1R - 240

REPORTS

DATE:

1995-1993

Shell Oil Products Company

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

HAND DELIVERED

December 6, 1995

RECEIVED

DEC 0 8 1995

Environmental Bureau
Oil Conservation Division

William Olson
State of New Mexico Oil Conservation Division
Environmental Bureau
2040 S. Pacheco St.
Santa Fe, New Mexico 87504

SUBJECT: QUARTERLY REPORTS, DENTON AND LEA STATIONS, LEA COUNTY NEW MEXICO

Dear Mr. Olson,

Enclosed are the fourth quarter 1995 groundwater monitoring reports for Lea and Denton Stations. Product recovery continues at both locations and there were no significant changes in water quality or groundwater elevations during the report period. No additional wells developed phase separated hydrocarbon. We can discuss this further on the 8th.

Sincerely,

Neal Stidham
Staff Engineer
Shell Oil Products Company
Representing Shell Pipe Line Corporation

cc: Paul Newman (w/copy)
EOTT Energy Corp.

Jerry Sexton (w/copy)
OCD-Hobbs

CURA INC.
Engineering & Environmental Consultants
10301 Northwest Freeway • Suite 400 • Houston, Texas 77092 • 713/686-0050 • FAX 713/686-8656

November 27, 1995

Mr. Neal D. Stidham
Shell Oil Products Company
Two Shell Plaza, Room 1452
777 Walker Street
Houston, Texas 77002

RE: QUARTERLY GROUNDWATER MONITORING REPORT
FOURTH QUARTER, 1995
LEA STATION
LEA COUNTY, NEW MEXICO

CURA PROJECT NO. 24-93677

Mr. Stidham:

CURA, Inc., has completed the groundwater monitoring and sampling operations at the above-referenced site. The work was performed in accordance with the scope of services requested by Shell Oil Products Company in your letter dated January 25, 1995.

Monitoring wells MW-1 through MW-13 were gauged and checked for phase-separated hydrocarbons (PSH) on October 17, 1995. Following gauging operations, monitoring wells MW-3, MW-4, MW-6, MW-7, MW-9, MW-10, MW-12 and MW-13 were developed and sampled. In accordance with water quality monitoring requirements set forth by the New Mexico Oil Conservation Division (NMOCD), the groundwater samples were analyzed for benzene, toluene, ethylbenzene, and total xylenes (BTEX). The New Mexico Water Quality Control Commission (WQCC) regulations do not contain a groundwater standard for total petroleum hydrocarbons (TPH). Therefore, the NMOCD does not require that groundwater samples be analyzed for TPH. In addition to laboratory analysis for BTEX, dissolved oxygen (DO) levels for each sampled well were measured during field operations. Monitoring wells MW-1, MW-2, MW-5, MW-8, and MW-11 were not sampled due to the presence of PSH.

Groundwater Sampling and PSH Recovery

The monitoring wells were gauged on October 12, 1995, to determine the depth to groundwater and PSH thickness (if any). A summary of groundwater elevations and PSH thicknesses is presented in Table 1, Appendix B.

PSH was initially observed on site in September, 1993, with approximately 0.04 feet of PSH measured in monitoring well MW-8. Following soil vapor extraction (SVE) feasibility testing in December, 1993, in which monitoring well MW-8 was employed as a vapor extraction well, PSH thickness increased to 2.84 feet in MW-8 and measurable PSH was observed for the first time in monitoring wells MW-1 and MW-11. Expanded PSH recovery operations were then initiated at the site. PSH has since been observed in monitoring wells MW-2 and MW-5.

In February, 1995, a remediation system consisting of SVE with product-only pumping was installed at the site. The system was designed with high vacuum levels at the wellheads in an effort to induce oil flow towards the wells as observed during pilot testing. Oil drawn to the wells is immediately evacuated by the pumps; however, consistent oil recharge to the wells has been poor. Frequent adjustments have been made to the system in an effort to enhance recovery operations. The system has been temporarily run with the SVE unit turned off, the ambient air bleed valve has been adjusted and the pumps have been removed and inspected. Adjustments are ongoing to establish a wellhead vacuum pressure that encourages oil migration to the wells, yet prevents excessive upward coning of water thought to be restricting oil flow. Regardless of system adjustment, the high viscosity of the oil results in low recharge rates to the wells and poor oil recovery by the remediation system. During the fourth quarter of 1995, approximately 6 gallons of crude oil were recovered by the system,and an estimated 5.5 gallons were recovered by hydrocarbon absorbing booms located across the site. A combined estimated total of 11.5 gallons of crude oil were recovered during the fourth quarter, resulting in a cumulative total of approximately 76 gallons of oil recovered from Lea Station.

Monitoring well gauging data obtained on October 17, 1995, indicates that the apparent direction of groundwater flow is toward the southeast which is consistent with previous measurements.

PSH was observed in monitoring wells MW-1, MW-2, MW-5, MW-8, and MW-11 during gauging operations.

The monitoring wells were purged by removing approximately three well volumes of water or bailing the wells dry. During well purging operations, approximately 70 gallons of water was removed from monitoring wells MW-3, MW-4, MW-6, MW-7, MW-9, MW-10, MW-12, and MW-13. The purged groundwater is stored on-site in labelled 55-gallon drums pending sampling and proper disposal.

After development, DO measurements were performed on site and groundwater samples were obtained from the monitoring wells using a disposable bailer. The groundwater samples were preserved at 4°C in accordance with EPA protocol for shipment to SPL Laboratories in Houston, Texas, for analysis of BTEX using EPA Method 8020. Quality Assurance/Quality Control information is included in Appendix D.

Analytical Results

The groundwater samples obtained on October 17, 1995, indicate no significant change in dissolved hydrocarbon concentrations or in the distribution of PSH thicknesses across the site since the last sampling event in July, 1995. Downgradient monitoring wells MW-4, MW-9, and MW-10 (east side) and MW-6 and MW-7 (west side) continue to record dissolved hydrocarbon concentrations near or below method detection limits indicating that the hydrocarbon impacted groundwater remains restricted to apparently two separate areas.

DO concentrations were obtained as a possible indicator of the natural biological activity of hydrocarbon degrading microorganisms in the groundwater. Microbial and mineral oxidation reactions within a dissolved hydrocarbon plume typically result in depletion of DO. DO levels measured during October sampling generally indicate sufficient dissolved oxygen is present to promote natural biodegradation of hydrocarbons. CURA will continue to monitor DO levels as a means of documenting the occurrence of natural attenuation. A summary of groundwater analytical results is presented in Table 2, Appendix B. The laboratory reports and chain-of-custody are included in Appendix C.

CURA appreciates the opportunity to provide you with our professional consulting services. If you have any questions regarding the information presented, please contact Brad Smith at (713) 686-0050.

Respectfully,
CURA, Inc.

for James W. Leach
Environmental Geologist

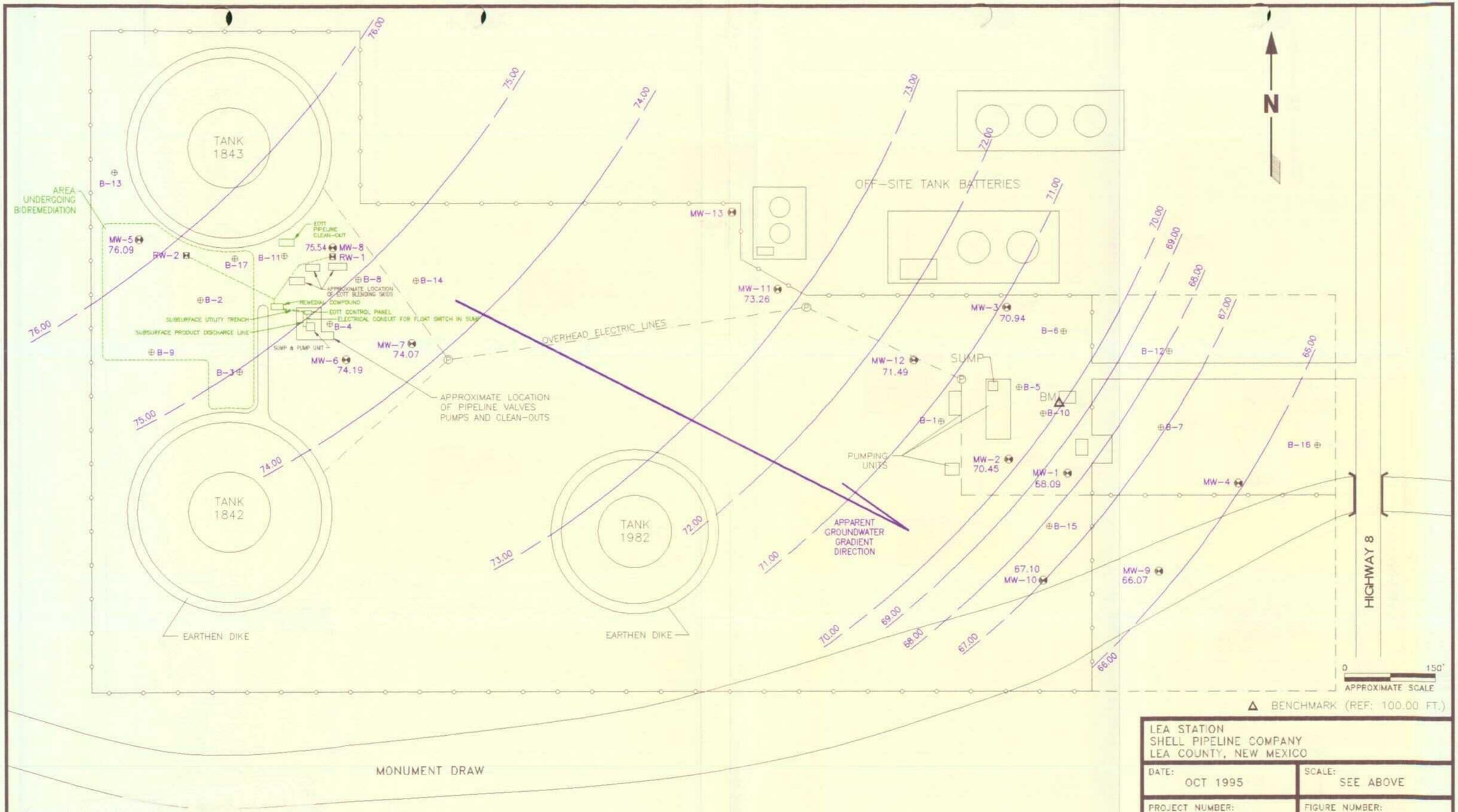
Bradley S. Smith
Project Manager

Enclosures

APPENDICES

APPENDIX A

FIGURES



△ BENCHMARK (REF: 100.00 FT.)

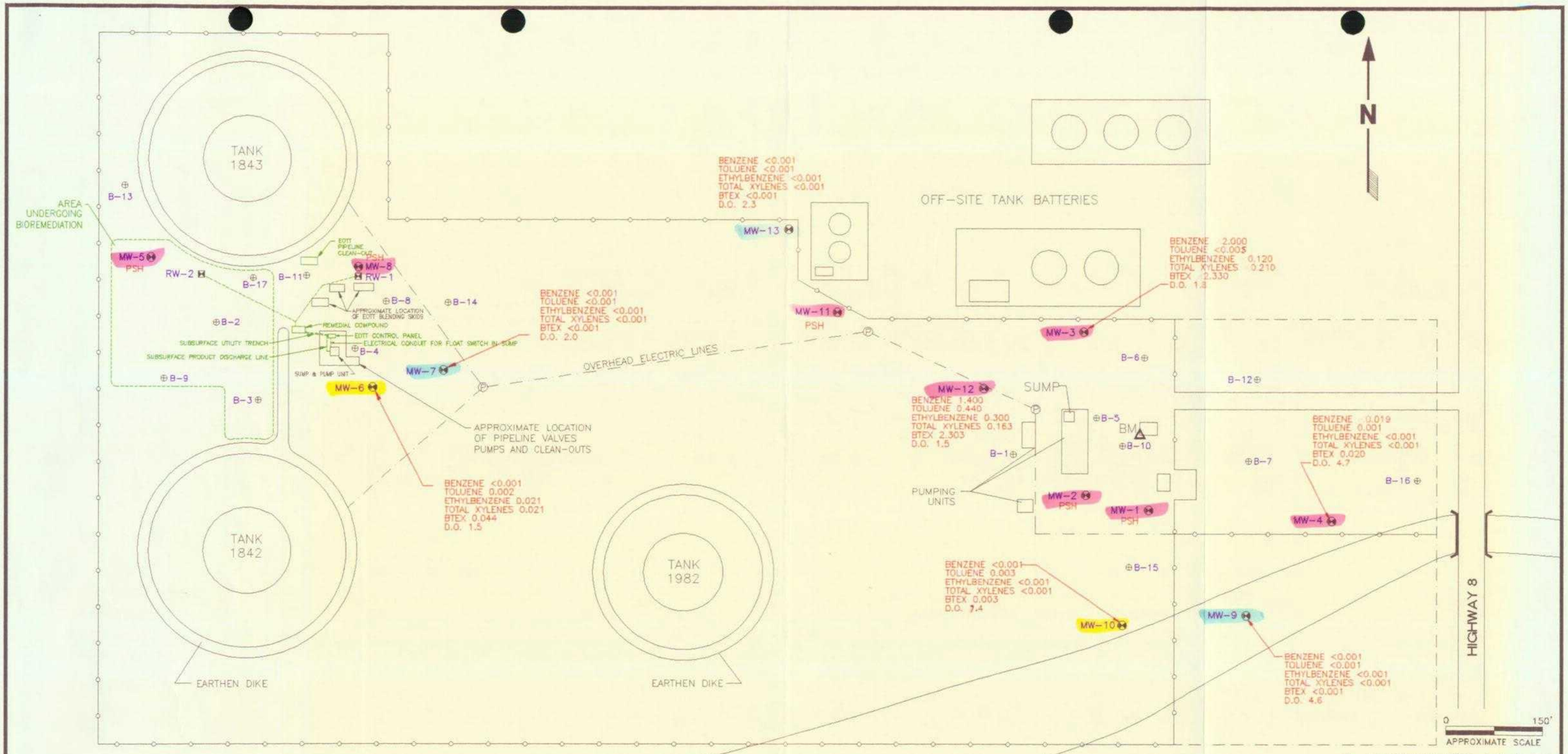
GROUNDWATER GRADIENT MAP

- GROUNDWATER ELEVATIONS OBTAINED 10/17/95
- CONTOUR INTERVAL = 1.00 FOOT
- MW-13 AND MW-4 NOT USED IN DETERMINING GROUNDWATER GRADIENT

LEA STATION
SHELL PIPELINE COMPANY
LEA COUNTY, NEW MEXICO

DATE:	SCALE:
OCT 1995	SEE ABOVE
PROJECT NUMBER: 24-93677	FIGURE NUMBER: 1

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



△ BENCHMARK (REF: 100.00 FT.)

DISSOLVED HYDROCARBON MAP

SAMPLES OBTAINED ON 10/17/95
MONITOR WELLS HYDROCARBON CONCENTRATIONS IN mg/l (ppm)

LEA STATION
SHELL PIPELINE COMPANY
LEA COUNTY, NEW MEXICO

DATE:	SCALE:
OCT 1995	SEE ABOVE
PROJECT NUMBER: 24-93677	FIGURE NUMBER: 2

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

APPENDIX B

TABLES

TABLE 1
SUMMARY OF RELATIVE GROUNDWATER LEVEL ELEVATIONS AND PHASE-SEPARATED HYDROCARBON THICKNESSES

Monitoring Well	Date Gauged	Relative Ground Surface Elevation (feet)	Relative Top of Casing Elevation (feet)*	Depth to Water Below Top of Casing (feet)	Corrected Relative Groundwater Elevation (feet)**	Phase-Separated Hydrocarbon Thickness (feet)
MW-1	02/03/95	98.88	100.73	30.97	69.85	0.11
	04/25/95	98.88	100.73	29.54	71.30	0.14
	07/19/95	98.88	100.73	29.27	70.83	0.12
	10/17/95	**98.88**	**100.73**	**33.15**	**68.09**	**0.63**
MW-2	02/03/95	102.37	31.92	31.92	70.54	0.11
	04/25/95	102.37	30.24	30.24	72.24	0.14
	07/19/95	102.37	30.24	30.16	72.08	0.16
	10/17/95	**100.78**	**102.37**	**32.04**	**70.45**	**0.15**
MW-3	02/03/95	101.79	103.61	31.53	72.08	Trace
	04/25/95	101.79	103.61	34.25	69.36	0.00
	07/19/95	101.79	103.61	32.20	71.41	0.00
	10/17/95	**101.79**	**103.61**	**32.67**	**70.94**	**0.00**
MW-4	02/03/95	93.80	96.08	27.91	68.17	0.00
	04/25/95	93.80	96.08	28.13	67.95	0.00
	07/19/95	93.80	96.08	28.27	68.81	0.00
	10/17/95	**93.80**	**96.08**	**27.20**	**68.88**	**0.00**
MW-5	02/03/95	107.08	109.21	35.35	73.96	0.13
	04/25.95	107.08	109.21	30.42	79.35	0.00
	07/19/95	107.08	109.21	33.08	76.17	0.06
	10/17/95	**107.08**	**109.21**	**33.26**	**76.09**	**0.18**
MW-6	02/03/95	103.66	106.26	30.46	75.80	0.00
	04/25.95	103.66	106.26	31.62	74.64	0.00
	07/19/95	103.66	106.26	31.24	75.02	0.00
	10/17/95	**103.66**	**106.26**	**32.07**	**74.19**	**0.00**
MW-7	02/03/95	104.34	106.27	31.16	75.11	0.00
	04/25/95	104.34	106.27	32.41	73.86	0.00
	07/19/95	104.34	106.27	31.80	74.47	0.00
	10/17/95	**104.34**	**106.27**	**32.20**	**74.07**	**0.00**

TABLE 1
SUMMARY OF RELATIVE GROUNDWATER LEVEL ELEVATIONS AND PHASE-SEPARATED HYDROCARBON THICKNESSES

Monitoring Well	Date Gauged	Relative Ground Surface Elevation (feet)	Relative Top of Casing Elevation (feet)*	Depth to Water Below Top of Casing (feet)	Corrected Relative Groundwater Elevation (feet)**	Phase-Separated Hydrocarbon Thickness (feet)
MW-8	02/03/95	105.52	107.44	33.69	76.71	3.61
	04/25/95	105.52	107.44	31.87	78.10	3.07
	07/19/95	105.52	107.44	30.77	78.64	2.40
	10/17/95	**105.52**	**107.44**	**33.22**	**75.54**	**1.60**
MW-9	02/03/95	93.76	97.21	29.90	67.31	0.00
	04/25/95	93.76	97.21	31.13	66.08	0.00
	07/19/95	93.76	97.21	30.34	66.87	0.00
	10/17/95	**93.76**	**97.21**	**31.14**	**66.07**	**0.00**
MW-10	02/03/95	99.63	102.51	35.40	67.11	0.00
	04/25/95	99.63	102.51	33.93	68.59	0.00
	07/19/95	99.63	102.51	35.71	66.80	0.00
	10/17/95	**99.63**	**102.51**	**35.41**	**67.10**	**0.00**
MW-11	02/03/95	104.48	105.62	33.14	73.40	1.12
	04/25/95	104.48	105.62	34.41	72.40	1.45
	07/19/95	104.48	105.62	31.64	73.98	Trace
	10/17/95	**104.48**	**105.62**	**32.48**	**73.26**	**0.15**
MW-12	02/03/95	--	103.90	31.79	72.11	0.00
	04/25/95	--	103.90	30.17	73.73	0.00
	07/19/95	--	103.90	31.84	72.06	0.00
	10/17/95	**--**	**103.90**	**32.41**	**71.49**	**0.00**
MW-13	02/03/95	--	103.89	29.65	74.24	0.00
	04/25/95	--	103.89	28.75	75.14	0.00
	07/19/95	--	103.89	30.31	73.58	0.00
	10/17/95	**--**	**103.89**	**32.61**	**71.28**	**0.00**

* Measured from a relative datum (benchmark = 100.00 feet). The monitor well casings were marked to provide consistent reference points for future gauging operations.

** Correction Equation for Phase-Separated Hydrocarbons: Corrected Groundwater Elevation = Top of Casing Elevation - (Depth to Water Below Top of Casing - [SG] [PSH Thickness])
Specific Gravity (SG) = 0.82 for crude oil.

TABLE 2
WATER SAMPLE ANALYTICAL RESULTS

Monitoring Well	Date Sampled	Benzene	Toluene	Ethyl-benzene	Xylenes	Total BTEX	TPH	DO
MW-1	02/09/95	PSH	PSH	PSH	PSH	PSH	PSH	--
	04/25/95	PSH	PSH	PSH	PSH	PSH	PSH	--
	07/19/95	PSH	PSH	PSH	PSH	PSH	PSH	--
	10/17/95	**PSH**	**PSH**	**PSH**	**PSH**	**PSH**	**PSH**	**--**
MW-2	02/09/95	PSH	PSH	PSH	PSH	PSH	PSH	--
	04/25/95	PSH	PSH	PSH	PSH	PSH	PSH	--
	07/19/95	PSH	PSH	PSH	PSH	PSH	PSH	--
	10/17/95	**PSH**	**PSH**	**PSH**	**PSH**	**PSH**	**PSH**	**--**
MW-3	02/09/95	1.30	<0.005	0.260	0.090	1.650	--	0.5
	04/25/95	NS	NS	NS	NS	NS	--	--
	07/19/95	NS	NS	NS	NS	NS	--	--
	10/17/95	**2.000**	**<0.005**	**0.120**	**0.210**	**2.330**	**--**	**1.8**
MW-4	02/09/95	<0.001	<0.001	<0.001	<0.001	<0.001	--	0.6
	04/25/95	<0.001	<0.001	<0.001	<0.001	<0.001	--	2.4
	07/19/95	<0.001	<0.001	<0.001	<0.001	<0.001	--	2.8
	10/17/95	**0.019**	**0.001**	**<0.001**	**<0.001**	**0.020**	**--**	**4.7**
MW-5	02/09/95	PSH	PSH	PSH	PSH	PSH	PSH	--
	04/25/95	PSH	PSH	PSH	PSH	PSH	PSH	--
	07/19/95	PSH	PSH	PSH	PSH	PSH	PSH	--
	10/17/95	**PSH**	**PSH**	**PSH**	**PSH**	**PSH**	**PSH**	**--**
MW-6	02/09/95	0.001	<0.001	0.002	0.011	0.014	--	0.8
	04/25/95	<0.001	<0.001	<0.001	<0.001	<0.001	--	3.4
	07/19/95	<0.001	<0.001	0.002	0.019	0.021	--	3.8
	10/17/95	**<0.001**	**0.002**	**0.021**	**0.021**	**0.044**	**--**	**1.5**
MW-7	02/09/95	<0.001	<0.001	<0.001	<0.001	<0.001	--	1.8
	04/25/95	<0.001	<0.001	<0.001	<0.001	<0.001	--	5.0
	07/19/95	<0.001	<0.001	<0.001	<0.001	<0.001	--	5.2
	10/17/95	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**--**	**2.0**
MW-8	02/09/95	PSH	PSH	PSH	PSH	PSH	PSH	--
	04/25/95	PSH	PSH	PSH	PSH	PSH	PSH	--
	07/19/95	PSH	PSH	PSH	PSH	PSH	PSH	--
	10/17/95	**PSH**	**PSH**	**PSH**	**PSH**	**PSH**	**PSH**	**--**
MW-9	02/09/95	<0.001	<0.001	<0.001	<0.001	<0.001	--	4.6
	04/25/95	<0.001	<0.001	<0.001	<0.001	<0.001	--	5.2
	07/19/95	<0.001	<0.001	<0.001	<0.001	<0.001	--	6.7
	10/17/95	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**--**	**4.6**

TABLE 2
WATER SAMPLE ANALYTICAL RESULTS

Monitoring Well	Date Sampled	Benzene	Toluene	Ethyl-benzene	Xylenes	Total BTEX	TPH	DO
MW-10	02/09/95	<0.001	<0.001	<0.001	<0.001	<0.001	--	1.2
	04/25/95	0.001	<0.001	<0.001	<0.001	0.001	--	1.4
	07/19/95	0.002	<0.001	<0.001	<0.001	0.003	--	3.6
	10/17/95	**<0.001**	**0.003**	**<0.001**	**<0.001**	**0.003**	**--**	**7.4**
MW-11	02/09/95	PSH	PSH	PSH	PSH	PSH	PSH	--
	04/25/95	PSH	PSH	PSH	PSH	PSH	PSH	--
	07/25/95	PSH	PSH	PSH	PSH	PSH	PSH	--
	10/17/95	**PSH**	**PSH**	**PSH**	**PSH**	**PSH**	**PSH**	**--**
MW-12	02/09/95	0.590	0.009	0.430	0.067	1.096	--	0.8
	04/25/95	--	--	--	--	--	--	--
	07/19/95	0.580	0.130	0.076	0.032	0.818	--	0.4
	10/17/95	**1.400**	**0.440**	**0.300**	**0.163**	**2.303**	**--**	**1.5**
MW-13	02/09/95	<0.001	<0.001	<0.001	<0.001	<0.001	--	1.0
	04/25/95	--	--	--	--	--	--	--
	07/19/95	<0.001	<0.001	<0.001	<0.001	<0.001	--	1.6
	10/17/95	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**--**	**2.3**

BTEX results listed in mg/l (parts per million; ppm), method detection limits are listed on the certificates of analysis. 0TPH and DO results listed in mg/l (parts per million; ppm) with a method detection limit of 1 ppm.
Analyses were conducted using EPA Method 8020 (BTEX), EPA Method 418.1 (TPH), and EPA Method 160.1 (TDS) by SPL Environmental Laboratories and CEL Laboratories.
-- Not sampled
A total dissolved solids (TDS) concentration of 2,380 ppm was reported for MW-1 in December, 1992. A TDS concentration of 2,500 ppm was recorded for MW-6 in February, 1993 and a TDS level of 2,130 was recorded for MW-9 in August, 1993.

TABLE 3
PHASE-SEPARATED HYDROCARBON RECOVERY

Monitoring Well	Date	PSH Thickness (feet)	PSH Recovery (gallons)	PSH Cumulative Recovery (gallons)	Type of Recovery
MW-1	02/03/95	0.11	0.3	6.4	Hand bailed
	03/28/95	Trace	0.3	6.7	Boom absorption
	04/25/95	0.14	0.4	7.1	Boom absorption
	07/19/95	0.12	0.5	7.6	Boom absorption
	10/17/95	**0.63**	1.5	**9.1**	Boom absorption
MW-2	02/03/95	0.11	0.8	3.1	Hand bailed/boom installed
	03/28/95	0.05	0.1	3.2	Boom absorption
	04/25/95	0.14	0.3	3.5	Boom absorption
	07/19/95	0.16	0.5	4.0	Boom absorption
	10/17/95	**0.15**	**0.5**	**4.5**	Boom absorption
MW-3	02/03/95	Trace	0.0	0.0	Boom absorption
	03/28/95	Trace	0.0	0.0	Boom absorption
	04/25/95	Trace	0.0	0.0	Boom absorption
	07/19/95	0.00	0.0	0.0	Boom absorption
	10/17/95	**0.00**	**0.0**	**0.0**	Boom absorption
MW-5	02/03/95	0.08	0.7	3.3	Hand bailed
	03/28/95	0.07	0.2	3.5	Boom absorption
	04/25/95	0.13	0.3	3.8	Boom absorption
	07/19/95	0.06	0.5	4.3	Boom absorption
	10/17/95	**0.18**	**1.0**	**5.3**	Boom absorption
MW-8	02/03/95	3.61	1.8	27.3	Hand bailed
	03/28/95	2.67	0.8	28.1	Boom absorption
	04/25/95	3.07	1.0	29.1	Boom absorption
	07/19/95	2.40	1.0	30.1	Boom absorption
	10/17/95	**1.60**	**1.5**	**31.6**	Boom absorption
MW-11	02/03/95	1.12	2.4	7.2	Hand bailed
	03/28/95	0.71	0.5	7.7	Boom absorption
	04/25/95	1.45	0.8	8.5	Boom absorption
	07/19/95	Trace	0.0	8.5	Boom absorption
	10/17/95	**0.15**	**1.0**	**9.5**	Boom absorption
RW-1	05/18/95	--	2.0	2.0	Recovery system
	07/19/95	--	3.0 (est.)	5.0	Recovery system
	10/17/95	**--**	**3.0**	**8.0**	Recovery system
RW-2	05/18/95	--	3.0	3.0	Recovery system
	07/19/95	--	2.0 (est.)	5.0	Recovery system
	10/17/95	**--**	**3.0**	**8.0**	Recovery system

-- PSH not measured because of equipment in well.
Cumulative product recovery as of 10/17/95 = 76 gallons.

APPENDIX C

ANALYTICAL RESULTS

4510813

SHELL OIL COMPANY
RETAIL ENVIRONMENTAL ENGINEERING

CHAIN OF CUSTODY RECORD NO. H 23475

Date: 10-18-95
Page 1 of 1

SITE ADDRESS: Shell Pipe Line Lea Station
~~Bill~~ # 24-93677504
CONSULTANT NAME & ADDRESS: CURA Inc. 731 W. Wadley, L-200, Midland TX
CONSULTANT CONTACT: Brad Smith (Houston)
PHONE: (915) 570-8408 FAX: (915) 570-8409
SAMPLED BY: Bill D. Smith

CHECK ONE BOX ONLY CT/DT

- QUARTERLY MONITORING ☒ 5461
- SITE INVESTIGATION ☐ 5441
- SOIL FOR DISPOSAL ☐ 5442
- WATER FOR DISPOSAL ☐ 5443
- AIR SAMPLER - SYS O+M ☐ 5452
- WATER SAMPLE - SYS O+M ☐ 5453
- OTHER ☐

SAMPLE I.D.	DATE	TIME	COMP.	GRAB	MATRIX: H2O	SOIL	AIR	SLUDGE	OTHER	METHOD PRESERVED: HCl	HNO3	H2SO4	NONE	OTHER	NO. OF CONTAINERS	CONTAINER SIZE	ANALYSIS REQUEST: BTEX 602 ☐ / 8020 ☒ WITH MTBE ☐	BTEX/GAS HYDROCARBONS PID/FID ☐ WITH MTBE	VOL 624/PPL ☐ 8240/TAL ☐ NBS (+15) ☐	PNA/PAH 8310 ☐ 8100 ☐ 610 ☐	SEMI - VOL 625/PPL ☐ 8270/TAL ☐ NBS (+25) ☐	TPH/IR 418.1 ☐ SM503 ___ ☐ ___ ☐	TPH/GC 8015 Mod. GAS ☐ 8015 Mod DIESEL ☐	TCLP METALS ☐ VOL ☐ SEMI-VOL ☐ PEST ☐ HERB ☐	EP TOX METALS ☐ PESTICIDES ☐ HERBICIDES ☐	REACTIVITY ☐ CORROSIVITY ☐ IGNITABILITY ☐	OTHER	REMARKS
MW-4	10-17-95	1030		✓	✓					✓				✓	3	40 ml	✓											
MW-9	10-17-95	1100		✓	✓					✓				✓	3	40 ml	✓											
MW-10	10-17-95	1130		✓	✓					✓				✓	3	40 ml	✓											
MW-7	10-17-95	1200		✓	✓					✓				✓	3	40 ml	✓											
MW-13	10-17-95	1230		✓	✓					✓				✓	3	40 ml	✓											
MW-6	10-17-95	1300		✓	✓					✓				✓	3	40 ml	✓											
MW-3	10-17-95	1330		✓	✓					✓				✓	3	40 ml	✓											
MW-12	10-17-95	1400		✓	✓					✓				✓	3	40 ml	✓											

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME
Bill D. Smith	10-18-95	1100			
RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME
RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME
			S. West	10/19/95	1031

BILL NO.:
LABORATORY:
SHELL CONTACT: PHONE: FAX:

TURN AROUND TIME (CHECK ONE)
7 DAYS ☐ 14 DAYS ☐ (NORMAL)
48 HOURS ☐ 4°C Intact OTHER ☐

THE LABORATORY MUST PROVIDE A COPY OF THIS CHAIN OF CUSTODY WITH INVOICE AND RESULTS

DISTRIBUTION: PINK Sampling Coordinator - WHITE & YELLOW Accompanies Shipment - WHITE Returned with Report

CORRECTED COPY

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Certificate of Analysis No. H9-9510813-07

Shell Pipe Line Corporation
P.O. Box 2648
Houston, TX 77252
ATTN: Neal Stidham

P.O.# MESA-CAO-B-131201-PX-4204-NS
DATE: 11/27/95

PROJECT: 24-93677504
SITE: Lea Station ←
SAMPLED BY: Cura, Inc.
SAMPLE ID: MW-3

PROJECT NO: H 23475
MATRIX: WATER
DATE SAMPLED: 10/17/95 13:30:00
DATE RECEIVED: 10/19/95

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	2000	5 P	µg/L
TOLUENE	ND	5 P	µg/L
ETHYLBENZENE	120	5 P	µg/L
TOTAL XYLENE	210	5 P	µg/L
TOTAL VOLATILE AROMATIC HYDROCARBONS	2330		µg/L

Surrogate	% Recovery
1,4-Difluorobenzene	102
4-Bromofluorobenzene	108

METHOD 8020***
Analyzed by: VHZ
Date: 10/30/95

(P) - Practical Quantitation Limit ND - Not detected.

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
**Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.
***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

SPL, Inc., - Project Manager

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HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Certificate of Analysis No. H9-9510813-01

Shell Pipe Line Corporation
P.O. Box 2648
Houston, TX 77252
ATTN: Neal Stidham

P.O.# MESA-CAO-B-131201-PX-4204-NS
DATE: 11/27/95

PROJECT: 24-93677504
SITE: Lea Station
SAMPLED BY: Cura, Inc.
SAMPLE ID: MW-4

PROJECT NO: H 23475
MATRIX: WATER
DATE SAMPLED: 10/17/95 10:30:00
DATE RECEIVED: 10/19/95

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	19	1 P	µg/L
TOLUENE	1	1 P	µg/L
ETHYLBENZENE	ND	1 P	µg/L
TOTAL XYLENE	ND	1 P	µg/L
TOTAL VOLATILE AROMATIC HYDROCARBONS	20		µg/L

Surrogate	% Recovery
1,4-Difluorobenzene	95
4-Bromofluorobenzene	81

METHOD 8020***
Analyzed by: AA
Date: 10/21/95

(P) - Practical Quantitation Limit ND - Not detected.

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
**Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.
***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

SPL, Inc., - Project Manager

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HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Certificate of Analysis No. H9-9510813-06

Shell Pipe Line Corporation
P.O. Box 2648
Houston, TX 77252
ATTN: Neal Stidham

P.O.# MESA-CAO-B-131201-PX-4204-NS
DATE: 11/27/95

PROJECT: 24-93677504
SITE: Lea Station
SAMPLED BY: Cura, Inc.
SAMPLE ID: MW-6

PROJECT NO: H 23475
MATRIX: WATER
DATE SAMPLED: 10/17/95 13:00:00
DATE RECEIVED: 10/19/95

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	ND	1 P	µg/L
TOLUENE	2	1 P	µg/L
ETHYLBENZENE	21	1 P	µg/L
TOTAL XYLENE	21	1 P	µg/L
TOTAL VOLATILE AROMATIC HYDROCARBONS	44		µg/L

Surrogate	% Recovery
1,4-Difluorobenzene	90
4-Bromofluorobenzene	78

METHOD 8020***
Analyzed by: AA
Date: 10/21/95

ND - Not detected. (P) - Practical Quantitation Limit

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
**Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.
***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

SPL, Inc., - Project Manager

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HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Certificate of Analysis No. H9-9510813-04

Shell Pipe Line Corporation
P.O. Box 2648
Houston, TX 77252
ATTN: Neal Stidham

P.O.# MESA-CAO-B-131201-PX-4204-NS
DATE: 11/27/95

PROJECT: 24-93677504
SITE: Lea Station
SAMPLED BY: Cura, Inc.
SAMPLE ID: MW-7

PROJECT NO: H 23475
MATRIX: WATER
DATE SAMPLED: 10/17/95 12:00:00
DATE RECEIVED: 10/19/95

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	ND	1 P	µg/L
TOLUENE	ND	1 P	µg/L
ETHYLBENZENE	ND	1 P	µg/L
TOTAL XYLENE	ND	1 P	µg/L
TOTAL VOLATILE AROMATIC HYDROCARBONS	ND		µg/L

Surrogate	% Recovery
1,4-Difluorobenzene	97
4-Bromofluorobenzene	79

METHOD 8020***
Analyzed by: AA
Date: 10/20/95

ND - Not detected. (P) - Practical Quantitation Limit

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
**Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.
***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

SPL, Inc., - Project Manager

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HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Certificate of Analysis No. H9-9510813-02

Shell Pipe Line Corporation
P.O. Box 2648
Houston, TX 77252
ATTN: Neal Stidham

P.O.# MESA-CAO-B-131201-PX-4204-NS
DATE: 11/27/95

PROJECT: 24-93677504
SITE: Lea Station
SAMPLED BY: Cura, Inc.
SAMPLE ID: MW-9

PROJECT NO: H 23475
MATRIX: WATER
DATE SAMPLED: 10/17/95 11:00:00
DATE RECEIVED: 10/19/95

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	ND	1 P	µg/L
TOLUENE	ND	1 P	µg/L
ETHYLBENZENE	ND	1 P	µg/L
TOTAL XYLENE	ND	1 P	µg/L
TOTAL VOLATILE AROMATIC HYDROCARBONS	ND		µg/L

Surrogate	% Recovery
1,4-Difluorobenzene	97
4-Bromofluorobenzene	84

METHOD 8020***
Analyzed by: AA
Date: 10/20/95

ND - Not detected. (P) - Practical Quantitation Limit

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
**Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.
***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

SPL, Inc., - Project Manager

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HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Certificate of Analysis No. H9-9510813-03

Shell Pipe Line Corporation
P.O. Box 2648
Houston, TX 77252
ATTN: Neal Stidham

P.O.# MESA-CAO-B-131201-PX-4204-NS
DATE: 11/27/95

PROJECT: 24-93677504
SITE: Lea Station
SAMPLED BY: Cura, Inc.
SAMPLE ID: MW-10

PROJECT NO: H 23475
MATRIX: WATER
DATE SAMPLED: 10/17/95 11:30:00
DATE RECEIVED: 10/19/95

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	ND	1 P	µg/L
TOLUENE	3	1 P	µg/L
ETHYLBENZENE	ND	1 P	µg/L
TOTAL XYLENE	ND	1 P	µg/L
TOTAL VOLATILE AROMATIC HYDROCARBONS	3		µg/L

Surrogate	% Recovery
1,4-Difluorobenzene	96
4-Bromofluorobenzene	79

METHOD 8020***
Analyzed by: AA
Date: 10/20/95

ND - Not detected. (P) - Practical Quantitation Limit

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
**Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.
***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

SPL, Inc., - Project Manager

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HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Certificate of Analysis No. H9-9510813-08

Shell Pipe Line Corporation
P.O. Box 2648
Houston, TX 77252
ATTN: Neal Stidham

P.O.# MESA-CAO-B-131201-PX-4204-NS
DATE: 11/27/95

PROJECT: 24-93677504
SITE: Lea Station
SAMPLED BY: Cura, Inc.
SAMPLE ID: MW-12

PROJECT NO: H 23475
MATRIX: WATER
DATE SAMPLED: 10/17/95 14:00:00
DATE RECEIVED: 10/19/95

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	1400	25 P	µg/L
TOLUENE	440	25 P	µg/L
ETHYLBENZENE	300	25 P	µg/L
TOTAL XYLENE	160	25 P	µg/L
TOTAL VOLATILE AROMATIC HYDROCARBONS	2300		µg/L

Surrogate	% Recovery
1,4-Difluorobenzene	96
4-Bromofluorobenzene	80

METHOD 8020***
Analyzed by: AA
Date: 10/24/95

(P) - Practical Quantitation Limit

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
**Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.
***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

SPL, Inc., - Project Manager

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HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Certificate of Analysis No. H9-9510813-05

Shell Pipe Line Corporation
P.O. Box 2648
Houston, TX 77252
ATTN: Neal Stidham

P.O.# MESA-CAO-B-131201-PX-4204-NS
DATE: 11/27/95

PROJECT: 24-93677504
SITE: Lea Station
SAMPLED BY: Cura, Inc.
SAMPLE ID: MW-13

PROJECT NO: H 23475
MATRIX: WATER
DATE SAMPLED: 10/17/95 12:30:00
DATE RECEIVED: 10/19/95

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	ND	1 P	µg/L
TOLUENE	ND	1 P	µg/L
ETHYLBENZENE	ND	1 P	µg/L
TOTAL XYLENE	ND	1 P	µg/L
TOTAL VOLATILE AROMATIC HYDROCARBONS	ND		µg/L

Surrogate	% Recovery
1,4-Difluorobenzene	97
4-Bromofluorobenzene	79

METHOD 8020***
Analyzed by: AA
Date: 10/21/95

ND - Not detected. (P) - Practical Quantitation Limit

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
**Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.
***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

SPL, Inc., - Project Manager

QUALITY CONTROL

DOCUMENTATION

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

** SPL BATCH QUALITY CONTROL REPORT **
METHOD 8020

Matrix: Aqueous
Units: µg/L

Batch Id: HP_U951023173000

LABORATORY CONTROL SAMPLE

SPIKE COMPOUNDS	Method Blank Result <2>	Spike Added <3>	Blank Spike Result <1>	Blank Spike Recovery %	QC Limits(**) (Mandatory) % Recovery Range
Benzene	ND	50	51	102	61 - 123
Toluene	ND	50	50	100	62 - 122
EthylBenzene	ND	50	47	94.0	56 - 119
O Xylene	ND	50	57	114	32 - 160
M & P Xylene	ND	100	100	100	32 - 160

MATRIX SPIKES

SPIKE COMPOUNDS	Sample Results <2>	Spike Added <3>	Matrix Spike Result <1>	Matrix Spike Recovery <4>	Matrix Spike Duplicate Result <1>	Matrix Spike Duplicate Recovery <5>	MS/MSD Relative % Difference	QC Limits(***) (Advisory) RPD Max.	QC Limits(***) (Advisory) Recovery Range
BENZENE	3	20	20	85.0	20	85.0	0	25	39 - 150
TOLUENE	5	20	20	75.0	20	75.0	0	26	56 - 134
ETHYLBENZENE	14	20	18	25.0	19	30.0	18.2	38	61 - 128
O XYLENE	4	20	18	80.0	18	80.0	0	20	40 - 130
M & P XYLENE	4	40	37	85.0	39	90.0	5.71	20	43 - 152

Analyst: AA
Sequence Date: 10/23/95
SPL ID of sample spiked: 9510950-11A
Sample File ID: U___666.TX0
Method Blank File ID:
Blank Spike File ID: U___631.TX0
Matrix Spike File ID: U___635.TX0
Matrix Spike Duplicate File ID: U___636.TX0

* = Values Outside QC Range
NC = Not Calculated (Sample exceeds spike by factor of 4 or more)
ND = Not Detected/Below Detection Limit
% Recovery = [(<1> - <2>) / <3>] x 100
LCS % Recovery = (<1> / <3>) x 100
Relative Percent Difference = |(<4> - <5> | / [(<4> + <5>) x 0.5] x 100
(**) = Source: SPL Historical Data
(***) = Source: SPL-Houston Historical Data

SAMPLES IN BATCH(SPL ID): 9510747-10A 9510950-08A 9510950-09A 9510813-08A 9510855-05A 9510854-09A 9510950-11A 9510855-03A 9510855-04A 9510100-20A

QC Officer

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

** SPL BATCH QUALITY CONTROL REPORT **

METHOD 8020

Matrix: Aqueous

Batch Id: HP_S951030125700

Units: µg/L

LABORATORY CONTROL SAMPLE

SPIKE COMPOUNDS	Method Blank Result <2>	Spike Added <3>	Blank Spike Result <1>	Blank Spike Recovery %	QC Limits(**) (Mandatory) % Recovery Range
Benzene	ND	50	41	82.0	61 - 123
Toluene	ND	150	135	90.0	62 - 122
EthylBenzene	ND	50	48	96.0	56 - 119
O Xylene	ND	100	98	98.0	32 - 160
M & P Xylene	ND	200	205	102	32 - 160

MATRIX SPIKES

SPIKE COMPOUNDS	Sample Results <2>	Spike Added <3>	Matrix Spike Result <1>	Matrix Spike Recovery <4>	Matrix Spike Duplicate Result <1>	Matrix Spike Duplicate Recovery <5>	MS/MSD Relative % Difference	QC Limits(***) (Advisory) RPD Max.	QC Limits(***) (Advisory) Recovery Range
BENZENE	ND	100	92	92.0	91	91.0	1.09	25	39 - 150
TOLUENE	ND	100	87	87.0	86	86.0	1.16	26	56 - 134
ETHYLBENZENE	ND	100	92	92.0	93	93.0	1.08	38	61 - 128
O XYLENE	ND	100	91	91.0	92	92.0	1.09	20	40 - 130
M & P XYLENE	ND	100	100	100	100	100	0	20	43 - 152

Analyst: VHZ

Sequence Date: 10/30/95

SPL ID of sample spiked: 9510C70-01A

Sample File ID: SS__603.TX0

Method Blank File ID:

Blank Spike File ID: SS__581.TX0

Matrix Spike File ID: SS__600.TX0

Matrix Spike Duplicate File ID: SS__601.TX0

* = Values Outside QC Range

NC = Not Calculated (Sample exceeds spike by factor of 4 or more)

ND = Not Detected/Below Detection Limit

% Recovery = [(<1> - <2>) / <3>] x 100

LCS % Recovery = (<1> / <3>) x 100

Relative Percent Difference = |(<4> - <5> | / [(<4> + <5>) x 0.5] x 100

(**) = Source: SPL Historical Data

(***) = Source: SPL-Houston Historical Data

SAMPLES IN BATCH(SPL ID): 9510813-07A 9510C04-03A 9510C70-01A 9510C70-02A 9510C70-03A 9510C06-09A 9510C65-01A 9510987-01A 9510C24-01A 9510747-06A 9510950-12A

QC Officer

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

** SPL BATCH QUALITY CONTROL REPORT **

METHOD 8020

Matrix: Aqueous

Batch Id: HP_U951021125600

Units: µg/L

LABORATORY CONTROL SAMPLE

SPIKE COMPOUNDS	Method Blank Result <2>	Spike Added <3>	Blank Spike Result <1>	Blank Spike Recovery %	QC Limits(**) (Mandatory) % Recovery Range
Benzene	ND	50	56	112	61 - 123
Toluene	ND	50	53	106	62 - 122
EthylBenzene	ND	50	48	96.0	56 - 119
O Xylene	ND	50	59	118	32 - 160
M & P Xylene	ND	100	110	110	32 - 160

MATRIX SPIKES

SPIKE COMPOUNDS	Sample Results <2>	Spike Added <3>	Matrix Spike Result <1>	Matrix Spike Recovery <4>	Matrix Spike Duplicate Result <1>	Matrix Spike Duplicate Recovery <5>	MS/MSD Relative % Difference	QC Limits(***) (Advisory) RPD Max.	QC Limits(***) (Advisory) Recovery Range
BENZENE	ND	20	21	105	21	105	0	25	39 - 150
TOLUENE	ND	20	21	105	20	100	4.88	26	56 - 134
ETHYLBENZENE	ND	20	19	95.0	18	90.0	5.41	38	61 - 128
O XYLENE	ND	20	23	115	22	110	4.44	20	40 - 130
M & P XYLENE	ND	40	40	100	38	95.0	5.13	20	43 - 152

Analyst: AA

Sequence Date: 10/21/95

SPL ID of sample spiked: 9510731-01A

Sample File ID: U___557.TX0

Method Blank File ID:

Blank Spike File ID: U___570.TX0

Matrix Spike File ID: U___566.TX0

Matrix Spike Duplicate File ID: U___567.TX0

* = Values Outside QC Range

NC = Not Calculated (Sample exceeds spike by factor of 4 or more)

ND = Not Detected/Below Detection Limit

% Recovery = [(<1> - <2>) / <3>] x 100

LCS % Recovery = (<1> / <3>) x 100

Relative Percent Difference = |(<4> - <5> | / [(<4> + <5>) x 0.5] x 100

(**) = Source: SPL Historical Data

(***) = Source: SPL-Houston Historical Data

SAMPLES IN BATCH(SPL ID): 9510809-01B 9510817-01A 9510813-06A 9510888-05A 9510888-02A 9510888-01A 9510888-03A 9510898-01A 9510894-01A 9510893-01A 9510854-02A 9510854-03A 9510854-01A 9510817-03A 9510731-01A 9510817-02A 9510804-01A 9510813-01A 9510813-05A

QC Officer

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

** SPL BATCH QUALITY CONTROL REPORT **

METHOD 8020

Matrix: Aqueous

Batch Id: HP_U951017215900

Units: µg/L

LABORATORY CONTROL SAMPLE

SPIKE COMPOUNDS	Method Blank Result <2>	Spike Added <3>	Blank Spike Result <1>	Blank Spike Recovery %	QC Limits(**) (Mandatory) % Recovery Range
Benzene	ND	50	60	120	61 - 123
Toluene	ND	50	58	116	62 - 122
EthylBenzene	ND	50	54	108	56 - 119
O Xylene	ND	50	65	130	32 - 160
M & P Xylene	ND	100	120	120	32 - 160

MATRIX SPIKES

SPIKE COMPOUNDS	Sample Results <2>	Spike Added <3>	Matrix Spike Result <1>	Matrix Spike Recovery <4>	Matrix Spike Duplicate Result <1>	Matrix Spike Duplicate Recovery <5>	MS/MSD Relative % Difference	QC Limits(***) (Advisory) RPD Max.	QC Limits(***) (Advisory) Recovery Range
BENZENE	ND	20	22	110	22	110	0	25	39 - 150
TOLUENE	ND	20	20	100	21	105	4.88	26	56 - 134
ETHYLBENZENE	ND	20	19	95.0	19	95.0	0	38	61 - 128
O XYLENE	ND	20	22	110	22	110	0	20	40 - 130
M & P XYLENE	ND	40	39	97.5	39	97.5	0	20	43 - 152

Analyst: AA

Sequence Date: 10/21/95

SPL ID of sample spiked: 9510810-01A

Sample File ID: U___538A.TX0

Method Blank File ID:

Blank Spike File ID: U___552.TX0

Matrix Spike File ID: U___549.TX0

Matrix Spike Duplicate File ID: U___550.TX0

* = Values Outside QC Range

NC = Not Calculated (Sample exceeds spike by factor of 4 or more)

ND = Not Detected/Below Detection Limit

% Recovery = [(<1> - <2>) / <3>] x 100

LCS % Recovery = (<1> / <3>) x 100

Relative Percent Difference = |(<4> - <5> | / [(<4> + <5>) x 0.5] x 100

(**) = Source: SPL Historical Data

(***) = Source: SPL-Houston Historical Data

SAMPLES IN BATCH(SPL ID): 9510677-05A 9510677-06A 9510810-01A 9510810-03A 9510810-05A 9510810-04A 9510813-02A 9510813-04A 9510807-01A 9510807-02A 9510813-03A 9510677-04A 9510677-03A 9510677-01A

QC Officer

APPENDIX D

QUALITY ASSURANCE/QUALITY CONTROL

SAFETY PLAN AND LIMITATIONS

QUALITY ASSURANCE/QUALITY CONTROL

A strict Quality Assurance Plan was incorporated throughout all phases of the on-site operations and sampling procedures. Soil or solid material samples were collected using new disposable or properly decontaminated reusable stainless steel equipment. Water or liquid samples were collected with new disposable bailers or decontaminated pump equipment. All non-reusable equipment was disposed of and reusable equipment was decontaminated between sampling stations to eliminate the potential of cross-contamination. The water samples were transferred from the bailers into airtight septum-sealed 40-ml glass VOA vials, one-liter amber glass jars with Teflon-lined lids, or other sample containers appropriate for the required analyses.

The samples were sealed with QA/QC seals, preserved with acid (if required), and maintained at 4°C in accordance with Environmental Protection Agency (EPA) requirements (EPA 600/4-82-029) for shipment to the laboratory. A chain-of-custody (COC) which documents sample collection times and delivery times to the laboratory was completed for each set of samples. The COC is included with the analytical results in the Appendix.

