1R - 234

GENERAL CORRESPONDENCE

YEAR(S):
1994-1993

STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

BRUCE KING
GOVERNOR

2040 S. PACHECO
SANTA FE, NEW MEXICO 87505
(505) 827-7131

December 5, 1994

CERTIFIED MAIL
RETURN RECEIPT NO. P-667-242-182

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

RE: SITE REMEDIATION
DENTON 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 Pipe Line Corporation (SPLC) documents which were received by the OCD on October 3, 1994:

- September 30, 1994 "DENTON STATION, LEA COUNTY, NEW MEXICO".
- September 7, 1994 "CONTAMINANT REDUCTION PLAN, DENTON STATION, LEA COUNTY, NEW MEXICO, CURA PROJECT NO. 15-9367800F".
- September 7, 1994 "PHASE III ADDENDUM - SUBSURFACE INVESTIGATION, DENTON STATION, LEA COUNTY, NEW MEXICO, CURA PROJECT NO. 15-9367800D.3".
- September 7, 1994 "SOIL SAMPLING, DENTON STATION, LEA COUNTY, NEW MEXICO, CURA PROJECT NO. 15-93678C.3".

These documents contain the results of SPLC's investigations at the Denton Station and SPLC's proposed work plan for remediation of contaminated soil and ground water.

The proposed work plan for remediation of contaminated soil and ground water, as contained in the above referenced documents, is approved under conditions contained in the enclosed attachment.

Please be advised that OCD approval does not relieve SPLC 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 SPLC's activities. In addition, OCD approval does not relieve SPLC of responsibility for compliance with any other federal, state or local laws and/or regulations.

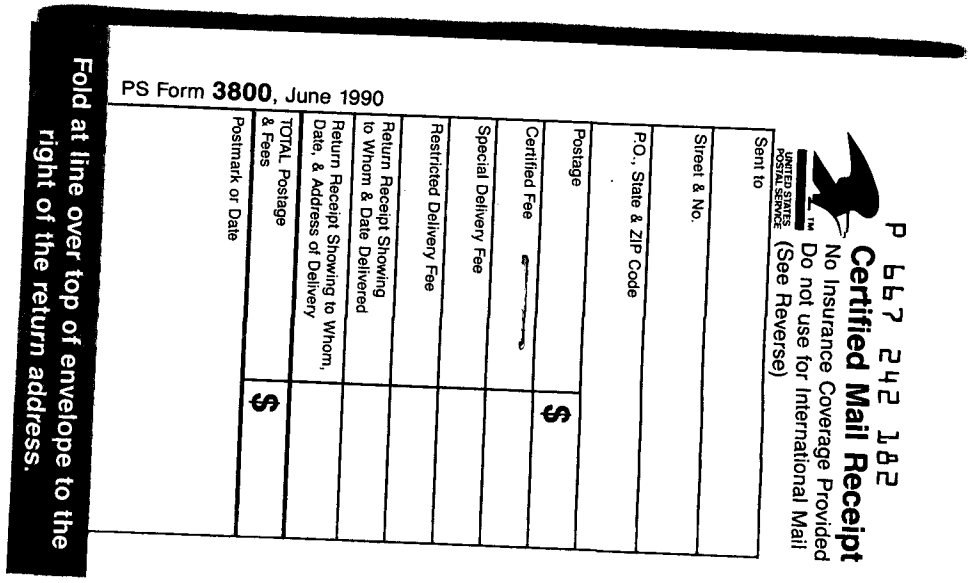
If you have any questions, please call me at (505) 827-5885.

Sincerely,

William C. Olson
Hydrogeologist
Environmental Bureau

Attachment

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



December 5, 1994

APPROVAL CONDITIONS
SOIL AND GROUND WATER REMEDIAL ACTION PLAN
SHELL OIL COMPANY
DENTON CRUDE PUMP STATION

1. Soil Remediation

SPLC will document the final levels of benzene, toluene, ethylbenzene, xylene (BTEX) and total petroleum hydrocarbons (TPH) in the landfarmed areas. A final report will be submitted to the OCD upon completion and will include a description and the results of all remediation activities including the volume excavated, the composition, volume and application rates of any materials used in bioremediation and the final remediation levels achieved in the excavated and landfarmed areas.

