results in ppm of the monitoring well water sample at Lea Station were .44 benzene, .005 toluene, 0.120 ethyl/benzene, .063 xylene, 0.628 total BTEX, 3 TPH and 2,380 TDS.

Your agency will be contacted after the data is compiled.

If you have any questions, please contact me at (713) 241-1001.

Sincerely,

John B. Hite, Engineering Advisor
General Engineering

cc: New Mexico Oil Conservation Department
Jerry Sexton
P. O. Box 1980
Hobbs, NM 88240

CURA, Inc.
Greg C. Walterscheid, R.E.M.
2735 Villa Creek Drive
Building C, Suite 250
Dallas, TX 75234