CURA utilizes laboratories that maintain strict quality controls; i.e., equipment calibration and standardization, appropriate analytical methods, preparation of quality control samples, and complete chains-of-custody. Analyses were performed on all samples using the EPA-, state-, or local agency-directed methods. The maximum recommended holding times were not exceeded unless noted in the text.

SAFETY PLAN

The sampling operations were performed at level D personal protection. CURA personnel involved in on-site activities have completed the Occupational Safety and health for Hazardous Waste Field Operation training course (OSHA 29 CFR 1910.120). Applicable safety equipment was on site to CURA personnel.

LIMITATIONS

It should be noted that all subsurface investigations are inherently limited in the sense that conclusions are drawn and recommendations are developed from samples which depict subsurface conditions at representative locations over relatively short periods of time. Subsurface conditions elsewhere may differ from those at the sampling locations. In addition, subsurface conditions at sampling locations may vary over longer periods of time than can be observed in a study of this type. The passage of time, manifestation of latent conditions, or occurrence of future events may require further site exploration, data collection and analysis, and reevaluation of the findings, observations, conclusions, and recommendation expressed in this report.

OIL CONSERVATION DIVISION
2040 S. Pacheco
Santa Fe, New Mexico 87505

November 7, 1995

CERTIFIED MAIL
RETURN RECEIPT NO. Z-765-962-509

Mr. Neal Stidham
Shell Pipe Line Corporation
Two Shell Plaza
P.O. Box 2099
Houston, Texas 77252-2099

RE: GROUND WATER DEVELOPMENT WATER
DENTON AND LEA CRUDE PUMP STATIONS
LEA COUNTY, NEW MEXICO

Dear Mr. Stidham:

The New Mexico Oil Conservation Division (OCD) has completed a review of Shell Oil Products Company's (SOPC) October 23, 1995 "DEVELOPMENT WATER, DENTON STATION AND LEA STATIONS". This document contains SOPC's request to dispose of monitor well development and purge water on the surface at each station. The request is based upon the analytical results of the waters generated during development and purging.

The above referenced request is approved.

If you have any questions, please call me at (505) 827-7154.

Sincerely,

William C. Olson
Hydrogeologist
Environmental Bureau

xc: Jerry Sexton, OCD Hobbs District Supervisor
Wayne Price , OCD Hobbs Office

Shell Oil Products Company

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

October 23, 1995

William Olson
State of New Mexico Oil Conservation Division
Environmental Bureau
2040 S. Pacheco St.
Santa Fe, New Mexico 87504

SUBJECT: DEVELOPMENT WATER, DENTON AND LEA STATIONS

Dear Mr. Olson,

Enclosed are copies of the laboratory results from sampling the development water at the subject stations. All samples were non-detect for benzene. With your concurrence we will surface discharge this water. If I do not hear from you within 30 days I will assume concurrence and we will proceed. If you have any questions please call me at 713-241-2961.

Sincerely,

Neal Stidham
Staff Engineer
Shell Oil Company
Representing Shell Pipe Line Corporation

cc: Paul Newman-EOTT Energy Corp.
Jerry Sexton-OCD Hobbs

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Certificate of Analysis No. H9-9509368-01

Cura Inc.
6049 South Loop East
Houston, TX 77033
ATTN: Brad Smith

P.O.# MESA-1312-HOE
DATE: 09/18/95

PROJECT: 24-93678S04
SITE: Denton Station
SAMPLED BY: CURA, Inc.
SAMPLE ID: D.W.

PROJECT NO: H 15784
MATRIX: WATER
DATE SAMPLED: 09/06/95 16:00:00
DATE RECEIVED: 09/12/95

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Benzene	ND	1 P	µg/L
Surrogate	% Recovery		
1,4-Difluorobenzene	102		
4-Bromofluorobenzene	87		

METHOD 8020***
Analyzed by: RR
Date: 09/14/95

ND - Not detected. (P) - Practical Quantitation Limit

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
**Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.
***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

SPL, Inc., - Project Manager

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Certificate of Analysis No. H9-9509366-01

Cura Inc.
6049 South Loop East
Houston, TX 77033
ATTN: Brad Smith

P.O.# MESA-1312-HO
DATE: 09/18/9

PROJECT: 24-93677S04
SITE: Lea Station
SAMPLED BY: CURA, Inc.
SAMPLE ID: D.W.

PROJECT NO: H 13835
MATRIX: WATER
DATE SAMPLED: 09/06/95 13:00:0
DATE RECEIVED: 09/12/95

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Benzene	ND	1 P	µg/
Surrogate	% Recovery		
1,4-Difluorobenzene	102		
4-Bromofluorobenzene	83		
METHOD 8020***			
Analyzed by: RR			
Date: 09/14/95			

ND - Not detected. (P) - Practical Quantitation Limit

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
**Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.
***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

SPL, Inc., - Project Manager

Shell Oil Products Company

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

August 31, 1995

William Olson
State of New Mexico Oil Conservation Division
Environmental Bureau
2040 S. Pacheco St.
Santa Fe, New Mexico 87504

SUBJECT: QUARTERLY REPORTS, DENTON AND LEA STATIONS, LEA COUNTY NEW MEXICO

Dear Mr. Olson,

Enclosed are the third quarter 1995 groundwater monitoring reports for Lea and Denton Stations. The product recovery systems at both stations are now operational. Groundwater analyses show essentially no change from the previous sampling events and phase separated hydrocarbon did not develop in any additonal wells during the report period. I will be submitting the report on the additional subsurface delineation at Denton by mid-September. If you have any questions please call me at 713-241-2961.

Sincerely,

Neal Stidham
Staff Engineer
Shell Oil Products Company
Representing Shell Pipe Line Corporation

cc: Paul Newman (w/copy)
EOTT Energy Corp.

Jerry Sexton (w/copy)
OCD-Hobbs

CURA INC.
Environmental Consultants, Engineers & Scientists
6049 South Loop East • Houston, Texas 77033 • 713/640-1490 • FAX 640-2593

August 30, 1995

Mr. Neal D. Stidham
Shell Oil Products Company
Two Shell Plaza, Room 1452
777 Walker Street
Houston, Texas 77002

RE: QUARTERLY GROUNDWATER MONITORING REPORT
THIRD QUARTER, 1995
LEA STATION
LEA COUNTY, NEW MEXICO

CURA PROJECT NO. 24-93677

Mr. Stidham:

CURA, Inc., has completed the groundwater monitoring and sampling operations at the above-referenced site. The work was performed in accordance with the scope of services requested by Shell Oil Company in their letter dated January 25, 1995.

Monitoring wells MW-1 through MW-13 were gauged and checked for phase-separated hydrocarbons (PSH) during sampling operations on July 19, 1995. Monitoring wells MW-4, MW-6, MW-7, MW-9, MW-10, MW-12 and MW-13 were developed and sampled by CURA on July 19, 1995. In accordance with water quality monitoring requirements set forth by the New Mexico Oil Conservation Division (NMOCD) the groundwater samples were analyzed for benzene, toluene, ethylbenzene, and total xylenes (BTEX). The New Mexico Water Quality Control Commission (WQCC) regulations do not contain a groundwater standard for total petroleum hydrocarbons (TPH). Therefore, the NMOCD does not require that groundwater samples be analyzed for TPH. In addition to laboratory analysis for BTEX, dissolved oxygen (DO) levels for each sampled well were measured during field operations. Monitoring wells MW-1, MW-2, MW-5, MW-8, and MW-11 were not sampled because of the presence of PSH.

Groundwater Sampling and PSH Recovery

The monitoring wells were gauged on July 19, 1995, to determine the depth to groundwater and PSH thickness (if any). A summary of groundwater elevations, and PSH thicknesses is presented in Table 1, Appendix B.

PSH was initially observed on site in September, 1993 following the installation of monitoring wells MW-8 through MW-11. At that time approximately 0.04 feet of PSH was observed in monitoring well MW-8. Following soil vapor extraction (SVE) feasibility testing in December, 1993 in which monitoring well MW-8 was employed as a vapor extraction well, approximately 2.84 feet of PSH was observed in MW-8 and measurable PSH was also observed for the first time in monitoring wells MW-1 and MW-11. Expanded PSH recovery operations were then initiated at the site. PSH has since been observed in monitoring wells MW-2 and MW-5. During the third quarter of 1995 approximately 7.5 gallons of PSH were recovered from the site. A cumulative total of approximately 64.5 gallons of PSH have been recovered at Lea Station.

In February, 1995 a remediation system consisting of soil vapor extraction (SVE) with product-only pumping was installed at the site. Early operation of the system involved high vacuum levels at the wellheads in an effort to induce oil flow towards the wells as observed during pilot testing. Oil that accumulated in the wells was immediately evacuated by the pumps; however, consistent oil recharge to the wells has been poor. The lack of oil recharge to the wells is being addressed by bleeding ambient air into the SVE system to reduce vacuum pressures and diminish the upward coning of water thought to be restricting oil flow to the wells. Regardless of the SVE or pumping strategy, the high viscosity of the oil results in migration towards the wells at rates much slower than our ability to remove it.

Monitoring well gauging data obtained on July 19, 1995 indicates that the apparent direction of groundwater flow is toward the southeast which is consistent with

previous measurements. PSH was observed in monitoring wells MW-1, MW-2, MW-5, MW-8, and MW-11 during gauging operations.

The monitoring wells were purged by removing approximately three well volumes of water or bailing the wells dry. During well purging operations approximately 20 gallons of water was removed from monitoring wells MW-4, MW-6, MW-7, MW-9, and MW-10. The purged groundwater was stored on-site in labelled 55-gallon drums pending sampling and proper disposal.

After development, DO measurements were performed on-site and groundwater samples were obtained from the monitoring wells using a dedicated disposable bailer. The groundwater samples were transported on ice to the laboratory for analysis of BTEX using EPA Method 8020. Quality Assurance/Quality Control information is included in Appendix D.

Analytical Results

The groundwater samples obtained on July 19, 1995 indicate no significant change in dissolved hydrocarbon concentrations or in the distribution of PSH thicknesses across the site since the last sampling event in April, 1995. The dissolved hydrocarbon concentrations for monitoring wells MW-4, MW-9, and MW-10 (east side) and MW-6 and MW-7 (west side) have consistently recorded levels near or below the method detection limits and indicate that the hydrocarbon impacted groundwater remains restricted to apparently two separate areas.

DO concentrations were obtained as a possible indicator of the natural biological activity of hydrocarbon degrading microorganisms in the groundwater. Microbial and mineral oxidation reactions within the dissolved hydrocarbon plume typically result in depletion of DO. DO levels measured during April sampling generally indicate sufficient dissolved oxygen is present to promote natural biodegradation of hydrocarbons. CURA will continue to monitor DO levels as a means of documenting the occurrence of natural attenuation. A summary of groundwater analytical results

is presented in Table 2, Appendix B. The laboratory reports and chain-of-custody are included in Appendix C.

CURA appreciates the opportunity to provide you with our professional services. If you have any questions regarding the information presented, please contact Brad Smith at (713) 640-1490.

Respectfully,
CURA, Inc.

for James W. Leach
Environmental Geologist

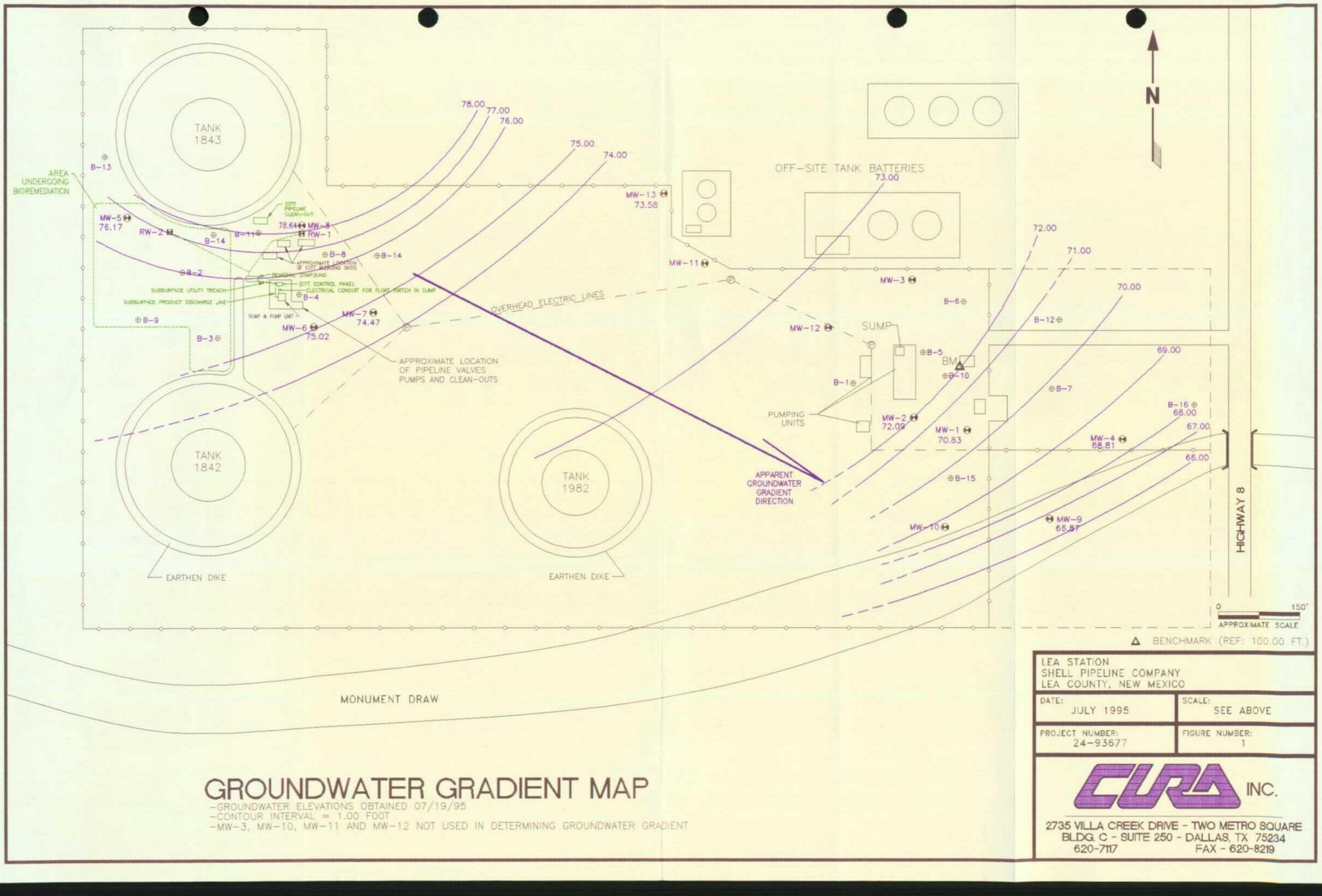
Bradley S. Smith
Project Manager

Kevin Van Hook
Senior Project Manager

Enclosures

APPENDICES

APPENDIX A
FIGURES



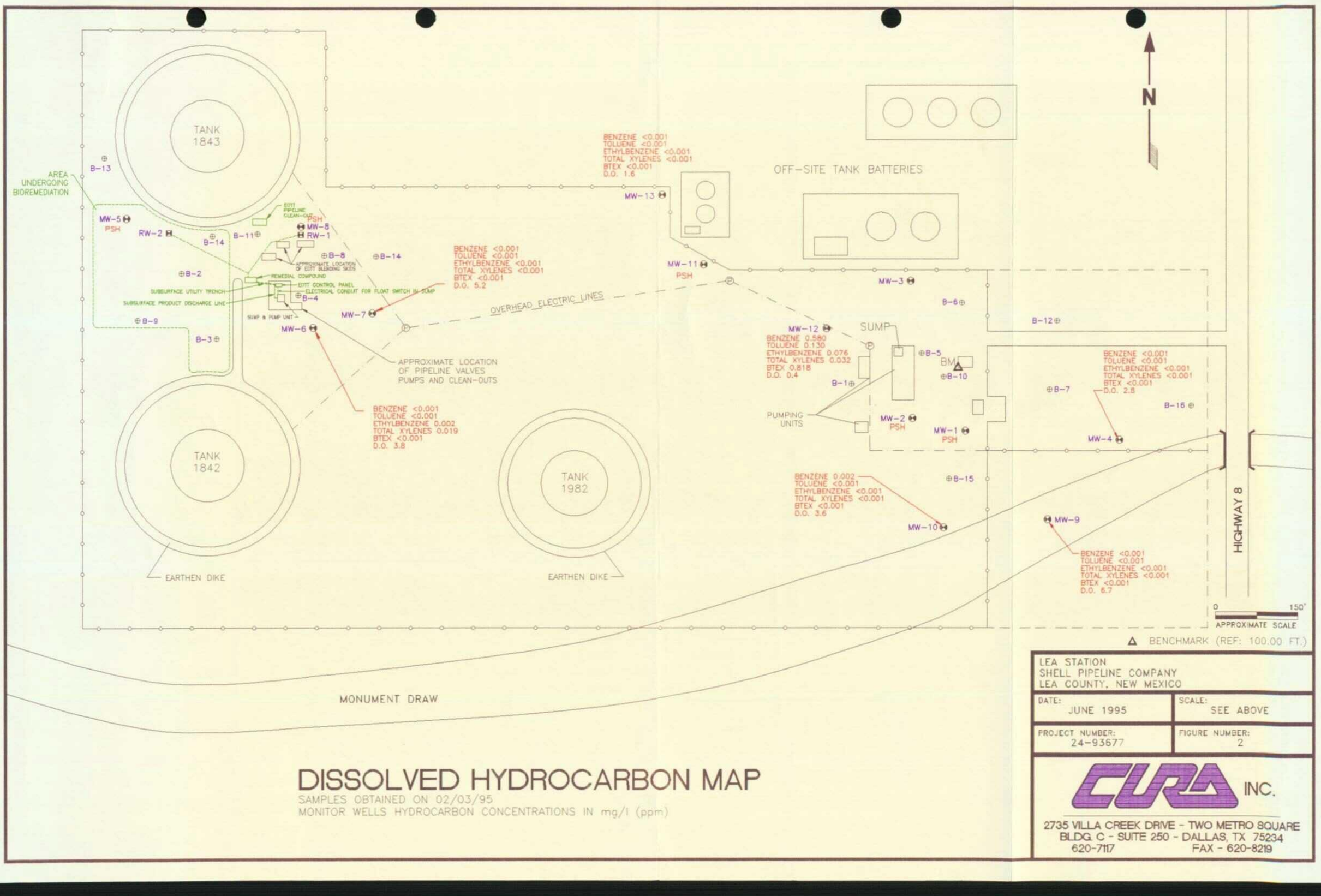
GROUNDWATER GRADIENT MAP

-GROUNDWATER ELEVATIONS OBTAINED 07/19/95
-CONTOUR INTERVAL = 1.00 FOOT
-MW-3, MW-10, MW-11 AND MW-12 NOT USED IN DETERMINING GROUNDWATER GRADIENT

LEA STATION
SHELL PIPELINE COMPANY
LEA COUNTY, NEW MEXICO

DATE:	SCALE:
JULY 1995	SEE ABOVE
PROJECT NUMBER: 24-93677	FIGURE NUMBER: 1

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



DISSOLVED HYDROCARBON MAP

SAMPLES OBTAINED ON 02/03/95
MONITOR WELLS HYDROCARBON CONCENTRATIONS IN mg/l (ppm)

LEA STATION
SHELL PIPELINE COMPANY
LEA COUNTY, NEW MEXICO

DATE:	SCALE:
JUNE 1995	SEE ABOVE
PROJECT NUMBER: 24-93677	FIGURE NUMBER: 2

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

APPENDIX B

TABLES

TABLE 1
SUMMARY OF RELATIVE GROUNDWATER LEVEL ELEVATIONS AND PHASE-SEPARATED HYDROCARBON THICKNESSES

Monitoring Well	Date Gauged	Relative Ground Surface Elevation (feet)	Relative Top of Casing Elevation (feet)*	Depth to Water Below Top of Casing (feet)	Corrected Relative Groundwater Elevation (feet)**	Phase-Separated Hydrocarbon Thickness (feet)
MW-1	12/21/95	98.88	100.73	28.32	72.41	0.0
	02/16/93	98.88	100.73	28.48	72.25	0.00
	09/28/93	98.88	100.73	29.18	71.55	0.00
	03/22/94	98.88	100.73	30.25	70.58	0.12
	08/19/94	98.88	100.73	30.38	70.37	0.03
	09/15/95	98.88	100.73	32.34	68.75	0.45
	10/28/94	98.88	100.73	32.28	68.79	0.41
	12/21/94	98.88	100.73	30.83	69.90	Trace
	02/03/94	98.88	100.73	30.97	69.85	0.11
	04/25/95	98.88	100.73	29.54	71.30	0.14
	07/19/95	**98.88**	**100.73**	**29.27**	**70.83**	**0.12**
MW-2	02/16/93	102.37	29.33	29.33	73.04	0.00
	09/28/93	102.37	30.23	30.23	72.14	0.00
	03/22/94	102.37	31.05	21.05	71.32	Trace
	08/19/94	102.37	31.12	31.12	69.66	Trace
	09/15/95	102.37	31.75	31.75	70.71	0.12
	10/28/94	102.37	31.65	31.65	70.83	0.14
	12/21/94	102.37	31.68	31.68	70.75	0.07
	02/03/94	102.37	31.92	31.92	70.54	0.11
	04/25/95	102.37	30.24	30.24	72.24	0.14
	07/19/95	**102.37**	**30.24**	**30.16**	**72.08**	**0.16**
MW-3	02/16/93	101.79	103.61	29.23	73.38	0.00
	09/28/93	101.79	103.61	30.04	73.57	0.00
	03/22/94	101.79	103.61	30.87	72.74	0.00
	08/19/94	101.79	103.61	30.92	72.69	0.00
	09/15/95	101.79	103.61	31.71	71.90	0.00
	10/28/94	101.79	103.61	31.63	71.98	0.00
	12/21/94	101.79	103.61	31.55	72.06	Trace
	02/03/95	101.79	103.61	34.25	69.36	Trace
	07/19/95	**101.79**	**103.61**	**32.20**	**71.41**	**0.00**

TABLE 1
SUMMARY OF RELATIVE GROUNDWATER LEVEL ELEVATIONS AND PHASE-SEPARATED HYDROCARBON THICKNESSES

Monitoring Well	Date Gauged	Relative Ground Surface Elevation (feet)	Relative Top of Casing Elevation (feet)*	Depth to Water Below Top of Casing (feet)	Corrected Relative Groundwater Elevation (feet)**	Phase-Separated Hydrocarbon Thickness (feet)
MW-4	02/16/93	93.80	96.08	25.44	70.64	0.00
	09/28/93	93.80	96.08	26.12	69.96	0.00
	03/22/94	93.80	96.08	27.13	68.65	0.00
	08/19/94	93.80	96.08	29.70	66.38	0.00
	09/15/95	93.80	96.08	27.65	68.43	0.00
	10/28/94	93.80	96.08	27.54	68.54	0.00
	02/03/95	93.80	96.08	27.91	68.17	0.00
	04/25/95	93.80	96.08	28.13	67.95	0.00
	07/19/95	**93.80**	**96.08**	**28.27**	**68.81**	**0.00**
MW-5	02/16/93	107.08	109.21	29.86	78.35	0.00
	09/28/93	107.08	109.21	30.42	77.81	0.00
	03/22/94	107.08	109.21	31.40	77.60	0.00
	08/19/94	107.08	109.21	31.61	76.86	0.13
	09/15/95	107.08	109.21	32.45	77.07	0.15
	10/28/94	107.08	109.21	32.26	77.07	0.14
	12/21/94	107.08	109.21	32.25	75.02	0.08
	02/03/95	107.08	109.21	35.35	73.96	0.13
	04/25.95	107.08	109.21	30.42	79.35	0.00
	07/19/95	**107.08**	**109.21**	**33.08**	**76.17**	**0.06**
MW-6	02/16/93	103.66	106.26	28.60	77.66	0.00
	09/28/93	103.66	106.26	29.96	76.30	0.00
	03/22/94	103.66	106.26	30.23	76.03	0.00
	08/19/94	103.66	106.26	30.68	75.58	0.00
	09/15/95	103.66	106.26	30.93	75.33	0.00
	10/28/94	103.66	106.26	30.67	75.59	0.00
	02/03/95	103.66	106.26	30.46	75.80	0.00
	04/25.95	103.66	106.26	31.62	74.64	0.00
	07/19/95	**103.66**	**106.26**	**31.24**	**75.02**	**0.00**

TABLE 1
SUMMARY OF RELATIVE GROUNDWATER LEVEL ELEVATIONS AND PHASE-SEPARATED HYDROCARBON THICKNESSES

Monitoring Well	Date Gauged	Relative Ground Surface Elevation (feet)	Relative Top of Casing Elevation (feet)*	Depth to Water Below Top of Casing (feet)	Corrected Relative Groundwater Elevation (feet)**	Phase-Separated Hydrocarbon Thickness (feet)
MW-7	02/16/93	104.34	106.27	29.24	77.03	0.00
	09/28/93	104.34	106.27	30.65	75.62	0.00
	03/22/94	104.34	106.27	30.87	75.40	0.00
	08/19/94	104.34	106.27	30.83	75.44	0.00
	09/15/94	104.34	106.27	31.64	74.63	0.00
	10/28/94	104.34	106.27	31.42	74.85	0.00
	02/03/95	104.34	106.27	31.16	75.11	0.00
	04/25/95	104.34	106.27	32.41	73.86	0.00
	07/19/95	**104.34**	**106.27**	**31.80**	**74.47**	**0.00**
MW-8	09/28/93	105.52	107.44	32.81	76.63	0.04
	03/22/94	105.52	107.44	33.30	76.78	3.22
	10/19/94	105.52	107.44	33.40	75.68	2.00
	09/15/94	105.52	107.44	32.52	75.98	1.30
	10/28/94	105.52	107.44	32.25	76.42	1.50
	12/21/94	105.52	107.44	33.15	76.40	2.58
	02/03/95	105.52	107.44	33.69	76.71	3.61
	04/25/95	105.52	107.44	31.87	78.10	3.07
	07/19/95	**105.52**	**107.44**	**30.77**	**78.64**	**2.40**
MW-9	09/28/93	93.76	97.21	28.60	68.61	0.00
	03/22/94	93.76	97.21	29.04	68.17	0.00
	08/19/94	93.76	97.21	30.24	66.97	0.00
	09/15/94	93.76	97.21	29.66	67.55	0.00
	10/28/94	93.76	97.21	29.42	67.79	0.00
	02/03/95	93.76	97.21	29.90	67.31	0.00
	04/25/95	93.76	97.21	31.13	66.08	0.00
	07/19/95	**93.76**	**97.21**	**30.34**	**66.87**	**0.00**

TABLE 1
SUMMARY OF RELATIVE GROUNDWATER LEVEL ELEVATIONS AND PHASE-SEPARATED HYDROCARBON THICKNESSES

Monitoring Well	Date Gauged	Relative Ground Surface Elevation (feet)	Relative Top of Casing Elevation (feet)*	Depth to Water Below Top of Casing (feet)	Corrected Relative Groundwater Elevation (feet)**	Phase-Separated Hydrocarbon Thickness (feet)
MW-10	09/28/93	99.63	102.51	34.11	68.4	0.00
	03/22/94	99.63	102.51	34.57	67.94	0.00
	08/19/94	99.63	102.51	33.06	69.45	0.00
	09/15/94	99.63	102.51	35.26	67.25	0.00
	10/28/94	99.63	102.51	35.18	67.33	0.00
	02/03/95	99.63	102.51	35.40	67.11	0.00
	04/25/95	99.63	102.51	33.93	68.59	0.00
	07/19/95	**99.63**	**102.51**	**35.71**	**66.80**	**0.00**
MW-11	09/28/93	104.48	105.62	31.38	74.24	0.00
	03/22/94	104.48	105.62	31.73	74.04	0.18
	08/19/94	104.48	105.62	32.36	73.92	0.80
	09/15/94	104.48	105.62	31.68	74.03	0.12
	12/21/94	104.48	105.62	32.66	73.54	1071
	02/03/95	104.48	105.62	33.14	73.40	1.12
	04/25/95	104.48	105.62	34.41	72.40	1.45
	07/19/95	**104.48**	**105.62**	**31.64**	**73.98**	**Trace**
MW-12	02/03/95	--	103.90	31.79	72.11	0.00
	04/25/95	--	103.90	30.17	73.73	0.00
	07/19/95	**--**	**103.90**	**31.84**	**72.06**	**0.00**
MW-13	02/03/95	--	103.89	29.65	74.24	0.00
	04/25/95	--	103.89	28.75	75.14	0.00
	07/19/95	**--**	**103.89**	**30.31**	**73.58**	**0.00**

* Measured from a relative datum (benchmark = 100.00 feet). The monitor well casings were marked to provide consistent reference points for future gauging operations.

** Correction Equation for Phase-Separated Hydrocarbons: Corrected Groundwater Elevation = Top of Casing Elevation - (Depth to Water Below Top of Casing - [SG] [PSH Thickness])
Specific Gravity (SG) = 0.82 for crude oil.

TABLE 2
WATER SAMPLE ANALYTICAL RESULTS

Monitoring Well	Date Sampled	Benzene	Toluene	Ethyl-benzene	Xylenes	Total BTEX	TPH	DO
MW-1	12/21/92	0.440	0.005	0.120	0.063	0.628	3	--
	02/16/93	0.350	0.010	0.095	0.070	0.525	5	--
	09/15/94	PSH	PSH	PSH	PSH	PSH	PSH	--
	02/09/95	PSH	PSH	PSH	PSH	PSH	PSH	--
	04/25/95	PSH	PSH	PSH	PSH	PSH	PSH	--
	07/19/95	**PSH**	**PSH**	**PSH**	**PSH**	**PSH**	**PSH**	--
MW-2	02/16/93	0.370	0.040	0.210	0.510	1.130	1	--
	03/22/94	0.410	0.012	0.230	0.450	1.102	--	--
	09/15/94	PSH	PSH	PSH	PSH	PSH	PSH	--
	02/09/95	PSH	PSH	PSH	PSH	PSH	PSH	--
	04/25/95	PSH	PSH	PSH	PSH	PSH	PSH	--
	07/19/95	**PSH**	**PSH**	**PSH**	**PSH**	**PSH**	**PSH**	--
MW-3	02/16/93	2.500	0.010	0.370	0.640	3.520	2	--
	09/15/94	1.00	0.006	0.280	0.190	1.476	<0.5	2.6
	02/09/95	1.30	<0.005	0.260	0.090	1.650	--	0.5
	04/25/95	NS	NS	NS	NS	NS	NS	--
	07/19/95	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	--
MW-4	02/16/93	<0.001	<0.001	<0.001	<0.001	<0.001	<1	--
	09/15/94	<0.001	<0.001	<0.001	<0.001	<0.001	<0.5	4.0
	02/09/95	<0.001	<0.001	<0.001	<0.001	<0.001	--	0.6
	04/25/95	<0.001	<0.001	<0.001	<0.001	<0.001	--	2.4
	07/19/95	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.001**	--	**2.8**
MW-5	02/16/93	<0.001	<0.001	0.002	0.004	0.006	<1	--
	09/15/94	PSH	PSH	PSH	PSH	PSH	PSH	--
	02/09/95	PSH	PSH	PSH	PSH	PSH	PSH	--
	04/25/95	PSH	PSH	PSH	PSH	PSH	PSH	--
	07/19/95	**PSH**	**PSH**	**PSH**	**PSH**	**PSH**	**PSH**	--
MW-6	02/16/93	0.002	0.001	<0.001	0.091	0.094	<1	--
	09/15/94	<0.007	0.003	0.005	0.005	0.020	<0.5	2.2
	02/09/95	0.001	<0.001	0.002	0.011	0.014	--	0.8
	04/25/95	<0.001	<0.001	<0.001	<0.001	<0.001	--	3.4
	07/19/95	**<0.001**	**<0.001**	**0.002**	**0.019**	**0.021**	--	**3.8**

TABLE 2
WATER SAMPLE ANALYTICAL RESULTS

Monitoring Well	Date Sampled	Benzene	Toluene	Ethyl-benzene	Xylenes	Total BTEX	TPH	DO
MW-7	02/16/93	<0.001	<0.001	<0.001	<0.001	<0.001	<1	--
	09/15/94	0.001	<0.001	0.002	0.002	0.005	<0.5	3.8
	02/09/95	<0.001	<0.001	<0.001	<0.001	<0.001	---	1.8
	04/25/95	<0.001	<0.001	<0.001	<0.001	<0.001	--	5.0
	07/19/95	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**--**	**5.2**
MW-8	09/28/93	PSH	PSH	PSH	PSH	PSH	PSH	--
	02/09/95	PSH	PSH	PSH	PSH	PSH	PSH	--
	04/25/95	PSH	PSH	PSH	PSH	PSH	PSH	--
	07/19/95	**PSH**	**PSH**	**PSH**	**PSH**	**PSH**	**PSH**	**--**
MW-9	09/28/93	<0.001	<0.001	<0.001	<0.001	<0.001	<1	--
	09/15/94	<0.001	<0.001	<0.001	0.001	<0.001	<0.5	5.4
	02/09/95	<0.001	<0.001	<0.001	<0.001	<0.001	--	4.6
	04/25/95	<0.001	<0.001	<0.001	<0.001	<0.001	--	5.2
	07/19/95	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**--**	**6.7**
MW-10	09/28/93	<0.001	<0.001	0.009	0.001	0.010	7	--
	09/15/94	<0.001	<0.001	<0.001	<0.001	<0.001	<0.5	3.0
	02/09/95	<0.001	<0.001	<0.001	<0.001	<0.001	--	1.2
	04/25/95	0.001	<0.001	<0.001	<0.001	0.001	--	1.4
	07/19/95	**0.002**	**<0.001**	**<0.001**	**<0.001**	**0.003**	**--**	**3.6**
MW-11	09/28/93	0.24	0.14	0.11	0.14	0.63	3	--
	09/15/94	PSH	PSH	PSH	PSH	PSH	PSH	--
	02/09/95	PSH	PSH	PSH	PSH	PSH	PSH	--
	04/25/95	PSH	PSH	PSH	PSH	PSH	PSH	--
	07/25/95	**PSH**	**PSH**	**PSH**	**PSH**	**PSH**	**PSH**	**--**
MW-12	02/09/95	0.590	0.009	0.430	0.067	1.096	--	0.8
	04/25/95	--	--	--	--	--	--	--
	07/19/95	**0.580**	**0.130**	**0.076**	**0.032**	**0.818**	**--**	**0.4**
MW-13	02/09/95	<0.001	<0.001	<0.001	<0.001	<0.001	--	1.0
	04/25/95	--	--	--	--	--	--	--
	07/19/95	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**--**	**1.6**

TABLE 3
PHASE-SEPARATED HYDROCARBON RECOVERY

Date	Monitor Well	PSH Thickness (feet)	PSH Recovery (gallons)	PSH Cumulative Recovery (gallons)	Type of Recovery
09/28/93	MW-1	0.00	0.0	0.0	
03/22/94	MW-1	0.12	0.1	0.1	Hand bailed
05/09/94	MW-1	0.23	0.3	0.4	Hand bailed, installed boom
05/25/94	MW-1	Trace	0.1	0.5	Boom absorption
06/14/94	MW-1	Trace	0.1	0.6	Boom absorption
07/13/94	MW-1	0.01	0.2	0.8	Boom absorption
07/22/94	MW-1	0.02	0.2	1.0	Boom absorption
08/19/94	MW-1	0.03	0.3	1.3	Boom absorption
09/15/94	MW-1	0.45	2.6	3.9	Hand bailed, adjusted boom
10/03/94	MW-1	0.37	0.8	4.7	Hand bailed, adjusted boom
10/28/94	MW-1	0.41	1.2	5.9	Hand bailed, adjusted boom
11/28/94	MW-1	0.12	0.2	6.1	Boom absorption
21/21/94	MW-1	Trace	0.0	6.1	Boom removed
02/03/95	MW-1	0.11	0.3	6.4	Hand bailed
03/28/95	MW-1	Trace	0.3	6.7	Boom absorption
04/25/95	MW-1	0.14	0.4	7.1	Boom absorption
07/19/95	MW-1	0.12	0.5	7.6	Boom absorption
09/28/93	MW-2	0.0	0.0	0.0	
03/22/94	MW-2	Trace	0.0	0.0	
05/09/94	MW-2	Trace	0.0	0.0	Boom Installed
05/25/94	MW-2	Trace	0.1	0.1	Boom absorption
06/14/94	MW-2	Trace	0.1	0.2	Boom absorption
07/13/94	MW-2	0.05	0.1	0.3	Boom absorption
07/22/94	MW-2	0.08	0.2	0.5	Boom absorption
08/19/94	MW-2	Trace	0.0	0.5	Boom absorption
09/15/94	MW-2	0.12	0.2	0.7	Boom absorption
10/03/94	MW-2	0.11	0.3	1.0	Boom absorption
10/28/94	MW-2	0.14	0.8	1.8	Hand bailed, adjusted boom

TABLE 3
PHASE-SEPARATED HYDROCARBON RECOVERY

Date	Monitor Well	PSH Thickness (feet)	PSH Recovery (gallons)	PSH Cumulative Recovery (gallons)	Type of Recovery
11/28/94	MW-2	0.04	0.4	2.2	Boom absorption
21/21/94	MW-2	0.07	0.1	2.3	Boom removed
02/03/95	MW-2	0.11	0.8	3.1	Hand bailed/Boom installed
03/28/95	MW-2	0.05	0.1	3.2	Boom absorption
04/25/95	MW-2	0.14	0.3	3.5	Boom absorption
07/19/95	MW-2	0.16	0.5	4.0	Boom absorption
11/28/94	MW-3	0.00	0.0	0.0	
12/21/94	MW-3	Trace	0.0	0.0	
02/03/95	MW-3	Trace	0.0	0.0	
03/28/95	MW-3	Trace	0.0	0.0	Boom absorption
04/25/95	MW-3	Trace	0.0	0.0	Boom absorption
07/19/95	MW-3	0.00	0.0	0.0	Boom absorption
08/19/94	MW-5	0.00	0.00	0.0	
09/15/94	MW-5	0.13	0.00	0.0	Boom installed
10/03/94	MW-5	0.07	0.4	0.4	Boom absorption
10/28/94	MW-5	0.15	0.9	1.3	Hand bailed, adjusted boom
11/28/94	MW-5	0.14	0.3	1.6	Boom adsorption
12/21/94	MW-5	0.14	0.8	2.4	Hand bailed, removed boom
02/03/95	MW-5	0.08	0.7	3.3	Hand bailed
03/28/95	MW-5	0.07	0.2	3.5	Boom absorption
04/25/95	MW-5	0.13	0.3	3.8	Boom absorption
07/19/95	MW-5	0.06	0.5	4.3	Boom absorption
09/28/93	MW-8	0.04	0.0	0.0	
03/22/94	MW-8	3.22	6.7	6.7	Hand bailed
05/09/94	MW-8	3.00	5.4	12.1	Hand bailed
05/25/94	MW-8	0.56	1.8	13.9	Hand bailed, boom installed

TABLE 3
PHASE-SEPARATED HYDROCARBON RECOVERY

Date	Monitor Well	PSH Thickness (feet)	PSH Recovery (gallons)	PSH Cumulative Recovery (gallons)	Type of Recovery
06/14/94	MW-8	0.01	1.0	14.9	Boom absorption
07/13/94	MW-8	0.62	0.4	15.3	Boom absorption
07/22/94	MW-8	0.94	1.6	16.9	Hand bailed, adjusted boom
08/29/94	MW-8	2.0	1.6	18.5	Hand bailed, adjusted boom
09/15/94	MW-8	1.30	0.0	18.5	Boom absorption
10/03/94	MW-8	1.43	1.5	20.0	Boom absorption
10/28/94	MW-8	1.50	1.4	21.4	Boom absorption
11/28/94	MW-8	0.8	3.7	25.1	Hand bailed, adjusted boom
12/21/94	MW-8	2.58	0.4	25.5	Boom absorption, boom removed
02/03/95	MW-8	3.61	1.8	27.3	Hand bailed
03/28/95	MW-8	2.67	0.8	28.1	Boom absorption
04/25/95	MW-8	3.07	1.0	29.1	Boom absorption
07/19/95	MW-8	2.4	1.0	30.1	Boom absorption
09/28/93	MW-11	0.00	0.0	0.0	
03/22/94	MW-11	0.18	0.1	0.1	Boom installed
05/09/94	MW-11	0.35	0.4	0.5	Hand bailed, adjusted boom
05/25/94	MW-11	0.01	0.2	0.7	Boom absorption
06/14/94	MW-11	0.01	0.1	0.8	Boom absorption
07/13/94	MW-11	0.24	0.3	1.1	Boom absorption
07/22/94	MW-11	0.42	0.4	1.5	Boom absorption
08/19/94	MW-11	0.80	1.1	2.6	Hand bailed, adjusted boom
09/15/94	MW-11	0.12	0.0	2.6	Boom absorption
10/03/94	MW-11	0.13	0.7	3.3	Hand bailed, adjusted boom
10/28/94	MW-11	0.23	0.3	3.6	Boom absorption
11/28/94	MW-11	0.62	0.4	4.0	Boom absorption
12/21/94	MW-11	0.71	0.8	4.8	Hand bailed, removed boom
02/03/95	MW-11	1.12	2.4	7.2	Hand bailed

TABLE 3
PHASE-SEPARATED HYDROCARBON RECOVERY

Date	Monitor Well	PSH Thickness (feet)	PSH Recovery (gallons)	PSH Cumulative Recovery (gallons)	Type of Recovery
03/28/95	MW-11	0.71	0.5	7.7	Boom absorption
04/25/95	MW-11	1.45	0.8	8.5	Boom absorption
07/19/95	MW-11	Trace	0.0	8.5	Hand bailed
05/18/95	RW-1	--	2.0	2.0	Recovery system
07/19/95	RW-1	--	3.0 (est.)	5.0	Recovery system
05/18/95	RW-2	--	3.0	3.0	Recovery system
07/19/95	RW-2	--	2.0 (est.)	5.0	Recovery system

APPENDIX C
ANALYTICAL RESULTS

9507889

SHELL OIL COMPANY
RETAIL ENVIRONMENTAL ENGINEERING

CHAIN OF CUSTODY RECORD NO. H 11306

Date: 7-24-95
Page 1 of 1

SITE ADDRESS: Shell Pipe Line
LEA Station
~~WO #~~ Proj # 24-93677504
CONSULTANT NAME & ADDRESS: CURA Inc
731 W. Wadley, L-200, Midland TX
CONSULTANT CONTACT: Brad Smith (Houston)
PHONE: (915) 570-8408 FAX: (915) 570-8409
SAMPLED BY: Bill D. Smith

CHECK ONE BOX ONLY CT/DT

- QUARTERLY MONITORING ☒ 5461
- SITE INVESTIGATION ☐ 5441
- SOIL FOR DISPOSAL ☐ 5442
- WATER FOR DISPOSAL ☐ 5443
- AIR SAMPLER - SYS O+M ☐ 5452
- WATER SAMPLE - SYS O+M ☐ 5453
- OTHER _____ ☐

SAMPLE I.D.	DATE	TIME	COMP.	GRAB	MATRIX: H2O	SOIL	AIR	SLUDGE	OTHER	METHOD PRESERVED: HCl	HNO3	H2SO4	NONE	OTHER: ICE	NO. OF CONTAINERS	CONTAINER SIZE	ANALYSIS REQUEST: BTEX 602 ☐ WITH MTBE ☐ 8020 ☒	BTEX/GAS HYDROCARBONS PID/FID ☐ WITH MTBE	VOL 624/PPL ☐ 8240/TAL ☐ NBS (+15) ☐	PNA/PAH 8310 ☐ 8100 ☐ 610 ☐	SEMI - VOL 625/PPL ☐ 8270/TAL ☐ NBS (+25) ☐	TPH/IR 418.1 ☐ SM503 ☐ ☐ ☐	TPH/GC 8015 Mod. GAS ☐ 8015 Mod DIESEL ☐	TCLP METALS ☐ VOL ☐ SEMI-VOL ☐ PEST ☐ HERB ☐	EP TOX METALS ☐ PESTICIDES ☐ HERBICIDES ☐	REACTIVITY ☐ CORROSIVITY ☐ IGNITABILITY ☐	OTHER	REMARKS
MW-4	7-19-95	1140		✓	✓					✓				✓	3	40 ml VOA	✓											
MW-6	7-20-95	1315		✓	✓					✓				✓	2	40 VOA	✓											
MW-7	7-20-95	1245		✓	✓					✓				✓	3	✓	✓											
MW-9	7-19-95	1215		✓	✓					✓				✓	3	VOA	✓											
MW-10	7-19-95	1245		✓	✓					✓				✓	3	VOA	✓											
MW-12	7-20-95	1150		✓	✓					✓				✓	3	VOA	✓											
MW-13	7-20-95	1215		✓	✓					✓				✓	3	VOA	✓											

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME
Bill D. Smith	7-24-95	1100			
RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME
RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME
			S. West	7/25/95	1045

BILL NO.: _____
LABORATORY: SPL (Houston)
SHELL CONTACT: Neil Stidham PHONE: _____ FAX: _____

TURN AROUND TIME (CHECK ONE)
7 DAYS ☐ (NORMAL) 14 DAYS ☐
48 HOURS ☐ OTHER As per Shell Contract

Intact 3 C

THE LABORATORY MUST PROVIDE A COPY OF THIS CHAIN OF CUSTODY WITH INVOICE AND RESULTS

DISTRIBUTION: PINK Sampling Coordinator - WHITE & YELLOW Accompanies Shipment - WHITE Returned with Report

0597877464

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Certificate of Analysis No. H9-9507889-01

Shell Pipe Line Corporation
P.O. Box 2648
Houston, TX 77252
ATTN: Neal Stidham

P.O.# MESA-CAO-B-131201-PX-4204-NS
DATE: 07/31/95

PROJECT: 24-93677504
SITE: Lea Station
SAMPLED BY: Cura, Inc.
SAMPLE ID: MW-4

PROJECT NO: H 11306
MATRIX: WATER
DATE SAMPLED: 07/19/95 11:40:00
DATE RECEIVED: 07/25/95

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	ND	1 P	µg/L
TOLUENE	ND	1 P	µg/L
ETHYLBENZENE	ND	1 P	µg/L
TOTAL XYLENE	ND	1 P	µg/L
TOTAL BTEX	ND		µg/L

Surrogate	% Recovery
1,4-Difluorobenzene	92
4-Bromofluorobenzene	98

METHOD 5030/8020 ***
Analyzed by: DAO
Date: 07/26/95

ND - Not detected. (P) - Practical Quantitation Limit

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
**Ref: Standard Methods for Examination of Water & Wastewater, 17th ed.
***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

SPL, Inc., - Project Manager

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Certificate of Analysis No. H9-9507889-02

Shell Pipe Line Corporation
P.O. Box 2648
Houston, TX 77252
ATTN: Neal Stidham

P.O.# MESA-CAO-B-131201-PX-4204-NS
DATE: 07/31/95

PROJECT: 24-93677504
SITE: Lea Station
SAMPLED BY: Cura, Inc.
SAMPLE ID: MW-6

PROJECT NO: H 11306
MATRIX: WATER
DATE SAMPLED: 07/20/95 13:15:00
DATE RECEIVED: 07/25/95

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	ND	1 P	µg/L
TOLUENE	ND	1 P	µg/L
ETHYLBENZENE	2	1 P	µg/L
TOTAL XYLENE	19	1 P	µg/L
TOTAL BTEX	21		µg/L

Surrogate	% Recovery
1,4-Difluorobenzene	91
4-Bromofluorobenzene	111

METHOD 5030/8020 ***
Analyzed by: DAO
Date: 07/26/95

ND - Not detected. (P) - Practical Quantitation Limit

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
**Ref: Standard Methods for Examination of Water & Wastewater, 17th ed.
***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

SPL, Inc., - Project Manager

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Certificate of Analysis No. H9-9507889-03

Shell Pipe Line Corporation
P.O. Box 2648
Houston, TX 77252
ATTN: Neal Stidham

P.O.# MESA-CAO-B-131201-PX-4204-NS
DATE: 07/31/95

PROJECT: 24-93677504
SITE: Lea Station
SAMPLED BY: Cura, Inc.
SAMPLE ID: MW-7

PROJECT NO: H 11306
MATRIX: WATER
DATE SAMPLED: 07/20/95 12:45:00
DATE RECEIVED: 07/25/95

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	ND	1 P	µg/L
TOLUENE	ND	1 P	µg/L
ETHYLBENZENE	ND	1 P	µg/L
TOTAL XYLENE	ND	1 P	µg/L
TOTAL BTEX	ND		µg/L

Surrogate	% Recovery
1,4-Difluorobenzene	91
4-Bromofluorobenzene	98

METHOD 5030/8020 ***
Analyzed by: DAO
Date: 07/26/95

ND - Not detected. (P) - Practical Quantitation Limit

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
**Ref: Standard Methods for Examination of Water & Wastewater, 17th ed.
***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

SPL, Inc., - Project Manager

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Certificate of Analysis No. H9-9507889-04

Shell Pipe Line Corporation
P.O. Box 2648
Houston, TX 77252
ATTN: Neal Stidham

P.O.# MESA-CAO-B-131201-PX-4204-NS
DATE: 07/31/95

PROJECT: 24-93677504
SITE: Lea Station
SAMPLED BY: Cura, Inc.
SAMPLE ID: MW-9

PROJECT NO: H 11306
MATRIX: WATER
DATE SAMPLED: 07/19/95 12:15:00
DATE RECEIVED: 07/25/95

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	ND	1 P	µg/L
TOLUENE	ND	1 P	µg/L
ETHYLBENZENE	ND	1 P	µg/L
TOTAL XYLENE	ND	1 P	µg/L
TOTAL BTEX	ND		µg/L

Surrogate	% Recovery
1,4-Difluorobenzene	93
4-Bromofluorobenzene	100

METHOD 5030/8020 ***
Analyzed by: DAO
Date: 07/26/95

ND - Not detected. (P) - Practical Quantitation Limit

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
**Ref: Standard Methods for Examination of Water & Wastewater, 17th ed.
***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

SPL, Inc., - Project Manager

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Certificate of Analysis No. H9-9507889-05

Shell Pipe Line Corporation
P.O. Box 2648
Houston, TX 77252
ATTN: Neal Stidham

P.O.# MESA-CAO-B-131201-PX-4204-NS
DATE: 07/31/95

PROJECT: 24-93677504
SITE: Lea Station
SAMPLED BY: Cura, Inc.
SAMPLE ID: MW-10

PROJECT NO: H 11306
MATRIX: WATER
DATE SAMPLED: 07/19/95 12:45:00
DATE RECEIVED: 07/25/95

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	2	1 P	µg/L
TOLUENE	ND	1 P	µg/L
ETHYLBENZENE	ND	1 P	µg/L
TOTAL XYLENE	ND	1 P	µg/L
TOTAL BTEX	2		µg/L

Surrogate	% Recovery
1,4-Difluorobenzene	89
4-Bromofluorobenzene	104

METHOD 5030/8020 ***
Analyzed by: AA
Date: 07/29/95

(P) - Practical Quantitation Limit ND - Not detected.