NOTE: **Field headspace measurements of 100 parts per million of total organic vapor, if determined in accordance with OCD guidelines (enclosed), may be substituted for a laboratory analysis of the concentrations of BTEX.**

2. Waste Disposal

Prior to disposal, SPLC will submit to the OCD for approval the proposed disposal method and location for all wastes generated.

3. Extent of Ground Water Contamination

SPLC will submit a work plan to completly define the downgradient extent of ground water contamination related to SPLC's activities.

4. Water Quality Monitoring

SPLC will monitor the water quality in monitor wells MW-2, MW-6 and MW-9 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 SPLC analyze ground water samples for TPH.

5. Quarterly Reports

Quarterly reports will be submitted to the OCD on March 1, June 1, September 1 and December 1 of each year. 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.

c. The total volume of product pumped from the recovery wells and the volume pumped from each well during the quarter and to date.

d. A water table elevation map showing the elevation of the water table in all wells and the direction of the hydraulic gradient.

6. Tank Berming

All above ground tanks used to contain fluids other than non-contaminated fresh water will be bermed such that they can contain one and one-third times the volume of the largest tank or all interconnected tanks.

7. Notification

SPLC 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.

8. 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

September 30, 1994

Mr. William Olson
State of New Mexico Oil Conservation Division
Environmental Bureau
P. O. Box 2088
Santa Fe, New Mexico 87504-2088

SUBJECT: DENTON STATION, LEA COUNTY, NEW MEXICO

Dear Mr. Olson:

The following is in response to the comments in your letter to Shell Pipe Line Corporation of December 1, 1993, regarding Denton Station.

Comment 1 Samples designated as SB-1A, SB-2-1-1A, and SS-1A were collected from the areas previously sampled by Weston, (SB-01, SB-02, and SS-1A respectively). Samples SS-1A and SB-1A were analyzed for extractable lead, and SB-2-1A was analyzed for extractable barium, lead and chromium. The total cadmium reported in the Weston report was below the TCLP Toxicity level so therefore we did not analyze for cadmium. All results (enclosed) were less than the threshold for hazardous waste.

Comment 2 The soils proposed to be excavated and or landfarmed will be tilled in-place or mixed with clean soil and backfilled. The affected soils will be mixed or tilled to obtain a TPH level of 5,000 ppm or less, a Benzene/BTEX level not to exceed 10/50 ppm or a field headspace measurement of 100 ppm Total Organic Vapor.

Comment 3 Enclosed is a "Contamination Reduction Plan" for Denton Station. The October and November 1993 letters considered a groundwater recovery plan, however we feel it would be more prudent to address the remediation in a phased approach. Our plan is to 1)-conduct the landfarming/excavation as per Comment 2 above, and 2)-install a product recovery system that recovers only the Phase Separated Hydrocarbon. We will also continue our

semi-annual groundwater monitoring. Upon completion of the PSH recovery, the next phase would involve treatment of the dissolved phase in the ground water and additional soil remediation.

Comment 4 Enclosed is a copy of the "Phase II Addendum-Subsurface Investigation, Denton Station". This investigation delineates the extent of the ground water contamination at Denton.

Comment 5 The first phase of the remediation is to recover the Phase Separated Hydrocarbon as opposed to either a total fluids recovery or ground water extraction and treatment system. We will address this issue in conjunction with our future ground water treatment plans.