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
**Ref: Standard Methods for Examination of Water & Wastewater, 17th ed.
***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

SPL, Inc., - Project Manager

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Certificate of Analysis No. H9-9507889-06

Shell Pipe Line Corporation
P.O. Box 2648
Houston, TX 77252
ATTN: Neal Stidham

P.O.# MESA-CAO-B-131201-PX-4204-NS
DATE: 07/31/95

PROJECT: 24-93677504
SITE: Lea Station
SAMPLED BY: Cura, Inc.
SAMPLE ID: MW-12

PROJECT NO: H 11306
MATRIX: WATER
DATE SAMPLED: 07/20/95 11:50:00
DATE RECEIVED: 07/25/95

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	580	5 P	µg/L
TOLUENE	130	5 P	µg/L
ETHYLBENZENE	76	5 P	µg/L
TOTAL XYLENE	32	5 P	µg/L
TOTAL BTEX	818		µg/L

Surrogate	% Recovery
1,4-Difluorobenzene	90
4-Bromofluorobenzene	100

METHOD 5030/8020 ***
Analyzed by: AA
Date: 07/29/95

(P) - Practical Quantitation Limit

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
**Ref: Standard Methods for Examination of Water & Wastewater, 17th ed.
***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

SPL, Inc., Project Manager

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Certificate of Analysis No. H9-9507889-07

Shell Pipe Line Corporation
P.O. Box 2648
Houston, TX 77252
ATTN: Neal Stidham

P.O.# MESA-CAO-B-131201-PX-4204-NS
DATE: 07/31/95

PROJECT: 24-93677504
SITE: Lea Station
SAMPLED BY: Cura, Inc.
SAMPLE ID: MW-13

PROJECT NO: H 11306
MATRIX: WATER
DATE SAMPLED: 07/20/95 12:15:00
DATE RECEIVED: 07/25/95

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	ND	1 P	µg/L
TOLUENE	ND	1 P	µg/L
ETHYLBENZENE	ND	1 P	µg/L
TOTAL XYLENE	ND	1 P	µg/L
TOTAL BTEX	ND		µg/L

Surrogate	% Recovery
1,4-Difluorobenzene	92
4-Bromofluorobenzene	97

METHOD 5030/8020 ***
Analyzed by: DAO
Date: 07/27/95

ND - Not detected. (P) - Practical Quantitation Limit

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
**Ref: Standard Methods for Examination of Water & Wastewater, 17th ed.
***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

SPL, Inc., - Project Manager

QUALITY CONTROL

DOCUMENTATION

** SPL BATCH QUALITY CONTROL REPORT ** PAGE

METHOD 8020

Matrix: Aqueous Batch Id: HP_S950726084300

Units: µg/L

LABORATORY CONTROL SAMPLE

SPIKE COMPOUNDS	Method Blank Result <2>	Spike Added <3>	Blank Spike Result <1>	Blank Spike Recovery %	QC Limits(**) (Mandatory) % Recovery Range
Benzene	ND	50	45	90.0	61 - 123
Toluene	ND	150	140	93.3	62 - 122
EthylBenzene	ND	50	54	108	56 - 119
O Xylene	ND	100	100	100	32 - 160
M & P Xylene	ND	200	220	110	32 - 160

MATRIX SPIKES

SPIKE COMPOUNDS	Sample Results <2>	Spike Added <3>	Matrix Spike Result <1>	Matrix Spike Recovery <4>	Matrix Spike Duplicate Result <1>	Matrix Spike Duplicate Recovery <5>	MS/MSD Relative % Difference	QC Limits(***) (Advisory) RPD Max.	QC Limits(***) (Advisory) Recovery Range
BENZENE	ND	50	48	96.0	47	94.0	2.11	25	39 - 150
TOLUENE	ND	150	140	93.3	140	93.3	0	26	56 - 134
ETHYLBENZENE	ND	50	49	98.0	50	100	2.02	38	61 - 128
O XYLENE	ND	100	97	97.0	96	96.0	1.04	20	40 - 130
M & P XYLENE	ND	100	110	110	110	110	0	20	43 - 152

Analyst: DAO

Sequence Date: 07/26/95

SPL ID of sample spiked: 9507889-03A

Sample File ID: SS__924.TX0

Method Blank File ID:

Blank Spike File ID: SS__920.TX0

Matrix Spike File ID: SS__954.TX0

Matrix Spike Duplicate File ID: SS__955.TX0

* = Values Outside QC Range

NC = Not Calculated (Sample exceeds spike by factor of 4 or more)

ND = Not Detected/Below Detection Limit

% Recovery = [(<1> - <2>) / <3>] x 100

LCS % Recovery = (<1> / <3>) x 100

Relative Percent Difference = |(<4> - <5> | / [(<4> + <5>) x 0.5] x 100

(**) = Source: SPL-Houston Historical Data

(***) = Source: SPL-Houston Historical Data

SAMPLES IN BATCH(SPL ID): 9507889-04A 9507889-07A 9507871-02A 9507871-01A 9507871-03A 9507835-02A 9507835-07A 9507565-01G 9507889-01A 9507889-02A 9507889-03A

Cynthia Schreiner, QC Officer

** SPL BATCH QUALITY CONTROL REPORT ** PAGE

METHOD 8020

Matrix: Aqueous Batch Id: HP_S950728144800

Units: µg/L

LABORATORY CONTROL SAMPLE

SPIKE COMPOUNDS	Method Blank Result <2>	Spike Added <3>	Blank Spike Result <1>	Blank Spike Recovery %	QC Limits(**) (Mandatory) % Recovery Range
Benzene	ND	50	41	82.0	61 - 123
Toluene	ND	150	130	86.7	62 - 122
EthylBenzene	ND	50	45	90.0	56 - 119
O Xylene	ND	100	89	89.0	32 - 160
M & P Xylene	ND	200	190	95.0	32 - 160

MATRIX SPIKES

SPIKE COMPOUNDS	Sample Results <2>	Spike Added <3>	Matrix Spike Result <1>	Matrix Spike Recovery <4>	Matrix Spike Duplicate Result <1>	Matrix Spike Duplicate Recovery <5>	MS/MSD Relative % Difference	QC Limits(***) (Advisory) RPD Max.	QC Limits(***) (Advisory) Recovery Range
BENZENE	1	50	57	112	57	112	0	25	39 - 150
TOLUENE	2	150	170	112	170	112	0	26	56 - 134
ETHYLBENZENE	ND	50	60	120	59	118	1.68	38	61 - 128
O XYLENE	ND	100	110	110	110	110	0	20	40 - 130
M & P XYLENE	1	100	130	129	130	129	0	20	43 - 152

Analyst: AA

Sequence Date: 07/28/95

SPL ID of sample spiked: 9507929-12A

Sample File ID: SS__992.TX0

Method Blank File ID:

Blank Spike File ID: SS__990.TX0

Matrix Spike File ID: SS__018.TX0

Matrix Spike Duplicate File ID: SS__019.TX0

* = Values Outside QC Range

NC = Not Calculated (Sample exceeds spike by factor of 4 or more)

ND = Not Detected/Below Detection Limit

% Recovery = [(<1> - <2>) / <3>] x 100

LCS % Recovery = (<1> / <3>) x 100

Relative Percent Difference = |(<4> - <5> | / [(<4> + <5>) x 0.5] x 100

(**) = Source: SPL-Houston Historical Data

(***) = Source: SPL-Houston Historical Data

SAMPLES IN BATCH(SPL ID): 9507929-26A 9507929-22A 9507929-24A 9507889-05A 9507889-06A 9507565-01G 9507929-12A 9507929-15A

Cynthia Schreiner, QC Officer

APPENDIX D
QUALITY ASSURANCE/QUALITY CONTROL SAFETY PLAN AND LIMITATIONS

QUALITY ASSURANCE/QUALITY CONTROL

A strict Quality Assurance Plan was incorporated throughout all phases of the on-site operations and sampling procedures. Soil or solid material samples were collected using new disposable or properly decontaminated reusable stainless steel equipment. Water or liquid samples were collected with new disposable bailers or decontaminated pump equipment. All non-reusable equipment was disposed of and reusable equipment was decontaminated between sampling stations to eliminate the potential of cross-contamination. The water samples were transferred from the bailers into airtight septum-sealed 40-ml glass VOA vials, one-liter amber glass jars with Teflon-lined lids, or other sample containers appropriate for the required analyses.

The samples were sealed with QA/QC seals, preserved with acid (if required), and maintained at 4°C in accordance with Environmental Protection Agency (EPA) requirements (EPA 600/4-82-029) for shipment to the laboratory. A chain-of-custody (COC) which documents sample collection times and delivery times to the laboratory was completed for each set of samples. The COC is included with the analytical results in the Appendix.

CURA utilizes laboratories that maintain strict quality controls, i.e. equipment calibration and standardization, appropriate analytical methods, preparation of quality control samples, and complete chains-of-custody. Analyses were performed on all samples using the EPA-, state-, or local agency-directed methods. The maximum recommended holding times were not exceeded unless noted in the text.

SAFETY PLAN

The sampling operations were performed at level D personal protection. CURA personnel involved in on-site activities have completed the Occupational Safety and health for Hazardous Waste Field Operation training course (OSHA 29 CFR 1910.120). Applicable safety equipment was on site to CURA personnel.

LIMITATIONS

It should be noted that all subsurface investigations are inherently limited in the sense that conclusions are drawn and recommendations are developed from samples which depict subsurface conditions at representative locations over relatively short periods of time. Subsurface conditions elsewhere may differ from those at the sampling locations. In addition, subsurface conditions at sampling locations may vary over longer periods of time than can be observed in a study of this type. The passage of time, manifestation of latent conditions, or occurrence of future events may require further site exploration, data collection and analysis, and reevaluation of the findings, observations, conclusions, and recommendation expressed in this report.

Shell Oil Products Company

OIL CONSERVATION DIVISION
RECEIVED
'95 JUN 14 AM 8

Two Shell Plaza
P. O. Box 2099
Houston, Texas 77252-2099

June 14, 1995

RECEIVED
JUN 21 1995
Environmental Bureau
Oil Conservation Division

William Olson
State of New Mexico Oil Conservation Division
Environmental Bureau
2040 S. Pacheco St.
Santa Fe, New Mexico 87504

SUBJECT: DEVELOPMENT WATER, DUBLIN, DENTON, AND LEA STATIONS

Dear Mr. Olson,

Enclosed are copies of the laboratory results from sampling the development water at the subject stations. This water was form the last sampling event. The water was analyzed for benzene and was non-detect at Dublin and Denton and 0.35ppm at Lea. With your concurrence we will surface discharge this water. If you have any questions please call me at 713-241-2961.

Sincerely

Neal Stidham
Staff Engineer
Shell Oil Products Company
Representing Shell Pipe Line Corporation

cc: Paul Newman-EOTT Energy Corp.
Jerry Sexton-OCD Hobbs

Verbal approval to Neal Stidham on 7/24/95
Wm Olson

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

LCA

SPL, INC.

REPORT APPROVAL SHEET

WORK ORDER NUMBER: 95 - 05 - 815

Approved for release by:

Date: 6/1/95

Brent Barron, Project Manager

Date: 6/2/95

S. Sample, Laboratory Director

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Certificate of Analysis No. H9-9505815-01

Shell Pipe Line Corporation
P.O. Box 2648
Houston, TX 77252
ATTN: Neal Stidham

P.O.# MESA-CAO-B-131201-PX-4204-NS
DATE: 05/31/95

PROJECT: 24-93677504.03
SITE: Lea Station
SAMPLED BY: Cura, Inc.
SAMPLE ID: Dev. Water

PROJECT NO: H 13360
MATRIX: WATER
DATE SAMPLED: 05/19/95 15:00:00
DATE RECEIVED: 05/23/95

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Benzene	350	1 P	µg/L
Surrogate	**% Recovery**		
1,4-Difluorobenzene	153		
4-Bromofluorobenzene	118		

METHOD 8020***
Analyzed by: SLB
Date: 05/30/95

(P) - Practical Quantitation Limit

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
**Ref: Standard Methods for Examination of Water & Wastewater, 17th ed.
***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

SPL, Inc., - Project Manager

QUALITY CONTROL DOCUMENTATION

METHOD 8020/602

Matrix: Aqueous Batch Id: HP_J950528200900

Units: µg/L

LABORATORY CONTROL SAMPLE

SPIKE COMPOUNDS	Method Blank Result <2>	Spike Added <3>	Blank Spike Result <1>	Blank Spike Recovery %	QC Limits(**) (Mandatory) % Recovery Range
MTBE	ND	50	44	88.0	56 - 135
Benzene	ND	50	39	78.0	61 - 123
Toluene	ND	50	40	80.0	62 - 122
EthylBenzene	ND	50	40	80.0	56 - 119
O Xylene	ND	50	42	84.0	32 - 160
M & P Xylene	ND	100	88	88.0	32 - 160

MATRIX SPIKES

SPIKE COMPOUNDS	Sample Results <2>	Spike Added <3>	Matrix Spike Result <1>	Matrix Spike Recovery <4>	Matrix Spike Duplicate Result <1>	Matrix Spike Duplicate Recovery <5>	MS/MSD Relative % Difference	QC Limits(***) (Advisory) RPD Max.	QC Limits(***) (Advisory) Recovery Range
MTBE	7	20	29	110	29	110	0	20	39 - 150
Benzene	ND	20	23	115	23	115	0	33	39 - 150
Toluene	ND	20	21	105	22	110	4.65	35	56 - 134
EthylBenzene	ND	20	21	105	21	105	0	40	61 - 128
O Xylene	ND	20	21	105	20	100	4.88	29	40 - 130
M & P Xylene	ND	40	43	108	43	108	0	20	43 - 152

Analyst: YN

Sequence Date: 05/28/95

SPL ID of sample spiked: 9505884-07A

Sample File ID: J___434.TX0

Method Blank File ID:

Blank Spike File ID: J___426.TX0

Matrix Spike File ID: J___429.TX0

Matrix Spike Duplicate File ID: J___430.TX0

* = Values Outside QC Range

NC = Not Calculated (Sample exceeds spike by factor of 4 or more)

ND = Not Detected/Below Detection Limit

% Recovery = [(<1> - <2>) / <3>] x 100

LCS % Recovery = (<1> / <3>) x 100

Relative Percent Difference = |(<4> - <5> | / [(<4> + <5>) x 0.5] x 100

(**) = Source: SPL-Houston Historical Data

(***) = Source: SPL-Houston Historical Data

SAMPLES IN BATCH(SPL ID):

9505A50-01A 9505816-01A 9505815-01A 9505814-01A
9505A50-02A 9505813-01A 9505813-03A 9505899-05A
9505715-09A 9505A34-01A 9505844-05A 9505690-01B
9505844-03A 9505884-02A 9505884-08A 9505884-09A
9505884-07A 9505844-10A 9505884-10A

Idelis Williams, QC Officer

CHAIN OF CUSTODY
AND
SAMPLE RECEIPT CHECKLIST

4505815

SHELL OIL COMPANY
RETAIL ENVIRONMENTAL ENGINEERING

CHAIN OF CUSTODY RECORD NO. H 13360

Date: 5-22-95
Page 1 of 1

SITE ADDRESS: Shell Pipe Line
LEA Station
(HOU) # 24-93677504.03

CONSULTANT NAME & ADDRESS: CURA Inc.
731 W. Wadley, C-200, Midland TX

CONSULTANT CONTACT: Brad Smith (Houston)

PHONE: (915) 570-8408 FAX: (915) 570-8409

SAMPLED BY: Bill Smith

CHECK ONE BOX ONLY CT/DT

- QUARTERLY MONITORING ☒ 5461
- SITE INVESTIGATION ☐ 5441
- SOIL FOR DISPOSAL ☐ 5442
- WATER FOR DISPOSAL ☐ 5443
- AIR SAMPLER - SYS O+M ☐ 5452
- WATER SAMPLE - SYS O+M ☐ 5453
- OTHER ☐

SAMPLE I.D.	DATE	TIME	COMP.	GRAB	MATRIX: H2O	SOIL	AIR	SLUDGE	OTHER	METHOD PRESERVED: HCl	HNO3	H2SO4	NONE	OTHER: ICE	NO. OF CONTAINERS	CONTAINER SIZE
Dev. Water	5-19-95	1500	✓		✓					✓				✓	3	40ml VOA

ANALYSIS REQUEST (CHECK APPROPRIATE BOX)

BTEX 602 ☐	8020 ☐ WITH MTBE ☐	BTEX/GAS HYDROCARBONS PID/FID ☐ WITH MTBE	VOL 624/PPL ☐	8240/TAL ☐	NBS (+15) ☐	PNA/PAH 8310 ☐	8100 ☐	610 ☐	SEMI - VOL 625/PPL ☐	8270/TAL ☐	NBS (+25) ☐	TPH/IR 418.1 ☐	SM503 ☐ ___ ☐ ___ ☐	TPH/GC 8015 Mod. GAS ☐	8015 Mod DIESEL ☐	TCLP METALS ☐ VOL ☐ SEMI-VOL ☐ PEST ☐ HERB ☐	EP TOX METALS ☐ PESTICIDES ☐ HERBICIDES ☐	REACTIVITY ☐ CORROSIVITY ☐ IGNITABILITY ☐

OTHER: total Benzene ✓

REMARKS

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME
Bill D. Smith	5-22-95	1500			
RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME
RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME
			S. West	5/23/95	1025

BILL NO.: _____
LABORATORY: SPL Houston
SHELL CONTACT: Neil Stidham PHONE: _____ FAX: _____

TURN AROUND TIME (CHECK ONE)
7 DAYS ☐ (NORMAL) 14 DAYS ☐
48 HOURS ☐ OTHER ☒ per Shell contract

THE LABORATORY MUST PROVIDE A COPY OF THIS CHAIN OF CUSTODY WITH INVOICE AND RESULTS

DISTRIBUTION: PINK Sampling Coordinator - WHITE & YELLOW Accompanies Shipment - WHITE Returned with Report

24 hr data

FedEx Federal Express

RECIPIENT'S COPY

QUESTIONS? CALL 800-238-5355 TOLL FREE.

AIRBILL PACKAGE TRACKING NUMBER 4530723525

4 5 3 0 7 2 3 5 2 5

4530723525

[redacted]

Date

1 From (Your Name) Please Print | Your Phone Number (Very Important)

Company | Department/Floor No.

Street Address

City | State | ZIP Required

2 To (Recipient's Name) Please Print | Recipient's Phone Number (Very Important)

Company | Department/Floor No.

Exact Street Address *(We Cannot Deliver to P.O. Boxes or P.O. Zip Codes.)*

City | State | ZIP Required

YOUR INTERNAL BILLING REFERENCE INFORMATION (optional) (First 24 characters will appear on invoice.)

H IF HOLD AT FEDEX LOCATION, Print FEDEX Address Here
Street Address 4702 TRAVIS
City HOUSTON, State TX ZIP Required 77002

3 PAYMENT 1 ☐ Bill Sender 2 ☐ Bill Recipient's FedEx Acct. No. 3 ☐ Bill 3rd Party FedEx Acct. No. 4 ☐ Bill Credit Card
5 ☐ Cash/Check [redacted]

4 SERVICES (Check only one box)

Priority Overnight (Delivery by next business morning†)
11 ☐ OTHER PACKAGING
16 ☐ FEDEX LETTER*
12 ☐ FEDEX PAK*
13 ☐ FEDEX BOX
14 ☐ FEDEX TUBE

Standard Overnight (Delivery by next business afternoon† No Saturday delivery)
51 ☒ OTHER PACKAGING
56 ☐ FEDEX LETTER*
52 ☐ FEDEX PAK*
53 ☐ FEDEX BOX
54 ☐ FEDEX TUBE

Economy Two-Day (Delivery by second business day †)
30 ☐ ECONOMY*
*Economy Letter Rate not available. Minimum charge: One pound Economy rate.

Government Overnight (Restricted for authorized users only)
46 ☐ GOVT LETTER
41 ☐ GOVT PACKAGE

Freight Service (for packages over 150 lbs.)
70 ☐ OVERNIGHT FREIGHT** (Confirmed reservation required)
80 ☐ TWO-DAY FREIGHT**

5 DELIVERY AND SPECIAL HANDLING (Check services required)

Weekday Service
1 ☒ HOLD AT FEDEX LOCATION WEEKDAY (Fill in Section H)
2 ☐ DELIVER WEEKDAY

Saturday Service
31 ☐ HOLD AT FEDEX LOCATION SATURDAY (Fill in Section H)
3 ☐ DELIVER SATURDAY (Extra charge) (Not available to all locations)
9 ☐ SATURDAY PICK-UP (Extra charge)

Special Handling
4 ☐ DANGEROUS GOODS (Extra charge)
6 ☐ DRY ICE Dangerous Goods Shipper's Declaration not required
Dry Ice, 9, UN 1845, ______ x ______ kg. 904 III
☐ DESCRIPTION
12 ☐ HOLIDAY DELIVERY (If offered)

6 PACKAGES | WEIGHT In Pounds Only | YOUR DECLARED VALUE (See right)

Total | Total | Total

DIM SHIPMENT (Chargeable Weight)
☐ ______ lbs.
L x W x H

Received At
1 ☐ Regular Stop 3 ☐ Drop Box 4 ☐ B S C

7 Release

Emp. No. | Date
☐ Cash Received
☐ Return Shipment
☐ Third Party ☐ Chg. To Del. ☐ Chg. To Hold
Street Address
City | State | Zip
Received By:
X
Date/Time Received | FedEx Employee Number

Federal Express Use
Base Charges
Declared Value Charge
Other 1
Other 2
Total Charges

REVISION DATE 4/94
PART #145412 FXEM 2/95
FORMAT #160

160

SPL HOUSTON ENVIRONMENTAL LABORATORY

SAMPLE LOGIN CHECKLIST

DATE: 5/23/95 TIME: 1025 CLIENT NO. _____
LOT NO. _____ CONTRACT NO. _____

CLIENT SAMPLE NOS. _____

SPL SAMPLE NOS.: 9505815

		YES	NO
1.	Is a Chain-of-Custody form present?	✓	
2.	Is the COC properly completed?	✓	
	If no, describe what is incomplete:		
	If no, has the client been contacted about it? (Attach subsequent documentation from client about the situation)		
3.	Is airbill/packing list/bill of lading with shipment? If yes, ID#: PD EX	✓	
4.	Is a USEPA Traffic Report present?		✓
5.	Is a USEPA SAS Packing List present?		
6.	Are custody seals present on the package?	✓	
	If yes, were they intact upon receipt?		
7.	Are all samples tagged or labeled?	✓	
	Do the sample tags/labels match the COC?	✓	
	If no, has the client been contacted about it? (Attach subsequent documentation from client about the situation)		
8.	Do all shipping documents agree?	✓	
	If no, describe what is in nonconformity:		

9. Condition/temperature of shipping container: 3°C INTACT
10. Condition/temperature of sample bottles: GOOD
11. Sample Disposal?: SPL disposal ✓ Return to client ____

NOTES (reference item number if applicable): _____

ATTEST: R Ringuay DATE: 5/23/95
DELIVERED FOR RESOLUTION: REC'D _____ DATE: _____
RESOLVED: _____ DATE: _____

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

SPL, INC.

REPORT APPROVAL SHEET

WORK ORDER NUMBER: 95 - 05 - 816

Approved for release by:

Date: 6/1/95

Brent Barron, Project Manager

Date: 6/2/95

S. Sample, Laboratory Director

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Certificate of Analysis No. H9-9505816-01

Shell Pipe Line Corporation
P.O. Box 2648
Houston, TX 77252
ATTN: Neal Stidham

P.O.# MESA-CAO-B-131201-PX-4204-NS
DATE: 05/31/95

PROJECT: 24-93676504.03
SITE: Dublin Station
SAMPLED BY: Cura, Inc.
SAMPLE ID: Dev. Water

PROJECT NO: H 13358
MATRIX: WATER
DATE SAMPLED: 05/19/95 16:00:00
DATE RECEIVED: 05/23/95

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Benzene	ND	1 P	µg/L
Surrogate	**% Recovery**		
1,4-Difluorobenzene	109		
4-Bromofluorobenzene	94		
METHOD 8020***			
Analyzed by: SLB			
Date: 05/30/95			

ND - Not detected. (P) - Practical Quantitation Limit

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
**Ref: Standard Methods for Examination of Water & Wastewater, 17th ed.
***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

SPL, Inc. - Project Manager

QUALITY CONTROL DOCUMENTATION

METHOD 8020/602

Matrix: Aqueous Batch Id: HP_J950528200900

Units: µg/L

LABORATORY CONTROL SAMPLE

SPIKE COMPOUNDS	Method Blank Result <2>	Spike Added <3>	Blank Spike Result <1>	Blank Spike Recovery %	QC Limits(**) (Mandatory) % Recovery Range
MTBE	ND	50	44	88.0	56 - 135
Benzene	ND	50	39	78.0	61 - 123
Toluene	ND	50	40	80.0	62 - 122
EthylBenzene	ND	50	40	80.0	56 - 119
O Xylene	ND	50	42	84.0	32 - 160
M & P Xylene	ND	100	88	88.0	32 - 160

MATRIX SPIKES

SPIKE COMPOUNDS	Sample Results <2>	Spike Added <3>	Matrix Spike Result <1>	Matrix Spike Recovery <4>	Matrix Spike Duplicate Result <1>	Matrix Spike Duplicate Recovery <5>	MS/MSD Relative % Difference	QC Limits(***) (Advisory) RPD Max.	QC Limits(***) (Advisory) Recovery Range
MTBE	7	20	29	110	29	110	0	20	39 - 150
Benzene	ND	20	23	115	23	115	0	33	39 - 150
Toluene	ND	20	21	105	22	110	4.65	35	56 - 134
EthylBenzene	ND	20	21	105	21	105	0	40	61 - 128
O Xylene	ND	20	21	105	20	100	4.88	29	40 - 130
M & P Xylene	ND	40	43	108	43	108	0	20	43 - 152

Analyst: YN

Sequence Date: 05/28/95

SPL ID of sample spiked: 9505884-07A

Sample File ID: J___434.TX0

Method Blank File ID:

Blank Spike File ID: J___426.TX0

Matrix Spike File ID: J___429.TX0

Matrix Spike Duplicate File ID: J___430.TX0

* = Values Outside QC Range

NC = Not Calculated (Sample exceeds spike by factor of 4 or more)

ND = Not Detected/Below Detection Limit

% Recovery = [(<1> - <2>) / <3>] x 100

LCS % Recovery = (<1> / <3>) x 100

Relative Percent Difference = |(<4> - <5> | / [(<4> + <5>) x 0.5] x 100

(**) = Source: SPL-Houston Historical Data

(***) = Source: SPL-Houston Historical Data

SAMPLES IN BATCH(SPL ID):

9505A50-01A 9505816-01A 9505815-01A 9505814-01A
9505A50-02A 9505813-01A 9505813-03A 9505899-05A
9505715-09A 9505A34-01A 9505844-05A 9505690-01B
9505844-03A 9505884-02A 9505884-08A 9505884-09A
9505884-07A 9505844-10A 9505884-10A

Idelis Williams, QC Officer

CHAIN OF CUSTODY
AND
SAMPLE RECEIPT CHECKLIST

SHELL OIL COMPANY
RETAIL ENVIRONMENTAL ENGINEERING

CHAIN OF CUSTODY RECORD NO. H 13358

Date: 5-22-95
Page 1 of 1

SITE ADDRESS: Shell Pipe Line
Dublin Station
Proj #: 24-93676504.03
CONSULTANT NAME & ADDRESS: CURA Fax.
731 W. Wadley, L-200, Midland TX
CONSULTANT CONTACT: Brad Smith (Houston)
PHONE: (915) 570-8409 FAX: (915) 570-8409
SAMPLED BY: Bill D. Smith

CHECK ONE BOX ONLY CT/DT

- QUARTERLY MONITORING ☐ 5461
- SITE INVESTIGATION ☐ 5441
- SOIL FOR DISPOSAL ☐ 5442
- WATER FOR DISPOSAL ☐ 5443
- AIR SAMPLER - SYS O+M ☐ 5452
- WATER SAMPLE - SYS O+M ☐ 5453
- OTHER _____ ☐

SAMPLE I.D.	DATE	TIME	COMP.	GRAB	MATRIX: H2O	SOIL	AIR	SLUDGE	OTHER	METHOD PRESERVED: HCl	HNO3	H2SO4	NONE	OTHER: ICE	NO. OF CONTAINERS	CONTAINER SIZE	ANALYSIS REQUEST: BTEX 602 ☐ 8020 ☐ WITH MTBE ☐	BTEX/GAS HYDROCARBONS PID/FID ☐ WITH MTBE	VOL 624/PPL ☐ 8240/TAL ☐ NBS (+15) ☐	PNA/PAH 8310 ☐ 8100 ☐ 610 ☐	SEMI - VOL 625/PPL ☐ 8270/TAL ☐ NBS (+25) ☐	TPH/IR 418.1 ☐ SM503 ___ ☐ ___ ☐	TPH/GC 8015 Mod. GAS ☐ 8015 Mod DIESEL ☐	TCLP METALS ☐ VOL ☐ SEMI-VOL ☐ PEST ☐ HERB ☐	EP TOX METALS ☐ PESTICIDES ☐ HERBICIDES ☐	REACTIVITY ☐ CORROSIVITY ☐ IGNITABILITY ☐	OTHER	REMARKS
Dev. Water	5-19-95	1600	✓		✓					✓				✓	3	40 ml VOA											total Benzene

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME
Bill D. Smith	5-22-95	1500			
RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME
RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME
			S. West	5/23/95	1025

BILL NO.: _____
LABORATORY: SPL Houston
SHELL CONTACT: Neil Stidham PHONE: _____ FAX: _____

TURN AROUND TIME (CHECK ONE)
7 DAYS ☐ (NORMAL) 14 DAYS ☐
48 HOURS ☐ OTHER: per Shell Contract

FedEx# 453072355

THE LABORATORY MUST PROVIDE A COPY OF THIS CHAIN OF CUSTODY WITH INVOICE AND RESULTS
DISTRIBUTION: PINK Sampling Coordinator - WHITE & YELLOW Accompanies Shipment - WHITE Returned with Report

2 ATTACH

SPL HOUSTON ENVIRONMENTAL LABORATORY

SAMPLE LOGIN CHECKLIST

DATE: 5/23/95 TIME: 1025 CLIENT NO. _____
LOT NO. _____ CONTRACT NO. _____

CLIENT SAMPLE NOS. _____

SPL SAMPLE NOS.: 9505816

		YES	NO
1.	Is a Chain-of-Custody form present?	✓	
2.	Is the COC properly completed?	✓	
	If no, describe what is incomplete:		
	If no, has the client been contacted about it?		
	(Attach subsequent documentation from client about the situation)		
3.	Is airbill/packing list/bill of lading with shipment?	✓	
	If yes, ID#: RD EX		
4.	Is a USEPA Traffic Report present?		
5.	Is a USEPA SAS Packing List present?		✓
6.	Are custody seals present on the package?	✓	
	If yes, were they intact upon receipt?	✓	
7.	Are all samples tagged or labeled?	✓	
	Do the sample tags/labels match the COC?	✓	
	If no, has the client been contacted about it?		
	(Attach subsequent documentation from client about the situation)		
8.	Do all shipping documents agree?	✓	
	If no, describe what is in nonconformity:		

9. Condition/temperature of shipping container: 3C INTACT
10. Condition/temperature of sample bottles: 3C GOOD
11. Sample Disposal?: SPL disposal ✓ Return to client _____

NOTES (reference item number if applicable): _____

ATTEST: BRINSON DATE: 5/23/95
DELIVERED FOR RESOLUTION: REC'D _____ DATE: _____
RESOLVED: _____ DATE: _____

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

SPL, INC.

REPORT APPROVAL SHEET

WORK ORDER NUMBER: 95 - 05 - 817

Approved for release by:

Date: 6/1/95

Brent Barron, Project Manager

Date: 6/2/95

S. Sample, Laboratory Director

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Certificate of Analysis No. H9-9505817-01

Shell Pipe Line Corporation
P.O. Box 2648
Houston, TX 77252
ATTN: Neal Stidham

P.O.# MESA-CAO-B-131201-PX-4204-NS
DATE: 05/31/95

PROJECT: 24-93678504.03
SITE: Denton Station
SAMPLED BY: Cura, Inc.
SAMPLE ID: Dev. Water

PROJECT NO: H 13359
MATRIX: WATER
DATE SAMPLED: 05/19/95 14:00:00
DATE RECEIVED: 05/23/95

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Benzene	ND	1 P	µg/L
Surrogate	**% Recovery**		
1,4-Difluorobenzene	109		
4-Bromofluorobenzene	92		
METHOD 8020***			
Analyzed by: SLB			
Date: 05/31/95			

ND - Not detected. (P) - Practical Quantitation Limit

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
**Ref: Standard Methods for Examination of Water & Wastewater, 17th ed.
***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

SPL, Inc. - Project Manager

QUALITY CONTROL DOCUMENTATION

METHOD 8020/602

Matrix: Aqueous Batch Id: HP_J950530210700

Units: µg/L

LABORATORY CONTROL SAMPLE

SPIKE COMPOUNDS	Method Blank Result <2>	Spike Added <3>	Blank Spike Result <1>	Blank Spike Recovery %	QC Limits(**) (Mandatory) % Recovery Range
MTBE	ND	50	50	100	56 - 135
Benzene	ND	50	52	104	61 - 123
Toluene	ND	50	51	102	62 - 122
EthylBenzene	ND	50	52	104	56 - 119
O Xylene	ND	50	55	110	32 - 160
M & P Xylene	ND	100	120	120	32 - 160

MATRIX SPIKES

SPIKE COMPOUNDS	Sample Results <2>	Spike Added <3>	Matrix Spike Result <1>	Matrix Spike Recovery <4>	Matrix Spike Duplicate Result <1>	Matrix Spike Duplicate Recovery <5>	MS/MSD Relative % Difference	QC Limits(***) (Advisory) RPD Max.	QC Limits(***) (Advisory) Recovery Range
MTBE	23	20	46	115	43	100	14.0	20	39 - 150
Benzene	ND	20	21	105	21	105	0	33	39 - 150
Toluene	ND	20	22	110	20	100	9.52	35	56 - 134
EthylBenzene	ND	20	21	105	21	105	0	40	61 - 128
O Xylene	ND	20	21	105	20	100	4.88	29	40 - 130
M & P Xylene	ND	40	44	110	42	105	4.65	20	43 - 152

Analyst: SLB

Sequence Date: 05/31/95

SPL ID of sample spiked: 9505A20-01A

Sample File ID: J___462.TX0

Method Blank File ID:

Blank Spike File ID: J___487.TX0

Matrix Spike File ID: J___460.TX0

Matrix Spike Duplicate File ID: J___461.TX0

* = Values Outside QC Range

NC = Not Calculated (Sample exceeds spike by factor of 4 or more)

ND = Not Detected/Below Detection Limit

% Recovery = [(<1> - <2>) / <3>] x 100

LCS % Recovery = (<1> / <3>) x 100

Relative Percent Difference = |(<4> - <5> | / [(<4> + <5>) x 0.5] x 100

(**) = Source: SPL-Houston Historical Data

(***) = Source: SPL-Houston Historical Data

SAMPLES IN BATCH(SPL ID):

9505894-02B 9505894-01B 9505844-08A 9505994-07A
9505994-06A 9505994-04A 9505994-08A 9505994-03A
9505994-02A 9505994-01A 9505973-02A 9505973-01A
9505884-06A 9505884-04A 9505884-01A 9505817-01A
9505942-01A 9505942-03A 9505A20-01A

Idelis Williams, QC Officer

CHAIN OF CUSTODY
AND
SAMPLE RECEIPT CHECKLIST

4505401 7

SHELL OIL COMPANY
RETAIL ENVIRONMENTAL ENGINEERING

CHAIN OF CUSTODY RECORD NO. H 13359

Date: 5-22-95
Page 1 of 1

SITE ADDRESS: Shell Pipe Line
Denton Station
Proj #/MO#: 24-93678504.03
CONSULTANT NAME & ADDRESS: Cura Inc
731 W. Wadley, L-200, Midland TX
CONSULTANT CONTACT: Brad Smith (Houston)
PHONE: (915) 570-8408 FAX: (915) 570-8409
SAMPLED BY: Bill D. Smith

CHECK ONE BOX ONLY CT/DT

- QUARTERLY MONITORING ☒ 5461
- SITE INVESTIGATION ☐ 5441
- SOIL FOR DISPOSAL ☐ 5442
- WATER FOR DISPOSAL ☐ 5443
- AIR SAMPLER - SYS O+M ☐ 5452
- WATER SAMPLE - SYS O+M ☐ 5453
- OTHER ☐

SAMPLE I.D.	DATE	TIME	COMP.	GRAB	MATRIX: H2O	SOIL	AIR	SLUDGE	OTHER	METHOD PRESERVED: HCl	HNO3	H2SO4	NONE	OTHER: ICE	NO. OF CONTAINERS	CONTAINER SIZE
Dev. Water	5-17-95	1400	✓		✓					✓				✓	3	40 ml VOA

ANALYSIS REQUEST: (CHECK APPROPRIATE BOX)

- BTEX 602 ☐ 8020 ☐ WITH MTBE ☐
- BTEX/GAS HYDROCARBONS PID/FID ☐ WITH MTBE ☐
- VOL 624/PPL ☐ 8240/TAL ☐ NBS (+15) ☐
- PNA/PAH 8310 ☐ 8100 ☐ 610 ☐
- SEMI - VOL 625/PPL ☐ 8270/TAL ☐ NBS (+25) ☐
- TPH/IR 418.1 ☐ SM503 ___ ☐ ___ ☐ ___ ☐
- TPH/GC 8015 Mod. GAS ☐ 8015 Mod DIESEL ☐
- TCLP METALS ☐ VOL ☐ SEMI-VOL ☐ PEST ☐ HERB ☐
- EP TOX METALS ☐ PESTICIDES ☐ HERBICIDES ☐
- REACTIVITY ☐ CORROSIVITY ☐ IGNITABILITY ☐

OTHER: ✓ total Benzene

REMARKS:

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME
Bill D. Smith	5-22-95	1500			
RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME
RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME
			S. West	5/23/95	1025

BILL NO.:
LABORATORY: SPL Houston
SHELL CONTACT: Neil Stidham PHONE: FAX:

TURN AROUND TIME (CHECK ONE)
7 DAYS ☐ (NORMAL) 14 DAYS ☐
48 HOURS ☐ OTHER ☒ per Shell contract

THE LABORATORY MUST PROVIDE A COPY OF THIS CHAIN OF CUSTODY WITH INVOICE AND RESULTS
DISTRIBUTION: PINK Sampling Coordinator - WHITE & YELLOW Accompanies Shipment - WHITE Returned with Report

Fed Ex # 453072352 5
CONTRACT

SPL HOUSTON ENVIRONMENTAL LABORATORY

SAMPLE LOGIN CHECKLIST

DATE: 5/23/95 TIME: 1025 CLIENT NO. _____
LOT NO. _____ CONTRACT NO. _____

CLIENT SAMPLE NOS. _____

SPL SAMPLE NOS.: 9505817

		YES	NO
1.	Is a Chain-of-Custody form present?	✓	
2.	Is the COC properly completed?	✓	
	If no, describe what is incomplete:		
	If no, has the client been contacted about it?		
	(Attach subsequent documentation from client about the situation)		
3.	Is airbill/packing list/bill of lading with shipment? If yes, ID#: FED EX	✓	
4.	Is a USEPA Traffic Report present?		✓
5.	Is a USEPA SAS Packing List present?		✓
6.	Are custody seals present on the package?	✓	
	If yes, were they intact upon receipt?	✓	
7.	Are all samples tagged or labeled?	✓	
	Do the sample tags/labels match the COC?	✓	
	If no, has the client been contacted about it?		
	(Attach subsequent documentation from client about the situation)		
8.	Do all shipping documents agree?	✓	
	If no, describe what is in nonconformity:		

9. Condition/temperature of shipping container: 3°C INTACT
10. Condition/temperature of sample bottles: 3°C GOOD
11. Sample Disposal?: SPL disposal ✓ Return to client _____

NOTES (reference item number if applicable): _____

ATTEST: R RINSAUL DATE: 5/23/95
DELIVERED FOR RESOLUTION: REC'D _____ DATE: _____
RESOLVED: _____ DATE: _____

Shell Oil Products Company

Two Shell Plaza
P. O. Box 2099
Houston, Texas 77252-2099

June 1, 1995

William Olson
State of New Mexico Oil Conservation Division
Environmental Bureau
2040 S. Pacheco St.
Santa Fe, New Mexico 87504

SUBJECT: QUARTERLY REPORTS, LEA AND DENTON STATIONS, LEA COUNTY NEW MEXICO.

Dear Mr. Olson,

Enclosed are copies of the second quarter, 1995, monitoring reports for Lea and Denton Stations. This information is in response to the approval conditions set forth in your letters of January 10, 1995 and December 5, 1994 respectively. As authorized by your letters of April 28, quarterly sampling for polynuclear aromatic hydrocarbons (PAH) was discontinued but will be done annually, for MW-4, MW-5, MW-6, MW-7, MW-9, and MW-10 at Lea Station and at Denton Station, MW-2, MW-6, and MW-9. Wells containing Phase-Separated Hydrocarbon were not sampled but were measured and reported. If you have any questions please call me at 713-241-2961.

Sincerely

Neal Stidham
Staff Engineer
Shell Oil Products Company
Representing Shell Pipe Line Corporation

cc: Paul Newman-EOTT Energy Corp.
Jerry Sexton-OCD Hobbs

CURA INC.
Environmental Consultants, Engineers & Scientists
6049 South Loop East • Houston, Texas 77033 • 713/640-1490 • FAX 640-2593

52

May 30, 1995

Mr. Neal D. Stidham
Shell Oil Company
Two Shell Plaza, Room 1452
777 Walker Street
Houston, Texas 77002

RE: QUARTERLY GROUNDWATER MONITORING REPORT
SECOND QUARTER, 1995
LEA STATION
LEA COUNTY, NEW MEXICO

CURA PROJECT NO. 24-93677

Mr. Stidham:

CURA, Inc., has completed the groundwater monitoring and sampling operations at the above-referenced site. The work was performed in accordance with the scope of services requested by Shell Oil Company in their letter dated January 25, 1995.

Monitoring wells MW-1 through MW-13 were gauged and checked for phase-separated hydrocarbons (PSH) during sampling operations on April 25, 1995. Monitoring wells MW-4, MW-5, MW-6, MW-7, MW-9, and MW-10 were developed and sampled by CURA on April 25, 1995. In accordance with water quality monitoring requirements set forth by the New Mexico Oil Conservation Division (NMOCD) the groundwater samples were analyzed for benzene, toluene, ethylbenzene, and total xylenes (BTEX). The New Mexico Water Quality Control Commission (WQCC) regulations do not contain a groundwater standard for total petroleum hydrocarbons (TPH). Therefore, the NMOCD does not require that groundwater samples be analyzed for TPH. In addition to laboratory analysis for BTEX, dissolved oxygen (DO) levels for each sampled well were measured during field operations. Monitoring wells MW-1, MW-2, MW-5, MW-8, and MW-11 were not sampled because of the presence of PSH.

Groundwater Sampling and PSH Recovery

The monitoring wells were gauged on April 25, 1995, to determine the depth to groundwater and PSH thickness (if any). A summary of groundwater elevations, and PSH thicknesses is presented in Table 1, Appendix B.

PSH was initially observed on site in September, 1993 following the installation of monitoring wells MW-8 through MW-11. At that time approximately 0.04 feet of PSH was observed in monitoring well MW-8. Following soil vapor extraction (SVE) feasibility testing in December, 1993 in which monitoring well MW-8 was employed as a vapor extraction well, approximately 2.84 feet of PSH was observed in MW-8 and measurable PSH was also observed for the first time in monitoring wells MW-1 and MW-11. Expanded PSH recovery operations were then initiated at the site. PSH has since been observed in monitoring wells MW-2 and MW-5. During the second quarter of 1995 approximately 8 gallons of PSH were recovered from the site. A cumulative total of approximately 57 gallons of PSH have been recovered at Lea Station. In February, 1995 a remediation system consisting of soil vapor extraction (SVE) with product-only pumping was installed at the site. As a result of start-up difficulties, including unrelated high levels of crude oil in the receptor sump, the system had not removed appreciable amounts of crude oil during March and April of 1995. A site visit conducted on May 18, 1995 revealed no crude oil in recovery wells RW-1 and RW-2 with an estimated 5 gallons having been recovered by the system. Crude oil did not appear to be recharging into the wells and the SVE system was adjusted to evaluate crude oil recharge under reduced vacuum conditions. Continued performance monitoring information will be provided in subsequent reports.

Monitoring well gauging data obtained on April 25, 1995 indicates that the apparent direction of groundwater flow is toward the southeast which is consistent with previous measurements. PSH was observed in monitoring wells MW-1, MW-2, MW-5, MW-8, and MW-11 during gauging operations.

The monitoring wells were purged by removing approximately three well volumes of water or bailing the wells dry. During well purging operations approximately 20 gallons of water was removed from monitoring wells MW-4, MW-6, MW-7, MW-9, and MW-10, respectively. The purged groundwater was stored on-site in labelled 55-gallon drums pending sampling and proper disposal.

After development, DO measurements were performed on-site and groundwater samples were obtained from the monitoring wells using a dedicated disposable bailer. The groundwater samples

were transported on ice to the laboratory for analysis of BTEX using EPA Method 8020. Quality Assurance/Quality Control information is included in Appendix D.

Results and Discussion

The groundwater samples obtained on April 25, 1995 indicate no significant change in dissolved hydrocarbon concentrations or in the distribution of PSH thicknesses across the site since the last sampling event in February, 1995. Monitoring well MW-5 recorded no PSH thickness for the first time since March 1994. The dissolved hydrocarbon concentrations for monitoring wells MW-4, MW-6, MW-7, MW-9, and MW-10 have consistently recorded levels near or below the method detection limits and indicate that the hydrocarbon impacted groundwater remains restricted to apparently two separate areas.

DO concentrations were obtained as a possible indicator of the natural biological activity of hydrocarbon degrading microorganisms in the groundwater. Microbial and mineral oxidation reactions within the dissolved hydrocarbon plume typically result in depletion of DO so that an inverse relationship between DO and BTEX will be found where natural attenuation of the contaminant plume has occurred. With the exception of monitoring well MW-10 which recorded a DO level of 1.4 ppm, DO levels measured during April sampling indicated sufficient dissolved oxygen is present to promote natural biodegradation of hydrocarbons. CURA will continue to monitor DO levels as a means of documenting the occurrence of natural attenuation. A summary of groundwater analytical results is presented in Table 2, Appendix B. The laboratory reports and chain-of-custody are included in Appendix C.

CURA appreciates the opportunity to provide you with our professional services. If you have any questions regarding the information presented, please contact Brad Smith at (713) 640-1490.

Respectfully,
CURA, Inc.

for James W. Leach
Environmental Geologist

Bradley S. Smith
Project Manager

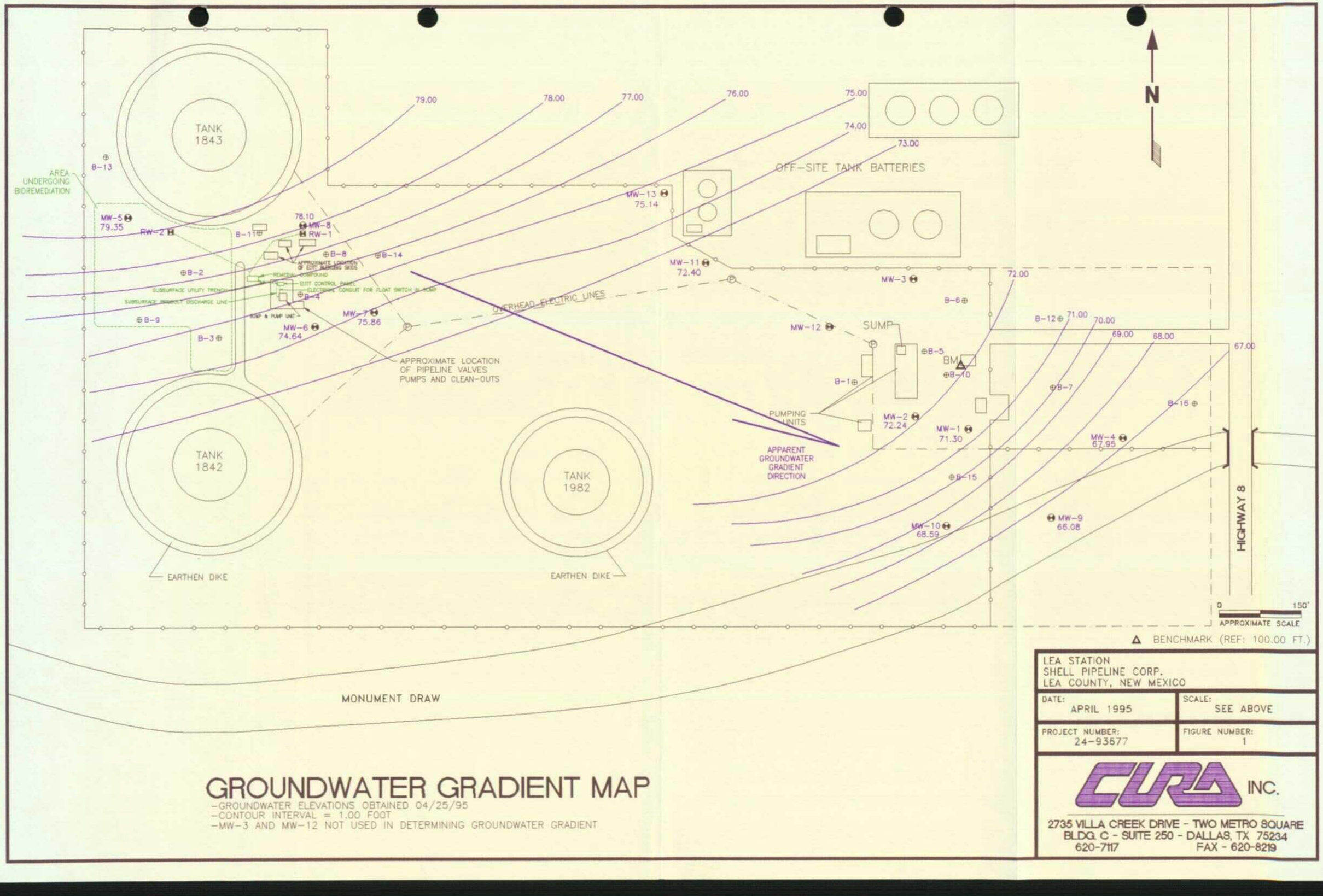
Richard G. Burbidge, Ph.D.
Vice President

Enclosures

APPENDICES

APPENDIX A

FIGURES



△ BENCHMARK (REF: 100.00 FT.)

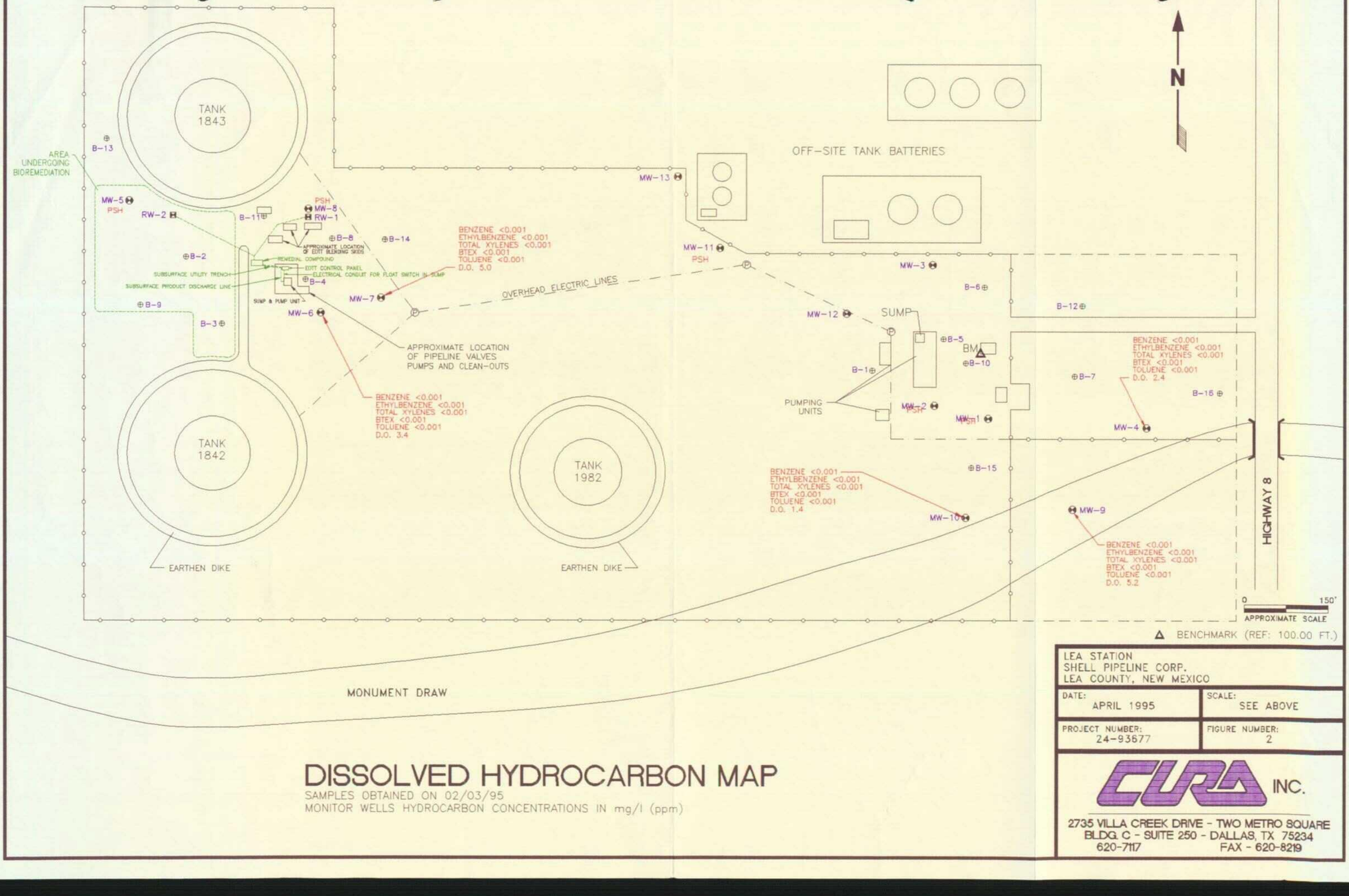
GROUNDWATER GRADIENT MAP

-GROUNDWATER ELEVATIONS OBTAINED 04/25/95
-CONTOUR INTERVAL = 1.00 FOOT
-MW-3 AND MW-12 NOT USED IN DETERMINING GROUNDWATER GRADIENT

LEA STATION
SHELL PIPELINE CORP.
LEA COUNTY, NEW MEXICO

DATE:	SCALE:
APRIL 1995	SEE ABOVE
PROJECT NUMBER: 24-93677	FIGURE NUMBER: 1

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



△ BENCHMARK (REF: 100.00 FT.)