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

Sincerely,

Neal Stidham
Transportation Engineering

Enclosures

cc: Mr. Paul Newman
EOTT Energy Corporation

CURA INC.
Environmental Consultants, Engineers & Scientists
2735 Villa Creek Drive • Building C • Suite 250 • Dallas, Texas 75234 • 214/620-7117 • FAX 620-8219

September 7, 1994

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

RE: CONTAMINATION REDUCTION PLAN

DENTON STATION
LEA COUNTY, NEW MEXICO
CURA PROJECT NO. 15-9367800F

Mr. Stidham:

CURA, Inc. (CURA) is pleased to present this plan to prepare and implement a contamination reduction system for the crude oil impacted area at the above-referenced facility. This plan was prepared based on information obtained during previous site investigation activities performed by CURA, subsequent discussions with Shell Pipe Line Corporation (SPLC) and in response to previous New Mexico Oil Conservation Division written comments (December 1, 1993). SPLC will be in direct communication with the New Mexico Oil Conservation Division. As requested, CURA will support the regulatory interface efforts.

Background

Soil boring and monitor well operations performed at the subject facility during previous subsurface investigations have identified crude oil impacted soil and groundwater. The impact includes shallow subsurface soil impact, phase-separated hydrocarbons (PSH) consisting of free-floating crude oil, and dissolved hydrocarbon constituents in the groundwater. SPLC has requested CURA to develop a plan and install a recovery system to recover PSH only and conduct operation and maintenance of the recovery system.

This plan outlines CURA's scope of services, the proposed project approach, and the project schedule for preparing and implementing the plan for the above-referenced facility.

SCOPE OF SERVICES

CURA's Contamination Reduction Plan (CRP) consists of a PSH recovery system designed to remove the free-floating crude oil with minimal groundwater recovery. Upon review and approval by SPLC and the New Mexico Oil Conservation Division as an acceptable remediation method, implementation of the CRP and subsequent monitoring will be performed. The CRP includes the following:

- Installation of a PSH-only recovery system
- System operational start-up
- Performance monitoring
- Operation and maintenance activities
- Reporting

APPROACH

CURA's CRP is based on efforts to recover PSH from the hydrocarbon impacted groundwater utilizing PSH pump recovery to remove free-floating crude oil. PSH-only pumps will be installed in monitor wells MW-3, MW-5, MW-7 and abandoned water well WW-1. The four recovery wells will be manifolded to a centrally located recovery system to reduce capital costs. The proposed system of PSH recovery will allow feasible remedial efforts in the form of maximum PSH recovery, with minimum recovery of groundwater. Crude oil influx rates observed during previous gauging and hand bailing operations indicate that initial PSH recovery can be accomplished without the installation of a groundwater recovery system. As PSH recovery volumes level out and decline over time, the system can be modified to a dual pump recovery system utilizing a groundwater pump to create a cone of depression to induce PSH flow towards the well bores.

PSH Recovery System Installation/Recovery Evaluation

Upon receiving SPLC notice to proceed, CURA will proceed with system installation. Four PSH pumps will be installed in monitor wells MW-3, MW-5, MW-7 and WW-1. Each

recovery well will contain a pneumatic powered pump capable of recovering PSH with a specific gravity less than 0.9.

The system is expected to consist of the following primary components:

- Oil/water separator
- Four PSH recovery pumps and controller, with accessories
- One 500-gallon hydrocarbon recovery tank with level switches
- Sensor cable, conduits, flowmeters, air/fluid hoses
- Associated piping to connect components
- Control panel
- Equipment skid (portable) with housing
- Air compressor with accesssories
- Transfer pump
- Well vaults
- One 1,000-gallon water tank with level switches
- Telemetry system

Upon completion of recovery system installation, CURA will perform startup to monitor recovery volumes and flow rates. The flow rates will be adjusted to maximize PSH recovery. Recovered PSH will be discharged into the onsite pipeline sump.

Performance Monitoring/Operations and Maintenance

CURA will have the primary responsibility for operation and maintenance of the system. We will complete annual scheduled performance monitoring to confirm the system efficiency and effectiveness. A telemetry system will be utilized to report down time system failures. CURA personnel will respond to system failures within 48 hours. A system log will be kept to record system performance and any down time responses. 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 for routine maintenance scheduled thereafter. The following will be conducted during each visit:

- Obtain fluid measurements (PSH thickness and groundwater elevations)
- Obtain PSH recovery volumes and run time readings from system.
- Check system components with routine maintenance as necessary or scheduled.