DISSOLVED HYDROCARBON MAP

SAMPLES OBTAINED ON 02/03/95
MONITOR WELLS HYDROCARBON CONCENTRATIONS IN mg/l (ppm)

LEA STATION
SHELL PIPELINE CORP.
LEA COUNTY, NEW MEXICO

DATE:	SCALE:
APRIL 1995	SEE ABOVE
PROJECT NUMBER: 24-93677	FIGURE NUMBER: 2

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

APPENDIX B

TABLES

TABLE 1
SUMMARY OF RELATIVE GROUNDWATER LEVEL ELEVATIONS AND PHASE-SEPARATED HYDROCARBON THICKNESSES

Monitor Well	Date Gauged	Relative Ground Surface Elevation (feet)	Relative Top of Casing Elevation (feet)*	Depth to Water Below Top of Casing (feet)	Corrected Relative Groundwater Elevation (feet)**	Phase-Separated Hydrocarbon Thickness (feet)
MW-1	12/21/95	98.88	100.73	28.32	72.41	0.0
	02/16/93	98.88	100.73	28.48	72.25	0.00
	09/28/93	98.88	100.73	29.18	71.55	0.00
	03/22/94	98.88	100.73	30.25	70.58	0.12
	08/19/94	98.88	100.73	30.38	70.37	0.03
	09/15/95	98.88	100.73	32.34	68.75	0.45
	10/28/94	98.88	100.73	32.28	68.79	0.41
	12/21/94	98.88	100.73	30.83	69.90	Trace
	02/03/94	98.88	100.73	30.97	69.85	0.11
	04/25/95	98.88	100.73	29.54	71.30	0.14
MW-2	02/16/93	102.37	29.33	29.33	73.04	0.00
	09/28/93	102.37	30.23	30.23	72.14	0.00
	03/22/94	102.37	31.05	21.05	71.32	Trace
	08/19/94	102.37	31.12	31.12	69.66	Trace
	09/15/95	102.37	31.75	31.75	70.71	0.12
	10/28/94	102.37	31.65	31.65	70.83	0.14
	12/21/94	102.37	31.68	31.68	70.75	0.07
	02/03/94	102.37	31.92	31.92	70.54	0.11
	04/25/95	102.37	30.24	30.24	72.24	0.14
MW-3	02/16/93	101.79	103.61	29.23	73.38	0.00
	09/28/93	101.79	103.61	30.04	73.57	0.00
	03/22/94	101.79	103.61	30.87	72.74	0.00
	08/19/94	101.79	103.61	30.92	72.69	0.00
	09/15/95	101.79	103.61	31.71	71.90	0.00
	10/28/94	101.79	103.61	31.63	71.98	0.00
	12/21/94	101.79	103.61	31.55	72.06	Trace
	02/03/95	101.79	103.61	34.25	69.36	Trace
MW-4	02/16/93	93.80	96.08	25.44	70.64	0.00
	09/28/93	93.80	96.08	26.12	69.96	0.00
	03/22/94	93.80	96.08	27.13	68.65	0.00
	08/19/94	93.80	96.08	29.70	66.38	0.00
	09/15/95	93.80	96.08	27.65	68.43	0.00
	10/28/94	93.80	96.08	27.54	68.54	0.00
	02/03/95	93.80	96.08	27.91	68.17	0.00
	04/25/95	93.80	96.08	28.13	67.95	0.00

TABLE 1
SUMMARY OF RELATIVE GROUNDWATER LEVEL ELEVATIONS AND PHASE-SEPARATED HYDROCARBON THICKNESSES

Monitor Well	Date Gauged	Relative Ground Surface Elevation (feet)	Relative Top of Casing Elevation (feet)*	Depth to Water Below Top of Casing (feet)	Corrected Relative Groundwater Elevation (feet)**	Phase-Separated Hydrocarbon Thickness (feet)
MW-5	02/16/93	107.08	109.21	29.86	78.35	0.00
	09/28/93	107.08	109.21	30.42	77.81	0.00
	03/22/94	107.08	109.21	31.40	77.60	0.00
	08/19/94	107.08	109.21	31.61	76.86	0.13
	09/15/95	107.08	109.21	32.45	77.07	0.15
	10/28/94	107.08	109.21	32.26	77.07	0.14
	12/21/94	107.08	109.21	32.25	75.02	0.08
	02/03/95	107.08	109.21	35.35	73.96	0.13
	04/25.95	107.08	109.21	30.42	79.35	0.00
MW-6	02/16/93	103.66	106.26	28.60	77.66	0.00
	09/28/93	103.66	106.26	29.96	76.30	0.00
	03/22/94	103.66	106.26	30.23	76.03	0.00
	08/19/94	103.66	106.26	30.68	75.58	0.00
	09/15/95	103.66	106.26	30.93	75.33	0.00
	10/28/94	103.66	106.26	30.67	75.59	0.00
	02/03/95	103.66	106.26	30.46	75.80	0.00
	04/25.95	103.66	106.26	31.62	74.64	0.00
MW-7	02/16/93	104.34	106.27	29.24	77.03	0.00
	09/28/93	104.34	106.27	30.65	75.62	0.00
	03/22/94	104.34	106.27	30.87	75.40	0.00
	08/19/94	104.34	106.27	30.83	75.44	0.00
	09/15/94	104.34	106.27	31.64	74.63	0.00
	10/28/94	104.34	106.27	31.42	74.85	0.00
	02/03/95	104.34	106.27	31.16	75.11	0.00
	04/25/95	104.34	106.27	32.41	73.86	0.00
MW-8	09/28/93	105.52	107.44	32.81	76.63	0.04
	03/22/94	105.52	107.44	33.30	76.78	3.22
	10/19/94	105.52	107.44	33.40	75.68	2.00
	09/15/94	105.52	107.44	32.52	75.98	1.30
	10/28/94	105.52	107.44	32.25	76.42	1.50
	12/21/94	105.52	107.44	33.15	76.40	2.58
	02/03/95	105.52	107.44	33.69	76.71	3.61
	04/25/95	105.52	107.44	31.87	78.10	3.07
MW-9	09/28/93	93.76	97.21	28.60	68.61	0.00
	03/22/94	93.76	97.21	29.04	68.17	0.00
	08/19/94	93.76	97.21	30.24	66.97	0.00
	09/15/94	93.76	97.21	29.66	67.55	0.00
	10/28/94	93.76	97.21	29.42	67.79	0.00
	02/03/95	93.76	97.21	29.90	67.31	0.00
	04/25/95	93.76	97.21	31.13	66.08	0.00

TABLE 1
SUMMARY OF RELATIVE GROUNDWATER LEVEL ELEVATIONS AND PHASE-SEPARATED HYDROCARBON THICKNESSES

Monitor Well	Date Gauged	Relative Ground Surface Elevation (feet)	Relative Top of Casing Elevation (feet)*	Depth to Water Below Top of Casing (feet)	Corrected Relative Groundwater Elevation (feet)**	Phase-Separated Hydrocarbon Thickness (feet)
MW-10	09/28/93	99.63	102.51	34.11	68.4	0.00
	03/22/94	99.63	102.51	34.57	67.94	0.00
	08/19/94	99.63	102.51	33.06	69.45	0.00
	09/15/94	99.63	102.51	35.26	67.25	0.00
	10/28/94	99.63	102.51	35.18	67.33	0.00
	02/03/95	99.63	102.51	35.40	67.11	0.00
	04/25/95	99.63	102.51	33.93	68.59	0.00
MW-11	09/28/93	104.48	105.62	31.38	74.24	0.00
	03/22/94	104.48	105.62	31.73	74.04	0.18
	08/19/94	104.48	105.62	32.36	73.92	0.80
	09/15/94	104.48	105.62	31.68	74.03	0.12
	12/21/94	104.48	105.62	32.66	73.54	1071
	02/03/95	104.48	105.62	33.14	73.40	1.12
	04/25/95	104.48	105.62	34.41	72.40	1.45
MW-12	02/03/95	--	103.90	31.79	72.11	0.00
	04/25/95	--	103.90	30.17	73.73	0.00
MW-13	02/03/95	--	103.89	29.65	74.24	0.00
	04/25/95	--	103.89	28.75	75.14	0.00

* Measured from a relative datum (benchmark = 100.00 feet). The monitor well casings were marked to provide consistent reference points for future gauging operations.
** Correction Equation for Phase-Separated Hydrocarbons: Corrected Groundwater Elevation = Top of Casing Elevation - (Depth to Water Below Top of Casing - [SG] [PSH Thickness])
Specific Gravity (SG) = 0.82 for crude oil.

TABLE 2
WATER SAMPLE ANALYTICAL RESULTS

Monitor Well	Date Sampled	Benzene	Toluene	Ethyl-benzene	Xylenes	Total BTEX	TPH	DO
MW-1	12/21/92	0.440	0.005	0.120	0.063	0.628	3	--
	02/16/93	0.350	0.010	0.095	0.070	0.525	5	--
	09/15/94	PSH	PSH	PSH	PSH	PSH	PSH	--
	02/09/95	PSH	PSH	PSH	PSH	PSH	PSH	--
	04/25/95	PSH	PSH	PSH	PSH	PSH	PSH	--
MW-2	02/16/93	0.370	0.040	0.210	0.510	1.130	1	--
	03/22/94	0.410	0.012	0.230	0.450	1.102	--	--
	09/15/94	PSH	PSH	PSH	PSH	PSH	PSH	--
	02/09/95	PSH	PSH	PSH	PSH	PSH	PSH	--
	04/25/95	PSH	PSH	PSH	PSH	PSH	PSH	--
MW-3	02/16/93	2.500	0.010	0.370	0.640	3.520	2	--
	09/15/94	1.00	0.006	0.280	0.190	1.476	<0.5	2.6
	02/09/95	1.30	<0.005	0.260	0.090	1.650	--	0.5
	04/25/95	NS	NS	NS	NS	NS	NS	--
MW-4	02/16/93	<0.001	<0.001	<0.001	<0.001	<0.001	<1	--
	09/15/94	<0.001	<0.001	<0.001	<0.001	<0.001	<0.5	4.0
	02/09/95	<0.001	<0.001	<0.001	<0.001	<0.001	--	0.6
	04/25/95	<0.001	<0.001	<0.001	<0.001	<0.001	--	2.4
MW-5	02/16/93	<0.001	<0.001	0.002	0.004	0.006	<1	--
	09/15/94	PSH	PSH	PSH	PSH	PSH	PSH	--
	02/09/95	PSH	PSH	PSH	PSH	PSH	PSH	--
	04/25/95	PSH	PSH	PSH	PSH	PSH	PSH	--
MW-6	02/16/93	0.002	0.001	<0.001	0.091	0.094	<1	--
	09/15/94	<0.007	0.003	0.005	0.005	0.020	<0.5	2.2
	02/09/95	0.001	<0.001	0.002	0.011	0.014	--	0.8
	04/25/95	<0.001	<0.001	<0.001	<0.001	<0.001	--	3.4
MW-7	02/16/93	<0.001	<0.001	<0.001	<0.001	<0.001	<1	--
	09/15/94	0.001	<0.001	0.002	0.002	0.005	<0.5	3.8
	02/09/95	<0.001	<0.001	<0.001	<0.001	<0.001	---	1.8
	04/25/95	<0.001	<0.001	<0.001	<0.001	<0.001	--	5.0

TABLE 2
WATER SAMPLE ANALYTICAL RESULTS

Monitor Well	Date Sampled	Benzene	Toluene	Ethyl-benzene	Xylenes	Total BTEX	TPH	DO
MW-8	09/28/93	PSH	PSH	PSH	PSH	PSH	PSH	--
	02/09/95	PSH	PSH	PSH	PSH	PSH	PSH	--
	04/25/95	PSH	PSH	PSH	PSH	PSH	PSH	--
MW-9	09/28/93	<0.001	<0.001	<0.001	<0.001	<0.001	<1	--
	09/15/94	<0.001	<0.001	<0.001	0.001	<0.001	<0.5	5.4
	02/09/95	<0.001	<0.001	<0.001	<0.001	<0.001	--	4.6
	04/25/95	<0.001	<0.001	<0.001	<0.001	<0.001	--	5.2
MW-10	09/28/93	<0.001	<0.001	0.009	0.001	0.010	7	--
	09/15/94	<0.001	<0.001	<0.001	<0.001	<0.001	<0.5	3.0
	02/09/95	<0.001	<0.001	<0.001	<0.001	<0.001	--	1.2
	04/25/95	0.001	<0.001	<0.001	<0.001	0.001	--	1.4
MW-11	09/28/93	0.24	0.14	0.11	0.14	0.63	3	--
	09/15/94	PSH	PSH	PSH	PSH	PSH	PSH	--
	02/09/95	PSH	PSH	PSH	PSH	PSH	PSH	--
	04/25/95	PSH	PSH	PSH	PSH	PSH	PSH	--
MW-12	02/09/95	0.590	0.009	0.430	0.067	1.096	--	0.8
	04/25/95	--	--	--	--	--	--	--
MW-13	02/09/95	<0.001	<0.001	<0.001	<0.001	<0.001	--	1.0
	04/25/95	--		--	--	--	--	--
WW-1	12/08/92	<0.001	<0.001	<0.001	<0.001	5	--	--

BTEX results listed in mg/l (parts per million; ppm), method detection limits are listed on the certificates of analysis.
TPH and DO results listed in mg/l (parts per million; ppm) with a method detection limit of 1 ppm.
Analyses were conducted using EPA Method 8020 (BTEX), EPA Method 418.1 (TPH), and EPA Method 160.1 (TDS) by SPL Environmental Laboratories and CEL Laboratories.
-- Not sampled
A total dissolved solids (TDS) concentration of 2,380 ppm was reported for MW-1 in December, 1992. A TDS concentration of 2,500 ppm was recorded for MW-6 in February, 1993 and a TDS level of 2,130 was recorded for MW-9 in August, 1993.

TABLE 3
PHASE-SEPARATED HYDROCARBON RECOVERY

Date	Monitor Well	PSH Thickness (feet)	PSH Recovery (gallons)	PSH Cumulative Recovery (gallons)	Type of Recovery
09/28/93	MW-1	0.00	0.0	0.0	
03/22/94	MW-1	0.12	0.1	0.1	Hand bailed
05/09/94	MW-1	0.23	0.3	0.4	Hand bailed, installed boom
05/25/94	MW-1	Trace	0.1	0.5	Boom absorption
06/14/94	MW-1	Trace	0.1	0.6	Boom absorption
07/13/94	MW-1	0.01	0.2	0.8	Boom absorption
07/22/94	MW-1	0.02	0.2	1.0	Boom absorption
08/19/94	MW-1	0.03	0.3	1.3	Boom absorption
09/15/94	MW-1	0.45	2.6	3.9	Hand bailed, adjusted boom
10/03/94	MW-1	0.37	0.8	4.7	Hand bailed, adjusted boom
10/28/94	MW-1	0.41	1.2	5.9	Hand bailed, adjusted boom
11/28/94	MW-1	0.12	0.2	6.1	Boom absorption
21/21/94	MW-1	Trace	0.0	6.1	Boom removed
02/03/95	MW-1	0.11	0.3	6.4	Hand bailed
03/28/95	MW-1	Trace	0.3	6.7	Boom absorption
04/25/95	MW-1	0.14	0.4	7.1	Boom absorption
09/28/93	MW-2	0.0	0.0	0.0	
03/22/94	MW-2	Trace	0.0	0.0	
05/09/94	MW-2	Trace	0.0	0.0	Boom Installed
05/25/94	MW-2	Trace	0.1	0.1	Boom absorption
06/14/94	MW-2	Trace	0.1	0.2	Boom absorption
07/13/94	MW-2	0.05	0.1	0.3	Boom absorption
07/22/94	MW-2	0.08	0.2	0.5	Boom absorption
08/19/94	MW-2	Trace	0.0	0.5	Boom absorption
09/15/94	MW-2	0.12	0.2	0.7	Boom absorption
10/03/94	MW-2	0.11	0.3	1.0	Boom absorption
10/28/94	MW-2	0.14	0.8	1.8	Hand bailed, adjusted boom
11/28/94	MW-2	0.04	0.4	2.2	Boom Absorption

TABLE 3
PHASE-SEPARATED HYDROCARBON RECOVERY

Date	Monitor Well	PSH Thickness (feet)	PSH Recovery (gallons)	PSH Cumulative Recovery (gallons)	Type of Recovery
21/21/94	MW-2	0.07	0.1	2.3	Boom removed
02/03/95	MW-2	0.11	0.8	3.1	Hand bailed/Boom installed
03/28/95	MW-2	0.05	0.1	3.2	Boom absorption
04/25/95	MW-2	0.14	0.3	3.5	Boom absorption
11/28/94	MW-3	0.00	0.0	0.0	
12/21/94	MW-3	Trace	0.0	0.0	
02/03/95	MW-3	Trace	0.0	0.0	
03/28/95	MW-3	Trace	0.0	0.0	Boom absorption
04/25/95	MW-3	Trace	0.0	0.0	Boom absorption
08/19/94	MW-5	0.00	0.00	0.0	
09/15/94	MW-5	0.13	0.00	0.0	Boom installed
10/03/94	MW-5	0.07	0.4	0.4	Boom absorption
10/28/94	MW-5	0.15	0.9	1.3	Hand bailed, adjusted boom
11/28/94	MW-5	0.14	0.3	1.6	Boom adsorption
12/21/94	MW-5	0.14	0.8	2.4	Hand bailed, removed boom
02/03/95	MW-5	0.08	0.7	3.3	Hand bailed
03/28/95	MW-5	0.07	0.2	3.5	Boom absorption
04/25/95	MW-5	0.13	0.3	3.8	Boom absorption
09/28/93	MW-8	0.04	0.0	0.0	
03/22/94	MW-8	3.22	6.7	6.7	Hand bailed
05/09/94	MW-8	3.00	5.4	12.1	Hand bailed
05/25/94	MW-8	0.56	1.8	13.9	Hand bailed, boom installed
06/14/94	MW-8	0.01	1.0	14.9	Boom absorption
07/13/94	MW-8	0.62	0.4	15.3	Boom absorption
07/22/94	MW-8	0.94	1.6	16.9	Hand bailed, adjusted boom
08/29/94	MW-8	2.0	1.6	18.5	Hand bailed, adjusted boom

TABLE 3
PHASE-SEPARATED HYDROCARBON RECOVERY

Date	Monitor Well	PSH Thickness (feet)	PSH Recovery (gallons)	PSH Cumulative Recovery (gallons)	Type of Recovery
09/15/94	MW-8	1.30	0.0	18.5	Boom absorption
10/03/94	MW-8	1.43	1.5	20.0	Boom absorption
10/28/94	MW-8	1.50	1.4	21.4	Boom absorption
11/28/94	MW-8	0.8	3.7	25.1	Hand bailed, adjusted boom
12/21/94	MW-8	2.58	0.4	25.5	Boom absorption, boom removed
02/03/95	MW-8	3.61	1.8	27.3	Hand bailed
03/28/95	MW-8	2.67	0.8	28.1	Boom absorption
04/25/95	MW-8	3.07	1.0	29.1	Boom absorption
09/28/93	MW-11	0.00	0.0	0.0	
03/22/94	MW-11	0.18	0.1	0.1	Boom installed
05/09/94	MW-11	0.35	0.4	0.5	Hand bailed, adjusted boom
05/25/94	MW-11	0.01	0.2	0.7	Boom absorption
06/14/94	MW-11	0.01	0.1	0.8	Boom absorption
07/13/94	MW-11	0.24	0.3	1.1	Boom absorption
07/22/94	MW-11	0.42	0.4	1.5	Boom absorption
08/19/94	MW-11	0.80	1.1	2.6	Hand bailed, adjusted boom
09/15/94	MW-11	0.12	0.0	2.6	Boom absorption
10/03/94	MW-11	0.13	0.7	3.3	Hand bailed, adjusted boom
10/28/94	MW-11	0.23	0.3	3.6	Boom absorption
11/28/94	MW-11	0.62	0.4	4.0	Boom absorption
12/21/94	MW-11	0.71	0.8	4.8	Hand bailed, removed boom
02/03/95	MW-11	1.12	2.4	7.2	Hand bailed
03/28/95	MW-11	0.71	0.5	7.7	Boom absorption
04/25/95	MW-11	1.45	0.8	8.5	Boom absorption
05/18/95	RW-1	--	2.0	2.0	Recovery system
05/18/95	RW-2	--	3.0	3.0	Recovery system

APPENDIX C
ANALYTICAL RESULTS

SHELL OIL COMPANY
RETAIL ENVIRONMENTAL ENGINEERING

CHAIN OF CUSTODY RECORD NO. H 13651

Date: 4-26-95
Page 1 of 1

SITE ADDRESS: Shell Pipe Line
LEA STATION
~~PIN~~ WIC #: 24-93677

CONSULTANT NAME & ADDRESS: CURA Inc
731 W. Wadley, G-200, Midland TX

CONSULTANT CONTACT: Bob Smith (Houston)

PHONE: (915)570-8408 FAX: (915)570-8409

SAMPLED BY: Bill Smith

CHECK ONE BOX ONLY CT/DT

- QUARTERLY MONITORING ☒ 5461
- SITE INVESTIGATION ☐ 5441
- SOIL FOR DISPOSAL ☐ 5442
- WATER FOR DISPOSAL ☐ 5443
- AIR SAMPLER - SYS O+M ☐ 5452
- WATER SAMPLE - SYS O+M ☐ 5453
- OTHER _____ ☐

ANALYSIS REQUEST: (CHECK APPROPRIATE BOX)

SAMPLE I.D.	DATE	TIME	COMP.	GRAB	MATRIX: H_2O	SOIL	AIR	SLUDGE	OTHER	METHOD PRESERVED: HCl	HNO_3	H_2SO_4	NONE	OTHER: ICE	NO. OF CONTAINERS	CONTAINER SIZE
MW-4	4-25-95	1600		✓	✓					✓				✓	4	✓
MW-6	4-25-95	1700		✓	✓					✓				✓	4	✓
MW-7	4-25-95	1730		✓	✓					✓				✓	4	✓
MW-9	4-25-95	1630		✓	✓					✓				✓	4	✓
MW-10	4-25-95	1630		✓	✓					✓				✓	4	✓

BTEX 602 ☐ / 8020 ☐ WITH MTBE ☐
BTEX/GAS HYDROCARBONS PID/FID ☐ WITH MTBE
VOL 624/PPL ☐ 8240/TAL ☐ NBS (+15) ☐
8100 ☐ 610 ☐
SEMI - VOL 625/PPL ☐ 8270/TAL ☐ NBS (+25) ☐
TPH/IR 418.1 ☐ SM503 ☐ ☐ ☐
TPH/GC 8015 Mod. GAS ☐ 8015 Mod DIESEL ☐
TCLP METALS ☐ VOL ☐ SEMI-VOL ☐ PEST ☐ HERB ☐
EP TOX METALS ☐ PESTICIDES ☐ HERBICIDES ☐
REACTIVITY ☐ CORROSIVITY ☐ IGNITABILITY ☐

OTHER

REMARKS

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME
Bill D. Smith	4-26-95	1030			
RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME
RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME
			Lab Courier	4/27/95	16:00

BILL NO.: _____
LABORATORY: SRL (Houston)
SHELL CONTACT: Dan Stidham PHONE: _____ FAX: _____

TURN AROUND TIME (CHECK ONE)
7 DAYS ☐ (NORMAL) 14 DAYS ☐
48 HOURS ☐ OTHER ☒ per Shell contract

THE LABORATORY MUST PROVIDE A COPY OF THIS CHAIN OF CUSTODY WITH INVOICE AND RESULTS

DISTRIBUTION: PINK Sampling Coordinator - WHITE & YELLOW Accompanies Shipment - WHITE Returned with Report

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Certificate of Analysis No. H9-9504A08-01

Shell Pipe Line Corporation
P.O. Box 2648
Houston, TX 77252
ATTN: Neal Stidham

P.O.# MESA-CAO-B-131201-PX-4204-NS
DATE: 05/15/95

PROJECT: Proj # 24-93677
SITE: Lea Station
SAMPLED BY: Cura, Inc.
SAMPLE ID: MW-4

PROJECT NO: 24-93677
MATRIX: WATER
DATE SAMPLED: 04/25/95 16:00:00
DATE RECEIVED: 04/27/95

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	ND	1 P	µg/L
TOLUENE	ND	1 P	µg/L
ETHYLBENZENE	ND	1 P	µg/L
TOTAL XYLENE	ND	1 P	µg/L
TOTAL BTEX	ND		µg/L

Surrogate	% Recovery
1,4-Difluorobenzene	93
4-Bromofluorobenzene	83

METHOD 5030/8020 ***
Analyzed by: AA
Date: 05/06/95

ND - Not detected. (P) - Practical Quantitation Limit

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
**Ref: Standard Methods for Examination of Water & Wastewater, 17th ed.
***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Certificate of Analysis No. H9-9504A08-02

Shell Pipe Line Corporation
P.O. Box 2648
Houston, TX 77252
ATTN: Neal Stidham

P.O.# MESA-CAO-B-131201-PX-4204-NS
DATE: 05/15/95

PROJECT: Proj # 24-93677
SITE: Lea Station
SAMPLED BY: Cura, Inc.
SAMPLE ID: MW-6

PROJECT NO: 24-93677
MATRIX: WATER
DATE SAMPLED: 04/25/95 17:00:00
DATE RECEIVED: 04/27/95

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	ND	1 P	µg/L
TOLUENE	ND	1 P	µg/L
ETHYLBENZENE	ND	1 P	µg/L
TOTAL XYLENE	ND	1 P	µg/L
TOTAL BTEX	ND		µg/L

Surrogate	% Recovery
1,4-Difluorobenzene	93
4-Bromofluorobenzene	103

METHOD 5030/8020 ***
Analyzed by: AA
Date: 05/06/95

ND - Not detected. (P) - Practical Quantitation Limit

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
**Ref: Standard Methods for Examination of Water & Wastewater, 17th ed.
***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Certificate of Analysis No. H9-9504A08-03

Shell Pipe Line Corporation
P.O. Box 2648
Houston, TX 77252
ATTN: Neal Stidham

P.O.# MESA-CAO-B-131201-PX-4204-NS
DATE: 05/15/95

PROJECT: Proj # 24-93677
SITE: Lea Station
SAMPLED BY: Cura, Inc.
SAMPLE ID: MW-7

PROJECT NO: 24-93677
MATRIX: WATER
DATE SAMPLED: 04/25/95 17:30:00
DATE RECEIVED: 04/27/95

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	ND	1 P	µg/L
TOLUENE	ND	1 P	µg/L
ETHYLBENZENE	ND	1 P	µg/L
TOTAL XYLENE	ND	1 P	µg/L
TOTAL BTEX	ND		µg/L

Surrogate	% Recovery
1,4-Difluorobenzene	93
4-Bromofluorobenzene	89

METHOD 5030/8020 ***
Analyzed by: AA
Date: 05/07/95

ND - Not detected. (P) - Practical Quantitation Limit

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
**Ref: Standard Methods for Examination of Water & Wastewater, 17th ed.
***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Certificate of Analysis No. H9-9504A08-04

Shell Pipe Line Corporation
P.O. Box 2648
Houston, TX 77252
ATTN: Neal Stidham

P.O.# MESA-CAO-B-131201-PX-4204-NS
DATE: 05/15/95

PROJECT: Proj # 24-93677
SITE: Lea Station
SAMPLED BY: Cura, Inc.
SAMPLE ID: MW-9

PROJECT NO: 24-93677
MATRIX: WATER
DATE SAMPLED: 04/25/95 16:30:00
DATE RECEIVED: 04/27/95

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	ND	1 P	µg/L
TOLUENE	ND	1 P	µg/L
ETHYLBENZENE	ND	1 P	µg/L
TOTAL XYLENE	ND	1 P	µg/L
TOTAL BTEX	ND		µg/L

Surrogate	% Recovery
1,4-Difluorobenzene	94
4-Bromofluorobenzene	89

METHOD 5030/8020 ***
Analyzed by: AA
Date: 05/07/95

ND - Not detected. (P) - Practical Quantitation Limit

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
**Ref: Standard Methods for Examination of Water & Wastewater, 17th ed.
***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Certificate of Analysis No. H9-9504A08-05

Shell Pipe Line Corporation
P.O. Box 2648
Houston, TX 77252
ATTN: Neal Stidham

P.O.# MESA-CAO-B-131201-PX-4204-NS
DATE: 05/15/95

PROJECT: Proj # 24-93677
SITE: Lea Station
SAMPLED BY: Cura, Inc.
SAMPLE ID: MW-10

PROJECT NO: 24-93677
MATRIX: WATER
DATE SAMPLED: 04/25/95 16:30:00
DATE RECEIVED: 04/27/95

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	1	1 P	µg/L
TOLUENE	ND	1 P	µg/L
ETHYLBENZENE	ND	1 P	µg/L
TOTAL XYLENE	ND	1 P	µg/L
TOTAL BTEX	1		µg/L

Surrogate	% Recovery
1,4-Difluorobenzene	95
4-Bromofluorobenzene	99

METHOD 5030/8020 ***
Analyzed by: AA
Date: 05/07/95

(P) - Practical Quantitation Limit ND - Not detected.

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
**Ref: Standard Methods for Examination of Water & Wastewater, 17th ed.
***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

QUALITY CONTROL DOCUMENTATION

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

** SPL BATCH QUALITY CONTROL REPORT **
METHOD 8020

Matrix: Aqueous **Batch Id:** HP_R950506021900

Units: µg/L

LABORATORY CONTROL SAMPLE

SPIKE COMPOUNDS	Method Blank Result <2>	Spike Added <3>	Blank Spike Result <1>	Blank Spike Recovery %	QC Limits(**) (Mandatory) % Recovery Range
Benzene	ND	50	49	98.0	61 - 123
Toluene	ND	150	161	107	62 - 122
EthylBenzene	ND	50	48	96.0	56 - 119
O Xylene	ND	100	102	102	32 - 160
M & P Xylene	ND	200	214	107	32 - 160

MATRIX SPIKES

SPIKE COMPOUNDS	Sample Results <2>	Spike Added <3>	Matrix Spike Result <1>	Matrix Spike Recovery <4>	Matrix Spike Duplicate Result <1>	Matrix Spike Duplicate Recovery <5>	MS/MSD Relative % Difference	QC Limits(***) (Advisory) RPD Max.	QC Limits(***) (Advisory) Recovery Range
Benzene	ND	50	43	86.0	41	82.0	4.76	25	39 - 150
Toluene	ND	150	140	93.3	130	86.7	7.33	26	56 - 134
EthylBenzene	ND	50	41	82.0	38	76.0	7.59	38	61 - 128
O Xylene	ND	100	84	84.0	78	78.0	7.41	20	40 - 130
M & P Xylene	ND	100	95	95.0	88	88.0	7.65	20	43 - 152

Analyst: AA
Sequence Date: 05/06/95
SPL ID of sample spiked: 9504A90-01A
Sample File ID: R___914.TX0
Method Blank File ID:
Blank Spike File ID: R___907.TX0
Matrix Spike File ID: R___908.TX0
Matrix Spike Duplicate File ID: R___909.TX0

* = Values Outside QC Range
NC = Not Calculated (Sample exceeds spike by factor of 4 or more)
ND = Not Detected/Below Detection Limit
% Recovery = [(<1> - <2>) / <3>] x 100
LCS % Recovery = (<1> / <3>) x 100
Relative Percent Difference = |(<4> - <5> | / [(<4> + <5>) x 0.5] x 100
(**) = Source: SPL-Houston Historical Data
(***) = Source: SPL-Houston Historical Data

SAMPLES IN BATCH(SPL ID):

9504999-02A 9504A48-01A 9504A47-01A 9504A08-04A
9504A08-03A 9504A08-02A 9504A08-01A 9504999-03A
9505039-02A 9504A92-04A 9505041-03A 9504A90-01A
9505039-01A 9504A97-03A

Idelis Williams, QC Officer

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

** SPL BATCH QUALITY CONTROL REPORT **
METHOD 8020

Matrix: Aqueous
Units: µg/L

Batch Id: HP_R950507050400

LABORATORY CONTROL SAMPLE

SPIKE COMPOUNDS	Method Blank Result <2>	Spike Added <3>	Blank Spike Result <1>	Blank Spike Recovery %	QC Limits(**) (Mandatory) % Recovery Range
Benzene	ND	50	49	98.0	61 - 123
Toluene	ND	150	160	107	62 - 122
EthylBenzene	ND	50	47	94.0	56 - 119
O Xylene	ND	100	100	100	32 - 160
M & P Xylene	ND	200	210	105	32 - 160

MATRIX SPIKES

SPIKE COMPOUNDS	Sample Results <2>	Spike Added <3>	Matrix Spike Result <1>	Matrix Spike Recovery <4>	Matrix Spike Duplicate Result <1>	Matrix Spike Duplicate Recovery <5>	MS/MSD Relative % Difference	QC Limits(***) (Advisory) RPD Max.	QC Limits(***) (Advisory) Recovery Range
Benzene	37	50	93	112	92	110	1.80	25	39 - 150
Toluene	ND	150	190	127	180	120	5.67	26	56 - 134
EthylBenzene	17	50	71	108	70	106	1.87	38	61 - 128
O Xylene	1	100	120	119	110	109	8.77	20	40 - 130
M & P Xylene	16	100	140	124	140	124	0	20	43 - 152

Analyst: AA
Sequence Date: 05/07/95
SPL ID of sample spiked: 9504A64-09B
Sample File ID: R___959.TX0
Method Blank File ID:
Blank Spike File ID: R___937.TX0
Matrix Spike File ID: R___955.TX0
Matrix Spike Duplicate File ID: R___956.TX0

* = Values Outside QC Range
NC = Not Calculated (Sample exceeds spike by factor of 4 or more)
ND = Not Detected/Below Detection Limit
% Recovery = [(<1> - <2>) / <3>] x 100
LCS % Recovery = (<1> / <3>) x 100
Relative Percent Difference = |(<4> - <5> | / [(<4> + <5>) x 0.5] x 100
(**) = Source: SPL-Houston Historical Data
(***) = Source: SPL-Houston Historical Data

SAMPLES IN BATCH(SPL ID):

9505041-01A 9504A51-07A 9504A64-08B 9504A51-04A
9504A63-01A 9504A51-08A 9504A64-09B 9504A08-05A
9505255-04A 9504A88-07A 9505255-02A 9505255-01A
9505255-03A 9504A51-06A 9504A51-05A 9504A51-03A
9504A48-03A 9504A48-02A

Idelis Williams, QC Officer

APPENDIX D

QUALITY ASSURANCE/QUALITY CONTROL SAFETY PLAN AND LIMITATIONS

QUALITY ASSURANCE/QUALITY CONTROL

A strict Quality Assurance Plan was incorporated throughout all phases of the on-site operations and sampling procedures. Soil or solid material samples were collected using new disposable or properly decontaminated reusable stainless steel equipment. Water or liquid samples were collected with new disposable bailers or decontaminated pump equipment. All non-reusable equipment was disposed of and reusable equipment was decontaminated between sampling stations to eliminate the potential of cross-contamination. The water samples were transferred from the bailers into airtight septum-sealed 40-ml glass VOA vials, one-liter amber glass jars with Teflon-lined lids, or other sample containers appropriate for the required analyses.

The samples were sealed with QA/QC seals, preserved with acid (if required), and maintained at 4°C in accordance with Environmental Protection Agency (EPA) requirements (EPA 600/4-82-029) for shipment to the laboratory. A chain-of-custody (COC) which documents sample collection times and delivery times to the laboratory was completed for each set of samples. The COC is included with the analytical results in the Appendix.

CURA utilizes laboratories that maintain strict quality controls, i.e. equipment calibration and standardization, appropriate analytical methods, preparation of quality control samples, and complete chains-of-custody. Analyses were performed on all samples using the EPA-, state-, or local agency-directed methods. The maximum recommended holding times were not exceeded unless noted in the text.

SAFETY PLAN

The sampling operations were performed at level D personal protection. CURA personnel involved in on-site activities have completed the Occupational Safety and health for Hazardous Waste Field Operation training course (OSHA 29 CFR 1910.120). Applicable safety equipment was on site to CURA personnel.

LIMITATIONS

It should be noted that all subsurface investigations are inherently limited in the sense that conclusions are drawn and recommendations are developed from samples which depict subsurface conditions at representative locations over relatively short periods of time. Subsurface conditions elsewhere may differ from those at the sampling locations. In addition, subsurface conditions at sampling locations may vary over longer periods of time than can be observed in a study of this type. The passage of time, manifestation of latent conditions, or occurrence of future events may require further site exploration, data collection and analysis, and reevaluation of the findings, observations, conclusions, and recommendation expressed in this report.

STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION DIVISION
2040 S. PACHECO
SANTA FE, NEW MEXICO 87505
(505) 827-7131

April 28, 1995

CERTIFIED MAIL
RETURN RECEIPT NO. P-667-242-250

Mr. Neal Stidham
Shell Oil Products Company
Two Shell Plaza
P.O. Box 2099
Houston, Texas 77252-2099

RE: GROUND WATER MONITORING
LEA CRUDE PUMP STATION
LEA COUNTY, NEW MEXICO

Dear Mr. Stidham:

The New Mexico Oil Conservation Division (OCD) has completed a review of the following Shell Oil Products Company (SOPC) documents:

- March 2, 1995 "QUARTERLY REPORTS, LEA AND DENTON STATIONS, LEA COUNTY, NEW MEXICO".

- March 2, 1995 "QUARTERLY GROUNDWATER MONITORING REPORT, FIRST QUARTER, 1995, LEA STATION, LEA COUNTY, NEW MEXICO".

These documents contain the results of SOPC's first quarter 1995 ground water monitoring at the Lea Crude Pump Station. The documents also contain a request to discontinue polynuclear aromatic hydrocarbon (PAH) sampling of monitor wells MW-4, MW-6, MW-7 and MW-9.

The OCD agrees that the monitor wells listed above do not need to be monitored frequently for PAH's due to the limited mobility of these constituents. However, since PAH's are present in excess of New Mexico Water Quality Control Commission (WQCC) ground water standards, the OCD believes that PAH concentrations in downgradient ground water need to be monitored at some interval. Therefore, the OCD modifies their January 10, 1995 PAH monitoring requirements as follows:

1. SOPC will sample and analyze ground water from monitor wells MW-4, MW-5, MW-6, MW-7, MW-9 and MW-10 for PAH's on an annual basis.

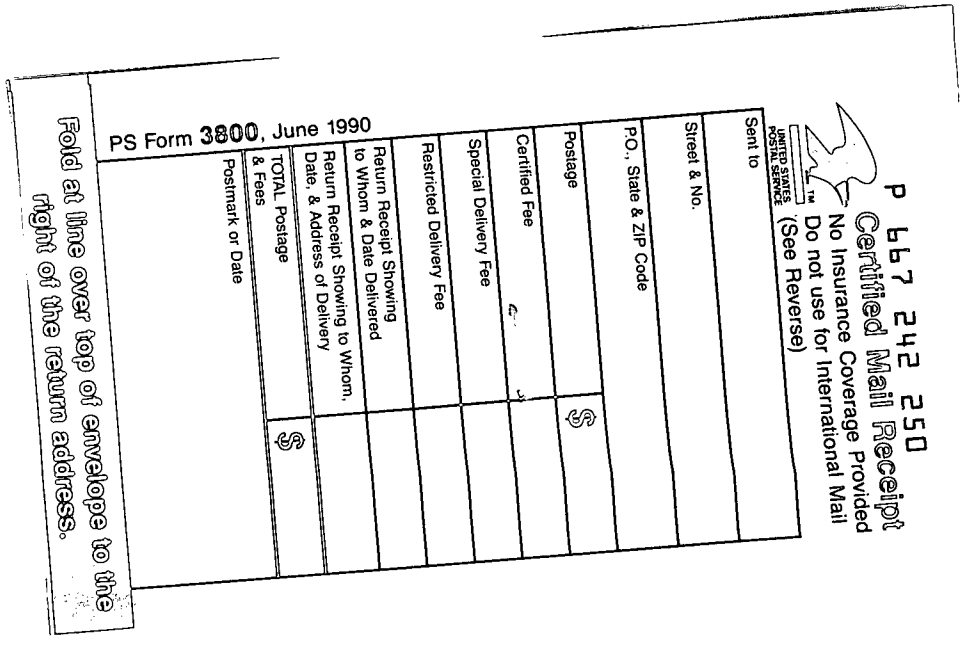
Please be advised that OCD approval does not limit SOPC to the above monitoring requirements should future monitoring determine that contamination exists which is beyond the scope of the work plan or should the actions fail to adequately monitor contamination related to SOPC's activities. In addition, OCD approval does not relieve SOPC of responsibility for compliance with any other federal, state or local laws and/or regulations.

If you have any questions, please call me at (505) 827-7154.

Sincerely,

William C. Olson
Hydrogeologist
Environmental Bureau

xc: Jerry Sexton, OCD Hobbs District Supervisor
Wayne Price, OCD Hobbs Office



Bill Olson

From: Bill Olson
To: Jerry Sexton
Cc: Wayne Price
Subject: Shell Lea Station
Date: Tuesday, April 25, 1995 2:45PM
Priority: High

Attached is a draft letter modifying the sampling sechedule at Shell's Lea Crude Station. Please provide me with any comments in writing by 2:30pm on 4/27/95. Thanks!

<<File Attachment: MONITOR1.MOD>>

Bill Olson

From: POSTOFFICE
To: Bill Olson
Subject: Registered: Wayne Price
Date: Wednesday, April 26, 1995 7:09AM

[013] ***** CONFIRMATION OF REGISTERED MAIL *****
Your message:

TO: Wayne Price DATE: 04-25-95
SUBJECT: Shell Lea Station TIME: 14:39

Was accessed on 04-26-95 07:09

Shell Oil Products Company

Two Shell Plaza
P. O. Box 2099
Houston, Texas 77252-2099

March 2, 1995

William Olson
State of New Mexico Oil Conservation Division
Environmental Bureau
2040 S. Pacheco St.
Santa Fe, New Mexico 87504

SUBJECT: QUARTERLY REPORTS, LEA AND DENTON STATIONS, LEA COUNTY NEW MEXICO.

Dear Mr. Olson,

Enclosed are copies of the first quarter, 1995, monitoring reports for Lea and Denton Stations. This information is in response to the approval conditions set forth in your letters of January 10, 1995 and December 5, 1994 respectively. I have accelerated the Lea Station report period due to the economics of sampling all locations in one outing. You had requested MW-5 at Lea to be sampled, however due to the presence of free phase hydrocarbon, we did not. If you feel a water sample from this well is needed, we can work around this issue next quarter. If I do not hear from you we will not sample MW-5 if PSH is present. We are finishing our plan for additional subsurface investigation at Denton Station and will submit it soon. Based upon the results of the PAH analyses I request to discontinue PAH sampling for MW-4, MW-6, MW-7, MW-9 at Lea Station and MW-2 and MW-9 at Denton Station.

If you have any questions please call me at 713-241-2961.

Sincerely

Neal Stidham
Shell Oil Products Company
For Itself and as agent for Shell Oil Company

cc: Paul Newman-EOTT Energy Corp.
Jerry Sexton-OCD Hobbs

CURA INC.
Environmental Consultants, Engineers & Scientists
6049 South Loop East • Houston, Texas 77033 • 713/640-1490 • FAX 640-2593

March 2, 1995

Mr. Neal D. Stidham
Shell Pipe Line Corporation
Two Shell Plaza, Room 1452
777 Walker Street
Houston, Texas 77002

RE: QUARTERLY GROUNDWATER MONITORING REPORT
FIRST QUARTER, 1995
LEA STATION
LEA COUNTY, NEW MEXICO

CURA PROJECT NO. 24-93677

Mr. Stidham:

CURA, Inc., has completed the groundwater monitoring and sampling operations at the above-referenced site. The work was performed in accordance with the scope of services requested by Shell Pipe Line Corporation. Monitoring wells MW-1 through MW-13 were gauged during well and remedial system installation operations on February 3, 1995. Monitoring wells MW-3, MW-4, MW-6, MW-7, MW-9, and MW-10 were gauged, developed, and sampled by CURA on February 9, 1995. In accordance with water quality monitoring requirements set forth in the New Mexico Oil Conservation Division (NMOCD) letter dated January 10, 1995, the groundwater samples were analysed for benzene, toluene, ethylbenzene, and total xylenes (BTEX) and for polynuclear aromatic hydrocarbons (PAH). The New Mexico Water Quality Control Commission (WQCC) regulations do not contain a groundwater standard for total petroleum hydrocarbons (TPH). Therefore, the NMOCD does not require that groundwater samples be analysed for TPH. In addition to laboratory analysis for BTEX and PAH, dissolved oxygen (DO) levels for each well were measured during field operations. The two newly installed monitoring wells (MW-12 and MW-13) were developed and sampled for DO and BTEX by CURA on February 9, 1995. Monitoring wells MW-1, MW-2, MW-5, MW-8, and MW-11 were not sampled due to the presence of phase separated hydrocarbons (PSH).

Groundwater Sampling and PSH Recovery

The monitoring wells were gauged on February 3, 1995, to determine the depth to groundwater and PSH thickness (if any). A summary of groundwater elevations, and PSH thicknesses is presented in Table 1, Appendix B.

PSH was initially observed on site in September, 1993 following the installation of monitoring wells MW-8 through MW-11. At that time approximately 0.04 feet of PSH was observed in monitoring well MW-8. Following soil vapor extraction (SVE) feasibility testing in December, 1993 in which monitoring well MW-8 was employed as a vapor extraction well, approximately 2.84 feet of PSH was observed in the well. During gauging operations conducted in March,1994 approximatelty 3.22 feet of PSH was observed in MW-8 while measuable PSH was also observed for the first time in monitoring wells MW-1 and MW-11. Expanded PSH recovery operations were subsequently initiated at the site. PSH has since been observed in monitoring wells MW-2 and MW-5. During the first quarter of 1995 approximately 6 gallons of PSH were recovered from the site. A cumulative total of approximately 47.1 gallons of PSH have been recovered at Lea Station.

In order to increase product recovery operations at the site, CURA has designed a product-only pumping system enhanced by soil vapor extraction. The installation of the remedial action system was completed in late February, 1995. The system will be fully activated in March, 1995 following completion of permitting and installation of a remote telemetry monitoring system. System performance information will be included in the 1995 Second Quarter report.

Monitoring well gauging data obtained on February 3 and 9, 1995 indicates that the apparent direction of groundwater flow is toward the southeast which is consistent with previous measurements. PSH was observed in monitoring wells MW-1, MW-2, MW-5, MW-8, and MW-11 during gauging operations.

The monitoring wells were purged by removing approximately three well volumes of water or bailing the wells dry. During well purging operations approximately 20 gallons of water was removed from MW-3, MW-4, MW-6, MW-7, MW-12, and MW-13, respectively, while approximately 16 gallons of water was removed from MW-9, and 6 gallons of water was removed from MW-10. The purged groundwater was stored on site in labelled 55-gallon drums pending disposal. After development, DO measurements were performed on-site and groundwater samples were obtained from the monitoring wells using a dedicated disposable bailer. The groundwater samples were transported on ice to the laboratory for analysis of BTEX and/or PAH using EPA Method 8020 and EPA Method 8100, respectively. Quality Assurance/Quality Control information is included in Appendix D.

Results and Discussion

The groundwater samples obtained on February 9, 1995 indicate no significant change in dissolved hydrocarbon concentrations or in the distribution of PSH thicknesses across the site since the last sampling event in September, 1994. The dissolved hydrocarbon concentrations for monitoring wells MW-4, MW-6, MW-7, MW-9, and MW-10 have consistently recorded levels near or below the method detection limits and indicate that the hydrocarbon impacted groundwater remains restricted to two apparently separate areas.

Dissolved oxygen concentrations (DO) were obtained as a possible indicator of the natural biological activity of hydrocarbon degrading microorganisms in the groundwater. Microbial and mineral oxidation reactions within the dissolved hydrocarbon plume typically result in depletion of DO so that an inverse relationship between DO and BTEX will be found where natural attenuation of the contaminant plume has occurred. A summary of groundwater analytical results is presented in Table 2, Appendix B. The laboratory reports and chain-of-custody are included in Appendix C.

CURA appreciates the opportunity to provide you with our professional consulting services. If you have any questions or concerns, please do not hesitate to contact us at (713) 640-1490.

Respectfully,
CURA, Inc.

F. Wesley Root
Environmental Geologist

Bradley S. Smith
Project Manager

Michael A. Clark, P.E.
Vice President

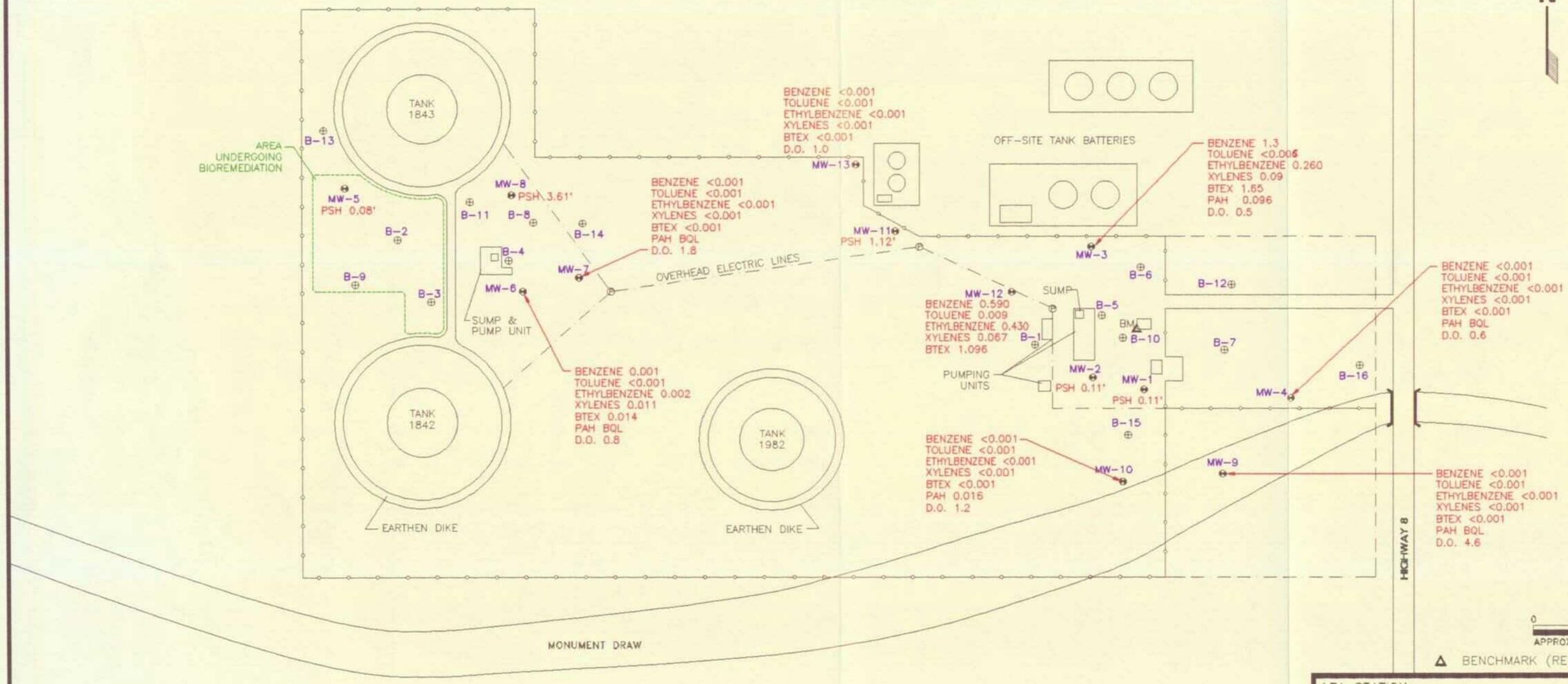
FWR/chs

Attachments

APPENDICES

APPENDIX A

FIGURES



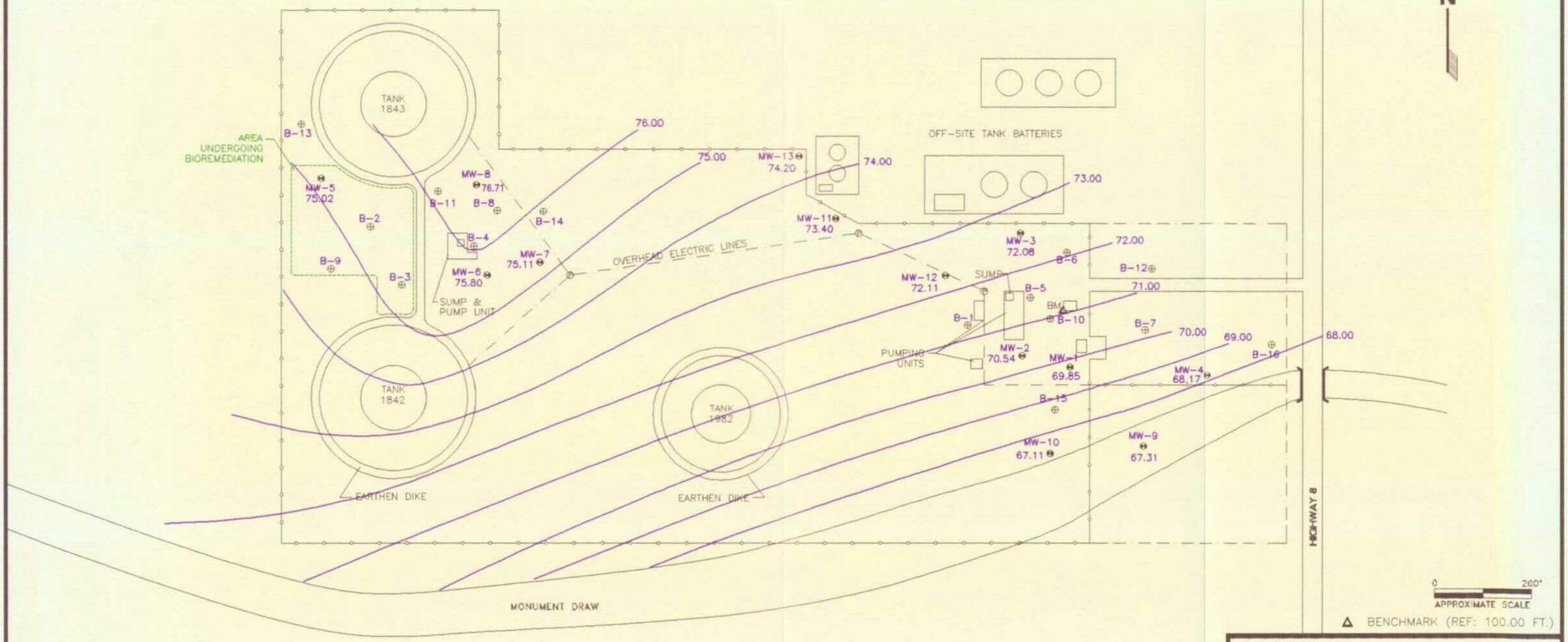
DISSOLVED HYDROCARBON MAP

SAMPLES OBTAINED ON 02/03/95
MONITOR WELLS HYDROCARBON CONCENTRATIONS IN mg/l (ppm)

LEA STATION
SHELL PIPELINE CORP.
LEA COUNTY, NEW MEXICO

DATE:	SCALE:
FEB 1995	SEE ABOVE
PROJECT NUMBER: 24-93677	FIGURE NUMBER: 1

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



GROUNDWATER GRADIENT MAP

-GROUNDWATER ELEVATIONS OBTAINED 02/03/95
-CONTOUR INTERVAL = 1.00 FOOT

LEA STATION
SHELL PIPELINE CORP.
LEA COUNTY, NEW MEXICO

DATE:	SCALE:
FEB 1995	SEE ABOVE
PROJECT NUMBER: 24-93677	FIGURE NUMBER: 2

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

APPENDIX B

TABLES

TABLE 1
LEA STATION
SUMMARY OF RELATIVE GROUNDWATER LEVEL ELEVATIONS AND PHASE-SEPARATED HYDROCARBON THICKNESSES

Monitor Well	Date Gauged	Relative Ground Surface Elevation (feet)	Relative Top of Casing Elevation (feet)*	Depth to Water Below Top of Casing (feet)	Corrected Relative Groundwater Elevation (feet)**	Phase-Separated Hydrocarbon Thickness (feet)
MW-1	12/21/92	98.88	100.73	28.32	72.41	0.00
	02/16/93	98.88	100.73	28.48	72.25	0.00
	09/28/93	98.88	100.73	29.18	71.55	0.00
	03/22/94	98.88	100.73	30.25	70.58	0.12
	08/19/94	98.88	100.73	30.38	70.37	0.03
	09/15/94	98.88	100.73	32.34	68.75	0.45
	10/28/94	98.88	100.73	32.28	68.79	0.41
	12/21/94	98.88	100.73	30.83	69.90	Trace
	02/03/95	98.88	100.73	30.97	69.85	0.11
MW-2	02/16/93	100.78	102.37	29.33	73.04	0.00
	09/28/93	100.78	102.37	30.23	72.14	0.00
	03/22/94	100.78	102.37	31.05	71.32	Trace
	08/19/94	100.78	102.37	31.12	69.66	Trace
	09/15/94	100.78	102.37	31.75	70.71	0.12
	10/28/94	100.78	102.37	31.65	70.83	0.14
	12/21/94	100.78	102.37	31.68	70.75	0.07
	02/03/95	100.78	102.37	31.92	70.54	0.11
MW-3	02/16/93	101.79	103.61	29.23	73.38	0.00
	09/28/93	101.79	103.61	30.04	73.57	0.00
	03/22/94	101.79	103.61	30.87	72.74	0.00
	08/19/94	101.79	103.61	30.92	72.69	0.00
	09/15/94	101.79	103.61	31.71	71.90	0.00
	10/28/94	101.79	103.61	31.63	71.98	0.00
	12/21/94	101.79	103.61	31.55	72.06	Trace
	02/03/95	101.79	103.61	31.53	72.08	Trace

TABLE 1
LEA STATION
SUMMARY OF RELATIVE GROUNDWATER LEVEL ELEVATIONS AND PHASE-SEPARATED HYDROCARBON THICKNESSES

Monitor Well	Date Gauged	Relative Ground Surface Elevation (feet)	Relative Top of Casing Elevation (feet)*	Depth to Water Below Top of Casing (feet)	Corrected Relative Groundwater Elevation (feet)**	Phase-Separated Hydrocarbon Thickness (feet)
MW-4	02/16/93	93.80	96.08	25.44	70.64	0.00
	09/28/93	93.80	96.08	26.12	69.96	0.00
	03/22/94	93.80	96.08	27.13	68.65	0.00
	08/19/94	93.80	96.08	29.70	66.38	0.00
	09/15/94	93.80	96.08	27.65	68.43	0.00
	10/28/94	93.80	96.08	27.54	68.54	0.00
	02/03/95	93.80	96.08	27.91	68.17	0.00
MW-5	02/16/93	107.08	109.21	29.86	78.35	0.00
	09/28/93	107.08	109.21	30.42	79.35	0.00
	03/22/94	107.08	109.21	31.40	77.81	0.00
	08/19/94	107.08	109.21	31.61	77.60	0.00
	09/15/94	107.08	109.21	32.45	76.86	0.13
	10/28/94	107.08	109.21	32.26	77.07	0.15
	12/21/94	107.08	109.21	32.25	77.07	0.14
	02/03/95	107.08	109.21	32.12	75.02	0.08
MW-6	02/16/93	103.66	106.26	28.60	77.66	0.00
	09/28/93	103.66	106.26	29.96	76.30	0.00
	03/22/94	103.66	106.26	30.23	76.03	0.00
	08/19/94	103.66	106.26	30.68	75.58	0.00
	09/15/94	103.66	106.26	30.93	75.33	0.00
	10/28/94	103.66	106.26	30.67	75.59	0.00
	02/03/95	103.66	106.26	30.46	75.80	0.00

TABLE 1
LEA STATION
SUMMARY OF RELATIVE GROUNDWATER LEVEL ELEVATIONS AND PHASE-SEPARATED HYDROCARBON THICKNESSES

Monitor Well	Date Gauged	Relative Ground Surface Elevation (feet)	Relative Top of Casing Elevation (feet)*	Depth to Water Below Top of Casing (feet)	Corrected Relative Groundwater Elevation (feet)**	Phase-Separated Hydrocarbon Thickness (feet)
MW-7	02/16/93	104.34	106.27	29.24	77.03	0.00
	09/28/93	104.34	106.27	30.65	75.62	0.00
	03/22/94	104.34	106.27	30.87	75.40	0.00
	08/19/94	104.34	106.27	30.83	75.44	0.00
	09/15/94	104.34	106.27	31.64	74.63	0.00
	10/28/94	104.34	106.27	31.42	74.85	0.00
	02/03/95	104.34	106.27	31.16	75.11	0.00
MW-8	09/28/93	105.52	107.44	32.81	76.63	0.04
	03/22/94	105.52	107.44	33.30	76.78	3.22
	08/19/94	105.52	107.44	33.40	75.68	2.00
	09/15/94	105.52	107.44	32.52	75.98	1.30
	10/28/94	105.52	107.44	32.25	76.42	1.5
	12/21/94	105.52	107.44	33.15	76.40	2.58
	02/03/95	105.52	107.44	33.69	76.71	3.61
MW-9	09/28/93	93.76	97.21	28.60	68.61	0.00
	03/22/94	93.76	97.21	29.04	68.17	0.00
	08/19/94	93.76	97.21	30.24	66.97	0.00
	09/15/94	93.76	97.21	29.66	67.55	0.00
	10/28/94	93.76	97.21	29.42	67.79	0.00
	02/03/95	93.76	97.21	29.90	67.31	0.00
MW-10	09/28/93	99.63	102.51	34.11	68.40	0.00
	03/22/94	99.63	102.51	34.57	67.94	0.00
	08/19/94	99.63	102.51	33.06	69.45	0.00
	09/15/94	99.63	102.51	35.26	67.25	0.00
	10/28/94	99.63	102.51	35.18	67.33	0.00
	02/03/95	99.63	102.51	35.40	67.11	0.00

TABLE 1
LEA STATION
SUMMARY OF RELATIVE GROUNDWATER LEVEL ELEVATIONS AND PHASE-SEPARATED HYDROCARBON THICKNESSES

Monitor Well	Date Gauged	Relative Ground Surface Elevation (feet)	Relative Top of Casing Elevation (feet)*	Depth to Water Below Top of Casing (feet)	Corrected Relative Groundwater Elevation (feet)**	Phase-Separated Hydrocarbon Thickness (feet)
MW-11	09/28/93	104.48	105.62	31.38	74.24	0.00
	03/22/94	104.48	105.62	31.73	74.04	0.18
	08/19/94	104.48	105.62	32.36	73.92	0.80
	09/15/94	104.48	105.62	31.68	74.03	0.12
	12/21/94	104.48	105.62	32.66	73.54	0.71
	02/03/95	104.48	105.62	33.14	73.40	1.12
MW-12	02/03/95	--	103.90	31.79	72.11	0.00
MW-13	02/03/95	--	103.89	29.65	74.24	0.00

* Measured from a relative datum (benchmark = 100.00 feet). The monitor well casings were marked to provide consistent reference points for future gauging operations.
** Correction Equation for Phase-Separated Hydrocarbons: Corrected Groundwater Elevation = Top of Casing Elevation - (Depth to Water Below Top of Casing - [SG] [PSH Thickness])
Specific Gravity (SG) = 0.82 for crude oil.

TABLE 2
LEA STATION
WATER SAMPLE ANALYTICAL RESULTS

Monitor Well	Date Sampled	Benzene	Toluene	Ethyl-benzene	Xylenes	Total BTEX	TPH	TDS	DO
MW-1	12/21/92	0.440	0.005	0.120	0.063	0.628	3	2,380	--
	02/16/93	0.350	0.010	0.095	0.070	0.525	5	--	--
	09/15/94	PSH	PSH	PSH	PSH	PSH	PSH	--	--
	02/09/95	PSH	PSH	PSH	PSH	PSH	PSH	--	--
MW-2	02/16/93	0.370	0.040	0.210	0.510	1.130	1	--	--
	03/22/94	0.410	0.012	0.230	0.450	1.102	--	--	--
	09/15/94	PSH	PSH	PSH	PSH	PSH	PSH	--	--
	02/09/95	PSH	PSH	PSH	PSH	PSH	PSH	--	--
MW-3	02/16/93	2.500	0.010	0.370	0.640	3.520	2	--	--
	09/15/94	1.000	0.006	0.280	0.190	1.476	<0.5	--	2.6
	02/09/95	1.30	<0.005	0.260	0.090	1.650	--	--	0.5
MW-4	02/16/93	<0.001	<0.001	<0.001	<0.001	<0.001	<1	--	--
	09/15/94	<0.001	<0.001	<0.001	<0.001	<0.001	<0.5	--	4.0
	02/09/95	<0.001	<0.001	<0.001	<0.001	<0.001	--	--	0.6
MW-5	02/16/93	<0.001	<0.001	0.002	0.004	0.006	<1	--	--
	09/15/94	PSH	PSH	PSH	PSH	PSH	PSH	--	--
	02/09/95	PSH	PSH	PSH	PSH	PSH	PSH	--	--
MW-6	02/16/93	0.002	0.001	<0.001	0.091	0.094	<1	2,500	--
	09/15/94	<0.007	0.003	0.005	0.005	0.020	<0.5	--	2.2
	02/09/95	0.001	<0.001	0.002	0.011	0.014	--	--	0.8
MW-7	02/16/93	<0.001	<0.001	<0.001	<0.001	<0.001	<1	--	--
	09/15/94	0.001	<0.001	0.002	0.002	0.005	<0.5	--	3.8
	02/09/95	<0.001	<0.001	<0.001	<0.001	<0.001	--	--	1.8
MW-8	09/28/93	PSH	PSH	PSH	PSH	PSH	PSH	--	--
	02/09/95	PSH	PSH	PSH	PSH	PSH	PSH	--	--
MW-9	09/28/93	<0.001	<0.001	<0.001	<0.001	<0.001	<1	2,130	--
	09/15/94	<0.001	<0.001	<0.001	<0.001	<0.001	<0.5	--	5.4
	02/09/95	<0.001	<0.001	<0.001	<0.001	<0.001	--	--	4.6

TABLE 2
LEA STATION
WATER SAMPLE ANALYTICAL RESULTS

Monitor Well	Date Sampled	Benzene	Toluene	Ethyl-benzene	Xylenes	Total BTEX	TPH	TDS	DO
MW-10	09/28/93	<0.001	<0.001	0.009	0.001	0.010	7	--	--
	09/15/94	<0.001	<0.001	<0.001	<0.001	<0.001	<0.5	--	3.0
	02/09/95	<0.001	<0.001	<0.001	<0.001	<0.001	--	--	1.2
MW-11	09/28/93	0.24	0.14	0.11	0.14	0.63	3	--	--
	09/15/94	PSH	PSH	PSH	PSH	PSH	PSH	--	--
	02/09/95	PSH	PSH	PSH	PSH	PSH	PSH	--	--
MW-12	02/09/95	0.590	0.009	0.430	0.067	1.096	--	--	0.8
MW-13	02/09/95	<0.001	<0.001	<0.001	<0.001	<0.001	--	--	1.0
WW-1	12/08/92	<0.001	<0.001	<0.001	<0.001	<0.001	5	--	--

BTEX results listed in m/l (parts per million; ppm) with a method detection limit of 0.001 ppm.
TPH and dissolved oxygen (DO) results listed in mg/l (parts per million; ppm) with a method detection limit of 1 ppm.
Analyses were conducted using EPA Method 8020 (BTEX), EPA Method 418.1 (TPH), and EPA Method 160.1 (TDS) by SPL Environmental Laboratories and CEL Laboratories.

TABLE 3
LEA STATION
WATER SAMPLE ANALYTICAL RESULTS
POLYNUCLEAR AROMATIC HYDROCARBONS (PAH)

Monitor wells sampled on 02/09/95

Parameter	Monitor Wells Sampled					
	MW-3	MW-4	MW-6	MW-7	MW-9	MW-10
Naphthalene	0.034	<0.0002	<0.0002	<0.0002	<0.0002	0.005
1-Methylnaphthalene	0.026	<0.0002	<0.002	<0.0002	<0.0002	0.005
2-Methylnaphthalene	0.036	<0.0002	<0.002	<0.0002	<0.0002	<0.0002
Acenaphthylene	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.001
Acenaphthene	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	0.006
Fluorene	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008
Phananthrene	<0.0012	<0.0012	<0.0012	<0.0012	<0.0012	<0.0012
Anthracene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Fluoranthene	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008
Pyrene	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006
Benzo (a) anthracene	<0.0004	<0.004	<0.004	<0.004	<0.004	<0.004
Chrysene	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016
Benzo (b) fluoranthene	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Benzo (k) fluoranthene	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Benzo (a) pyrene	<0.0056	<0.0056	<0.0056	<0.0056	<0.0056	<0.0056
Dibenzo (a,h) anthracene	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Benzo (g,h,i) perylene	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Indeno (1,2,3-cd) pyrene	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004

TABLE 4
LEA STATION
PHASE-SEPARATED HYDROCARBON RECOVERY

Date	Monitor Well	PSH Thickness (feet)	PSH Recovery (gallons)	PSH Cumulative Recovery (gallons)	Type of Recovery
09/28/93	MW-1	0.00	0.0	0.0	
03/22/94	MW-1	0.12	0.1	0.1	Hand bailed
05/09/94	MW-1	0.23	0.3	0.4	Hand bailed, installed Boom
05/25/94	MW-1	Trace	0.1	0.5	Boom absorption
06/14/94	MW-1	Trace	0.1	0.6	Boom absorption
07/13/94	MW-1	0.01	0.2	0.8	Boom absorption
07/22/94	MW-1	0.02	0.2	1.0	Boom absorption
08/19/94	MW-1	0.03	0.3	1.3	Boom absorption
09/15/94	MW-1	0.45	2.6	3.9	Hand bailed, adjusted boom
10/03/94	MW-1	0.37	0.8	4.7	Hand bailed, adjusted boom
10/28/94	MW-1	0.41	1.2	5.9	Hand bailed, adjusted boom
11/28/94	MW-1	0.12	0.2	6.1	Boom absorption
12/21/94	MW-1	Trace	0.0	6.1	Boom removed
02/03/95	MW-1	0.11	0.3	6.4	Hand bailed
09/28/93	MW-2	0.00	0.0	0.0	
03/22/94	MW-2	Trace	0.0	0.0	
05/09/94	MW-2	Trace	0.0	0.0	Boom installed
05/25/94	MW-2	Trace	0.1	0.1	Boom absorption
06/14/94	MW-2	Trace	0.1	0.2	Boom absorption
07/13/94	MW-2	0.05	0.1	0.3	Boom absorption
07/22/94	MW-2	0.08	0.2	0.5	Boom absorption
08/19/94	MW-2	Trace	0.0	0.5	Boom absorption
09/15/94	MW-2	0.12	0.2	0.7	Boom absorption
10/03/94	MW-2	0.11	0.3	1.0	Boom absorption
10/28/94	MW-2	0.14	0.8	1.8	Hand bailed, adjusted boom
11/28/94	MW-2	0.04	0.4	2.2	Boom absorption
12/21/94	MW-2	0.07	0.1	2.1	Boom removed

TABLE 4
LEA STATION
PHASE-SEPARATED HYDROCARBON RECOVERY

Date	Monitor Well	PSH Thickness (feet)	PSH Recovery (gallons)	PSH Cumulative Recovery (gallons)	Type of Recovery
02/03/95	MW-2	0.11	0.8	2.9	Hand bailed
11/28/94	MW-3	0.00	0.0	0.0	
12/21/94	MW-3	Trace	0.0	0.0	
02/03/95	MW-3	Trace	0.0	0.0	
08/19/94	MW-5	0.00	0.00	0.0	
09/15/94	MW-5	0.13	0.00	0.0	Boom installed
10/03/94	MW-5	0.07	0.4	0.4	Boom absorption
10/28/94	MW-5	0.15	0.9	1.3	Hand bailed, adjusted boom
11/28/94	MW-5	0.14	0.3	1.6	Boom absorption
12/21/94	MW-5	0.14	0.8	2.4	Hand bailed, removed boom
02/03/95	MW-5	0.08	0.7	3.3	Hand bailed
09/28/93	MW-8	0.04	0.0	0.0	
03/22/94	MW-8	3.22	6.7	6.7	Hand bailed
05/09/94	MW-8	3.00	5.4	12.1	Hand bailed
05/25/94	MW-8	0.56	1.8	13.9	Hand bailed, boom installed
06/14/94	MW-8	0.01	1.0	14.9	Boom absorption
07/13/94	MW-8	0.62	0.4	15.3	Boom absorption
7/22/94	MW-8	0.94	1.6	16.9	Hand bailed, adjusted boom
08/19/94	MW-8	2.00	1.6	18.5	Hand bailed, adjusted boom
09/15/94	MW-8	1.30	0.0	18.5	Boom absorption
10/03/94	MW-8	1.43	1.5	20.0	Boom absorption
10/28/94	MW-8	1.50	1.4	21.4	Boom absorption
11/28/94	MW-8	0.8	3.7	25.1	Hand bailed, adjusted boom
12/21/94	MW-8	2.58	0.4	25.5	Boom absorption, boom removed
02/03/95	MW-8	3.61	1.8	27.3	Hand bailed

TABLE 4
LEA STATION
PHASE-SEPARATED HYDROCARBON RECOVERY

Date	Monitor Well	PSH Thickness (feet)	PSH Recovery (gallons)	PSH Cumulative Recovery (gallons)	Type of Recovery
09/28/93	MW-11	0.00	0.0	0.0	
03/22/94	MW-11	0.18	0.1	0.1	Boom installed
05/09/94	MW-11	0.35	0.4	0.5	Hand bailed, adjusted boom
05/25/94	MW-11	0.01	0.2	0.7	Boom absorption
06/14/94	MW-11	0.01	0.1	0.8	Boom absorption
07/13/94	MW-11	0.24	0.3	1.1	Boom absorption
07/22/94	MW-11	0.42	0.4	1.5	Boom absorption
08/19/94	MW-11	0.80	1.1	2.6	Hand bailed, adjusted boom
09/15/94	MW-11	0.12	0.0	2.6	Boom absorption
10/03/94	MW-11	0.13	0.7	3.3	Hand bailed, adjusted boom
10/28/94	MW-11	0.23	0.3	3.6	Boom absorption
11/28/94	MW-11	0.62	0.4	4.0	Boom absorption
12/21/94	MW-11	0.71	0.8	4.8	Hand bailed, removed boom
02/03/95	MW-11	1.12	2.4	7.2	Hand bailed

APPENDIX C
ANALYTICAL RESULTS

SHELL OIL COMPANY
RETAIL ENVIRONMENTAL ENGINEERING

CHAIN OF CUSTODY RECORD NO. H 13654

Date: 2-14-95
Page 1 of 2

SITE ADDRESS: Shell Pipe Line
Lea Station

WIC #: 15-9367700B-03

CONSULTANT NAME & ADDRESS: Cura Inc
731 W. Wadley, L-200, Midland TX

CONSULTANT CONTACT: Brad Smith (Houston)

PHONE: (915) 570-8408 FAX: (915) 570-8409

SAMPLED BY: Bill Smith

CHECK ONE BOX ONLY CT/DT

- QUARTERLY MONITORING ☒ 5461
- SITE INVESTIGATION ☐ 5441
- SOIL FOR DISPOSAL ☐ 5442
- WATER FOR DISPOSAL ☐ 5443
- AIR SAMPLER - SYS O+M ☐ 5452
- WATER SAMPLE - SYS O+M ☐ 5453
- OTHER ________ ☐

ANALYSIS REQUEST: (CHECK APPROPRIATE BOX)

SAMPLE I.D.	DATE	TIME	COMP.	GRAB	MATRIX: H2O	SOIL	AIR	SLUDGE	OTHER	METHOD PRESERVED: HCl	HNO3	H2SO4	NONE	OTHER: ICE	NO. OF CONTAINERS	CONTAINER SIZE	BTEX 602 ☐ / 8020 ☒ / WITH MTBE ☐	BTEX/GAS HYDROCARBONS PID/FID ☐ WITH MTBE	VOL 624/PPL ☐ 8240/TAL ☐ NBS (+15) ☐	PNA/PAH 8310 ☐ 8100 ☐ 610 ☐	SEMI-VOL 625/PPL ☐ 8270/TAL ☐ NBS (+25) ☐	TPH/IR 418.1 ☐ SM503 ☐	TPH/GC 8015 Mod. GAS ☐ 8015 Mod DIESEL ☐	TCLP METALS ☐ VOL ☐ SEMI-VOL ☐ PEST ☐ HERB ☐	EP TOX METALS ☐ PESTICIDES ☐ HERBICIDES ☐	REACTIVITY ☐ CORROSIVITY ☐ IGNITABILITY ☐	OTHER: PAH (by 8100)	REMARKS
MW-3	2-9-95	1700		✓	✓								✓	✓	1	1l											✓	
MW-3	2-9-95	1700		✓	✓					✓				✓	3	40 ml	✓											
MW-4	2-9-95	1625		✓	✓								✓	✓	1	1l											✓	
MW-4	2-9-95	1625		✓	✓					✓				✓	3	40 ml	✓											
MW-6	2-9-95	1800		✓	✓								✓	✓	1	1l											✓	
MW-6	2-9-95	1800		✓	✓					✓				✓	3	40 ml	✓											
MW-7	2-9-95	1730		✓	✓								✓	✓	1	1l											✓	
MW-7	2-9-95	1730		✓	✓					✓				✓	3	40 ml	✓											
MW-9	2-9-95	1510		✓	✓								✓	✓	1	1l											✓	
MW-9	2-9-95	1510		✓	✓					✓				✓	3	40 ml	✓											
MW-10	2-9-95	1540		✓	✓								✓	✓	1	1l											✓	
MW-10	2-9-95	1540		✓	✓					✓				✓	3	40 ml	✓											

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME
Bill D. Smith	2-14-95	1000			
RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME
			[illegible]		
RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME
			M Taylor	2/15/95	10:00

BILL NO.: ________

LABORATORY: SPL (Houston)

SHELL CONTACT: Neil Stidham PHONE: ________ FAX: ________

TURN AROUND TIME (CHECK ONE)

7 DAYS ☐ (NORMAL) 14 DAYS ☐
48 HOURS ☐ OTHER ☒ per Shell Pipe Line contract

THE LABORATORY MUST PROVIDE A COPY OF THIS CHAIN OF CUSTODY WITH INVOICE AND RESULTS

DISTRIBUTION: PINK Sampling Coordinator - WHITE & YELLOW Accompanies Shipment - WHITE Returned with Report

7502017

SHELL OIL COMPANY
RETAIL ENVIRONMENTAL ENGINEERING

CHAIN OF CUSTODY RECORD NO. H 13655

Date: 2-14-95
Page 2 of 2

SITE ADDRESS: Shell Pipe Line
LEA Station
~~Proj.~~ Shell # 15-9360700B.03
CONSULTANT NAME & ADDRESS: CURA INC
B1 W. Wadley, C-200, Midland TX
CONSULTANT CONTACT: Brad Smith (Houston)
PHONE: (915) 570-8408 FAX: (915) 570-8409
SAMPLED BY: Bill Smith

CHECK ONE BOX ONLY CT/DT

- QUARTERLY MONITORING ☒ 5461
- SITE INVESTIGATION ☐ 5441
- SOIL FOR DISPOSAL ☐ 5442
- WATER FOR DISPOSAL ☐ 5443
- AIR SAMPLER - SYS O+M ☐ 5452
- WATER SAMPLE - SYS O+M ☐ 5453
- OTHER _____ ☐

SAMPLE I.D.	DATE	TIME	COMP.	GRAB	MATRIX: H2O	SOIL	AIR	SLUDGE	OTHER	METHOD PRESERVED: HCl	HNO3	H2SO4	NONE	OTHER 1645	NO. OF CONTAINERS	CONTAINER SIZE	BTEX 602 ☐ 8020 ☒ WITH MTBE ☐	BTEX/GAS HYDROCARBONS PID/FID ☐ WITH MTBE	VOL 624/PPL ☐	8240/TAL ☐	NBS (+15) ☐	PNA/PAH 8310 ☐	8100 ☐	610 ☐	SEMI - VOL 625/PPL ☐	8270/TAL ☐	NBS (+25) ☐	TPH/IR 418.1 ☐	SM503 ☐	☐	TPH/GC 8015 Mod. GAS ☐	8015 Mod DIESEL ☐	TCLP METALS ☐ VOL ☐ SEMI-VOL ☐ PEST ☐ HERB ☐	EP TOX METALS ☐ PESTICIDES ☐ HERBICIDES ☐	REACTIVITY ☐ CORROSIVITY ☐ IGNITABILITY ☐	OTHER	REMARKS
MW-12	2-10-95	1230		✓	✓					✓				✓	3	40 ml	✓																			
MW-13	2-10-95	1315		✓	✓					✓				✓	3	40 ml	✓																			

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME
Bill D. Smith	2-14-95	1000			
RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME
			Mact 3C		
RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME
			M Taylor	2/15/95	10:00

BILL NO.: _____
LABORATORY: SPL (Houston)
SHELL CONTACT: Neil Stidham PHONE: _____ FAX: _____

TURN AROUND TIME (CHECK ONE)
7 DAYS ~~(NORMAL)~~ 14 DAYS ☐
48 HOURS ☐ OTHER ☐ per Shell Pipe Line Contract

THE LABORATORY MUST PROVIDE A COPY OF THIS CHAIN OF CUSTODY WITH INVOICE AND RESULTS

DISTRIBUTION: PINK Sampling Coordinator - WHITE & YELLOW Accompanies Shipment - WHITE Returned with Report

Certificate of Analysis No. H9-9502514-01

Shell Pipe Line Corporation
P.O. Box 2648
Houston, TX 77252
ATTN: Neal Stidham

P.O.# MESA-CAO-B-131201-PX-4204-NS
DATE: 02/23/95

PROJECT: Lea Station
SITE: Lea County, New Mexico
SAMPLED BY: Cura, Inc.
SAMPLE ID: MW-3

PROJECT NO: H 13654
MATRIX: WATER
DATE SAMPLED: 02/09/95 17:00:00
DATE RECEIVED: 02/15/95

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	1300	5 P	µg/L
TOLUENE	ND	5 P	µg/L
ETHYLBENZENE	260	5 P	µg/L
TOTAL XYLENE	90	5 P	µg/L
TOTAL VOLATILE AROMATIC HYDROCARBONS	1650		µg/L

Surrogate	% Recovery
1,4-Difluorobenzene	104
4-Bromofluorobenzene	105

METHOD 8020***
Analyzed by: AF
Date: 02/18/95

(P) - Practical Quantitation Limit ND - Not detected.

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
**Ref: Standard Methods for Examination of Water & Wastewater, 17th ed.
***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

SPL, Inc., - Project Manager

CORRECTED COPY

Certificate of Analysis No. H9-9502514-01

Shell Pipe Line Corporation
P.O. Box 2648
Houston, TX 77252
ATTN: Neal Stidham

P.O.# MESA-CAO-B-131201-PX-4204-NS
03/01/95

PROJECT: Lea Station
SITE: Lea County, New Mexico
SAMPLED BY: Cura, Inc.
SAMPLE ID: MW-3

PROJECT NO: H 13654
MATRIX: WATER
DATE SAMPLED: 02/09/95 17:00:00
DATE RECEIVED: 02/15/95

ANALYTICAL DATA

PARAMETER	RESULTS	MDL*	UNITS
Naphthalene	34	0.20	µg/L
1-Methylnaphthalene	26	0.20	µg/L
2-Methylnaphthalene	36	0.20	µg/L
Acenaphthylene	ND	0.10	µg/L
Acenaphthene	ND	0.40	µg/L
Fluorene	ND	0.80	µg/L
Phenanthrene	ND	1.2	µg/L
Anthracene	ND	1.0	µg/L
Fluoranthene	ND	0.8	µg/L
Pyrene	ND	0.60	µg/L
Benzo (a) anthracene	ND	4.0	µg/L
Chrysene	ND	1.6	µg/L
Benzo (b) fluoranthene	ND	4.0	µg/L
Benzo (k) fluoranthene	ND	4.0	µg/L
Benzo (a) pyrene	ND	5.6	µg/L
Dibenzo (a,h) anthracene	ND	4.0	µg/L
Benzo (g,h,i) perylene	ND	4.0	µg/L
Indeno (1,2,3-cd) pyrene	ND	4.0	µg/L

SURROGATES	% RECOVERY
2-Fluorobiphenyl	125

ANALYZED BY: LT
DATE/TIME: 02/16/95 10:57:00
EXTRACTED BY: LJ
DATE/TIME: 02/15/95
METHOD: 8100 - Polynuclear Aromatic Hydrocarbons
NOTES: * - Method Detection Limit ND - Not Detected
NA - Not Analyzed

COMMENTS:

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

SPL, Inc., - Project Manager

Certificate of Analysis No. H9-9502514-02

Shell Pipe Line Corporation
P.O. Box 2648
Houston, TX 77252
ATTN: Neal Stidham

P.O.# MESA-CAO-B-131201-PX-4204-NS
DATE: 02/23/95

PROJECT: Lea Station
SITE: Lea County, New Mexico
SAMPLED BY: Cura, Inc.
SAMPLE ID: MW-4

PROJECT NO: H 13654
MATRIX: WATER
DATE SAMPLED: 02/09/95 16:25:00
DATE RECEIVED: 02/15/95

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	ND	1 P	µg/L
TOLUENE	ND	1 P	µg/L
ETHYLBENZENE	ND	1 P	µg/L
TOTAL XYLENE	ND	1 P	µg/L
TOTAL VOLATILE AROMATIC HYDROCARBONS	ND		µg/L

Surrogate	% Recovery
1,4-Difluorobenzene	95
4-Bromofluorobenzene	99

METHOD 8020***
Analyzed by: AF
Date: 02/17/95

ND - Not detected. (P) - Practical Quantitation Limit

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
**Ref: Standard Methods for Examination of Water & Wastewater, 17th ed.
***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

SPL, Inc. - Project Manager

CORRECTED COPY

Certificate of Analysis No. H9-9502514-02

Shell Pipe Line Corporation
P.O. Box 2648
Houston, TX 77252
ATTN: Neal Stidham

P.O.#
MESA-CAO-B-131201-PX-4204-NS
03/01/95

PROJECT: Lea Station
SITE: Lea County, New Mexico
SAMPLED BY: Cura, Inc.
SAMPLE ID: MW-4

PROJECT NO: H 13654
MATRIX: WATER
DATE SAMPLED: 02/09/95 16:25:00
DATE RECEIVED: 02/15/95

ANALYTICAL DATA

PARAMETER	RESULTS	MDL*	UNITS
Naphthalene	ND	0.20	µg/L
1-Methylnaphthalene	ND	0.20	µg/L
2-Methylnaphthalene	ND	0.20	µg/L
Acenaphthylene	ND	0.10	µg/L
Acenaphthene	ND	0.40	µg/L
Fluorene	ND	0.80	µg/L
Phenanthrene	ND	1.2	µg/L
Anthracene	ND	1.0	µg/L
Fluoranthene	ND	0.8	µg/L
Pyrene	ND	0.60	µg/L
Benzo (a) anthracene	ND	4.0	µg/L
Chrysene	ND	1.6	µg/L
Benzo (b) fluoranthene	ND	4.0	µg/L
Benzo (k) fluoranthene	ND	4.0	µg/L
Benzo (a) pyrene	ND	5.6	µg/L
Dibenzo (a,h) anthracene	ND	4.0	µg/L
Benzo (g,h,i) perylene	ND	4.0	µg/L
Indeno (1,2,3-cd) pyrene	ND	4.0	µg/L

SURROGATES	% RECOVERY
2-Fluorobiphenyl	90

ANALYZED BY: LT DATE/TIME: 02/16/95 10:57:00
EXTRACTED BY: LJ DATE/TIME: 02/15/95
METHOD: 8100 - Polynuclear Aromatic Hydrocarbons
NOTES: * - Method Detection Limit ND - Not Detected
NA - Not Analyzed

COMMENTS:

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

SPL, Inc., - Project Manager

Certificate of Analysis No. H9-9502514-03

Shell Pipe Line Corporation
P.O. Box 2648
Houston, TX 77252
ATTN: Neal Stidham

P.O.# MESA-CAO-B-131201-PX-4204-NS
DATE: 02/23/95

PROJECT: Lea Station
SITE: Lea County, New Mexico
SAMPLED BY: Cura, Inc.
SAMPLE ID: MW-6

PROJECT NO: H 13654
MATRIX: WATER
DATE SAMPLED: 02/09/95 18:00:00
DATE RECEIVED: 02/15/95

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	1	1 P	µg/L
TOLUENE	ND	1 P	µg/L
ETHYLBENZENE	2	1 P	µg/L
TOTAL XYLENE	11	1 P	µg/L
TOTAL VOLATILE AROMATIC HYDROCARBONS	14		µg/L

Surrogate	% Recovery
1,4-Difluorobenzene	96
4-Bromofluorobenzene	117

METHOD 8020***
Analyzed by: AF
Date: 02/17/95

(P) - Practical Quantitation Limit ND - Not detected.

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
**Ref: Standard Methods for Examination of Water & Wastewater, 17th ed.
***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

SPL, Inc., - Project Manager

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Certificate of Analysis No. H9-9502514-03

Shell Pipe Line Corporation
P.O. Box 2648
Houston, TX 77252
ATTN: Neal Stidham

P.O.# MESA-CAO-B-131201-PX-4204-NS
03/01/95

PROJECT: Lea Station
SITE: Lea County, New Mexico
SAMPLED BY: Cura, Inc.
SAMPLE ID: MW-6

PROJECT NO: H 13654
MATRIX: WATER
DATE SAMPLED: 02/09/95 18:00:00
DATE RECEIVED: 02/15/95

ANALYTICAL DATA

PARAMETER	RESULTS	MDL*	UNITS
Naphthalene	ND	2.00	µg/L
1-Methylnaphthalene	ND	2.00	µg/L
2-Methylnaphthalene	ND	2.00	µg/L
Acenaphthylene	ND	1.00	µg/L
Acenaphthene	ND	4.00	µg/L
Fluorene	ND	8.00	µg/L
Phenanthrene	ND	12.0	µg/L
Anthracene	ND	10.0	µg/L
Fluoranthene	ND	8.0	µg/L
Pyrene	ND	6.00	µg/L
Benzo (a) anthracene	ND	40.0	µg/L
Chrysene	ND	16.0	µg/L
Benzo (b) fluoranthene	ND	40.0	µg/L
Benzo (k) fluoranthene	ND	40.0	µg/L
Benzo (a) pyrene	ND	56.0	µg/L
Dibenzo (a,h) anthracene	ND	40.0	µg/L
Benzo (g,h,i) perylene	ND	40.0	µg/L
Indeno (1,2,3-cd) pyrene	ND	40.0	µg/L

SURROGATES	% RECOVERY
2-Fluorobiphenyl	74

ANALYZED BY: LT DATE/TIME: 02/16/95 10:57:00
EXTRACTED BY: LJ DATE/TIME: 02/15/95
METHOD: 8100 - Polynuclear Aromatic Hydrocarbons
NOTES: * - Method Detection Limit ND - Not Detected
NA - Not Analyzed

COMMENTS:

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

SPL, Inc., - Project Manager

Certificate of Analysis No. H9-9502514-04

Shell Pipe Line Corporation
P.O. Box 2648
Houston, TX 77252
ATTN: Neal Stidham

P.O.# MESA-CAO-B-131201-PX-4204-NS
DATE: 02/23/95

PROJECT: Lea Station
SITE: Lea County, New Mexico
SAMPLED BY: Cura, Inc.
SAMPLE ID: MW-7

PROJECT NO: H 13654
MATRIX: WATER
DATE SAMPLED: 02/09/95 17:30:00
DATE RECEIVED: 02/15/95

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	ND	1 P	µg/L
TOLUENE	ND	1 P	µg/L
ETHYLBENZENE	ND	1 P	µg/L
TOTAL XYLENE	ND	1 P	µg/L
TOTAL VOLATILE AROMATIC HYDROCARBONS	ND		µg/L

Surrogate	% Recovery
1,4-Difluorobenzene	96
4-Bromofluorobenzene	98

METHOD 8020***
Analyzed by: AF
Date: 02/17/95

ND - Not detected. (P) - Practical Quantitation Limit

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
**Ref: Standard Methods for Examination of Water & Wastewater, 17th ed.
***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

SPL, Inc. - Project Manager

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Certificate of Analysis No. H9-9502514-04

Shell Pipe Line Corporation
P.O. Box 2648
Houston, TX 77252
ATTN: Neal Stidham

P.O.# MESA-CAO-B-131201-PX-4204-NS
03/01/95

PROJECT: Lea Station
SITE: Lea County, New Mexico
SAMPLED BY: Cura, Inc.
SAMPLE ID: MW-7

PROJECT NO: H 13654
MATRIX: WATER
DATE SAMPLED: 02/09/95 17:30:00
DATE RECEIVED: 02/15/95

ANALYTICAL DATA

PARAMETER	RESULTS	MDL*	UNITS
Naphthalene	ND	0.20	µg/L
1-Methylnaphthalene	ND	0.20	µg/L
2-Methylnaphthalene	ND	0.20	µg/L
Acenaphthylene	ND	0.10	µg/L
Acenaphthene	ND	0.40	µg/L
Fluorene	ND	0.80	µg/L
Phenanthrene	ND	1.2	µg/L
Anthracene	ND	1.0	µg/L
Fluoranthene	ND	0.8	µg/L
Pyrene	ND	0.60	µg/L
Benzo (a) anthracene	ND	4.0	µg/L
Chrysene	ND	1.6	µg/L
Benzo (b) fluoranthene	ND	4.0	µg/L
Benzo (k) fluoranthene	ND	4.0	µg/L
Benzo (a) pyrene	ND	5.6	µg/L
Dibenzo (a,h) anthracene	ND	4.0	µg/L
Benzo (g,h,i) perylene	ND	4.0	µg/L
Indeno (1,2,3-cd) pyrene	ND	4.0	µg/L

SURROGATES	% RECOVERY
2-Fluorobiphenyl	101

ANALYZED BY: LT DATE/TIME: 02/16/95 10:57:00
EXTRACTED BY: LJ DATE/TIME: 02/15/95
METHOD: 8100 - Polynuclear Aromatic Hydrocarbons
NOTES: * - Method Detection Limit ND - Not Detected
NA - Not Analyzed

COMMENTS:

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

SPL, Inc., - Project Manager

Certificate of Analysis No. H9-9502514-05

Shell Pipe Line Corporation
P.O. Box 2648
Houston, TX 77252
ATTN: Neal Stidham

P.O.# MESA-CAO-B-131201-PX-4204-NS
DATE: 02/23/95

PROJECT: Lea Station
SITE: Lea County, New Mexico
SAMPLED BY: Cura, Inc.
SAMPLE ID: MW-9

PROJECT NO: H 13654
MATRIX: WATER
DATE SAMPLED: 02/09/95 15:10:00
DATE RECEIVED: 02/15/95

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	ND	1 P	µg/L
TOLUENE	ND	1 P	µg/L
ETHYLBENZENE	ND	1 P	µg/L
TOTAL XYLENE	ND	1 P	µg/L
TOTAL VOLATILE AROMATIC HYDROCARBONS	ND		µg/L

Surrogate	% Recovery
1,4-Difluorobenzene	96
4-Bromofluorobenzene	97

METHOD 8020***
Analyzed by: AF
Date: 02/17/95

ND - Not detected. (P) - Practical Quantitation Limit

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
**Ref: Standard Methods for Examination of Water & Wastewater, 17th ed.
***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

SPL, Inc., - Project Manager

CORRECTED COPY

Certificate of Analysis No. H9-9502514-05

Shell Pipe Line Corporation
P.O. Box 2648
Houston, TX 77252
ATTN: Neal Stidham

P.O.# MESA-CAO-B-131201-PX-4204-NS
03/01/95

PROJECT: Lea Station
SITE: Lea County, New Mexico
SAMPLED BY: Cura, Inc.
SAMPLE ID: MW-9

PROJECT NO: H 13654
MATRIX: WATER
DATE SAMPLED: 02/09/95 15:10:00
DATE RECEIVED: 02/15/95

ANALYTICAL DATA

PARAMETER	RESULTS	MDL*	UNITS
Naphthalene	ND	0.20	µg/L
1-Methylnaphthalene	ND	0.20	µg/L
2-Methylnaphthalene	ND	0.20	µg/L
Acenaphthylene	ND	0.10	µg/L
Acenaphthene	ND	0.40	µg/L
Fluorene	ND	0.80	µg/L
Phenanthrene	ND	1.2	µg/L
Anthracene	ND	1.0	µg/L
Fluoranthene	ND	0.8	µg/L
Pyrene	ND	0.60	µg/L
Benzo (a) anthracene	ND	4.0	µg/L
Chrysene	ND	1.6	µg/L
Benzo (b) fluoranthene	ND	4.0	µg/L
Benzo (k) fluoranthene	ND	4.0	µg/L
Benzo (a) pyrene	ND	5.6	µg/L
Dibenzo (a,h) anthracene	ND	4.0	µg/L
Benzo (g,h,i) perylene	ND	4.0	µg/L
Indeno (1,2,3-cd) pyrene	ND	4.0	µg/L

SURROGATES	% RECOVERY
2-Fluorobiphenyl	118

ANALYZED BY: LT DATE/TIME: 02/16/95 10:57:00
EXTRACTED BY: LJ DATE/TIME: 02/15/95
METHOD: 8100 - Polynuclear Aromatic Hydrocarbons
NOTES: * - Method Detection Limit ND - Not Detected
NA - Not Analyzed

COMMENTS:

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

SPL, Inc., - Project Manager

Certificate of Analysis No. H9-9502514-06

Shell Pipe Line Corporation
P.O. Box 2648
Houston, TX 77252
ATTN: Neal Stidham

P.O.# MESA-CAO-B-131201-PX-4204-NS
DATE: 02/23/95

PROJECT: Lea Station
SITE: Lea County, New Mexico
SAMPLED BY: Cura, Inc.
SAMPLE ID: MW-10

PROJECT NO: H 13654
MATRIX: WATER
DATE SAMPLED: 02/09/95 15:40:00
DATE RECEIVED: 02/15/95

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	ND	1 P	µg/L
TOLUENE	ND	1 P	µg/L
ETHYLBENZENE	ND	1 P	µg/L
TOTAL XYLENE	ND	1 P	µg/L
TOTAL VOLATILE AROMATIC HYDROCARBONS	ND		µg/L

Surrogate	% Recovery
1,4-Difluorobenzene	96
4-Bromofluorobenzene	104

METHOD 8020***
Analyzed by: AF
Date: 02/17/95

ND - Not detected. (P) - Practical Quantitation Limit

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
**Ref: Standard Methods for Examination of Water & Wastewater, 17th ed.
***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

SPL, Inc., - Project Manager

CORRECTED COPY

Certificate of Analysis No. H9-9502514-06

Shell Pipe Line Corporation
P.O. Box 2648
Houston, TX 77252
ATTN: Neal Stidham

P.O.# MESA-CAO-B-131201-PX-4204-NS
03/01/95

PROJECT: Lea Station
SITE: Lea County, New Mexico
SAMPLED BY: Cura, Inc.
SAMPLE ID: MW-10

PROJECT NO: H 13654
MATRIX: WATER
DATE SAMPLED: 02/09/95 15:40:00
DATE RECEIVED: 02/15/95

ANALYTICAL DATA

PARAMETER	RESULTS	MDL*	UNITS
Naphthalene	5	0.20	µg/L
1-Methylnaphthalene	5	0.20	µg/L
2-Methylnaphthalene	ND	0.20	µg/L
Acenaphthylene	ND	0.10	µg/L
Acenaphthene	6	0.40	µg/L
Fluorene	ND	0.80	µg/L
Phenanthrene	ND	1.2	µg/L
Anthracene	ND	1.0	µg/L
Fluoranthene	ND	0.8	µg/L
Pyrene	ND	0.60	µg/L
Benzo (a) anthracene	ND	4.0	µg/L
Chrysene	ND	1.6	µg/L
Benzo (b) fluoranthene	ND	4.0	µg/L
Benzo (k) fluoranthene	ND	4.0	µg/L
Benzo (a) pyrene	ND	5.6	µg/L
Dibenzo (a,h) anthracene	ND	4.0	µg/L
Benzo (g,h,i) perylene	ND	4.0	µg/L
Indeno (1,2,3-cd) pyrene	ND	4.0	µg/L

SURROGATES	% RECOVERY
2-Fluorobiphenyl	110

ANALYZED BY: LT DATE/TIME: 02/16/95 10:57:00
EXTRACTED BY: LJ DATE/TIME: 02/15/95
METHOD: 8100 - Polynuclear Aromatic Hydrocarbons
NOTES: * - Method Detection Limit ND - Not Detected
NA - Not Analyzed

COMMENTS:

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

SPL, Inc., - Project Manager

Certificate of Analysis No. H9-9502514-07

Shell Pipe Line Corporation
P.O. Box 2648
Houston, TX 77252
ATTN: Neal Stidham

P.O.# MESA-CAO-B-131201-PX-4204-NS
DATE: 02/23/95

PROJECT: Lea Station
SITE: Lea County, New Mexico
SAMPLED BY: Cura, Inc.
SAMPLE ID: MW-12

PROJECT NO: H 13654
MATRIX: WATER
DATE SAMPLED: 02/10/95 12:30:00
DATE RECEIVED: 02/15/95

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	590	1 P	µg/L
TOLUENE	9	1 P	µg/L
ETHYLBENZENE	430	1 P	µg/L
TOTAL XYLENE	67	1 P	µg/L
TOTAL VOLATILE AROMATIC HYDROCARBONS	1096		µg/L

Surrogate	% Recovery
1,4-Difluorobenzene	110
4-Bromofluorobenzene	158 «

METHOD 8020***
Analyzed by: AF
Date: 02/17/95

(P) - Practical Quantitation Limit « - Recovery beyond control limits.