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:

Activity	Weeks Following Notice to Proceed
Order system components	1
Complete system installation	8
Complete system startup	10
Complete System Installation Report	14

CURA appreciates the opportunity to present this change order and will began work upon receipt of a blanket order release number. The associated costs to implement this plan will be submitted under a separate cover. If you have any questions please contact Wes Root at (915) 570-8408 or Michael A. Clark at (214) 620-7117.

Respectfully,
CURA, Inc.

F. Wesley Root
Environmental Geologist

Michael A. Clark, P.E.
Vice President

FWR/chs

CURA INC.
Environmental Consultants, Engineers & Scientists
3001 North Big Spring, Suite 101 • Midland, Texas 79705 • 915/570-8408 • FAX 570-8409

September 7, 1994

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

RE: PHASE III ADDENDUM - SUBSURFACE INVESTIGATION
DENTON STATION
LEA COUNTY, NEW MEXICO

CURA PROJECT NO. 15-9367800D.3

Mr. Stidham:

CURA, Inc. has completed the Phase III Addendum - Subsurface Investigation at the above-referenced facility. The work was performed in accordance with the Scope of Services outlined in CURA's Change Order No. 15-049419 dated April 13, 1994 as requested by Shell Pipe Line and as outlined by the New Mexico Oil Conservation Division (OCD) December 1, 1993, letter. The field investigation included the drilling and sampling of six soil borings to total depths ranging from 60 feet to 74 feet and subsequent conversion of four borings to monitoring wells. Based on conditions observed in the field during this subsurface investigation, two additional borings and two additional monitoring wells were completed in addition to the original Scope of Services. The additional work was performed as verbally approved by Shell. The borings (B-12, B-13, MW-4, MW-5, MW-6, MW-7, MW-8, and MW-9) were completed to delineate the hydrocarbon-impacted soils and phase separated hydrocarbons (crude oil; PSH) previously identified at the site. Results from previous subsurface investigations identified hydrocarbon impacted soils and/or groundwater in monitoring wells MW-1 and MW-3, and the on-site abandoned water well WW-1.

Based on the findings of this subsurface investigation, delineation of groundwater conditions with respect to petroleum hydrocarbons is complete along the northern, western, and southern boundaries of the site. Dissolved hydrocarbons and/or PSH identified in MW-1,

MW-4, and MW-6 indicate hydrocarbon impact possibly extends off-site along the facility's east boundary.

Excavation (trenching) of potential source areas by Shell personnel in March 1994 indicated that the sump, abandoned pipelines, active pipelines, and associated subsurface piping were not the source of PSH observed on site. The source of hydrocarbon-impacted groundwater appears to be from a former crude oil tank battery location (Tanks 1979 and 1980) in the vicinity of MW-5.

SOIL BORING OPERATIONS/MONITOR WELL INSTALLATION

During the period from May 4, 1994 to May 10, 1994, eight soil borings/monitor wells were drilled to depths ranging from 60 to 72 feet. Monitor well placement and screened interval depth was specifically designed to evaluate hydrogeologic conditions. Monitoring wells (MW-4 through MW-9) were each drilled to a depth of approximately 72 feet using an air rotary drilling rig to delineate groundwater conditions and identify potential source areas. The screened interval in each of the wells extends from approximately 42 feet below ground surface to a total depth of approximately 72 feet and was designed to screen the upper 18 foot to 20 foot portion of the shallow groundwater aquifer.

Monitoring wells MW-4 and MW-5 were placed adjacent to potential source areas in the apparent downgradient (southeast) side of the sump and former Tank No. 1979, respectively. Boring B-13 was placed adjacent to former Tank No. 1979 and upgradient to the potential source area. Monitoring well MW-6 was located near the eastern property boundary to determine if off-site migration of petroleum hydrocarbons occurred in that direction. Borings B-12 and MW-8 (upgradient) and MW-9 (downgradient) were placed along the northern and southern property boundaries, respectively, to determine if off-site sources were likely or whether off-site migration occurred.