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
**Ref: Standard Methods for Examination of Water & Wastewater, 17th ed.
***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

SPL, Inc., - Project Manager

Certificate of Analysis No. H9-9502514-08

Shell Pipe Line Corporation
P.O. Box 2648
Houston, TX 77252
ATTN: Neal Stidham

P.O.# MESA-CAO-B-131201-PX-4204-NS
DATE: 02/23/95

PROJECT: Lea Station
SITE: Lea County, New Mexico
SAMPLED BY: Cura, Inc.
SAMPLE ID: MW-13

PROJECT NO: H 13654
MATRIX: WATER
DATE SAMPLED: 02/10/95 13:15:00
DATE RECEIVED: 02/15/95

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	ND	1 P	µg/L
TOLUENE	ND	1 P	µg/L
ETHYLBENZENE	ND	1 P	µg/L
TOTAL XYLENE	ND	1 P	µg/L
TOTAL VOLATILE AROMATIC HYDROCARBONS	ND		µg/L

Surrogate	% Recovery
1,4-Difluorobenzene	95
4-Bromofluorobenzene	98

METHOD 8020***
Analyzed by: AF
Date: 02/17/95

ND - Not detected. (P) - Practical Quantitation Limit

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
**Ref: Standard Methods for Examination of Water & Wastewater, 17th ed.
***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

SPL, Inc., - Project Manager

QUALITY CONTROL DOCUMENTATION

Matrix: Aqueous Batch Id: HP_R950216190800
Units: µg/L

LABORATORY CONTROL SAMPLE

SPIKE COMPOUNDS	Method Blank Result <2>	Spike Added <3>	Blank Spike Result <1>	Blank Spike Recovery %	QC Limits(**) (Mandatory) % Recovery Range
Benzene	ND	50	48	96.0	61 - 123
Toluene	ND	50	46	92.0	62 - 122
EthylBenzene	ND	50	50	100	56 - 119
O Xylene	ND	50	52	104	32 - 160
M & P Xylene	ND	100	120	120	32 - 160

MATRIX SPIKES

SPIKE COMPOUNDS	Sample Results <2>	Spike Added <3>	Matrix Spike Result <1>	Matrix Spike Recovery <4>	Matrix Spike Duplicate Result <1>	Matrix Spike Duplicate Recovery <5>	MS/MSD Relative % Difference	QC Limits(***) (Advisory) RPD Max.	QC Limits(***) (Advisory) Recovery Range
Benzene	ND	20	19	95.0	19	95.0	0	25	39 - 150
Toluene	ND	20	19	95.0	19	95.0	0	26	56 - 134
EthylBenzene	ND	20	20	100	19	95.0	5.13	38	61 - 128
O Xylene	ND	20	21	105	20	100	4.88	20	40 - 130
M & P Xylene	ND	40	45	112	43	108	3.64	20	43 - 152

Analyst: AF
Sequence Date: 02/16/95
SPL ID of sample spiked: 9502522-01A
Sample File ID: R___073.TX0
Method Blank File ID:
Blank Spike File ID: R___067.TX0
Matrix Spike File ID: R___070.TX0
Matrix Spike Duplicate File ID: R___071.TX0

* = Values Outside QC Range
NC = Not Calculated (Sample exceeds spike by factor of 4 or more)
ND = Not Detected/Below Detection Limit
% Recovery = [(<1> - <2>) / <3>] x 100
LCS % Recovery = (<1> / <3>) x 100
Relative Percent Difference = |(<4> - <5> | / [(<4> + <5>) x 0.5] x 100
(**) = Source: SPL-Houston Historical Data
(***) = Source: SPL-Houston Historical Data

SAMPLES IN BATCH(SPL ID):

9502514-07A 9502514-06A 9502493-03A 9502493-02A
9502520-01A 9502525-01A 9502502-06A 9502502-05A
9502493-04A 9502525-02A 9502438-01A 9502502-04A
9502502-03A 9502502-02A 9502502-01A 9502528-02A
9502516-03A 9502516-01A 9502522-01A

for Idelis Williams, QC Officer

Matrix: Aqueous Batch Id: HP_R950217104900
Units: µg/L

LABORATORY CONTROL SAMPLE

SPIKE COMPOUNDS	Method Blank Result <2>	Spike Added <3>	Blank Spike Result <1>	Blank Spike Recovery %	QC Limits(**) (Mandatory) % Recovery Range
Benzene	ND	50	41	82.0	61 - 123
Toluene	ND	50	40	80.0	62 - 122
EthylBenzene	ND	50	41	82.0	56 - 119
O Xylene	ND	50	45	90.0	32 - 160
M & P Xylene	ND	100	100	100	32 - 160

MATRIX SPIKES

SPIKE COMPOUNDS	Sample Results <2>	Spike Added <3>	Matrix Spike Result <1>	Matrix Spike Recovery <4>	Matrix Spike Duplicate Result <1>	Matrix Spike Duplicate Recovery <5>	MS/MSD Relative % Difference	QC Limits(***) (Advisory) RPD Max.	QC Limits(***) (Advisory) Recovery Range
Benzene	ND	20	18	90.0	18	90.0	0	25	39 - 150
Toluene	ND	20	17	85.0	17	85.0	0	26	56 - 134
EthylBenzene	ND	20	19	95.0	18	90.0	5.41	38	61 - 128
O Xylene	ND	20	19	95.0	19	95.0	0	20	40 - 130
M & P Xylene	ND	40	42	105	41	102	2.90	20	43 - 152

Analyst: AF
Sequence Date: 02/17/95
SPL ID of sample spiked: 9502514-04A
Sample File ID: R___104.TXO
Method Blank File ID:
Blank Spike File ID: R___096.TXO
Matrix Spike File ID: R___098.TXO
Matrix Spike Duplicate File ID: R___099.TXO

* = Values Outside QC Range
NC = Not Calculated (Sample exceeds spike by factor of 4 or more)
ND = Not Detected/Below Detection Limit
% Recovery = [(<1> - <2>) / <3>] x 100
LCS % Recovery = (<1> / <3>) x 100
Relative Percent Difference = |(<4> - <5> | / [(<4> + <5>) x 0.5] x 100
(**) = Source: SPL-Houston Historical Data
(***) = Source: SPL-Houston Historical Data

SAMPLES IN BATCH(SPL ID):

9502613-01A 9502613-06A 9502613-02A 9502613-07A
9502613-04A 9502610-05A 9502610-04A 9502610-03A
9502610-02A 9502610-01A 9502596-01A 9502514-08A
9502514-05A 9502514-03A 9502514-02A 9502528-01A
9502514-04A 9502523-02A

for Idelis Williams, QC Officer

Matrix: Aqueous Batch Id: HP_R950218045700
Units: µg/L

LABORATORY CONTROL SAMPLE

SPIKE COMPOUNDS	Method Blank Result <2>	Spike Added <3>	Blank Spike Result <1>	Blank Spike Recovery %	QC Limits(**) (Mandatory) % Recovery Range
Benzene	ND	50	47	94.0	61 - 123
Toluene	ND	50	46	92.0	62 - 122
EthylBenzene	ND	50	49	98.0	56 - 119
O Xylene	ND	50	52	104	32 - 160
M & P Xylene	ND	100	120	120	32 - 160

MATRIX SPIKES

SPIKE COMPOUNDS	Sample Results <2>	Spike Added <3>	Matrix Spike Result <1>	Matrix Spike Recovery <4>	Matrix Spike Duplicate Result <1>	Matrix Spike Duplicate Recovery <5>	MS/MSD Relative % Difference	QC Limits(***) (Advisory) RPD Max.	QC Limits(***) (Advisory) Recovery Range
Benzene	ND	20	19	95.0	19	95.0	0	25	39 - 150
Toluene	ND	20	18	90.0	18	90.0	0	26	56 - 134
EthylBenzene	ND	20	18	90.0	19	95.0	5.41	38	61 - 128
O Xylene	ND	20	19	95.0	19	95.0	0	20	40 - 130
M & P Xylene	ND	40	41	102	42	105	2.90	20	43 - 152

Analyst: AF
Sequence Date: 02/18/95
SPL ID of sample spiked: 9502613-10A
Sample File ID: R___132.TX0
Method Blank File ID:
Blank Spike File ID: R___126.TX0
Matrix Spike File ID: R___129.TX0
Matrix Spike Duplicate File ID: R___130.TX0

* = Values Outside QC Range
NC = Not Calculated (Sample exceeds spike by factor of 4 or more)
ND = Not Detected/Below Detection Limit
% Recovery = [(<1> - <2>) / <3>] x 100
LCS % Recovery = (<1> / <3>) x 100
Relative Percent Difference = |(<4> - <5> | / [(<4> + <5>) x 0.5] x 100
(**) = Source: SPL-Houston Historical Data
(***) = Source: SPL-Houston Historical Data

SAMPLES IN BATCH(SPL ID): 9502613-03A 9502396-08A 9502396-02A 9502503-03A 9502503-02A 9502613-05A 9502516-02A 9502493-01A 9502503-01A 9502514-01A 9502613-11A 9502613-09A 9502613-08A 9502613-10A

for Idelis Williams, QC Officer

PNA's by GC

Matrix: Aqueous Batch Id: VARH950216105700

Units: µg/L

LABORATORY CONTROL SAMPLE

SPIKE COMPOUNDS	Method Blank Result <2>	Spike Added <3>	Blank Spike Result <1>	Blank Spike Recovery %	QC Limits(**) (Mandatory) % Recovery Range
NAPHTHALENE	ND	25	21.0587	84.2	1 - 122
ACENAPHTHYLENE	ND	25	20.7778	83.1	1 - 139
ACENAPHTHENE	ND	25	23.3962	93.6	1 - 124
FLUORENE	ND	25	24.2413	97.0	1 - 142
PHENANTHRENE	ND	25	27.0000	108	1 - 155
ANTHRACENE	ND	25	23.000	92.0	1 - 126
FLUORANTHENE	ND	25	31.0349	124	1 - 142
PYRENE	ND	25	31.3821	126	1 - 140
CHRYSENE	ND	25	33.3290	133	1 - 199
BENZO (A) ANTHRACENE	ND	25	30.8053	123	12 - 135
BENZO (B) FLUORANTHENE	ND	25	28.720	115	6 - 150
BENZO (K) FLUORANTHENE	ND	25	26.940	108	1 - 159
BENZO (A) PYRENE	ND	25	23.7800	95.1	1 - 128
DIBENZO (A,H) ANTHRACENE	ND	25	27.1614	109	1 - 110
BENZO (G,H,I) PERYLENE	ND	25	26.8621	107	1 - 116
INDENO (1,2,3-CD) PYRENE	ND	25	25.3634	101	1 - 116

MATRIX SPIKES

SPIKE COMPOUNDS	Sample Results <2>	Spike Added <3>	Matrix Spike Result <1>	Matrix Spike Recovery <4>	Matrix Spike Duplicate Result <1>	Matrix Spike Duplicate Recovery <5>	MS/MSD Relative % Difference	QC Limits(***) (Advisory) RPD Max.	QC Limits(***) (Advisory) Recovery Range
NAPHTHALENE	ND	25.00	22.4992	90.0	21.4106	85.6	5.01	30	1 - 122
ACENAPHTHYLENE	ND	25.00	17.5528	70.2	17.0339	68.1	3.04	30	1 - 139
ACENAPHTHENE	ND	25.00	24.3965	97.6	22.0794	88.3	10.0	30	1 - 124
FLUORENE	ND	25.00	24.6257	98.5	23.8591	95.4	3.20	30	1 - 142
PHENANTHRENE	ND	25.0	24.278	97.1	24.088	96.4	0.724	30	1 - 155
ANTHRACENE	ND	25.0	23.0170	92.1	23.3947	93.6	1.62	30	1 - 126
FLUORANTHENE	ND	25.0	28.0754	112	24.0206	96.1	15.3	30	1 - 142
PYRENE	ND	25.00	28.6653	115	28.0485	112	2.64	30	1 - 140
CHRYSENE	ND	25.0	32.0018	128	31.0467	124	3.17	30	1 - 199
BENZO (A) ANTHRACENE	ND	25.0	29.0624	116	28.0126	112	3.51	30	12 - 135
BENZO (B) FLUORANTHENE	ND	25.0	26.0	104	24.0	96.0	8.00	30	6 - 150
BENZO (K) FLUORANTHENE	ND	25.0	29.0166	116	28.0272	112	3.51	30	1 - 159
BENZO (A) PYRENE	ND	25.0	19.3546	77.4	21.7230	86.9	11.6	30	1 - 128
DIBENZO (A,H) ANTHRACENE	ND	25.0	25.9820	104	25.0470	100	3.92	30	1 - 110

SAMPLES IN BATCH(SPL ID): 9502453-01C 9502514-03B 9502514-06B 9502514-01B 9502516-02B 9502516-01B 9502516-03B 9502514-05B 9502514-04B 9502514-02B 9502453-01C 9502453-03C 9502453-02C

for Idelis Williams, QC Officer

Matrix: Aqueous
Units: µg/L

Batch Id: VARH950216105700

MATRIX SPIKES

SPIKE COMPOUNDS	Sample Results <2>	Spike Added <3>	Matrix Spike Result <1>	Matrix Spike Recovery <4>	Matrix Spike Duplicate Result <1>	Matrix Spike Duplicate Recovery <5>	MS/MSD Relative % Difference	QC Limits(***) (Advisory) RPD Max.	QC Limits(***) (Advisory) Recovery Range
BENZO (G,H,I) PERYLENE	ND	25.0	26.3812	106	24.3651	97.5	8.35	30	1 - 116
INDENO (1,2,3-CD) PYRENE	ND	25.0	26.1334	105	23.326	93.3	11.8	30	1 - 116

Analyst: LT
Sequence Date: 02/16/95
SPL ID of sample spiked: 950209CXBI
Sample File ID: H___842.raw
Method Blank File ID:
Blank Spike File ID: H___906.raw
Matrix Spike File ID: H___848.raw
Matrix Spike Duplicate File ID: H___849.raw

* = Values Outside QC Range
NC = Not Calculated (Sample exceeds spike by factor of 4 or more)
ND = Not Detected/Below Detection Limit
% Recovery = [(<1> - <2>) / <3>] x 100
LCS % Recovery = (<1> / <3>) x 100
Relative Percent Difference = |(<4> - <5> | / [(<4> + <5>) x 0.5] x 100
(**) = Source: 8100, Table 2
(***) = Source: Temporary Limits

SAMPLES IN BATCH(SPL ID): 9502453-01C 9502514-03B 9502514-06B 9502514-01B 9502516-02B 9502516-01B 9502516-03B 9502514-05B 9502514-04B 9502514-02B 9502453-01C 9502453-03C 9502453-02C

for Idelis Williams, QC Officer

APPENDIX D

QUALITY ASSURANCE/QUALITY CONTROL

QUALITY ASSURANCE/QUALITY CONTROL PROCEDURES

A strict Quality Assurance Plan was incorporated throughout all phases of the monitoring and sampling operations. The samples were collected with new disposable Teflon bailers. The bailers were disposed of between sampling stations to eliminate the potential of cross-contamination. The water samples were transferred from the bailers into airtight septum-sealed 40-ml glass VOA vials with zero head space for BTEX analysis and one-liter amber glass jars with Teflon-lined lids for TPH analysis.

The samples were preserved with hydrochloric acid, sealed with QA/QC seals and maintained at 4°C in accordance with Environmental Protection Agency (EPA) requirements (EPA 600/4-82-029) for shipment to the laboratory. A chain-of-custody (COC) which documents sample collection times and delivery times to the laboratory was completed for each set of samples. The COC is included with the analytical results in the appropriate appendices.

Analyses were performed on all samples using the following TNRCC-recommended analytical methods: EPA Method 8020/5030 (BTEX) and EPA Method 8100 (PAH). The maximum recommended holding time for BTEX analysis is 14 days; the maximum recommended holding time for TPH analysis is 28 days.

CURA maintains the highest quality assurance standards with direct supervision of operations (sample handling and storage). CURA utilizes laboratories that maintain strict quality control; i.e., equipment calibration and standardization, TNRCC-recommended analytical methods, preparation of quality control samples, and complete chains-of-custody.

State of New Mexico
ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT
Santa Fe, New Mexico 87505

New Mexico DRUG FREE It's a State of Mind!

January 10, 1995

CERTIFIED MAIL
RETURN RECEIPT NO. P-667-242-198

Mr. Neal D. Stidham
Shell Oil Company
Two Shell Plaza
P.O. Box 2099
Houston, Texas 77252-2099

RE: INVESTIGATIVE AND REMEDIAL ACTIONS
SHELL LEA PUMP STATION
LEA COUNTY, NEW MEXICO

Dear Mr. Stidham:

The New Mexico Oil Conservation Division (OCD) has completed a review of the following Shell Oil Company (SOC) documents which were received by the OCD on November 17, 1994:

a. November 14, 1994 "LEA STATION, LEA COUNTY, NEW MEXICO".

b. September 23, 1994 "REMEDIATION PLAN, LEA STATION, LEA COUNTY, NEW MEXICO CURA PROJECT NO. 15-93677.E3".

c. April 26, 1994 " WATER SAMPLING, LEA STATION, LEA COUNTY, NEW MEXICO, CURA PROJECT NO.15-9367700C.3".

d. March 2, 1994 "SITE CHARACTERIZATION AND FEASIBILITY TESTING, LEA STATION, LEA COUNTY, NEW MEXICO, CURA PROJECT NO. 15-93677.B3".

e. October 28, 1993 "PHASE III SUBSURFACE INVESTIGATION, LEA STATION, LEA COUNTY, NEW MEXICO, CURA PROJECT NO. 15-93677.3".

These documents contain the results of SOC's investigation of petroleum contaminated soils and ground water at the Lea Crude Pump Station. The documents also contain a proposal for remediation of contaminated ground water on the western side of the station.

The investigative actions taken to date appear satisfactory. The proposed work plan for remediation of contaminated ground water, as contained in the above referenced documents, is approved under conditions contained in the enclosed attachment.

VILLAGRA BUILDING - 408 Galisteo
Forestry and Resources Conservation Division
P.O. Box 1948 87504-1948
827-5830
Park and Recreation Division
P.O. Box 1147 87504-1147
827-7465

2040 South Pacheco
Office of the Secretary
827-5950
Administrative Services
827-5925
Energy Conservation & Management
827-5900
Mining and Minerals
827-5970
Oil Conservation
827-7131

Please be advised that OCD approval does not relieve SOC of liability should the remedial actions determine that contamination exists ~~which~~ is beyond the scope of the work plan or should the actions fail to adequately remediate contamination related to SOC's activities. In addition, OCD approval does not relieve SOC of responsibility for compliance with any other federal, state or local laws and/or regulations.

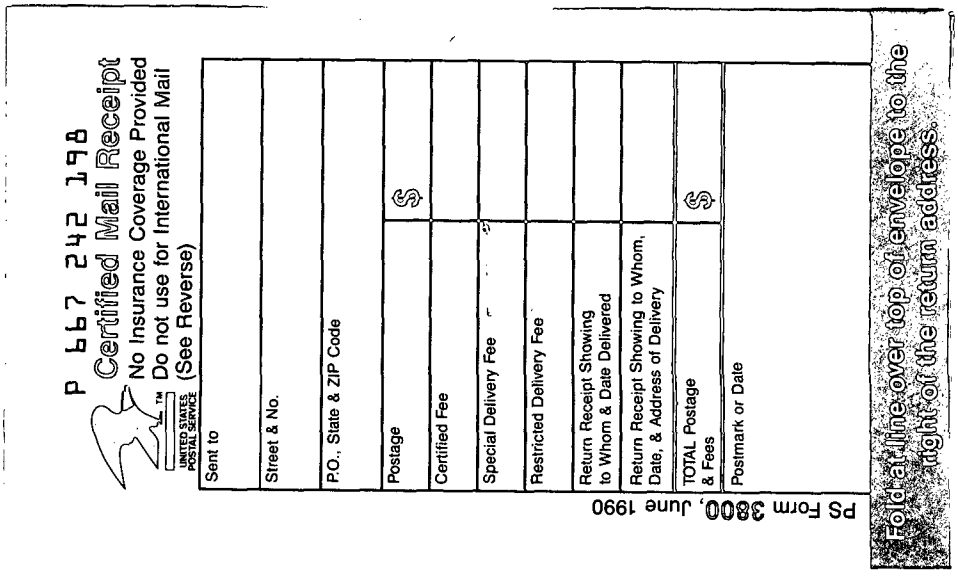
If you have any questions, please call me at (505) 827-7154.

Sincerely,

William C. Olson
Hydrogeologist
Environmental Bureau

Attachment

xc: Jerry Sexton, OCD Hobbs District Supervisor
Wayne Price, OCD Hobbs Office



January 10, 1995

APPROVAL CONDITIONS
GROUND WATER REMEDIAL ACTION PLAN
SHELL OIL COMPANY
LEA CRUDE PUMP STATION

1. Water Quality Monitoring

SOC will monitor the water quality in monitor wells MW-4, 5, 6, 7, 9 and 10 on a quarterly basis. The water from these wells will be sampled and analyzed for benzene, toluene, ethylbenzene, xylene (BTEX) and polynuclear aromatic hydrocarbons (PAH's) using EPA approved methods.

NOTE: The New Mexico Water Quality Control Commission (WQCC) regulations do not contain a ground water standard for total petroleum hydrocarbons (TPH). Therefore, the OCD does not require that SOC analyze ground water for TPH.

2. Quarterly Reports

Quarterly reports will be submitted to the OCD on April 1, July 1, October 1 and January 1 of each year. The first quarterly report submitted will include the exact locations and as built construction diagrams of the recovery wells. The quarterly reports will contain:

a. A summary of the laboratory analytic results of water quality sampling of monitor wells from the quarter. The data from each monitoring point will be presented in tabular form and will list past and present sampling results.

b. A product thickness map based on the thickness of free phase product on ground water in all monitor wells as measured during the quarter.

c. The total volume of product pumped from recovery wells and the volume pumped from each well during the quarter and to date.

d. A water table elevation map showing the quarterly elevation of the water table in all wells and the direction of the hydraulic gradient.

e. A description and status of the remedial activities and the results of any soil gas monitoring performed.

3. Notification

SOC will notify the OCD Santa Fe Office at least one week in advance of all scheduled activities such that the OCD has the opportunity to witness the events and/or split samples.

4. Submission Of Documents

All original documents will be submitted to the OCD Santa Fe Office with copies provided to the OCD Hobbs District Office.

Shell Oil Company

Two Shell Plaza
P. O. Box 2099
Houston, Texas 77252-2099

November 14, 1994

William Olson
State of New Mexico Oil Conservation Division
Environmental Bureau
2040 S. Pacheco St.
Santa Fe, New Mexico 87504

SUBJECT: LEA STATION, LEA COUNTY, NEW MEXICO

Dear Mr. Olson,

Enclosed are the following reports on Lea Station; "Phase III Subsurface Investigation", "Site Characterization and Feasibility Testing", "Remediation Plan", and "Groundwater Monitoring". The subsurface investigation was developed and completed to achieve the objectives as outlined in our letter of September 10, 1993. We believe this effort was successful in completing the contamination delineation. The active source, if any, of contamination was not identified by this study. If, in the future, we believe an active source exists, we will resume our investigation. The feasibility testing was designed to allow us to determine the hydrologic properties of the site as well as the potential for soil vapor extraction. The monitoring wells had little or no sustainable yields so "slug tests" were substituted for the pump tests. The SVE testing on MW-8 indicated that a vacuum assist will enhance the recovery of Phase Separated Hydrocarbon (PSH). Therefore the remediation plan includes a vapor extraction system in combination with two dedicated recovery wells with "product only" pumps. The groundwater monitoring report is a summary of the September 1994 sampling event.

Our priority is to remove the PSH before initiating groundwater or soils treatment. Should PSH recovery not diminish, we will resume our investigation for an active source. We are evaluating remediation options for the eastern side of the property and will probably be conducting feasibility tests early next year. In the interim we will continue our passive PSH recovery and groundwater monitoring.

I will keep you apprised of both our findings and our plans for Lea Station. If you have any questions, please do not hesitate to call me at 713-242-2961.

Sincerely,

Neal Stidham

Neal Stidham

CC: Paul Newman
EOTT Energy Corp.

CURA INC.
Environmental Consultants, Engineers & Scientists
2735 Villa Creek Drive • Building C • Suite 250 • Dallas, Texas 75234 • 214/620-7117 • FAX 620-8219

September 23, 1994

Mr. Neal D. Stidham
Shell Pipe Line Corporation
Room 1452, Two Shell Plaza
777 Walker Street
Houston, Texas 77002

RE: REMEDIATION PLAN

LEA STATION
LEA COUNTY, NEW MEXICO

CURA PROJECT NO. 15-93677.E3

Mr. Stidham:

CURA, Inc. (CURA) is pleased to present this work plan to prepare and implement a Remediation Plan (RP) for the crude oil impacted area at the above referenced facility. This proposal was prepared based on information obtained during previous site investigation activities performed by CURA and on subsequent discussions with Shell Pipe Line Corp. (SPLC).

BACKGROUND

Soil borings, monitor well installation operations, and soil vapor extraction testing at the subject facility during previous subsurface investigations have identified crude oil impact in both the unsaturated (vadose zone) and saturated zone. The impact includes adsorbed hydrocarbons in the unsaturated soils above the water table, phase-separated hydrocarbons (PSH) consisting of free-floating crude oil, and dissolved hydrocarbon constituents in the groundwater. SPLC has requested CURA develop a plan to recover the PSH only using a pumping system enhanced by a soil vapor extraction (SVE) system to help recover product and then to subsequently implement the plan with an operational system.

CURA has designed the following system for the primary purpose of providing an efficient and cost-effective system to recover PSH and aid in preventing additional expansion of the

dissolved hydrocarbon plume. Remedial system design includes the flexibility to add other equipment in the future, if needed.

This proposal outlines CURA's scope of services, the proposed project approach, the project schedule and compensation for preparing and implementing the plan for the above referenced facility.

SCOPE OF SERVICES

CURA's Remediation Plan (RP) will consist of a soil vapor extraction (SVE) and product-only pumping system near MW-8 in the northwestern corner of the site. Upon review and approval by SPLC and the New Mexico Oil Conservation Division (NMOCD) as an acceptable remediation method, implementation of the RP and subsequent monitoring will be performed. The RP will include the following:

- Installation of two 6-inch PSH recovery/air extraction wells (RW-1, and RW-2)
- Installation of one 4-inch monitoring well for further hydrocarbon plume delineation
- Regulatory notification for air emissions
- Installation of two PSH only pump/air extraction units (one unit each in RW-1 and RW-2)
- Installation of catalytic oxidizer (optional)
- Final installation of system
- Performance monitoring
- Operation and maintenance activities
- Reporting

APPROACH

CURA's approach to this project, the RP, is based on efforts to recover PSH enhanced by vacuum from the hydrocarbon impacted soils and groundwater utilizing product-only pumps to recover crude oil. Soil vapor extraction (SVE) will be utilized to assist recovery of crude oil from the vadose zone by disrupting soil capillary forces and soil pore volume equilibrium conditions. Two recovery wells (RW-1 and RW-2) will be installed near MW-8 to provide recovery points for use in remediating the hydrocarbon impacted area in the northwestern

corner of the site. The proposed system of product-only pump/air extraction will allow feasible remedial efforts in the form of maximum PSH recovery. In addition, the air movement through impacted soils will aid in the recovery of PSH through vaporization.

Phase I - Regulatory Notification/Bid Services

Remediation activities must be reviewed and approved by the NMOCD prior to initiating remedial activities. The product (crude oil) will be pumped from the remediation system to the sump unit located in that area.

Based on the results of the Phase I evaluation, CURA will submit a Notice of Intent to the New Mexico Department of Environmental Quality (NMDEQ) for estimated emissions from the system. CURA intends for the system to operate below NMDEQ allowable emission standards and thereby not require an air permit for the system.

CURA will finalize system components, equipment specifications, and bid services for subsurface and drilling activities. Equipment will be ordered pending final approval of the Notice of Intent (expected 30 day review period).

The system is expected to consist of the following primary components.

- Two recovery wells
- Two PSH only recovery pumps including controllers
- One 250-gallon hydrocarbon recovery tank
- Sensor cable, conduits, and flowmeter
- Telemonitoring system
- One blower (SVE) with motor starter
- Associated piping (underground) to connect components
- Valves and gauges to monitor blower, and individual wells within each system
- Moisture/particulate filters for each blower
- Control panel
- Equipment skid (portable)
- Building to house control panels and monitoring system

Phase II - Recovery Wells Installation/System Installation

Two PSH recovery/air extraction (recovery) wells will be constructed on-site near existing monitor well MW-8 (Figure 1). The additional recovery wells will be constructed of 6-inch PVC to a total depth of 50 feet and contain a screened interval between 5 feet to 45 feet. A 5 foot sump will be located at the bottom of each well. This well configuration will contain sufficient aquifer penetration thickness to create a sufficient unsaturated screen interval for efficient vapor extraction to enhance product recovery in the wells.

The contractor will start trenching operations once the recovery wells installation has been completed. The contractor will install two 4-inch PVC conduits (one used for SVE and one used for electrical lines, sensor cables, and product line) in the subsurface trench. The trench will be backfilled (pea gravel) and surface grade will be returned to original conditions. The contractor will also install well vaults at each recovery well.

Once subsurface construction is completed, the contractor will install the system components.

Phase III - Performance Monitoring/Operations and Maintenance

CURA will have the primary responsibility for operation and maintenance of the system and will also complete scheduled performance monitoring. These will include system maintenance, emissions monitoring, and measurement of vacuum pressures to operate the system at optimum conditions and monitor progress. This proposal covers these activities for the remainder of 1994.

During the first month of operation weekly visits (4) will be conducted to monitor the system. Two bi-weekly visits will be conducted in the second month, with monthly visits from the remainder of 1994 (one visit). The following will be conducted:

- Obtain air sample for BTEX, TPH, and CO2 analysis*
- Obtain flow rate and pressure readings from system.
- Use OVA to screen individual well emissions.
- Check system components with routine maintenance as necessary or scheduled.

* During the first six visits, only four air samples will be obtained.

At the end of the calendar year, CURA will prepare a Performance Status Report for system operations in 1994.

SCHEDULE

The following information outlines the anticipated schedule for the project in 1994.

Activity	Weeks Following Notice to Proceed
Phase I	
Prepare and file Notice of Intent	3
State review period	
Order system components	
Plans/spec/bid services	
Phase II	
Recovery wells installation	8
System installation	
System start-up	
Phase III	
Complete report on system construction	12
Weekly visits	
Bi-weekly visits	
Performance report for 1994	

COMPENSATION

CURA will proceed with the RP using a time and materials contract. Based upon the scope of work outlined, a budget of is expected for the three-phase project. (See Appendix B for a detailed cost breakdown).

The cost estimate includes the following assumptions/exceptions:

- Laboratory analyses will be provided and billed direct to SPLC by the contract laboratory, SPL Houston for approximately 10 air samples [BTEX, TPH, CO_2], 3 water samples and 6 soil samples [BTEX and TPH]).

- Costs for system components sized are estimated. If evaluation indicates groundwater to be pumped and treated, costs will be estimated at that time for upgrade to the remediation system.

- Air emissions will not be treated.

- No air permit will be obtained; a Notice of Intent will be submitted to the NMDEQ.

CURA appreciates the opportunity to present this change order and will began work upon receipt of a blanket order release number. If you have any questions please contact Wes Root at (915) 570-8408 or Charles Harlan at (800) 486-7117.

Respectfully,
CURA, Inc.

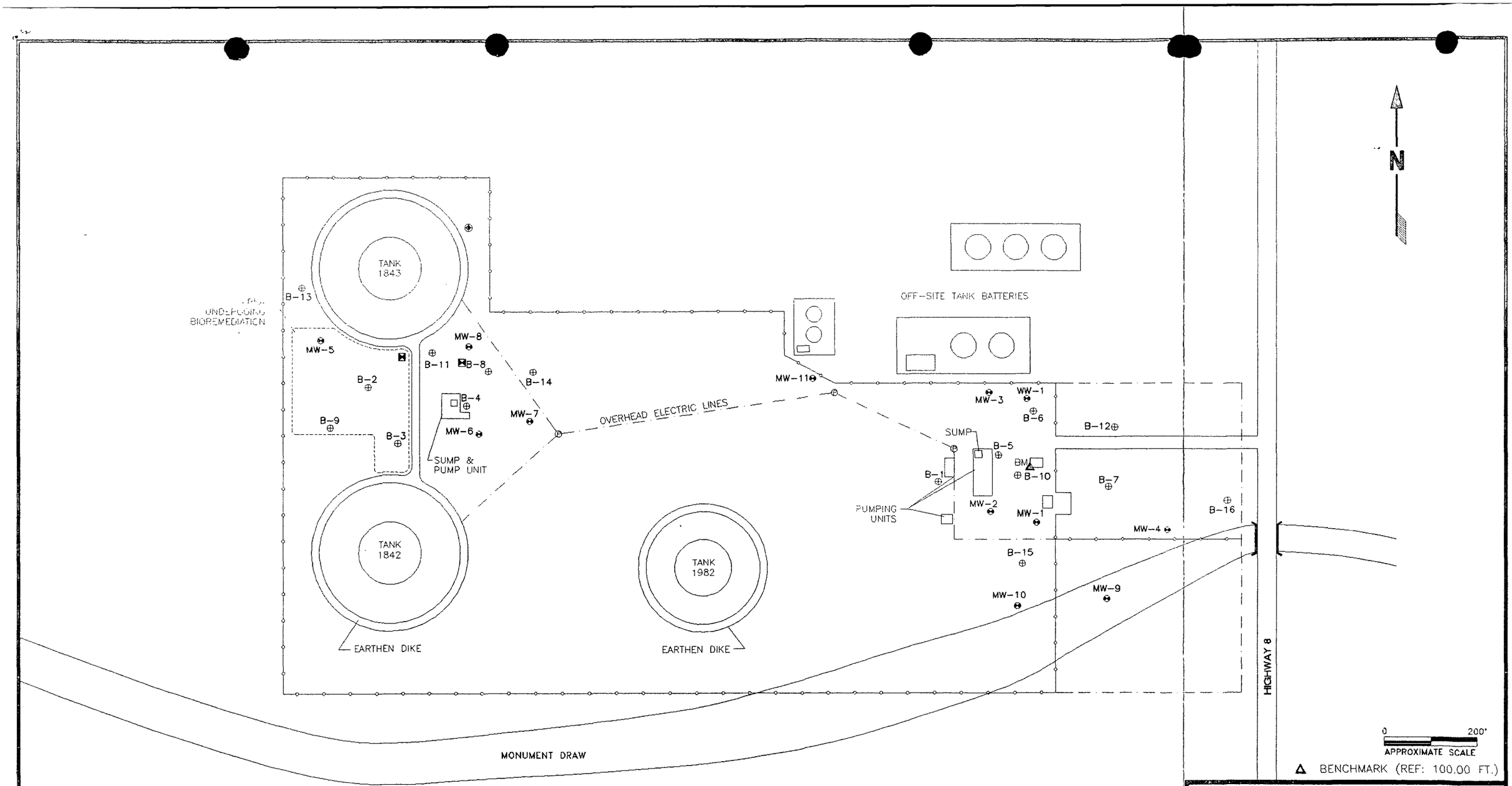
Charles D. Harlan
Project Manager

Michael A. Clark, P.E.
Vice President

Richard G. Burbidge, Ph.D.
Vice President/Technical Director

DRK/rkc

Enclosures



PROPOSED WELL LOCATION MAP

⊕ PROPOSED MONITORING WELL LOCATION
⊠ PROPOSED RECOVERY WELL LOCATION

LEA STATION
SHELL PIPELINE CORP.
LEA COUNTY, NEW MEXICO

DATE:	SCALE:
OCT 1993	SEE ABOVE
PROJECT NUMBER: 15-93677	FIGURE NUMBER: 1

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

CURA INC.
Environmental Consultants, Engineers & Scientists
3001 North Big Spring, Suite 101 • Midland, Texas 79705 • 915/570-8408 • FAX 570-840

April 26, 1994

Mr. Neal D. Stidham
Environmental & Technical
Shell Pipe Line Corporation
Room 1452, Two Shell Plaza
777 Walker Street
Houston, Texas 77002

RE: WATER SAMPLING
LEA STATION
LEA COUNTY, NEW MEXICO

CURA PROJECT NO. 15-9367700C.3

Mr. Stidham:

On March 22, 1994, CURA, Inc. was on site to gauge, develop, and collect groundwater samples from monitoring well MW-2 at Lea Station as requested by Shell Pipe Line Corporation (SPLC). The water sample was collected to verify benzene concentration levels. In addition, monitoring wells MW-1 through MW-11 were gauged and phase-separated hydrocarbons (PSH) were recovered from monitoring well MW-8. The operations were performed as discussed with you on March 21, 1994.

GROUNDWATER SAMPLING

Monitoring well MW-2 was gauged, developed, and sampled by CURA on March 22, 1994. The monitoring well was developed by removing approximately 15 gallons (bailing dry) of water. The purged groundwater was placed on site in a labelled steel 55-gallon drum until authorization for proper disposal is obtained.

After development, groundwater samples were collected from monitoring well MW-2 using a dedicated disposable bailer. The groundwater samples to be analyzed for BTEX (benzene, toluene, ethylbenzene, and xylenes) were placed into 40 ml airtight septum-sealed glass VOA vials and shipped to SPL in Houston for analysis using EPA Method 8020 and

EPA Method 8240. A summary of the analytical results is presented in Table 1. Laboratory reports and the chain-of-custody are included in Attachment A.

TABLE 1
GROUNDWATER ANALYTICAL RESULTS

Sample ID	Date	Benzene	Toluene	Ethyl-benzene	Xylenes	Total BTEX	TPH
MW-2	02/16/93	0.370	0.040	0.210	0.510	1.130	1
	03/22/94	0.410	0.012	0.230	0.450	1.102	--
	03/22/94*	0.450	--	--	--	--	--

-- Sample not analyzed for this constituent.
BTEX and TPH concentrations listed in mg/l (parts per million; ppm) with practical quantitation limits listed in Appendix B.
Analyses conducted at SPL-Houston Laboratories using EPA Method 8020 (BTEX) and EPA Method 418.1 (TPH) unless noted otherwise.
* Confirmatory analysis conducted using EPA Method 8240.

The results from the March 22, 1994 sampling event indicated benzene concentrations of 0.410 mg/l (EPA Method 8020) and 0.450 mg/l (EPA Method 8240) in monitoring well MW-2 which is consistent with the previous sampling event conducted on February 16, 1993.

The gauging data obtained on March 22, 1994, indicates that the apparent direction of groundwater flow is to the southeast which is consistent with previous measurements. Approximately 0.12 feet, 3.22 feet, and 0.18 feet of PSH was observed in monitoring wells MW-1, MW-8, and MW-11, respectively, indicating an increase in PSH thickness in MW-8 and first time occurrence in MW-1 and MW-11 since previous gauging events.

CONCLUSIONS

Based on the presence of PSH on site, CURA will initiate the PSH recovery operations as identified in CURA change order number 15039483 which directs bi-weekly site visits for PSH recovery and monitoring.

CURA appreciates the opportunity to provide you with our professional consulting services. If you have any questions or concerns, please do not hesitate to contact us at (915) 570-8408.

Respectfully,
CURA, Inc.

Gilbert J. Van Deventer, R.E.M.
Hydrogeologist

For Herbert E. Fry, C.P.G.
Project Manager

GJV/chs

Attachments

ATTACHMENT A

ANALYTICAL RESULTS

AND

CHAIN-OF-CUSTODY

SPL, INC.

REPORT APPROVAL SHEET

WORK ORDER NUMBER: 94-03-848

Approved for release by:

S. Sample, Laboratory Director Date: 4/11/94

Barbara Martinez, Client Services Representative Date: 4/7/94

Certificate of Analysis No. 9403848-01

Shell Pipe Line Corporation
P.O. Box 2648
Houston, TX 77252
ATTN: Neil Stidham

P.O.# NSX3-94
DATE: 04/04/94

PROJECT: Lea Station
SITE: Lea County, New Mexico
SAMPLED BY: CURA, Inc.
SAMPLE ID: MW-2

PROJECT NO: 15-93677
MATRIX: WATER
DATE SAMPLED: 03/22/94 12:00:00
DATE RECEIVED: 03/24/94

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	450	50 P	µg/L
Surrogate	**% Recovery**		
TOLUENE-D8	103		
4-BROMOFLUOROBENZENE	101		
1,2-DICHLOROETHANE-D4	103		
VOLATILE ORGANICS - METHOD 8240 ***			
Analyzed by: LAN			
Date: 03/26/94			
BENZENE	410	1 P	µg/L
TOLUENE	12	1 P	µg/L
ETHYLBENZENE	230	1 P	µg/L
TOTAL XYLENE	450	1 P	µg/L
TOTAL VOLATILE AROMATIC HYDROCARBONS	1102		µg/L
Surrogate	**% Recovery**		
1,4-Difluorobenzene	88		
4-Bromofluorobenzene	88		
Benzene	410	1	µg/L
METHOD 8020***			
Analyzed by: KA			
Date: 03/25/94 07:12:20			

(P) - Practical Quantitation Limit

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
**Ref: Standard Methods for Examination of Water & Wastewater, 17th ed.
***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

Shari L. Grice

SPL, Inc., - Shari L. Grice

Matrix:	Aqueous	**Reported on:**	04/04/94 14:42:47
Sample ID:	9403702-01A	**Analyzed on:**	03/25/94 07:12:00
Batch ID:	HP_N940325071200	**Analyst:**	KA

This sample was randomly selected for use in the SPL quality control program. Samples chosen are fortified with a known concentration in duplicate. The results are as follows:

BTEX-Water
METHOD 8020***

COMPOUND	Sample Value µg/L	Spike Added µg/L	MS % Recovery #	MSD % Recovery #	Relative % Difference #
BENZENE	3.6	20	97	84	15
TOLUENE	ND	20	110	90	20
ETHYLBENZENE	ND	20	98	81	18
O XYLENE	ND	20	95	80	18
M & P XYLENE	ND	40	100	83	18

NOTES

column to be used to flag recovery and RPD values with an asterisk
* values outside of QC Limits.

Idelis Williams, QC Officer

Matrix:	Aqueous	**Reported on:**	04/04/94 14:42:51
Sample ID:	9403702-01A	**Analyzed on:**	03/25/94 07:12:20
Batch ID:	HP_N940325071220	**Analyst:**	KA

This sample was randomly selected for use in the SPL quality control program. Samples chosen are fortified with a known concentration in duplicate. The results are as follows:

Benzene
Method 8020

C O M P O U N D	Sample Value µg/L	Spike Added µg/L	MS % Recovery #	MSD % Recovery #	Relative % Difference #
BENZENE	4.0	20	95	80	17

NOTES

column to be used to flag recovery and RPD values with an asterisk
* values outside of QC Limits.

Idelis Williams, QC Officer

2A

WATER VOLATILE SYSTEM MONITORING COMPOUND RECOVERY

Lab Name: SPLHOUSTON Contract: _____

Lab Code: SPL Case No.: 403848 SAS No.: _____ SDG No.: 403848

	EPA SAMPLE NO.	SMC1 (TOL)#	SMC2 (BFB)#	SMC3 (DCE)#	OTHER	TOT OUT
01	MW-2	103	101	103	0	0
02	VLBLK01	100	97	95	0	0

		QC LIMITS
SMC1 (TOL)	= Toluene-d8	(88-110)
SMC2 (BFB)	= Bromofluorobenzene	(86-115)
SMC3 (DCE)	= 1,2-Dichloroethane-d4	(76-114)

Column to be used to flag recovery values

* Values outside of contract required QC limits

D System Monitoring Compound diluted out

3A

WATER VOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: SPLHOUSTON Contract: _____

Lab Code: SPL Case No.: 403620 SAS No.: _____ SDG No.: 403848

Matrix Spike - EPA Sample No.: BB-1_A_B_C

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC #	QC LIMITS REC.
1,1-Dichloroethene	50.00	0	45.40	91	61-145
Trichloroethene	50.00	0	46.40	93	71-120
Benzene	50.00	0	45.40	91	76-127
Toluene	50.00	0	46.60	93	76-125
Chlorobenzene	50.00	0	47.10	94	75-130

COMPOUND	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
1,1-Dichloroethene	50.00	43.00	86	6	14	61-145
Trichloroethene	50.00	49.20	98	5	14	71-120
Benzene	50.00	44.20	88	3	11	76-127
Toluene	50.00	48.20	96	3	13	76-125
Chlorobenzene	50.00	48.20	96	2	13	75-130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 5 outside limits
Spike Recovery: 0 out of 10 outside limits

COMMENTS: ,403620,,BB-1 A B C,L,W,9403620-01A,V,E,C,G,X
C,G9893,G9891,G9895,,,,,G

4A
VOLATILE METHOD BLANK SUMMARY

EPA SAMPLE NO.

VLBLK01

Lab Name: SPLHOUSTON Contract: _____

Lab Code: SPL Case No.: 403848 SAS No.: _____ SDG No.: 403848

Lab File ID: G9961 Lab Sample ID: 940325VLBLK

Date Analyzed: 03/25/94 Time Analyzed: 2300

GC Column: CAP ID: _____(mm) Heated Purge: (Y/N) N

Instrument ID: G

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	MW-2	9403848-01B	G9965	0054

COMMENTS: ,BLANK.,VLBLK02,L,W,VLBLK02,V,B,C,G,X1
G,G9952,G9947,G9961,,,,,

Matrix: Aqueous
Sample ID: 940325VLBLK
Batch: VOG940325162500

Reported on: 03/30/94 09:03
Analyzed on: 03/25/94 23:00
Analyst: LAN

Compound	Result	Detection Limit	Units
Benzene	ND	5	µg/L

Surrogate	Result	QC Criteria	Units
Toluene-d8	100	88-110	% Recovery
4-Bromofluorobenzene	97	86-115	% Recovery
1,2-Dichloroethane-d4	95	76-114	% Recovery

Samples in Batch 9403848-01

Notes

ND - Not detected.

Idelis Williams, QC Officer

9403848

SHELL OIL COMPANY
RETAIL ENVIRONMENTAL ENGINEERING

CHAIN OF CUSTODY RECORD NO. H 10219

Date: 3-22-94
Page 1 of 1

SITE ADDRESS: Lea Station
Lea County, NM
~~WIC #~~: Proj. #15-93677
CONSULTANT NAME & ADDRESS: CURA, Inc.
731 W. Wadley, Ste. L-200 Midland, Tx 79705
CONSULTANT CONTACT: Wes Root
PHONE: 915-570-8408 FAX: 915-570-8409
SAMPLED BY: Gil Van Deventer

CHECK ONE BOX ONLY CT/DT

- QUARTERLY MONITORING ☐ 5461
- SITE INVESTIGATION ☒ 5441
- SOIL FOR DISPOSAL ☐ 5442
- WATER FOR DISPOSAL ☐ 5443
- AIR SAMPLER - SYS O+M ☐ 5452
- WATER SAMPLE - SYS O+M ☐ 5453
- OTHER _____ ☐

SAMPLE I.D.	DATE	TIME	COMP.	GRAB	MATRIX: H2O	SOIL	AIR	SLUDGE	OTHER	METHOD PRESERVED: HCl	HNO3	H2SO4	NONE	OTHER	NO. OF CONTAINERS	CONTAINER SIZE (4 L.)	BTEX 602 ☐ 8020 ☒ WITH MTBE ☐	BTEX/GAS HYDROCARBONS PID/FID ☐ WITH MTBE ☐	VOL 624/PPL ☐ 8240/TAL ☒ NBS (+15) ☐ X218	PNA/PAH 8310 ☐ 8100 ☐ 610 ☐	SEMI-VOL 625/PPL ☐ 8270/TAL ☐ NBS (+25) ☐	TPH/IR 418.1 ☐ SM503 ____ ☐ ____ ☐	TPH/GC 8015 Mod. GAS ☐ 8015 Mod DIESEL ☐	TCLP METALS ☐ VOL ☐ SEMI-VOL ☐ PEST ☐ HERB ☐	EP TOX METALS ☐ PESTICIDES ☐ HERBICIDES ☐	REACTIVITY ☐ CORROSIVITY ☐ IGNITABILITY ☐	OTHER	REMARKS
MW-2	3/22/94	1200		✓	✓				ice	✓					6	40	✓		✓									BTEX

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME
G Van Deventer	3/23/94	1100			
RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME
			intact 3°C		
RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME
			A Turrell	3/24/94	1400

BILL NO.: _____
LABORATORY: SPL - Houston
SHELL CONTACT: Neal Stidham PHONE: 713-241-2961 FAX: 713-241-1124

TURN AROUND TIME (CHECK ONE)
7 DAYS ☐ (NORMAL) 14 DAYS ☐
48 HOURS ☐ OTHER ☒ per SPLC contract

FEDEX: 059787745 3

THE LABORATORY MUST PROVIDE A COPY OF THIS CHAIN OF CUSTODY WITH INVOICE AND RESULTS

DISTRIBUTION: PINK Sampling Coordinator - WHITE & YELLOW Accompanies Shipment - WHITE Returned with Report

SPL HOUSTON ENVIRONMENTAL LABORATORY

SAMPLE LOGIN CHECKLIST

DATE: 3/24 TIME: 14:00 CLIENT NO. _____
LOT NO. _____ CONTRACT NO. _____

CLIENT SAMPLE NOS. _____

SPL SAMPLE NOS.: 9403848

		YES	NO
1.	Is a Chain-of-Custody form present?	✓	
2.	Is the COC properly completed?	✓	
	If no, describe what is incomplete:		
	If no, has the client been contacted about it? (Attach subsequent documentation from client about the situation)		
3.	Is airbill/packing list/bill of lading with shipment? If yes, ID#: By Fed Express		✓
4.	Is a USEPA Traffic Report present?		✓
5.	Is a USEPA SAS Packing List present?		✓
6.	Are custody seals present on the package?	✓	
	If yes, were they intact upon receipt?	✓	
7.	Are all samples tagged or labeled?	✓	
	Do the sample tags/labels match the COC?	✓	
	If no, has the client been contacted about it? (Attach subsequent documentation from client about the situation)		
8.	Do all shipping documents agree?	✓	
	If no, describe what is in nonconformity:		

9. Condition/temperature of shipping container: INTACT, 3°C
10. Condition/temperature of sample bottles: GOOD 3°C
11. Sample Disposal?: SPL disposal ✓ Return to client ____

NOTES (reference item number if applicable): _____

ATTEST: _____ DATE: 3/24/94
DELIVERED FOR RESOLUTION: REC'D _____ DATE: _____
RESOLVED: _____ DATE: _____

State of New Mexico
ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT
Santa Fe, New Mexico 87505

STATE OF NEW MEXICO
OIL CONSERVATION DIVISION

MEMORANDUM OF MEETING OR CONVERSATION

☑ Telephone ☐ Personal | Time 1515 | Date 3/16/94

Originating Party	Other Parties
Wes Root - CURA (915) 570-8408	Bill Olson - Envir. Bureau

Subject

Shell Crude Stations

Discussion

Will be taking water samples tommorow at - Denton Station
- Anderson Ranch

and Friday at - Lea Station

also taking soil samples Friday at - Delaware Station
Dublin Station

Conclusions or Agreements

I cannot attend but will inform Wayne Price at OCD Hobbs office

Distribution
Denton, Anderson Ranch, Lea, Delaware, Dublin files
Wayne Price OCD Hobbs (verbally not. Fri., 3/16)

Signed Bill Olson

STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION DIVISION

BRUCE KING
GOVERNOR

ANITA LOCKWOOD
CABINET SECRETARY

POST OFFICE BOX 2088
STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO 87504
(505) 827-5800

January 21, 1994

CERTIFIED MAIL
RETURN RECEIPT NO. P-667-241-896

Mr. Neal D. Stidham
Shell Pipeline Corporation
Two Shell Plaza
P.O. Box 2648
Houston, Texas 77252-2648

RE: DISPOSAL OF PUMP TEST WATER
SHELL LEA PUMP STATION
LEA COUNTY, NEW MEXICO

Dear Mr. Hite:

The New Mexico Oil Conservation Division (OCD) is in the process of reviewing Shell's January 10, 1994 correspondence requesting authorization to discharge 5,000 gallons of treated ground water generated during an aquifer pump test of monitor wells at the Lea Pump Station.

The OCD has the following comments, questions and requests for information regarding the above referenced document:

1. The document does not identify where the treated water is proposed to be discharged. Please provide a map showing the proposed discharge area.