The monitoring wells were constructed of 4-inch diameter schedule 40 PVC well casing and screen. The screened portion of the monitoring wells was surrounded by a sandpack which

was capped with a bentonite seal (minimum thickness of 25 feet). The annular space above the bentonite seal was then grouted to surface. A 3-foot by 3-foot concrete pad and an above grade steel monument pipe well cover were installed at the surface. A complete description of each monitor well's construction is illustrated by well construction diagrams included in Appendix B.

SITE GEOLOGY/HYDROGEOLOGY

The soils encountered during the boring operations consisted of 25 feet of buff-white and tan calcareous silty fine-grained sand (caliche) which is overlain in areas by 1 foot to 2 feet of brown slightly calcareous sand (SM). The buff-white caliche grades into a pink calcareous fine-grained sand (SM) at approximately 25 feet. This sand contained intermittent red medium-grained sandstone streaks and extended from 25 feet to a depth of 72 feet (maximum boring depth). Indurated zones of calcareous sand (caliche) of varying thickness were encountered at depths ranging from 3 feet to 70 feet below ground surface across the entire site. These zones appear discontinuous in nature.

After the additional monitor wells were installed and surveyed, monitor wells MW-1 through MW-9 and water well WW-1 were gauged on May 10, 1994 to determine the presence of PSH, groundwater elevation, and direction of groundwater flow. Depth to the water table ranged from approximately 52 feet to 56 feet below ground surface with the apparent direction of groundwater flow toward the southeast. A hydraulic gradient of 0.00171 was calculated for the eastern half of the site based on the groundwater gradient map (Appendix A, Figure 3). PSH thicknesses ranging from 0.16 feet to 3.80 feet were observed in on-site monitoring wells (MW-1, MW-3, MW-5, and MW-7) and the abandoned water well during gauging operations. One probable source area for the crude oil in the monitoring wells and abandoned water well appears to be the former tank battery area (Tank 1979) in the vicinity of monitoring well MW-5. The sump area and potential off-site sources do not appear to be contributing to the presence of PSH observed on site. A summary of groundwater elevation measurements and PSH thicknesses is listed in Table 3 (Appendix C).

The boring logs are included in Appendix B and provide a more detailed description of the subsurface conditions encountered at the site.

GROUNDWATER SAMPLING

The wells were gauged on May 10 and May 11, 1994 to determine the depth to groundwater and PSH thickness. A summary of groundwater data including depth to water and PSH thickness is presented in Table 3, Appendix B.

Monitoring wells MW-2, MW-4, MW-6, MW-8, and MW-9 were power developed using a submersible pump by removing approximately 45 gallons, 55 gallons, 55 gallons, 55 gallons, and 55 gallons, respectively. The purged groundwater was stored on-site in labelled drums pending proper disposal in accordance with NMOCD regulations.

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 TPH using EPA Method 8020 and EPA Method 418.1, respectively. Quality Assurance/Quality Control information is included in Appendix F.

SOIL ANALYTICAL RESULTS

Soil samples were collected intermittently using a split spoon sampling device and a conventional 5 foot core barrel. The samples were field screened with a Century 128 organic vapor analyzer (OVA). The soil samples which registered the highest OVA reading, had the greatest hydrocarbon odors or staining, and the samples from the greatest depth above groundwater were submitted to the laboratory to be analyzed for benzene, toluene, ethylbenzene, and total xylenes (BTEX); and total petroleum hydrocarbons (TPH) using EPA Method 8020 and EPA Method 418.1, respectively. Quality Assurance/Quality Control information is included in Appendix F.