2. Please provide the expected discharge quality of the treated water.

3. The document does not identify which monitor wells will be used for the pump test. Please supply this information.

4. For your information, the state of New Mexico has no ground water standard for total petroleum hydrocarbons (TPH). Therefore, the OCD does not require that Shell analyze the treated ground water for TPH.

Submission of the above information will allow the OCD to complete a review of your discharge request.

If you have any questions, please contact me at (505) 827-5885.

Sincerely,

William C. Olson
Hydrogeologist
Environmental Bureau

xc: Wayne Price, OCD Hobbs District Office

Shell Pipe Line Corporation

Two Shell Plaza
P. O. Box 2648
Houston, Texas 77252-2648

January 10, 1994

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

Gentlemen:

SUBJECT: LEA PUMP STATION - HOBBS NEW MEXICO SITE ASSESSMENT

Gentlemen:

Shell Pipe Line Corporation is requesting approval to discharge to the ground surface approximately 5,000 gallons of water to be generated during upcoming aquifer test operations. The produced water will be treated through a carbon drum system prior to discharge. A water sample obtained from the effluent stream will be analyzed for total BTEX and TPH and a copy of the laboratory analytical report submitted to your office.

Aquifer test operations will be performed using existing monitor wells on site. BTEX and TPH levels in the produced water are expected to be similar to previously measured concentrations. A table listing analytical results of groundwater samples obtained from these wells is attached for your review.

Shell appreciates your assistance with their project.

If you have any questions, please contact me at (713) 241-2961.

Sincerely,

Neal D. Stidham
Staff Engineer

Attachment

cc: F. Wesley Root
CURA, Inc.
731 W. Wadley, L-200
Midland, TX 79705

93363.01

TABLE 1
WATER SAMPLE ANALYTICAL RESULTS

Monitor Well	Date	Benzene	Toluene	Ethyl-benzene	Xylenes	Total BTEX	TPH	TDS
WW-1	12-08-92	<0.001	<0.001	<0.001	<0.001	<0.001	5	1,800
MW-1	12-21-92	0.440	0.005	0.120	0.063	0.628	3	2,380
	02-16-93	0.350	0.010	0.095	0.070	0.525	5	
MW-2	02-16-93	0.370	0.040	0.210	0.510	1.130	1	
MW-3	02-16-93	2.500	0.010	0.370	0.640	3.520	2	
MW-4	02-16-93	<0.001	<0.001	<0.001	<0.001	<0.001	<1	
MW-5	02-16-93	<0.001	<0.001	0.002	0.004	0.006	<1	
MW-6	02-16-93	0.002	0.001	<0.001	0.091	0.094	<1	2,500
MW-7	02-16-93	<0.001	<0.001	<0.001	<0.001	<0.001	<1	
MW-8	09-30-93	PSH						
MW-9	09-30-93	<0.001	<0.001	<0.001	<0.001	<0.001	<1	2,130
MW-10	09-30-93	<0.001	<0.001	<0.009	0.001	0.01	7	
MW-11	09-30-93	0.24	0.14	0.11	0.14	0.63	3	

BTEX results in m/l (parts per million; ppm) with a method detection limit of 0.001 ppm.
TPH and TDS results in mg/l (parts per million; ppm) with a method detection limit of 1 ppm.
Analyses were conducted using EPA Method 8020 (BTEX), EPA Method 418.1 (TPH), and EPA Method 160.1 (TDS) by SPL Environmental Laboratories.
PSH - Phase Separated Hydrocarbon

Shell Oil Company

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

January 5, 1994

State of New Mexico
Oil Conservation Division
ATTN Mr. Roger C. Anderson
P. O. Box 2088
Land Office Building
Santa Fe, NM 87504-2088

Gentlemen:

SUBJECT: SITE ASSESSMENTS AND ACTION PLANS
LEA COUNTY, NEW MEXICO

Thank you for meeting with us on December 15, 1993. The meeting was informative and will help us in our remediation activities.

I have been assigned to another department and Mr. Neal Stidham will be handling the environmental matters for the New Mexico locations. His telephone number is (713) 241-2961.

It has been my pleasure to work with you and Mr. Olson to develop action plans on these locations. I appreciate the help and guidance you both have provided.

Please thank Mr. Olson for me.

Again, thank you for your help and I hope both of you have a great 1994.

I enjoyed my trip to Santa Fe. It was all you said it would be.

Sincerely,

John B. Hite

cc: SHELL PIPE LINE CORPORATION
G. H. Sherwin, Manager Environmental & Technical
N. D. Stidham, Staff Engineer

DG400503.JBH

Shell Oil Company

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

November 11, 1993

State of New Mexico
Energy, Minerals and Natural Resource Dept.
Oil Conservation Division
ATTN Mr. William C. Olson
Hydrogeologist - Environmental Bureau
P. O. Box 2088
Santa Fe, NM 87504

Gentlemen:

SUBJECT: GENERAL LAND FARMING PROCEDURES FOR LOCATIONS REQUIRING ACTION

The site assessments and proposed action plans have been sent to you on the following locations:

Denton
Eunice
Dublin
Hugh
Anderson Ranch
Delaware

Land farming was a part of each of these locations remedial action plans. The areas to be land farmed are relatively small and all are inside the fenced station locations. We propose to till and/or disk the soil to 12 inches to 18 inches deep and add a high nitrogen content fertilizer at a rate of 200 to 250 pounds per acre and retill or disk the fertilizer into the soil. There are several areas that may require some spot excavation (primarily around the sumps). The excavated soils will be placed with the soils in the land farm areas. All of the sites will be land farmed in place. At the Delaware location, we propose to place some of the impacted soils on the tank dikes.

The soils in all cases are unsaturated contaminated soils. Our primary concern is with TPH levels. We will remediate until the soil TPH values are below 5000 ppm. At each of the facilities listed, the areas to be land farmed are located in places where any rainfall runoff will not be a concern.

DG331503.JBH

Attached is a paper (No. WRC-49-89 Land Farming) that was prepared by Shell and we will use it as a guide.

Please advise if these procedures will be acceptable to the Oil Conservation Division (OCD) for Shell to use on the subject locations.

The Denton Station will require a system to remove the crude oil found on an abandoned water well. The site assessment and proposed action plan sent to the OCD address it.

The Dublin Station has a hot spot that goes down to the groundwater at 103 feet. The groundwater was not impacted above your regulatory limit and our proposed plan sent to the OCD addresses it.

At the Lea Station, we are in the process of doing additional feasibility testing and you will receive a proposed action plan on it in the near future.

Shell would like to schedule a meeting with you after you have had a chance to review our proposed action plans. I will call you and see when it would be convenient for you to meet with us.

If you have any questions, please call me at (713) 241-1001. We look forward to working with the OCD to remediate the sites.

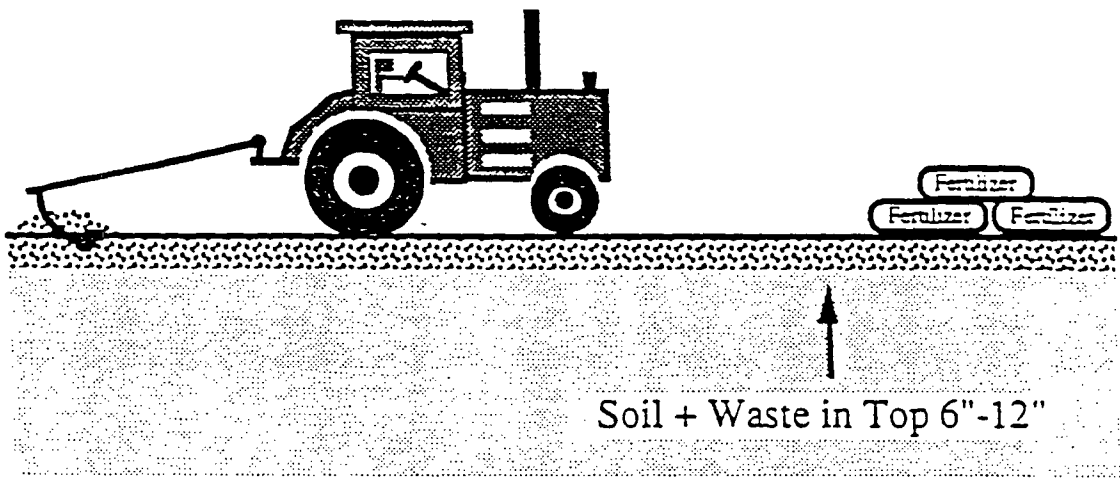
Sincerely,

John B. Hite
Engineering Advisor
General Engineering

Attachment

DG331503.JBH

Landfarming



Process Description

"Landfarming" refers to the practice of spreading organic wastes over an area of land, then relying on natural microbial action to degrade the waste. It is a widely accepted and cost-effective practice for the treatment of petroleum hydrocarbons, chlorinated compounds, and pesticides. In this process soil-associated microorganisms (bacteria and fungi) degrade the organic compounds to CO_2, water, and biomass.

An efficient and effective land treatment process involves optimizing the bacterial degradative activity by controlling soil aeration (discing, rotatilling), nutrient addition (NH_4^+ or NO_3^- - nitrogen, PO_4^{3-} - phosphorous, Fe - iron, fertilizer), and pH and moisture control.

A petroleum industry review on the treatment of waste oily sludges at refineries indicated that substantial hydrocarbon removal efficiencies of 70% - 90% can be achieved at loading rates of 1% - 5% (w/v) in surface soils.

Applications

Types of petroleum industry wastes that can be treated include refinery oily sludges, tank bottoms, crude oil, and gasoline. Landfarming has also been used to treat drilling mud pit sludges, and accidental releases of crude oil from pipelines.

Limitations

Landfarming is generally limited to wastes containing smaller hydrocarbon molecules. Medium chain length alkanes and aromatic fractions are degraded nearly completely, while polynuclear aromatic hydrocarbons (PAH's) are degraded very slowly in soil (0-10% total). Examples of PAH's include: chrysene, pyrene, fluoranthene, benzo (a) anthracene, and perylene. The presence of salts and/or metals may inhibit microbial activity.

Typical Operating Conditions

During landfarming, soil aeration (discing, rotatilling), nutrient addition (NH_4^+ or NO_3^- - nitrogen, PO_4^{3-} - phosphorous, Fe - iron, fertilizer), and pH and moisture are controlled to maximize the rate of biodegradation.

Soil pH:	6 to 8. If soil is too acidic (<pH 6), it can be treated with lime.
Waste Level:	0.5% - 5% by weight as oil and grease (O&G), incorporated into top six inches of soil.
Fertilizer Addition:	Approximately 50 - 500 lbs Nitrogen (as NH_4^+ or NO_3^- per acre, and 5 - 50 lbs Phosphorous (as PO_4^{3-}) per acre.
Other Amendments:	a) Mulch (bark, wood chips, straw, etc.) to facilitate mixing and soil aeration. b) Microbes and organic nutrients (i.e. animal manure) to enhance degradation.
Tilling Frequency:	For aeration, once every two to four weeks during growing season.
Water Application:	Soil should be maintained in a moist state, but not flooded. Spray irrigation may be required in dry climates.
Revegetation:	Plant regrowth (seeding) can occur after 0.5 to 3 years. Weeds or local crops can be used.
Sampling:	Composite samples from several representative plot areas. For example, soil might be analyzed for oil and grease if petroleum hydrocarbons are being treated.
Performance Evaluation:	Waste degradation occurs more rapidly when soil temperatures are ≥ 50°F. Decreases in the oil and grease content should decrease with a half-life ($t_{1/2}$) of 50 - 60%/month during the growing season, and $t_{1/2}$=0 - 20%/month during winter months.

Process Economics

Depending upon the extent of contamination, waste type, and biodegradation rates, costs are $5 - $50 per yd^3.

Waste Streams

Wastes streams are not usually generated, and often the hydrocarbons do not migrate beyond the root zone (6 - 12 inches below surface) before they are degraded. If the waste contains highly volatile or soluble compounds, the possibility of vapor emissions or migration to groundwater must be considered.

Permitting

Permits are not usually required for a one-time treatment, unless controlled substances are present in air emissions.

As with all ex-situ treatment processes, there will be permitting requirements for the vapors, odors, and dust associated with digging, storing, and feeding the soils.

Associated Factors

Depending on the location, surface water run-on/run-off controls may be required. While landfarming is an attractive remediation technology because it does not require sophisticated machinery, and the operating costs are low, the costs associated with permitting may increase the total treatment cost significantly. Large areas must also be dedicated for landfarming.

Contacts Within Shell

Joe P. Salanitro	- Westhollow Research Center (Room EC-661) - SSN-433-7552
Curtis C. Stanley	- Shell Oil Co. Head Office (Room TSP 2236) - SSN-241-6094

Shell Applications

Crude Oil Spill Release (Pipeline) Remediations:

(1)	Location:	Milepole 526 Capline Karmak, Illinois (Massac County).
	Date:	October 1988
	Spill:	Unknown amount released. Landfarmed 0.8 -3.6% by weight oil in soil.
	Remediation:	Fertilizer - at 300 lbs/acre Nitrogen, bark mulch, lime, and manure added. Soil was tilled once a week for six weeks.
	Results:	95% reduction in oil and grease content (degradation rate of 63% per month). Revegetation occurred with planted wheat and native grasses.
	Contact:	R. Williams, Shell Pipeline Co., Mid-Continent Division, Wood River, Illinois.
(2)	Location:	Everidge Cotton Farm, Upton County, West Texas
	Date:	November 1986
	Spill:	50 barrels crude oil in 0.2 acre of land. The contaminated area was landfarmed at 0.3 - 8.6% by weight oil and grease levels in soil.
	Remediation:	Fertilizer - 150 lbs/acre. The area was spray irrigated and tilled about once a month.
	Results:	Reduction rate for oil and grease content was about 4 - 10% per month during 15 months of treatment. Some vegetation (cotton) was observed at the edges of the treatment zone after one year.
	Contact:	C. D. Simons, Shell Pipeline Co., Mid-Continent, West Texas Unit, Midland, Texas.

State of New Mexico
ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT
Santa Fe, New Mexico 87505

STATE OF NEW MEXICO
OIL CONSERVATION DIVISION

MEMORANDUM OF MEETING OR CONVERSATION

☑ Telephone ☐ Personal	Time 1100	Date 9/27/93

Originating Party	Other Parties
Bill Olson - Envir. Bureau	John Hite - Shell Pipeline

Subject

Pump Station Environmental Assessments

Discussion

Told him OCD needs TCLP analyses on any constituents with totals above TC limits
OCD will also need MW construction details

Conclusions or Agreements

Shell is currently completing work referenced in the reports. Final reports on sites and proposed remediation will be submitted to OCD in approx. 30 days.

Distribution

Signed Bill Olson

Shell Oil Company

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

September 10, 1993

State of New Mexico
Energy, Minerals and Natural Resource Department
Oil Conservation Division
ATTN Mr. William C. Olson
Hydrogeologist - Environmental Bureau
P. O. Box 2088
Santa Fe, NM 87504

Gentlemen:

SUBJECT: SITE ASSESSMENT
LEA STATION
LEA COUNTY, NEW MEXICO

Please find enclosed a copy of Shell Pipe Line Corporation (Shell) environmental contractor's (CURA, Inc.) site assessment and EOTT Energy Corp. environmental contractor's (Roy F. Weston, Inc.) due diligence assessment for Lea Station.

CURA advanced 19 soil borings in areas where crude oil impact to the environment was likely to occur. Monitoring wells were installed where groundwater was encountered. Seven monitoring wells were installed. Samples were analyzed for TPH and BTEX. A minimum of two samples were obtained from each boring.

Lea Station is located approximately 3.5 miles north of Oil Center and 10 miles northwest of Eunice in Lea County, New Mexico. The site is surrounded by a barbed wire fence with a locked gate and is in a rural area within the Monument - Jal oil field.

No residences, public buildings, or surface bodies of water are within a 1,000 feet radius of the facility. One water well is located on site. The well is abandoned and has a depth of water of 54 feet. Total depth of the well is approximately 60 feet. The nearest registered off site water well is located approximately 4,500 feet south of the site and drilled to a depth of 395 feet. Currently, the groundwater in the site area is not used as a drinking water source. The drinking water in Eunice, the nearest municipality, is supplied from a well field located about 12 miles northeast of the site and produces from the Ogallala Formation at a depth of 80 to 120 feet. The abandoned water well on site was sampled and BTEX levels were all less than 0.001 ppm, TPH value of 5 ppm and TDS of 1800 ppm.

LeaSite.jbh

Soil sample TPH values ranged from less than 0.001 ppm to 15,000 ppm, benzene levels were 0.001 or less for all soil samples, and total BTEX levels ranged from less than 0.001 to 41 ppm.

From the site assessment data, the following can be concluded:

1. An abandoned water well is present on site. No other potential receptors were identified within a 1,000 foot radius of the site.

2. Approximately 3 feet of hydrocarbon-impacted soils (>100 ppm TPH) appear to extend across most of the eastern half of the site. The impacted soils extend to a depth of 15 feet near MW-4 and approximately 8 feet near MW-1 and B-5. Analytical data from MW-2 indicate the soils at the soil/groundwater interface are impacted (25 to 27 foot below surface). The eastern and southern extent of soil impact has not been delineated.

3. The extent of hydrocarbon-impacted soils identified in the western half of the site extend from the surface to the soil/groundwater interface (30 feet thick) in an area south of Tank 1843 and including the sump. The southern extent of impacted soils and/or groundwater is limited to the area north (upgradient) of MW-6 and MW-7. The area west of the sump, south of MW-5, and north of B-3 is impacted from the surface to a depth of approximately 10 feet.

4. Groundwater was encountered at depths ranging from 24 to 28 feet below ground surface with a groundwater gradient to the east-southeast towards Monument Draw. Dissolved hydrocarbon concentration levels are greatest in MW-3 near the north boundary of the site (upgradient) and indicate possible off site source (tank batteries north of MW-30.

Shell proposes to delineate the western portion of the site by drilling borings north of MW-5 and east of B-8 and install a monitoring well between B-11 and B-8. On the eastern portion of the site, we propose to install a monitoring well west of MW-3, a monitoring well south of MW-2 and southeast of MW-1 and a third well between MW-1 and MW-2. Soil borings are proposed to further delineate the soil impacted to 30 feet in the area south of MW-2 and east of MW-4.

We will conduct feasibility testing including soil vapor extraction and pumping test to evaluate remediation options.

After we have conducted the proposed delineation work, analyzed the results and conducted the feasibility testing, Shell will provide the Oil Conservation a proposed remediation action plan. A complete copy of the site assessment will also be provided.

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

Sincerely,

John B. Hite
Engineering Advisor
General Engineering

Attachment

LeaSite.jbh

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 9

LEA STATION

9.1 SITE LOCATION AND DESCRIPTION

Lea Station is located approximately 3 miles north-northwest of Oil Center, Lea County, New Mexico. The site location is shown in Figure 9-1. Lea Station is a crude oil pumping station and storage facility where oil from both sweet and sour gathering lines is pumped into trunk lines.

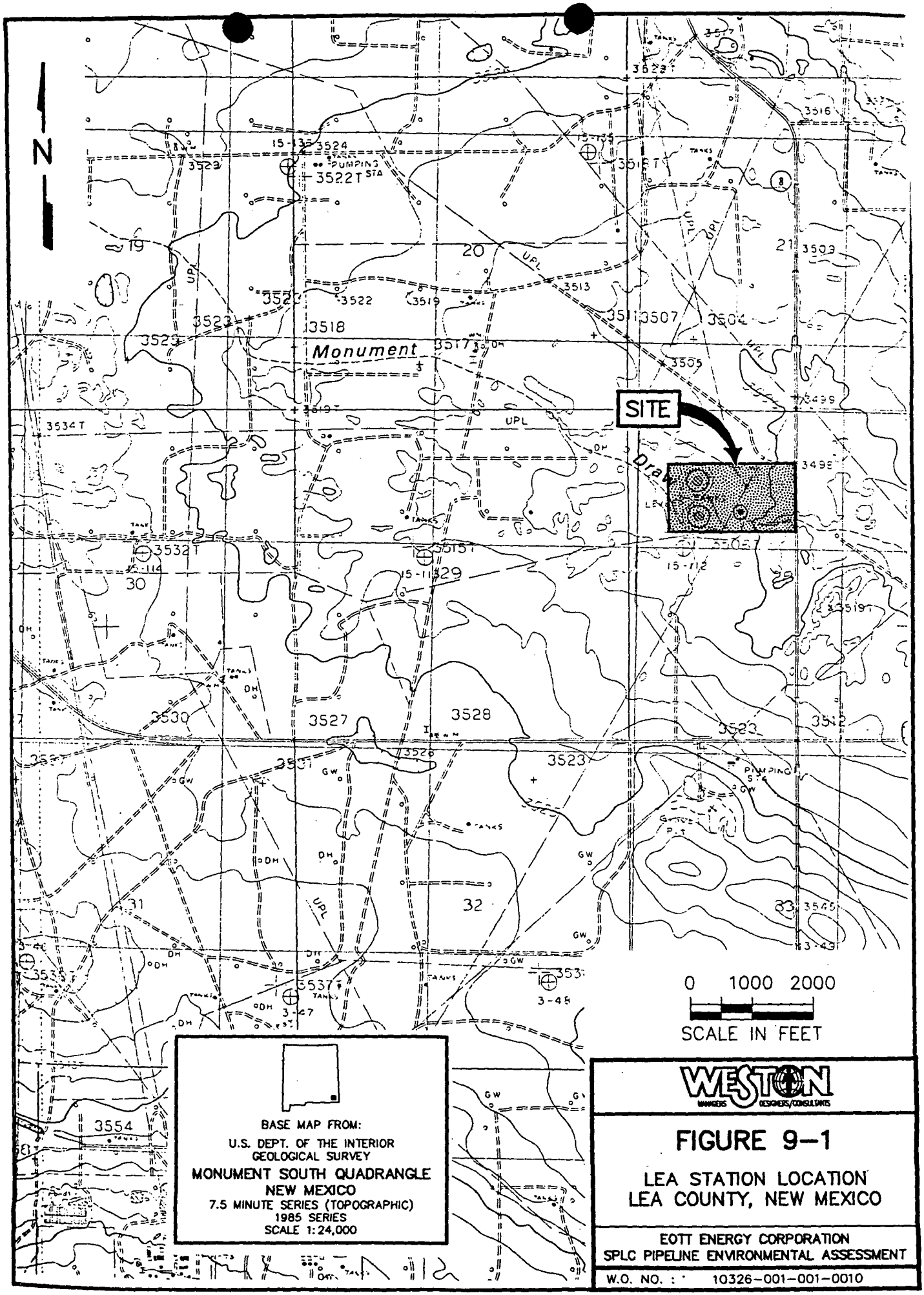
The Lea Station layout is shown in Figure 9-2. Above-ground facilities include:

- Tank 808, an 80,000 BBL external floating roof crude oil storage tank in sweet service,
- Tank 809, an 80,000 BBL external floating roof crude oil storage tank in sour service,
- Tank 810, a 25,000 BBL cone-top crude oil storage tank not in service,
- Two sweet crude oil pumps and one sour crude oil pump,
- Four pump sumps,
- Scraper traps, and
- Three metering stations.

The sweet facilities are located near the site entrance on the east side of the site. Three transformers attached to a utility pole at the south fence near the southeastern corner of the site belong to the local power company. Tanks 808 and 809 are located near the western site boundary. A bioremediation area (landfarm) is located between these two tanks. Hydrocarbon staining exists in soils throughout the facility. Hydrocarbon staining locations are depicted in Figure 9-2. The most severe staining is present on the site road, in the bioremediation area, and inside the tank dikes. SPLC reports that an abandoned, 64-foot deep on-site water well is contaminated with 5 ppm TPH.

The 100-acre Lea Station site is located in an oil field. A truck transfer station consisting of two above-ground crude oil transfer tanks and a diesel tank lies north of the north fence at the northeast corner of the site. The transfer station is owned by EOTT. Truck transfer stations owned by Sun Oil and Conoco Oil Company are located near the EOTT transfer station. A large spill area measuring approximately 150 feet by 50 feet lies south of the east side of the site. Monument draw, a dry depression, borders the site to the south.

SPLC purchased most of the Lea Station property from Chevron Oil Company. The site has always been a crude oil pumping and storage facility, and all of the above-ground facilities are in their original site locations.



WESTON MANAGERS DESIGNERS/CONSULTANTS

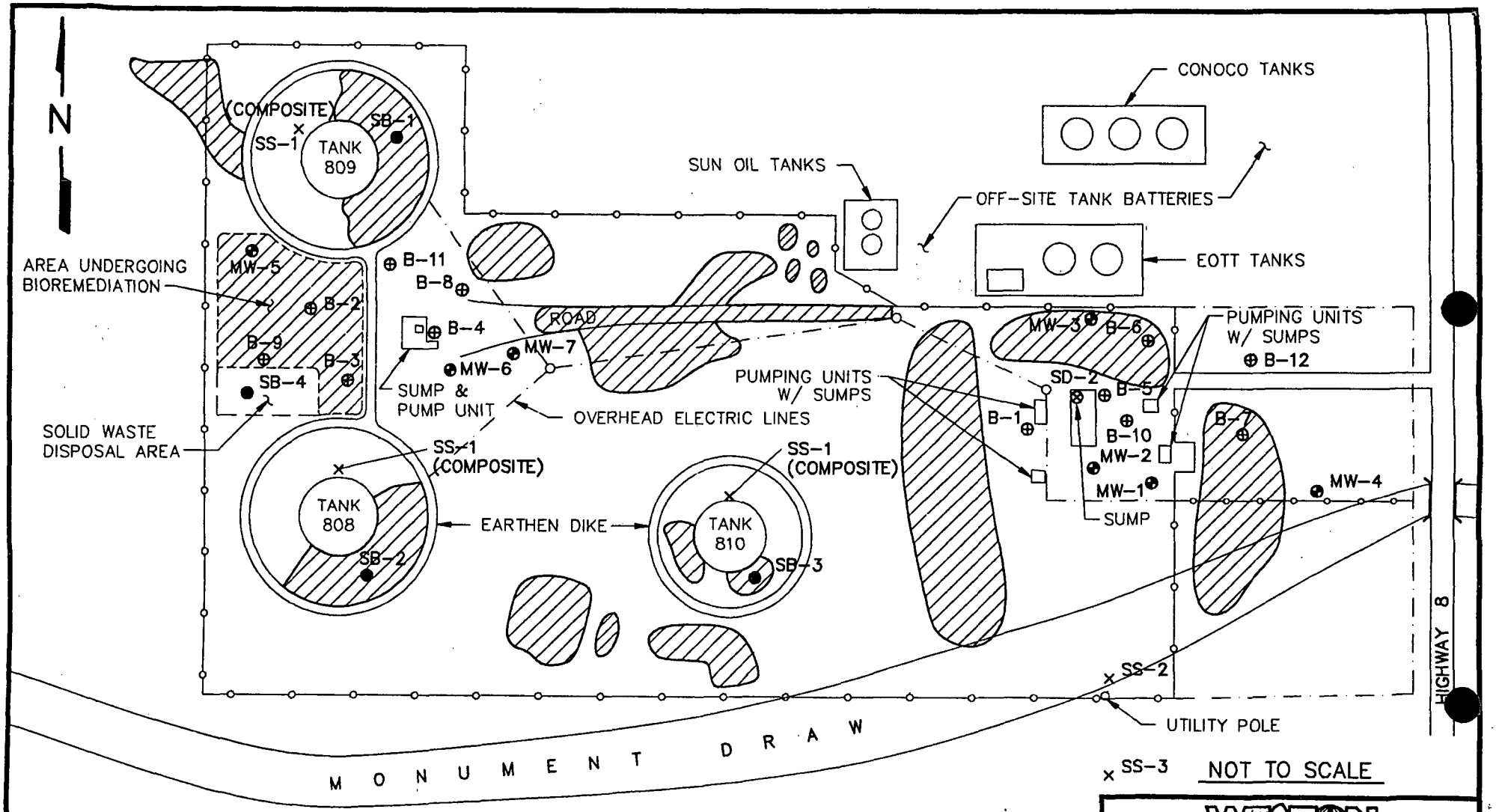
FIGURE 9-1

LEA 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



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 9-2

LEA STATION
SITE PLAN

EOTT ENERGY CORPORATION
SPLC PIPELINE ENVIRONMENTAL ASSESSMENT

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

H:\DWG\EOTT\SPZ.PB 1=1 07-22-93

9.2 PREVIOUS INVESTIGATION RESULTS AND CONCLUSIONS

CURA, Inc. performed a baseline assessment of soil and groundwater conditions at Lea Station in December, 1992, and a Phase II investigation in February 1993. As part of the investigation, CURA drilled 12 borings and installed seven monitor wells at the site. The CURA boring and well locations are shown in Figure 9-2. Soil samples collected from the borings and monitor well boreholes were analyzed for BTEX and TPH. Groundwater samples were also analyzed for BTEX and TPH.

BTEX concentrations in soil samples ranged from <0.001 mg/kg to 50 mg/kg. TPH concentrations in soil samples ranged from 10 mg/kg to 15,000 mg/kg. BTEX and TPH soil contamination was found at nearly all depths at the site, and was not homogeneously distributed.

Groundwater was encountered 20 to 25 feet below the surface. BTEX concentrations in groundwater samples ranged from <0.001 mg/L to 3.5 mg/L. TPH concentrations in groundwater ranged from <1 mg/L to 5 mg/L. No free-phase hydrocarbons were found in any of the monitor wells.

Based on the investigation data, CURA estimated that hydrocarbon-impacted soil extends across most of the eastern half of the site to varying depths. CURA could not establish the eastern and southern extent of hydrocarbon impacts from the available data. CURA estimated that hydrocarbon-impacted soils in the western portion of the site extend from the surface to the soil/groundwater interface south of tank 809, to an area north of wells MW-6 and MW-7, and within the bioremediation area west of the tanks.

9.3 SITE SAMPLING

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

- potential lead contamination of soil surrounding tank,
- potential PCB contamination beneath electrical equipment,
- potential PCB contamination of sumps from PCB oils,
- soil staining inside tank dikes, and
- soil contamination from the solid waste area west of the tanks.

The sample locations are shown on Figure 9-2. Analytical results are provided in Table 9-1.

SS-01, a composite sample collected from surface soils adjacent to all three tanks, contained 17.8 mg/kg total lead. Background sample SS-03 collected approximately 5 feet south of the south fence contained <4.8 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.

No PCBs were detected in SS-02 collected from beneath the transformers. No PCBs were detected in SD-01 collected one of the sweet crude pump sumps. The other sumps did not contain sufficient sediment to collect a sample.

Boring SB-01 was advanced into stained soils inside the tank 809 dike. A description of the soils encountered in this boring is as follows:

0 in. - 7 in.	Black, tarry oil residue; strong petroleum odor
7 in. - 1 ft.	Dark brown sand with clay, pet. odor
1.0 ft. - 1.5 ft.	Tannish gray sand with some clay
1.5 ft. - 2.0 ft.	Light brownish-gary sand
2.0 ft. - 2.5 ft.	Yellow-brown sand

Sample SB-01 collected from a depth of 2.0 to 2.5 feet, contained 0.00088 mg/kg BTEX. This concentration is barely over the 0.0008 mg/kg detection limit. The sample also contained 77.9 mg/kg TPH.

Boring SB-02 was advanced into stained soils inside the tank 808 dike. A description of the soils encountered in this boring is as follows:

0 in. - 5 in.	Stained brown silt and sand
5 in. - 2.5 ft.	Black hydrocarbon-saturated sand and clay; strong petroleum odor

Sample SB-02 was collected from a depth between 2.0 to 2.5 feet and contained 14.7 mg/kg BTEX and 4,590 mg/kg TPH.

Boring SB-03 was advanced into stained soils inside the tank 810 dike. A description of the soils encountered in this boring is as follows:

0 in. - 1.8 ft.	Tannish sand; possible staining
1.8 ft. - 2.5 ft.	Yellow-gray sand

Sample SB-03 was collected at a depth of 2.5 feet. It contained <0.00088 mg/kg BTEX and 1,500 mg/kg TPH.

Boring SB-04 was advanced into the solid waste disposal area south of the landfarm and west of tanks 808 and 809. A description of the soils encountered in this boring is as follows:

0 in. - 1 ft.	Dark brown sand, possible staining
1 ft. - 2.0 ft.	Light-colored, grayish-yellow sand; no staining

Samples SB-04-01 and SB-04-02 were collected at depths of 0.5 and 2.0 feet respectively. Analytical results for SB-04-01 are shown in Table 9-1. The lead concentration in this sample appears to be greater than background concentrations. However, the magnitude of the lead concentration is sufficiently low that lead contamination of the surface soils in the solid waste disposal area does not warrant further action.

Since no background samples were collected for metals other than lead, no determination was made as to whether or not the concentrations for the other metals are greater than background. However, as with the lead concentrations, the magnitude of the other metal concentrations is sufficiently low that further action is probably not warranted.

9.4 COMPLIANCE ISSUES

Air Issues for Tanks 808 and 809

Based on the available information, an air permit is not required for tanks 808 and 809 at Lea Station. If the tanks are not operated at a constant crude oil level, then air permits would probably be required if the tank throughput is greater than 120 million BBLs per year for tanks 808 and 809. The tanks appear to be in compliance with other New Mexico and federal air regulations.

Air Issues for Tank 810

This tank is not currently in service and does not require an air permit. This tank is probably no longer grandfathered since it appears to have been out of service for at least 5 years. If the tank is returned to service as a cone-roof tank, it would probably have to be registered with the EID since calculations indicate it would emit 17 tons/year of VOCs. An air permit would be required for the tank if it was not operated under a constant crude oil level and the throughput was greater than 40,000 BBLs per year.

If the tank is put back in service with a floating roof and is operated at a constant crude oil level, no registration or permit would be required. If the tank is put back in service with a floating roof, a permit would probably be required based on the throughput per year. The tank appears to be in compliance with other New Mexico and federal air regulations.

SPCC Plan

It is WESTON's opinion that an SPCC Plan is required for Lea Station because of its vicinity to Monument Draw. Monument Draw is a long, dry depression which may carry water after heavy rains. Monument Draw would probably be considered an intermittent stream which National Pollutant Discharge Elimination System regulations include as "Waters of the United States."

9.5 LIABILITY ISSUES

Hydrocarbon Contaminated Soil

The CURA investigation identified areas of hydrocarbon-contaminated soil on the west and east portions of the site. Additional work is needed to identify the horizontal and vertical extent of these hydrocarbon-impacted soils. Since groundwater is known to be contaminated, the OCD will most likely require soil remediation to the cleanup levels discussed in Section 2.1.4.

The WESTON soil borings and site inspection identified the following additional areas of significant hydrocarbon-impacted soil:

- Inside all three tank dikes,
- Along the entire length of the site road connecting the east and west sides of the site,
- At the northwest corner of the site west of tank 809,
- South of tank 810 outside of the tank dike, and
- At other locations shown in Figure 9-2.

The depth of hydrocarbon impacts to soils inside of the tank dikes and at these other locations is unknown. Additional work is necessary to identify the extent of hydrocarbon impacts to the subsurface soils. If subsurface impacts are significant and are a potential contributor to groundwater contamination, the OCD could require remediation of the soil to the cleanup levels discussed in Section 2.1.4.

Groundwater Contamination

Since groundwater contamination is known to exist at the site, the OCD will probably require the groundwater to be remediated to the cleanup criteria discussed in Section 2.1.4. Additional work is necessary to identify the source and extent of groundwater contamination 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 9-1
LEA STATION ANALYTICAL RESULTS
EOTT ENVIRONMENTAL ASSESSMENT OF THE
SPLC ZONE III PIPELINE

SAMPLE NUMBER: LOCATION: DATE COLLECTED:	SS-01 ADJACENT TO ALL 3 TANKS 6/24/93	SS-02 BENEATH ELECT. EQUIP. 6/24/93	SS-03 BACKGROUND 6/24/93	SB-01 INSIDE TANK 809C DIKE 6/24/93	SB-02 INSIDE TANK 808C DIKE 6/24/93	SB-03 INSIDE TANK 810 X DIKE 6/24/93
ORGANICS (mg/kg):[1]						
Benzene	NA	NA	NA	<0.00088	<0.084	<0.00088
Toluene	NA	NA	NA	<0.00088	<0.084	<0.00088
Ethylbenzene	NA	NA	NA	<0.00088	1.7	<0.00088
Total Xylenes	NA	NA	NA	<0.00088	13	<0.00088
TOTAL BTEX[2]	NA	NA	NA	<0.00088	14.7	<0.00088
TPH[3]	NA	NA	NA	77.9	4,590	1,500
TOTAL PCBs[4]	NA	<0.081	NA	NA	NA	NA
METALS (mg/kg):						
Silver	NA	NA	NA	NA	NA	NA
Arsenic	NA	NA	NA	NA	NA	NA
Barium	NA	NA	NA	NA	NA	NA
Cadmium	NA	NA	NA	NA	NA	NA
Chromium	NA	NA	NA	NA	NA	NA
Mercury	NA	NA	NA	NA	NA	NA
Lead	17.8	NA	<4.8	NA	NA	NA
Selenium	NA	NA	NA	NA	NA	NA

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

TABLE 9-1 (Cont.)
LEA STATION ANALYTICAL RESULTS
EOTT ENVIRONMENTAL ASSESSMENT OF THE
SPLC ZONE III PIPELINE

SAMPLE NUMBER: LOCATION: DATE COLLECTED:	SB-04-02 SOLID WASTE DISPOSAL AREA 6/24/93	SB-04-01 SOLID WASTE DISPOSAL AREA 6/24/93	SD-02 EAST SUMP 6/24/93		
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]	37.0	41.4	NA		
TOTAL PCBs[4]	NA	NA	<7.6		
METALS (mg/kg):					
Silver	<2.6	<2.6	NA		
Arsenic	1.4	2.6	NA		
Barium	45.1	16.1	NA		
Cadmium	<0.43	0.59	NA		
Chromium	4.1	7.6	NA		
Mercury	<0.095	<0.093	NA		
Lead	8.7	62.9	NA		
Selenium	<0.18	<0.2	NA		

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

7.0 APPENDICES

APPENDIX A

FIGURES

6.0 CONCLUSIONS

1. An abandoned water well is present on site. No other potential receptors were identified within a 1,000 foot radius of the site.

2. Based on the data obtained, approximately 3 feet of hydrocarbon-impacted soils (>100 ppm TPH) appear to extend across most of the eastern half of the site. The impacted soils extend to a depth of 15 feet near MW-4 and approximately 8 feet near MW-1 and B-5. Analytical data from MW-2 indicate the soils at the soil/groundwater interface are impacted (25 to 27 foot below surface). The eastern and southern extent of soil impact has not been delineated.

3. The extent of hydrocarbon-impacted soils identified in the western half of the site extend from the surface to the soil/groundwater interface (30 feet thick) in an area south of Tank 1843 and including the sump. The southern extent of impacted soils and/or groundwater is limited to the area north (upgradient) of MW-6 and MW-7. The area under bioremediation west of the sump, south of MW-5, and north of B-3 is impacted from the surface to a depth of approximately 10 feet.

4. Groundwater was encountered at depths ranging from 24 to 28 feet below ground surface with a groundwater gradient to the east-southeast towards Monument Draw. Dissolved hydrocarbon concentration levels are greatest in MW-3 near the north boundary of the site (upgradient) and indicate possible off site source (tank batteries north of MW-3).

5.2.4 WASTE MANAGEMENT - WATER

The liquids generated from decontamination procedures and from monitor well development operations (approximately 400 gallons) temporarily stored on site in labelled 55 gallon steel drums pending New Mexico Oil Conservation Division approval of on-site disposal into crude oil line system.

limit of 1 ppm to 5 ppm in MW-1. Monitor wells MW-1 and MW-6 recorded TDS (total Dissolved solids) values of 2,380 and 2,500 ppm, respectively.

A summary of analytical results is presented in Table 3. Laboratory reports and the chain-of-custody are included in Appendix E.

TABLE 3
WATER SAMPLE ANALYTICAL RESULTS

Water Samples Obtained on February 5, 1993

Monitor Well	Date	Benzene	Toluene	Ethyl-benzene	Xylenes	Total BTEX	TPH	TDS
WW-1	12/8/92	<0.001	<0.001	<0.001	<0.001	<0.001	5	1,800
MW-1	12/21/92	0.440	0.005	0.120	0.063	0.628	3	2,380
MW-1	2/16/93	0.350	0.010	0.095	0.070	0.525	5	
MW-2	2/16/93	0.370	0.040	0.210	0.510	1.130	1	
MW-3	2/16/93	2.500	0.010	0.370	0.640	3.520	2	
MW-4	2/16/93	<0.001	<0.001	<0.001	<0.001	<0.001	<1	
MW-5	2/16/93	<0.001	<0.001	0.002	0.004	0.006	<1	
MW-6	2/16/93	0.002	0.001	<0.001	0.091	0.094	<1	2,500
MW-7	2/16/93	<0.001	<0.001	<0.001	<0.001	<0.001	<1	

BTEX results listed in m/l (parts per million; ppm) with a method detection limit of 0.001 ppm.
TPH and TDS results listed in mg/l (parts per million; ppm) with a method detection limit of 1 ppm.
Analyses were conducted using EPA Method 8020 (BTEX), EPA Method 418.1 (TPH), and EPA Method 160.1 (TDS) by SPL Environmental Laboratories.

TABLE 2
SUMMARY OF RELATIVE GROUNDWATER LEVEL ELEVATIONS AND PHASE-SEPARATED HYDROCARBON THICKNESSES
Groundwater Elevations Obtained February 16, 1993

Monitor Well	Relative Ground Surface Elevation (feet)	Relative Top of Casing Elevation (feet)*	Depth to Water Below Top of Casing (feet)	Corrected Relative Groundwater Elevation (feet)**	Phase-Separated Hydrocarbon Thickness (feet)
MW-1	98.88	100.73	28.48	72.25	0.00
MW-2	100.78	102.37	29.33	73.04	0.00
MW-3	101.79	103.61	29.23	74.38	0.00
MW-4	93.80	96.08	25.44	70.64	0.00
MW-5	107.08	109.21	29.86	79.35	0.00
MW-6	103.66	106.26	28.60	77.66	0.00
MW-7	104.34	106.27	29.24	77.03	0.00

* Measured from a relative datum (benchmark = 100.00 feet) located at the southwest corner of the concrete pump pad. The monitor well casings were marked to provide consistent reference points for future gauging operations.
** Correction Equation for Phase-Separated Hydrocarbons: Corrected Groundwater Elevation = Top of Casing Elevation - (Depth to Water Below Top of Casing - [SG] [PSH Thickness])
Specific Gravity (SG) = 0.73 for gasoline, 0.85 for diesel, 0.9 for crude oil.

5.2.3 GROUNDWATER ANALYTICAL RESULTS

The analytical results of the groundwater samples obtained on February 16, 1993, recorded benzene levels ranging from below the method detection limit of 0.001 ppm in several wells to 2.5 ppm in MW-3. The Toluene levels ranged from below the method detection limit of 0.001 ppm in several wells to 0.04 ppm in MW-2. Ethylbenzene levels ranged from below method detection limit of 0.001 ppm in several wells to 0.37 ppm in MW-3. Xylene levels ranged from below method detection limit of 0.001 ppm in several wells to 0.64 ppm in MW-3. TPH levels ranged from below the method detection

5.2.2 GROUNDWATER GRADIENT AND FLOW

The depth to groundwater across the site ranges from approximately 24 to 28 feet below ground surface based on water level measurements presented in Table 2.

Based on gauging data groundwater movement beneath the site is to the southeast. A summary of relative groundwater elevations and phase-separated hydrocarbon thickness measurements is presented in Table 2.

extending from 35 to 15 feet and 41 to 21 feet below ground surface, respectively.

The monitor wells were completed with a sand pack extending from the bottom of the boring to approximately 5 feet above the casing/screen junction. A clean silica sand with a grain size larger than the well screen (sieve size 10 to 20) was used as the sand pack in the annular space between the casing and bore hole. Above the sand pack, a 4 foot thick bentonite plug was installed in the annular space between the casing and bore hole to provide a watertight seal between the surface and subsurface. An approximately 10-foot thick seal of non-shrink grout was placed on top of the bentonite seal. A watertight locking well cap was installed and a secured watertight monument type well cover was grouted in place.

After the monitor wells were installed on February 1, 2, and 3, 1993, they were developed on February 16, 1993 by surge bailing to remove the fine granulated materials and then purged by bailing prior to sampling. The monitor wells were then allowed to recover before obtaining groundwater samples for laboratory analyses.

5.2 GROUNDWATER ASSESSMENT

5.2.1 MONITOR WELL INSTALLATION AND SAMPLING OPERATIONS

Six on-site monitor wells (MW-2 through MW-7) were installed during this investigation. Monitor wells MW-2 and MW-4 were placed in the apparent downgradient direction of the observed local surface drainage to the sump and pumping units in the east portion of the site. Monitor well MW-3 was located upgradient from these potential sources. Monitor wells MW-2, MW-3, and MW-4 were drilled to a depth of 40 feet and completed at total depths of 40 feet, 40 feet, and 35 feet, respectively. Hydrocarbon odors were observed in monitor well MW-4 between 10 to 12 feet during drilling operations. Groundwater was encountered at approximately 24 to 28 feet below ground surface.

Monitor wells MW-6 and MW-7 were placed downgradient to the sump and pumping unit between tanks 1842 and 1843 in the western portion of the site. Monitor well MW-5 was located upgradient and near the west boundary of the site. Monitor wells MW-5, MW-6, and MW-7 were drilled to total depths of 41 feet, 41 feet, and 40 feet respectively. Groundwater was encountered at approximately 27 to 28 feet below ground surface. Monitor well MW-5 exhibited hydrocarbon staining and/or odors from near the surface to 28 feet (depth to groundwater).

The monitor wells were constructed of four-inch diameter schedule 40 PVC casing with a 0.02-inch factory-slotted well screen. The well screen in monitor wells MW-2, MW-3, MW-6, and MW-7 extends from 40 to 20 feet. Monitor wells MW-4 and MW-5 contain well screens

5.2 GROUNDWATER ASSESSMENT

5.2.1 MONITOR WELL INSTALLATION AND S OPERATIONS

Six on-site monitor wells (MW-2 through MW-7) were inst this investigation. Monitor wells MW-2 and MW-4 were apparent downgradient direction of the observed local surf to the sump and pumping units in the east portion of the well MW-3 was located upgradient from these poten Monitor wells MW-2, MW-3, and MW-4 were drilled to a feet and completed at total depths of 40 feet, 40 feet, respectively. Hydrocarbon odors were observed in monito between 10 to 12 feet during drilling operations. Grou encountered at approximately 24 to 28 feet below groun

Monitor wells ~~MW-6~~ and MW-7 were placed downgra sump and pumping unit between tanks 1842 and 1843 i portion of the site. Monitor well MW-5 was located up near the west boundary of the site. Monitor wells MW-6 MW-7 were drilled to total depths of 41 feet, 41 feet respectively. Groundwater was encountered at approxim feet below ground surface. Monitor well MW-5 exhibited staining and/or odors from near the surface to 28 fe groundwater).

The monitor wells were constructed of four-inch diamet PVC casing with a 0.02-inch factory-slotted well scre screen in monitor wells MW-2, MW-3, MW-6, and MW-7 40 to 20 feet. Monitor wells MW-4 and MW-5 contai

A review of the analytical results from the Preliminary Site Assessment conducted in December 1992 indicated hydrocarbon-impacted soils (>100 ppm TPH) in the 5 to 7 foot interval of boring B-2 (8,400 ppm TPH), the 3 to 5 foot (14,000 ppm TPH) and the 25 to 27 foot (2,700 ppm TPH) intervals of B-4. Additional hydrocarbon-impacted soils were identified in the 3 to 5 foot interval of boring B-5 (1,700 pm TPH) and the 1 to 3 foot interval of MW-1. Monitor well MW-1 encountered hydrocarbon-impacted groundwater at 28 feet.

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-8 through B-11 and monitor wells MW-2 through MW-7. Total BTEX levels in the soils ranged from below the method detection limit of 0.001 ppm in various sampled intervals of the borings to 41 ppm in the 15 to 17 foot interval of boring B-11. TPH levels ranged from 10 ppm in the 10 to 12 foot interval of monitor well MW-3 and the 26 to 27 foot interval of MW-6 to 15,000 ppm in the 20 to 22 foot interval of MW-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.

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TABLE 1
SOIL SAMPLE ANALYTICAL RESULTS

Boring	Date Sampled	Sample Interval (feet)	OVA	Benzene	Toluene	Ethyl-benzene	Xylenes	Total BTEX	TPH
MW-7	02-03-93	1 - 3	1						
		5 - 7	<1	<0.001	<0.001	<0.001	0.002	0.002	40
		10 - 12	<1						
		15 - 17	<1						
		20 - 22	1	<0.001	<0.001	<0.001	0.001	0.001	20
		25 - 27	<1	<0.001	<0.001	<0.001	<0.001	<0.001	30

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

TABLE 1
SOIL SAMPLE ANALYTICAL RESULTS

Boring	Date Sampled	Sample Interval (feet)	OVA	Benzene	Toluene	Ethyl-benzene	Xylenes	Total BTEX	TPH
MW-3	02-02-93	1 - 3	<1	<0.001	<0.001	<0.001	0.001	0.001	20
		5 - 7	<1						
		10 - 12	<1	<0.001	<0.001	<0.001	0.001	0.001	10
		15 - 17	<1						
		20 - 22	1	<0.001	0.001	0.002	0.006	0.009	20
		25 - 27	No Recovery						
		27 - 30	60						
MW-4	02-02-93	1 - 3	<1	<0.001	<0.001	<0.001	<0.001	<0.001	700
		5 - 7	200						
		10 - 12	400	<0.001	0.140	0.085	0.420	0.645	1,600
		15 - 17	4						
		20 - 22	<1						
		25 - 27	<1	<0.001	<0.001	<0.001	<0.001	<0.001	20
MW-5	02-01-93	1 - 3	2	<0.001	0.014	0.140	0.340	0.480	8,900
		5 - 7	80						
		10 - 12	100						
		15 - 17	500						
		20 - 22	600	<0.001	<0.001	6.200	0.710	6.910	15,000
		25 - 27	400	<0.001	<0.001	5.900	3.500	9.400	10,000
MW-6	02-02-93	1 - 3	2	<0.001	<0.001	<0.001	0.001	0.001	20
		5 - 7	<1						
		10 - 12	<1						
		15 - 17	<1	<0.001	<0.001	<0.001	<0.001	<0.001	20
		20 - 22	<1						
		25 - 26	200						
		26 - 27	20	<0.001	<0.001	<0.001	<0.001	<0.001	10

TABLE 1
SOIL SAMPLE ANALYTICAL RESULTS

Boring	Date Sampled	Sample Interval (feet)	OVA	Benzene	Toluene	Ethyl-benzene	Xylenes	Total BTEX	TPH
B-11	02-03-93	1 - 3	<1						
		5 - 7	30	<0.001	0.100	1.500	4.100	5.700	4,900
		10 - 12	900						
		15 - 17	>1,000	<0.001	<0.001	25.000	16.000	41.000	13,000
		20 - 22	>1,000						
		25 - 27	>1,000	<0.001	<0.001	12.000	8.700	20.700	11,000
B-12	02-04-93	1 - 3	<1						
		5 - 7	<1	<0.001	<0.001	<0.001	0.001	0.001	20
		10 - 12	<1						
		15 - 17	<1						
		20 - 22	<1	<0.001	<0.001	<0.001	<0.001	<0.001	10
MW-1	12-08-92	1 - 3	700	<0.001	<0.001	7.100	8.500	15.600	8,600
		5 - 7	110						
		10 - 12	21	<0.001	<0.001	<0.001	<0.001	<0.001	19
		15 - 17	20						
		20 - 22	25						
		25 - 27	70	<0.001	0.002	0.048	0.004	0.054	58
		30 - 32	5						
		35 - 37	1						
MW-2	02-01-93	1 - 3	<1	<0.001	<0.001	<0.001	<0.001	<0.001	150
		5 - 7	<1						
		10 - 12	<1	<0.001	<0.001	<0.001	<0.001	<0.001	30
		15 - 17	<1						
		20 - 22	<1						
		25 - 27	>1,000	<0.001	<0.001	6.200	4.800	9.000	6,300

TABLE 1
SOIL SAMPLE ANALYTICAL RESULTS

Boring	Date Sampled	Sample Interval (feet)	OVA	Benzene	Toluene	Ethyl-benzene	Xylenes	Total BTEX	TPH
B-6	12-09-92	1 - 3	8						
		3 - 5	<1	<0.001	0.003	<0.001	0.004	0.007	47
B-7	12-09-92	1 - 3	8						
		5 - 7	<1						
		10 - 12	<1	<0.001	0.003	<0.001	0.004	0.007	14
B-8	02-01-93	1 - 3	6	<0.001	<0.001	0.053	0.031	0.084	9,100
		5 - 7	50						
		10 - 12	900						
		15 - 17	>1,000	<0.001	<0.001	14.000	6.300	20.300	7,300
		20 - 22	600						
		25 - 27	>1,000	<0.001	<0.001	13.000	17.000	30.000	10,000
		30 - 32	12						
B-9	02-01-93	1 - 3							
		5 - 7	<1	<0.001	<0.001	<0.001	<0.001	<0.001	110
		10 - 12	<1						
		15 - 17	<1						
		20 - 22	<1	<0.001	<0.001	<0.001	<0.001	<0.001	20
B-10	02-01-93	1 - 3	<1						
		5 - 7	11	<0.001	<0.001	<0.001	<0.001	<0.001	20
		10 - 12	<1						
		15 - 17	<1						
		20 - 22	<1	<0.001	<0.001	<0.001	<0.001	<0.001	10

TABLE 1
SOIL SAMPLE ANALYTICAL RESULTS

Boring	Date Sampled	Sample Interval (feet)	OVA	Benzene	Toluene	Ethyl-benzene	Xylenes	Total BTEX	TPH
B-1	12-08-92	1 - 3	2						
		5 - 7	5	0.001	0.002	0.002	0.005	0.010	15
		9 - 11	<1						
		15 - 17	<1	<0.001	0.012	0.017	0.050	0.079	24
B-2	12-08-92	1 - 3	>1000						
		5 - 7	>1000	<0.001	<0.001	<0.001	<0.001	<0.001	9,400
		10 - 12	>1000						
		15 - 17	11	<0.001	0.004	<0.001	0.002	0.006	19
		20 - 22	7						
		25 - 27	<1	<0.001	0.002	<0.001	0.003	0.005	13
B-3	12-08-92	1 - 3	8						
		5 - 7	12	<0.001	<0.001	<0.001	<0.001	<0.001	31
		10 - 12	1						
		15 - 17	<1	<0.001	0.003	0.001	0.006	0.010	20
B-4	12-08-92	1 - 3	300						
		3 - 5	800	<0.001	<0.001	<0.001	<0.001	<0.001	14,000
		10 - 12	>1000	<0.001	<0.001	<0.001	0.940	0.940	9,200
		15 - 17	>1000						
		20 - 22	200						
		25 - 27	>1000	<0.001	<0.001	<0.001	<0.001	0.460	2,700
B-5	12-09-92	3 - 5	5	0.001	0.002	0.011	0.021	0.035	1,700
		5 - 7	<1						
		8 - 10	<1	<0.001	<0.001	<0.001	<0.001	<0.001	15

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 ppm methane equivalent.

5.1.3 SOIL SAMPLE ANALYTICAL RESULTS

OVA readings ranged from <1 ppm in various intervals of the borings to >1000 ppm in the 25 to 27 foot interval of MW-2, the 15 to 17 foot and 25 to 27 foot intervals of B-8, and the sampled intervals of B-11 between 15 to 27 feet. A minimum of two samples from each boring were submitted for laboratory analysis. 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. Monitor well MW-5 and boring B-8 exhibited hydrocarbon staining and/or odors between 0 to 28 feet (depth to groundwater). Hydrocarbon staining and/or odors were observed during sampling operations in the 1 to 3 foot interval of boring B-9. Hydrocarbon odors were observed in monitor well MW-4 between 10 to 12 feet.

5.0 HYDROGEOLOGIC INVESTIGATION AND FINDINGS

5.1 SOIL INVESTIGATION

5.1.1 SOIL BORING LOCATIONS

The locations of borings B-8 through B-12 and monitor wells MW-2 through MW-7 were chosen based on the discovery of hydrocarbon-impacted soils in borings B-2, B-4, B-5 and monitor well MW-1 during the Preliminary Site Assessment. Boring B-4 and monitor well MW-1 identified hydrocarbon-impacted soils to a depth of approximately 28 feet (depth of groundwater). Potential sources identified were the pumping units and sump in the center of the east portion of the site, the pump and sump between tanks 1843 and 1842, and the area undergoing bioremediation in the western portion of the site

Boring B-9 and monitor well MW-5 were located northwest and southwest, respectfully of boring B-2 to delineate the extent of hydrocarbon-impacted soils and/or groundwater. Borings B-8, B-11, MW-6, and MW-7 were placed around the impacted area identified by B-4. Borings B-10, B-12, MW-2, MW-3, and MW-4 were placed around the impacted area adjacent to B-5 and monitor well MW-1.

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.

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-12 and monitor wells MW-1 through MW-7. The soils consisted of 1 to 5 feet of brown to gray silty sand (SM) underlain by multicolored calcareous to slightly calcareous sands to a depth of approximately 41 feet (maximum boring depth). Water saturated sands were encountered in the borings at approximately 25 to 28 feet. 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 Eunice, the nearest municipality, is supplied from a well field located approximately 12 miles northeast of the site that produces from the Ogallala Formation at a depth of 80 to 120 feet.

A field survey of the site and surrounding area was conducted to identify potential receptors (residences, public buildings, water supply wells, and surface bodies of water) in the site vicinity. Other than the abandoned water well, no residences, public buildings, or water supply wells were identified within a 1000 foot radius of the site.

quantities of water, but some wells yield up to 100 gpm. Produced waters from both the Chinle formation and the Santa Rosa sandstone are high in sulfate content.

Other than the abandoned on site well, there are no registered water wells located within a 1,000 foot radius of the site (Geosource; December 29, 1992). Gulf Refining Company drilled the on site well (#L-2402) to a total depth of 60 feet in January 1954, and produced water from the Ogallala / Quaternary Alluvium aquifer at 57 to 60 feet. The depth-to-water was 40 feet upon completion. The produced water was utilized for domestic use. The well is abandoned and open to a depth of 54 feet. Physical evidence indicates that an unsuccessful attempt was made to pull the steel casing and the current subsurface construction of the well is unknown. The nearest registered offsite water well is located approximately 4,500 feet south of the site. Well #L-8157 was drilled by Northern Natural Gas Company in October 1979 to a total depth of 395 and perforated from 370 feet to 395 feet. The current status of this well is unknown.

According to the U.S.G.S. Monument South, New Mexico, topographic quadrangle, the site is approximately 3,500 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 toward Monument Draw.

The soils on site belong to the Wink Series and the Kermit-Wink complex. The Wink Series consist of well-drained fine grained sandy soils formed in strongly calcareous, wind-deposited and water-deposited, sandy sediments. The Kermit Series consist of excessively drained, noncalcareous fine to medium grained sands. The Kermit-Wink complex consists of about 70 percent Kermit soils on the stabilized sand dune areas and 30 percent Wink soils in depressions. Typically, the surface layer is pale-brown to brown fine sand about 12 inches thick. The subsoil is reddish-brown to yellowish-brown sandy loam, often calcareous, to varying depths ranging between 20 to 60 inches. This is underlain by white calcareous sandy loam (caliche). The

4.0 SITE HYDROGEOLOGY

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

Water wells in the site area typically produce water from three principal geologic units (from oldest to youngest), the Dockum group, the Ogallala formation, and Quaternary alluvium. The Ogallala formation is the major water-bearing formation in the area with well yields ranging from 30 gpm to 700 gpm. The Ogallala formation is of Pliocene age 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 Triassic rocks and ranges in thickness from a few inches to approximately 300 feet.

Eolian and alluvial deposits of Recent to Pleistocene age overlie the Ogallala formation in the site area. These deposits consist of fine to medium grained sands, and calcareous silt and clays. Ranging in thickness from 0 to 400 feet, these Quaternary deposits often form a continuous aquifer with the underlying Ogallala formation and are considered to act as one aquifer beneath the site area. Where the Ogallala is not present, the Quaternary alluvium produces limited quantities of groundwater with well yields generally less than 30 gpm.

The Triassic age Dockum group consists of the Chinle formation and the underlying Santa Rosa sandstone. The Chinle formation is a 0 to 1270 foot thick claystone containing minor fine-grained sandstones and siltstones. Wells completed in the Chinle formation generally yield less than 10 gpm. The Santa Rosa sandstone is a 140 to 300 foot thick fine to coarse-grained sandstone which generally yields small

3.0 SITE DESCRIPTION

Lea Station is utilized as a crude oil pipe line pumping station in which subsurface crude oil field lines from various oil field leases are manifolded into the main subsurface discharge pipe line currently operated by Shell Pipe Line Corporation. Two 80,000 barrel aboveground crude oil storage tanks (Tanks 1842 and 1843) are located on the western end of the site. Each tank is surrounded by an earthen dike, and a 300 foot earthen dike running north-south connects the two tanks. An approximate 300 square foot area between the two tanks and west of the dike is undergoing bioremediation. A pumping station and single-walled steel sump are located just east of the dike and remediation area. A 25,000 barrel aboveground crude oil storage tank (Tank 1982) is located near the center of the site (Appendix A, Figure 2). Three pumping stations and two control buildings are located east of the Tank 1982. An abandoned water well is located in the northeast corner of the site. Three off-site tank batteries are located north of the water well and adjacent to the north property boundary.

Lea Station is surrounded by barbed-wire fencing with two locked gates located near the center of the east site boundary. The site is located in a rural area within the Monument-Jal Oil Field. No residences, public buildings, or surface bodies of water were observed within a 1,000 foot radius of the facility. An abandoned water well is located in the northeast corner of the site.

2.0 INTRODUCTION

CURA was contracted by Shell Pipe Line Corporation to conduct a Preliminary Site Assessment during December 1992 prior to planned site divestment. Based on the findings of hydrocarbon-impacted soils (>100 ppm TPH) in borings B-2, B-4, B-5, and monitor well MW-1, the pumping units and sump in the center of the east portion of the site, the pump and sump between tanks 1843 and 1842, and the area undergoing bioremediation in the western portion of the site were identified as potential source areas. A Phase II - Environmental Site Assessment was performed to provide horizontal and vertical delineation of the subsurface soil and groundwater conditions near the impacted borings and monitor well. The site, Lea Station, is located approximately 3.5 miles north of the town of Oil Center and 10 miles northwest of the city of Eunice in Lea County, New Mexico (Appendix A, Figure 1).

- Prepared a dissolved hydrocarbon concentration map to depict the extent of benzene, BTEX and TPH levels in the groundwater.

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

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 delineate the extent of hydrocarbon-impacted soils discovered during the Preliminary Site Assessment conducted in December 1992.

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

- Installed six additional monitor wells, gauged, developed, and sampled seven on-site monitor wells.

- 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.

- Surveyed monitor well elevations on a relative datum, determined static fluid levels in each monitor well, and measured phase-separated hydrocarbon thickness (if any).

- Prepared a groundwater contour map from static water level measurements in order to establish the apparent groundwater gradient.

limit of 1 ppm to 5 ppm in MW-1. Monitor wells MW-1 and MW-6 recorded TDS (total Dissolved solids) values of 2,380 and 2,500 ppm, respectively. The New Mexico Water Quality Control Commission (WQCC) water quality standards related to the Oil Conservation Division's (OCD) Surface Impoundment Closure Guidelines are 0.01 ppm benzene, 0.62 ppm xylene, 0.75 ppm ethylbenzene, and 0,75 ppm toluene.

Based on the data obtained, approximately 3 feet of hydrocarbon-impacted soils (>100 ppm TPH) appear to extend across most of the eastern half of the site. The impacted soils extend to a depth of 15 feet near MW-4 and approximately 8 feet near MW-1 and B-5. Analytical data from MW-2 indicate the soils at the soil/groundwater interface are impacted (25 to 27 foot below surface).

The extent of hydrocarbon-impacted soils identified in the western half of the site extend from the surface to the soil/groundwater interface (30 feet thick) in an area south of Tank 1843 and including the sump. The southern extent of impacted soils and/or groundwater is limited to the area north (upgradient) of MW-6 and MW-7. The area under bioremediation west of the sump, south of MW-5, and north of B-3 is impacted from the surface to a depth of approximately 10 feet.

Groundwater was encountered at depths ranging from 24 to 28 feet below ground surface with a groundwater gradient to the east-southeast. Dissolved hydrocarbon concentration levels are greatest in MW-3 near the north boundary of the site (upgradient) and indicate possible off site source (tank batteries north of MW-3).

Based on the findings of the Preliminary Site Assessment, five additional borings (B-8 through B-12) were performed and six monitor wells (MW-2 through MW-7) were installed on February 1-4, 1993 to further delineate the horizontal and vertical extent of the hydrocarbon-impacted soils and/or groundwater previously identified during the Preliminary Site Assessment.

Benzene levels in the soils measured below method detection limits of 0.001 ppm in the sampled intervals of borings B-8 through B-12 and MW-2 through MW-7. The total BTEX (benzene, toluene, ethylbenzene, xylenes) levels in the soils ranged from less than the method detection limit of 0.001 ppm in the sampled intervals of several boring to 41 ppm in the 15 to 17 foot interval of B-11. TPH (total petroleum hydrocarbons) levels ranged from 10 ppm in the sampled intervals of several borings to 15,000 ppm in the 20 to 22 foot interval of monitor well MW-5. 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.

Monitor wells MW-1 through MW-7 were gauged, developed, and sampled on February 16, 1993. Depth to groundwater across the site ranges from approximately 24 to 28 feet below ground surface with groundwater movement beneath the site to the east-southeast.

Benzene levels in the groundwater ranged from below the method detection limit of 0.001 ppm in several wells to 2.5 ppm in MW-3. The Toluene levels ranged from below the method detection limit of 0.001 ppm in several wells to 0.04 ppm in MW-2. Ethylbenzene levels ranged from below method detection limit of 0.001 ppm in several wells to 0.37 ppm in MW-3. Xylene levels ranged from below method detection limit of 0.001 ppm in several wells to 0.64 ppm in MW-3. TPH levels ranged from below the method detection

1.0 REPORT SUMMARY

1.1 EXECUTIVE SUMMARY

The site, Lea Station, is located approximately 3.5 miles north of the town of Oil Center and 10 miles northwest of the city of Eunice in Lea County, New Mexico (Appendix A, Figure 1) and is utilized as a crude oil pipeline pump station.

A review of the analytical results from the Preliminary Site Assessment conducted in December 1992 indicated hydrocarbon-impacted soils (>100 ppm TPH) in borings B-2 (9,400 ppm TPH), B-4 (2,700 to 14,000 ppm TPH), B-5 (1,700 ppm TPH), and monitor well MW-1 (8,600 ppm TPH). Boring B-4 and monitor well MW-1 encountered water at approximately 28 feet.

Since the 25-27 foot interval of B-4 recorded a TPH level of 2,700 ppm, hydrocarbon-impacted groundwater was considered probable in the western portion of the site. Analytical results of groundwater samples obtained from MW-1 and an abandoned water (WW-1) located in the eastern portion of the site confirmed the presence of hydrocarbon-impacted groundwater.

The sump and pumping units near the center of the eastern portion of the site were identified as the potential source for the hydrocarbon-impacted soils identified in B-5, and the impacted soils and groundwater in monitor well MW-1 beneath portions of the eastern half of the site. The sump, pumps and/or subsurface piping located between tanks 1842 and 1843 were identified as the potential source of impacted soils and/or groundwater in boring B-4. The potential source of impacted soils identified in boring B-2 is the area undergoing bioremediation near the west boundary of the site.

TABLE OF CONTENTS

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

PHASE II
ENVIRONMENTAL SITE ASSESSMENT

LEA STATION
LEA COUNTY, NEW MEXICO

CURA PROJECT NO. 15-92567002.3

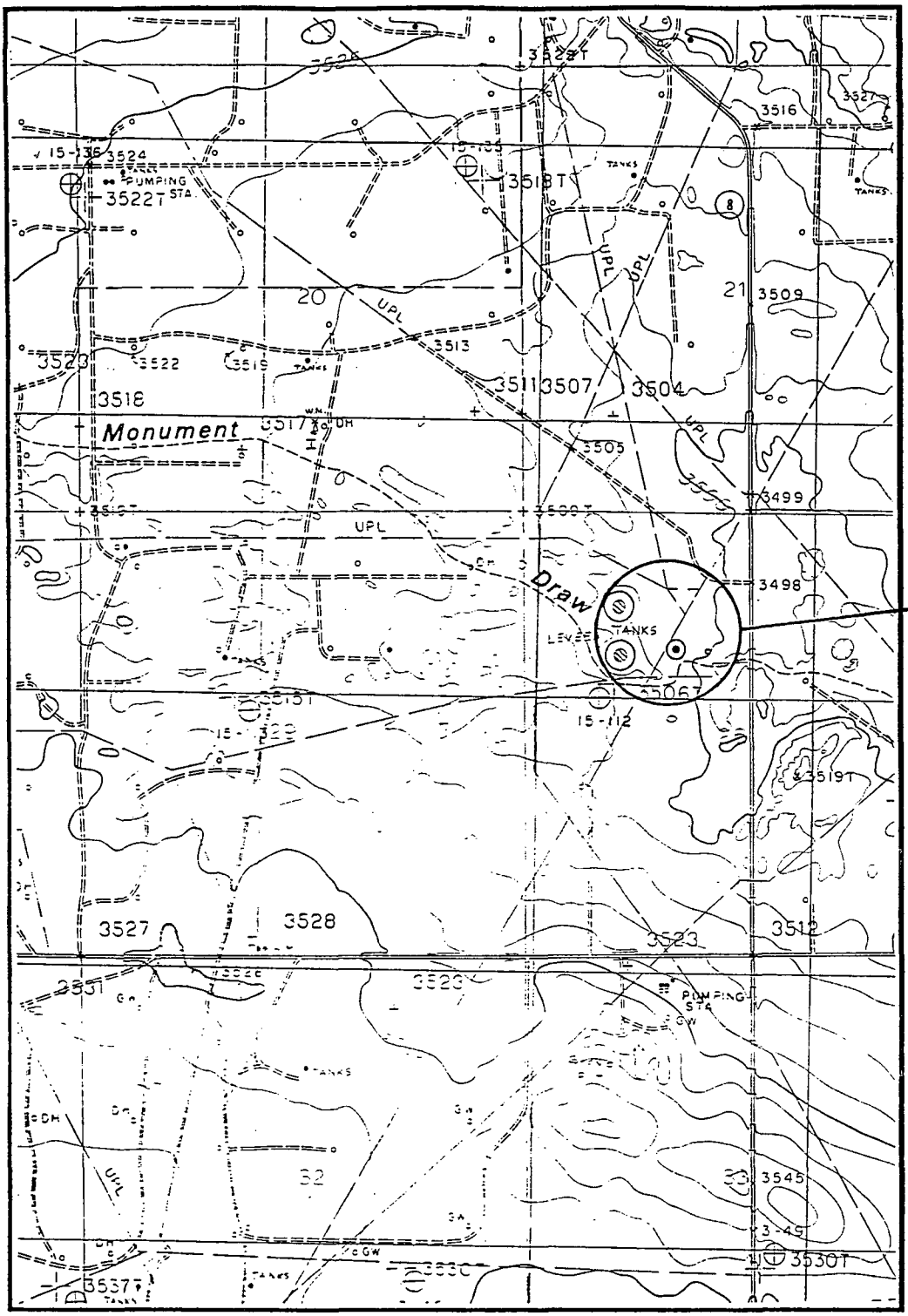
SHELL PIPE LINE CORPORATION
TWO SHELL PLAZA
P.O. BOX 2099
HOUSTON, TEXAS 77252-2099

March 12, 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



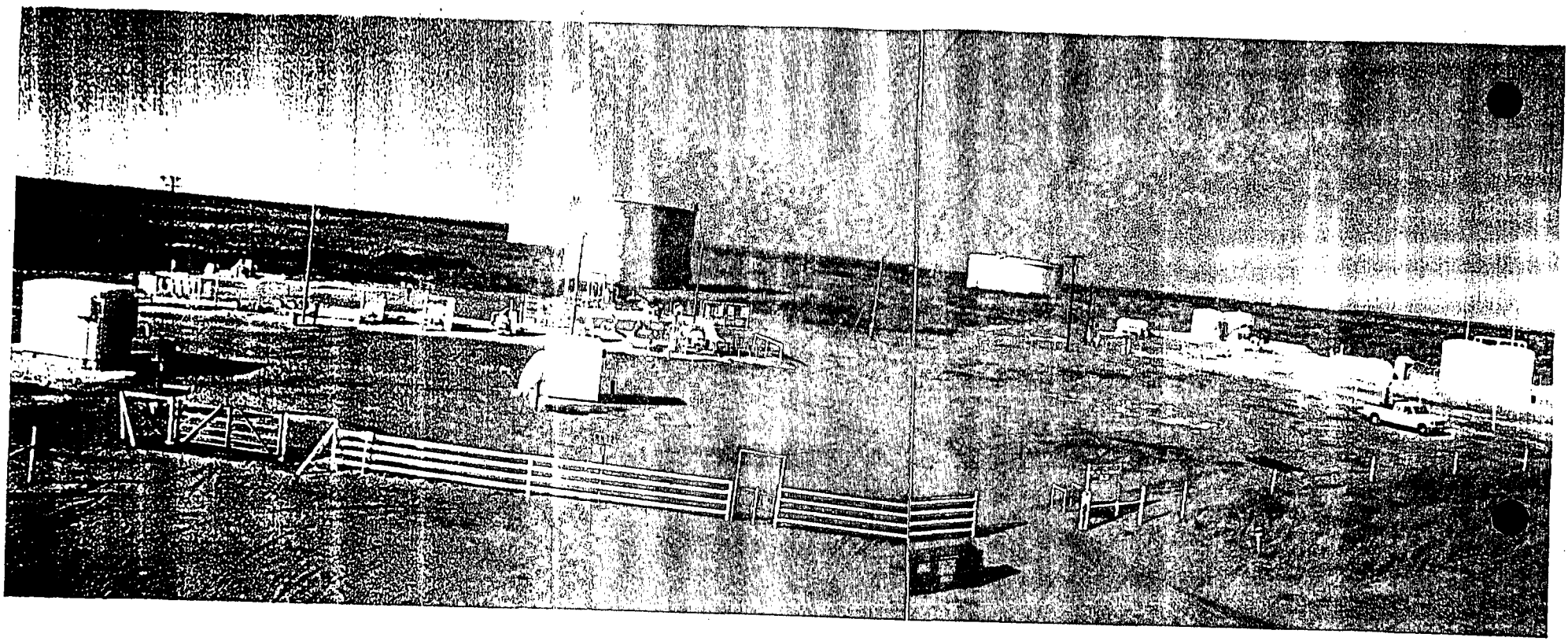
SITE LOCATION MAP

REF: USGS MONUMENT SOUTH, NEW MEXICO TOPOGRAPHIC QUADRANGLE (1985)

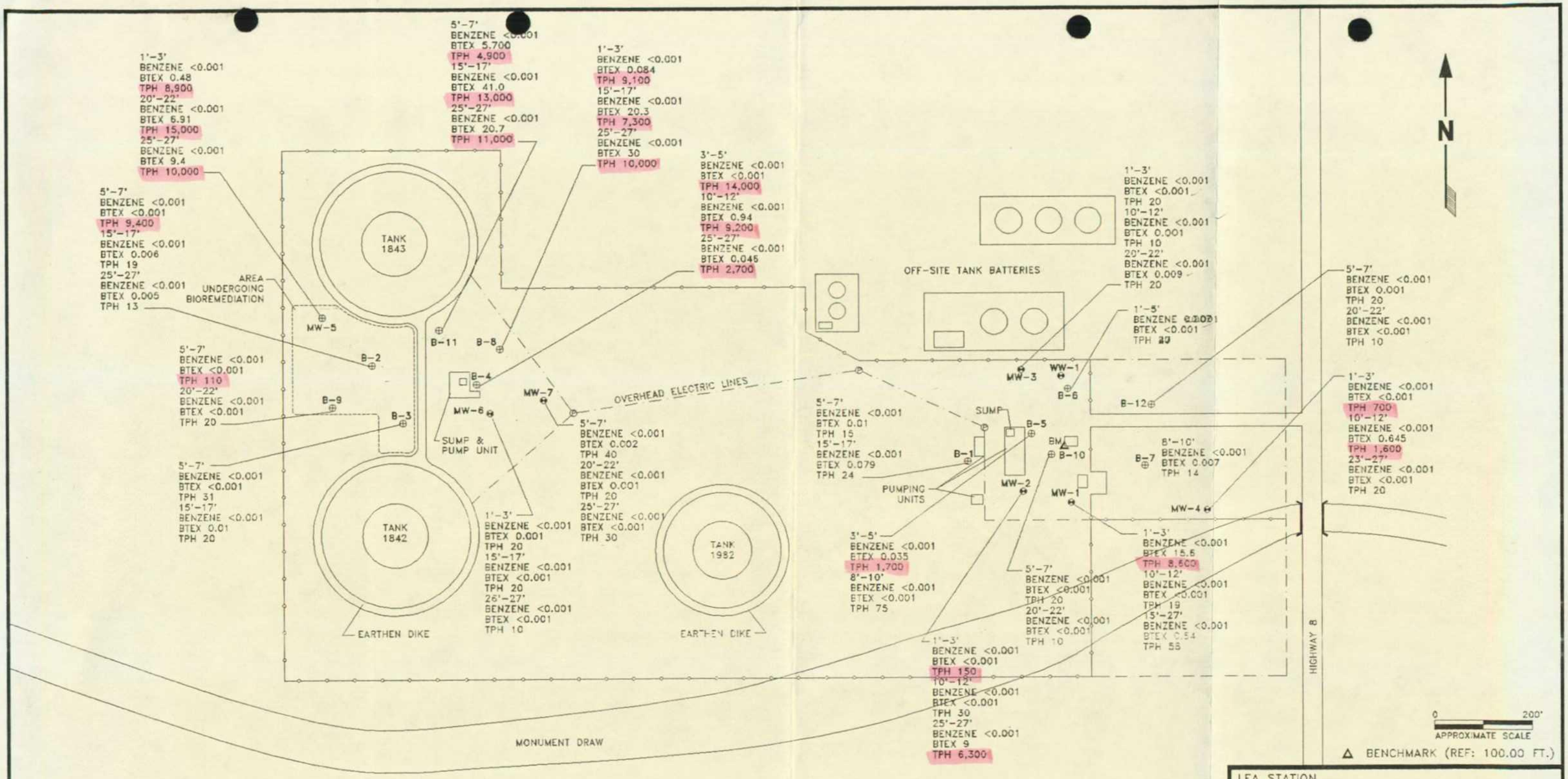
CURA INC.
2735 VILLA CREEK DRIVE - TWO METRO SQUARE
BLDG. C - SUITE 250 - DALLAS, TX 75234
620-7117 FAX - 620-8219

LEA STATION
SHELL PIPELINE CORPORATION
LEA COUNTY, NEW MEXICO

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



Photograph 1: Panoramic view looking west showing the Lea Station.



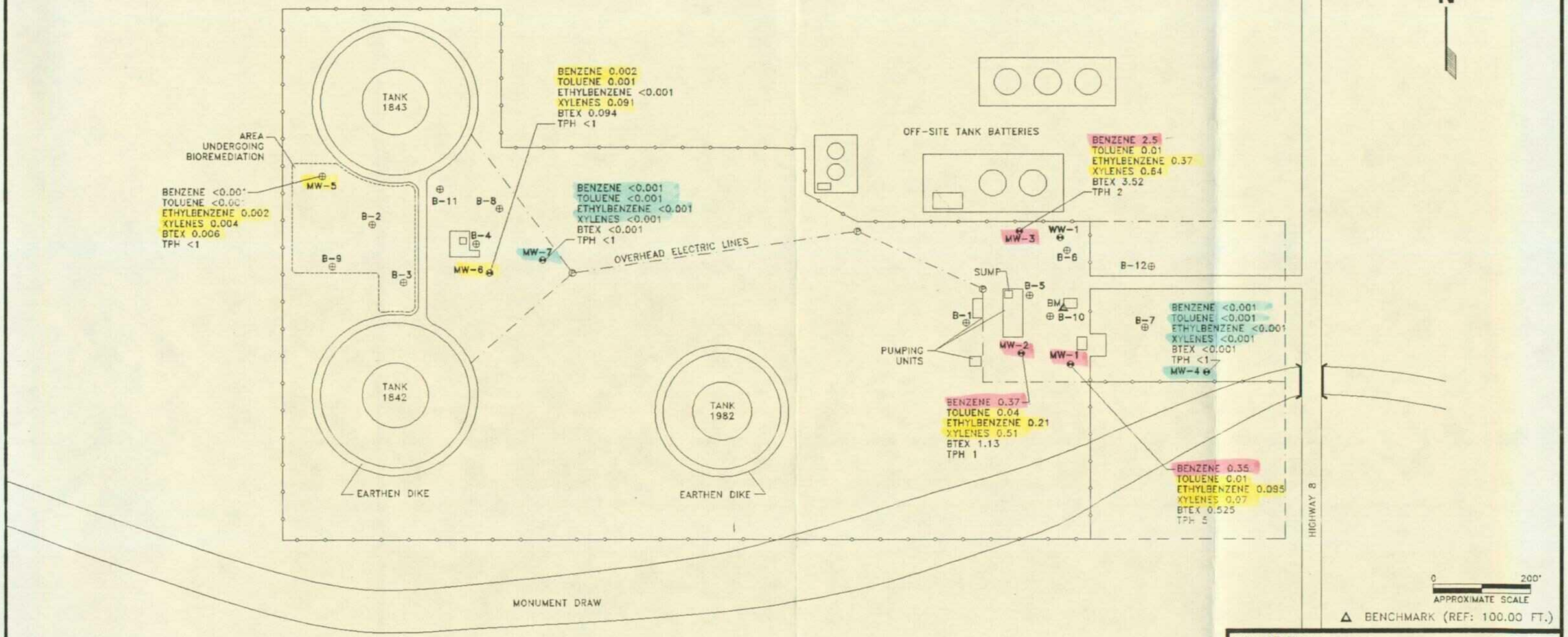
SITE MAP

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

LEA STATION
SHELL PIPELINE CORP.
LEA COUNTY, NEW MEXICO

DATE:	SCALE:
MARCH 1993	SEE ABOVE
PROJECT NUMBER: 15-92567	FIGURE NUMBER: 2

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



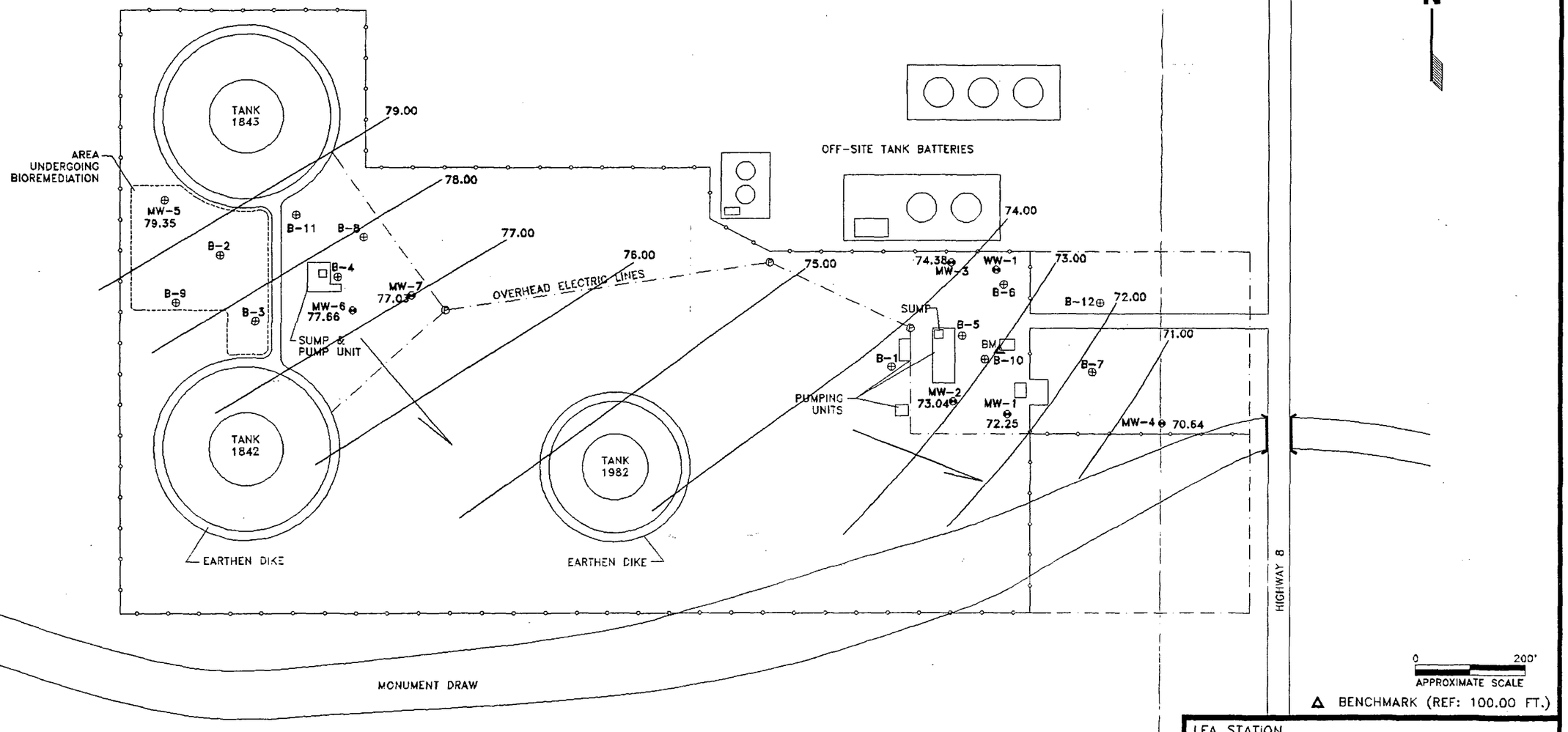
DISSOLVED HYDROCARBON MAP

RED NUMBERS INDICATE HYDROCARBON CONCENTRATIONS IN mg/l (ppm)

LEA STATION
SHELL PIPELINE CORP.
LEA COUNTY, NEW MEXICO

DATE:	SCALE:
MARCH 1993	SEE ABOVE
PROJECT NUMBER: 15-92567	FIGURE NUMBER: 3

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



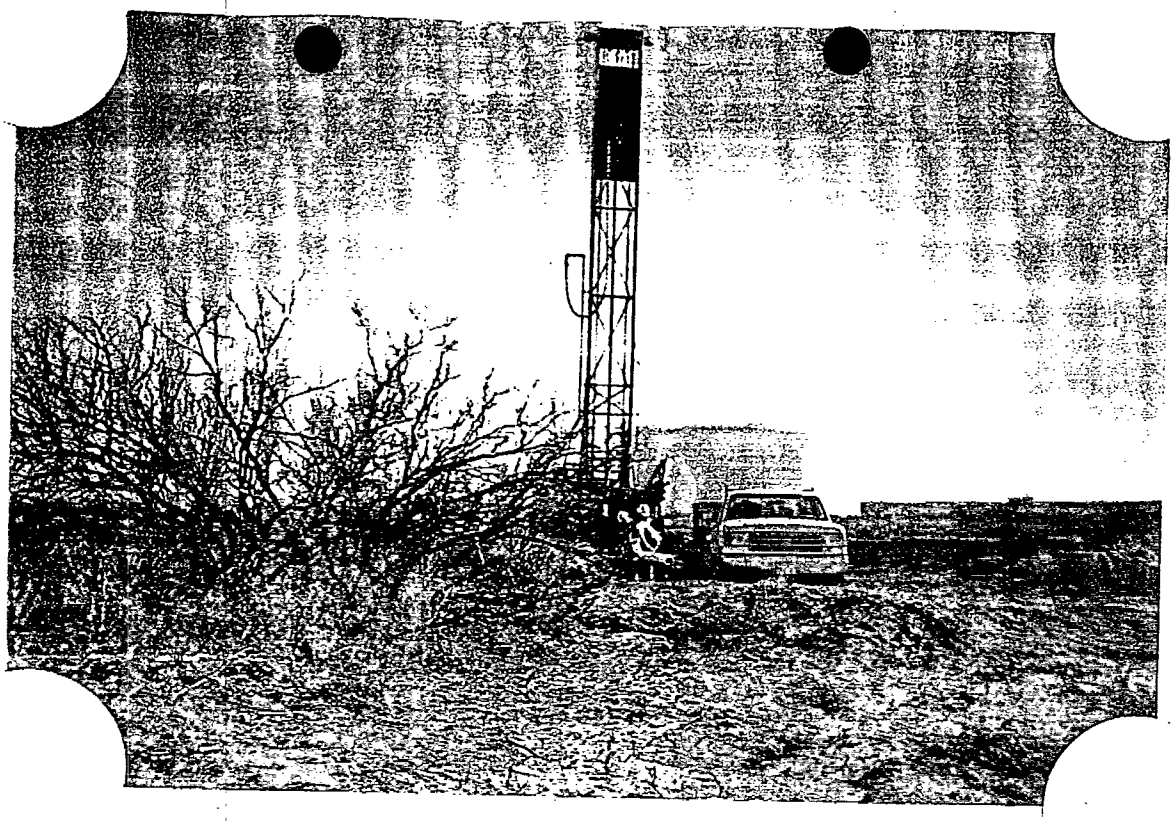
GROUNDWATER GRADIENT MAP

-WATER LEVELS OBTAINED 02/16/93
-CONTOUR INTERVAL = 1.00 FEET

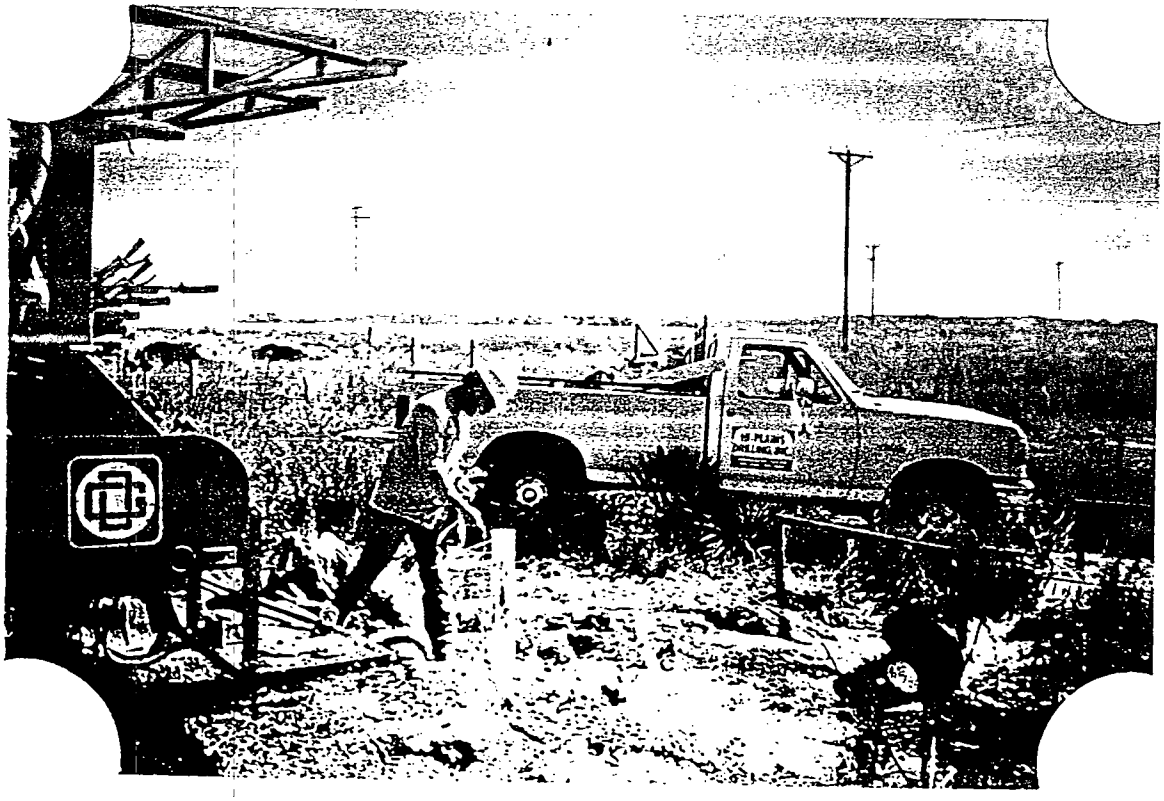
LEA STATION
SHELL PIPELINE CORP.
LEA COUNTY, NEW MEXICO

DATE:	SCALE:
MARCH 1993	SEE ABOVE
PROJECT NUMBER: 15-92557	FIGURE NUMBER: 4

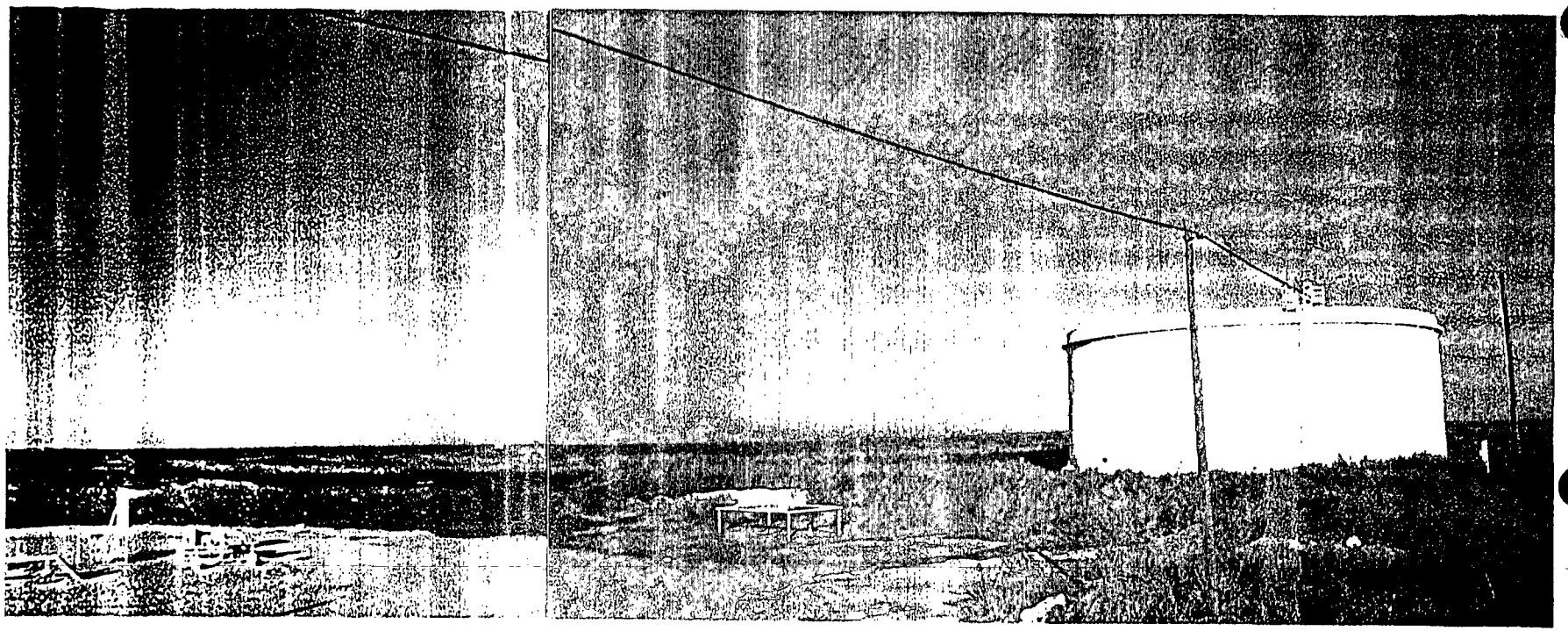
CURA INC.
2735 VILLA CREEK DRIVE - TWO METRO SQUARE
BLDG. C - SUITE 250 - DALLAS, TX 75234
620-7117 FAX - 620-8219



Photograph 2: View looking southeast showing well casing operations for MW-5 located near the northwest portion of the site.



Photograph 3: View looking south showing well completion operations for MW-4 located near the southeast portion of the site.



Photograph 4: Panoramic view looking northwest showing sump and pump (lower left), temporary breach in earthen dike (left center), and Tank 1842 (right center).

10.0 REFERENCES

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

CURA, Inc., January 15, 1993. Preliminary Site Assessment, Lea Station, Lea County, New Mexico. Midland, Texas.

Dinwiddie, G. A., 1963. Municipal Water Supplies and Uses, Southeastern New Mexico. Technical Report 29A. New Mexico State Engineer, Santa Fe, New Mexico.

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Oil Conservation Division, Memorandum, December 21, 1992. Final Draft OCD Surface Impoundment Closure Guidelines. Energy, Minerals and Resources Department, Santa Fe, New Mexico.

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Nicholson, Alexander, Jr., 1961. Geology and Ground-Water Conditions in Southern Lea County, New Mexico. United States Geological Survey, Ground-Water Report 6. New Mexico Bureau of Mines and Mineral Resources, Campus Station, Socorro, 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. Eunice, New Mexico, Quadrangle. 1969. Photorevised 1979.

USGS Topographic Survey Map. Oil Center, New Mexico, Quadrangle. 1984.

STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

BRUCE KING
GOVERNOR

ANITA LOCKWOOD
CABINET SECRETARY

April 5, 1993

POST OFFICE BOX 2088
STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO 87504
(505) 827-5800

CERTIFIED MAIL
RETURN RECEIPT NO. P-667-242-332

Mr. John B. Hite
Shell Oil Company
Two Shell Plaza
P.O. Box 2099
Houston, Texas 77252

RE: DISPOSAL OF CONTAMINATED GROUND WATER
SHELL LEA PUMP STATION
LEA COUNTY, NEW MEXICO

Dear Mr. Hite:

The New Mexico Oil Conservation Division (OCD) has reviewed your March 16, 1992 correspondence requesting authorization to inject contaminated ground water developed during installation of monitor wells at the Lea Pump Station into Shell's crude oil gathering system. Contaminated ground waters were discovered at the Lea Pump Station as part of an environmental assessments of the Denton, Hugh, Lea, Dublin and Anderson Ranch crude oil pump station locations in the Hobbs, New Mexico area.

The above referenced request **is hereby approved.**

The OCD requests that Shell provide OCD with copies of the final environmental site assessment reports for the stations with documented soil and ground water contamination.

The OCD commends Shell for their initiative in investigating potential environmental effects resulting from Shells activities at these stations.

If you have any questions, please contact me at (505) 827-5885.

Sincerely,

William C. Olson
Hydrogeologist
Environmental Bureau

xc: Jerry Sexton, OCD Hobbs District Supervisor

Shell Oil Company
Two Shell Plaza
P.O. Box 2099
Houston, Texas 77252

March 16, 1993

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

Gentlemen:

Subject: Lea Pump Station - Hobbs New Mexico Site Assessment

Shell Pipe Line Corporation is requesting approval to inject into our crude gathering system line approximately 400 gallons of water developed from the monitoring wells installed during the site assessment of our Lea Pump Station.

Cuva, Inc. sent a letter dated February 26, 1993, requesting to dispose of the water at the Paraho, Inc. facility in Eunice, New Mexico. We would rather inject the water into our crude gathering system lines.

A copy of the laboratory analytical report is attached for your review. Shell appreciates your assistance with their project.

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

Sincerely,

J B Hite/sbs

J. B. Hite

JBH/sbs

Attachment

cc - F. Wesley Root
Cuva, Inc.
3001 North Big Spring - Suite 101
Midland, TX 79705

Certificate of Analysis No. 9302476-08

Shell Pipe Line Corporation
P.O. Box 2099
Houston, TX 77252-2099
ATTN: John Hite

P.O.# MESA-1312-HO
DATE: 02/25/9

PROJECT: Lea Station
SITE: Lea County, New Mexico
SAMPLED BY: CURA Consultants
SAMPLE ID: Dev. Water

PROJECT NO: 15-92567.023
MATRIX: WATER
DATE SAMPLED: 02/16/93 16:45:0
DATE RECEIVED: 02/19/93

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	110	1 P	µg/
ETHYLBENZENE	50	1 P	µg/
TOLUENE	14	1 P	µg/
TOTAL XYLENE	120	1 P	µg/
TOTAL BTEX	294		µg/
METHOD 5030/8020 ***			
Analyzed by: DAO			
Date: 02/22/93			
Petroleum extractables	9	1	mg/
METHOD 418.1			
Analyzed by: PM			
Date: 02/22/93			

(P) - Practical Quantitation Limit

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
**Ref: Standard Methods for Examination of Water & Wastewater, 17th ed
***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

SPL, Inc., - Shari L. Grice

State of New Mexico
ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT
Santa Fe, New Mexico 87505

STATE OF NEW MEXICO
OIL CONSERVATION DIVISION

MEMORANDUM OF MEETING OR CONVERSATION

☑ Telephone ☐ Personal	Time	Date 3/10/93

Originating Party	Other Parties
Wes Root – CURA	Bill Olson – Envir. Bureau

Subject

Lea Station – Shell

Discussion

Contaminated G.W. proposal will amend 2/26/93 correspondence to request alternate disposal

Told him that OCD will require info related to G.W. investigation

Conclusions or Agreements

OCD will await new request for disposal

Distribution

Signed Bill Olson

CURA INC.
Environmental Consultants, Engineers & Scientists
3001 North Big Spring, Suite 101 • Midland, Texas 79705 • 915/570-8408 • FAX 570-8409

February 26, 1993

Oil Conservation Division
Environmental Bureau
Attn: Roger C. Anderson - Environmental Bureau Chief
State Land Office Building
P.O. Box 2088
Santa Fe, New Mexico 87504-2088

RE: DISPOSAL OF NON-HAZARDOUS CLASS II OIL AND GAS WASTE CONSISTING OF APPROXIMATELY 200 GALLONS OF CRUDE OIL-IMPACTED WATER

CURA PROJECT NO. 15-9256702.3

Dear Mr. Anderson:

CURA, Inc., on behalf of Shell Pipe Line Corporation is requesting approval to dispose of approximately 200 gallons of crude oil-impacted water at the Parabo, Inc. facility, Eunice, New Mexico.

The water was generated from monitor well development operations during an environmental site assessment. The site, Lea Station, is a crude oil pump station operated by Shell located on Highway 8 approximately 12 miles northwest of Eunice, New Mexico.

A copy of the laboratory analytical report is attached for your review. CURA and Shell appreciate your assistance with this project.

Respectfully,
CURA, Inc.

F. Wesley Root

F. Wesley Root
Environmental Geologist

FWR/chs

copy: Mr. John Hite - Shell Pipe Line Corporation

15925670.2NM

SPL®

Certificate of Analysis No. 9302476-08

Shell Pipe Line Corporation
P.O. Box 2099
Houston, TX 77252-2099
ATTN: John Hite

P.O.# MESA-1312-HOE
DATE: 02/25/9

PROJECT: Lea Station
SITE: Lea County, New Mexico
SAMPLED BY: CURA Consultants
SAMPLE ID: Dev. Water

PROJECT NO: 15-92567.023
MATRIX: WATER
DATE SAMPLED: 02/16/93 16:45:00
DATE RECEIVED: 02/19/93

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	110	1 P	µg/L
ETHYLBENZENE	50	1 P	µg/L
TOLUENE	14	1 P	µg/L
TOTAL XYLENE	120	1 P	µg/L
TOTAL BTEX	294		µg/L
METHOD 5030/8020 ***			
Analyzed by: DAO			
Date: 02/22/93			
Petroleum extractables	9	1	mg/L
METHOD 418.1			
Analyzed by: PM			
Date: 02/22/93			

(P) - Practical Quantitation Limit

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
**Ref: Standard Methods for Examination of Water & Wastewater, 17th ed.
***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

SPL, Inc., - Shari L. Grice

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

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