During this assessment no significant hydrocarbon concentrations (>10 ppm benzene, >50 ppm total BTEX, >100 ppm TPH, or >100 ppm OVA) were observed in boring B-12, monitoring wells MW-4, MW-8, and MW-9; the upper 45 to 50 feet of monitoring wells MW-5, MW-6, and MW-7; or the lower 40 to 50 feet of boring B-13. However, the soil sample analytical results indicate a hydrocarbon-impacted interval is present at a depth of approximately 50 feet in monitoring wells MW-4, MW-5, MW-6, and MW-7. This interval recorded TPH levels ranging from 430 ppm to 19,000 ppm and BTEX levels ranging from <0.001 ppm to 186.7 ppm. In general, the bottom 10 foot cored interval (45 feet to 55 feet) of monitoring wells MW-5, MW-6, and MW-7 indicated an increase in hydrocarbon concentrations toward the base of the cored interval near the groundwater table based on visual observations (odor and staining), OVA readings, and analytical results.

A complete listing of the OVA readings and the soil sample analytical results is provided in Table 1 (Appendix C). Hydrocarbon concentrations of the subsurface soils are illustrated on the site map (Appendix A, Figure 1). The laboratory reports and chains-of-custody are included in Appendix D.

GROUNDWATER ANALYTICAL RESULTS

Monitoring wells MW-2, MW-4, MW-6, MW-8, and MW-9 were gauged, developed, and sampled by CURA on May 10 and 11, 1994. The groundwater samples were analyzed for dissolved oxygen (DO) content, BTEX, and TPH. Monitor wells MW-1, MW-3, MW-5, MW-7, and water well WW-1 were not sampled due to the presence of PSH.

Total dissolved BTEX and TPH levels ranged from less than the method detection limit of 0.001 mg/l (parts per million; ppm) and 1 ppm, respectively in monitoring wells MW-8 (crossgradient) and MW-9 (downgradient) to a BTEX level of 1.024 ppm in MW-6 and a TPH level of 2 ppm in MW-4. Benzene concentrations ranged from below method detection limits to 0.92 ppm in MW-6.

The elevated dissolved hydrocarbon concentrations exhibited in MW-6 and MW-4 confirm the presence of impacted groundwater previously identified in MW-1, MW-2, and MW-3. The groundwater analytical results indicate the dissolved hydrocarbon plume is primarily restricted to the southeastern portion of the site.

A summary of the water analytical results is presented in Table 2 (Appendix C). A dissolved hydrocarbon concentration and PSH thickness map is illustrated in Figure 2 in Appendix A. The laboratory reports and chain-of-custody are included in Appendix D. Quality Assurance/Quality Control information is included in Appendix E.

PSH RECOVERY RESULTS

Previous investigations identified approximately 7.97 feet of PSH (crude oil) in abandoned water well WW-1 on February 26, 1993. Subsequent monitoring operations identified 8.25 feet in MW-3, and 0.32 feet of PSH in MW-1 on March 17, 1994. Thicknesses of crude oil ranging from approximately 0.3 feet to 8.0 feet have periodically been gauged and bailed out of the abandoned water well (WW-1) and monitoring wells MW-1 and MW-3 during gauging events conducted since February 26, 1993. PSH recovery operations by hand bailing have recovered 184.5 gallons of crude oil from WW-1 during 14 recovery events between February 26, 1993 to May 25, 1994. Approximately 19.2 gallons of crude oil have been recovered to date by manual bailing from monitoring wells MW-1 and MW-3. During this investigation gauging operations conducted on May 25, 1994 identified 6.80 feet and 1.95 feet of PSH in MW-5 and MW-7, respectively.

Based on historical gauging data of near static conditions (prior to bailing), crude oil (PSH) thickness across the site ranges from approximately 8.0 feet in MW-3 and WW-1 to approximately 0.3 feet in WW-1 with no PSH observed in MW-2, MW-4, MW-6, MW-8, or MW-9.

A summary of PSH recovery operations in presented in Table 4, Appendix C.

CONCLUSIONS

- PSH thicknesses ranging from 0.16 feet in MW-1 to 3.80 feet in the abandoned water well were observed on-site on May 10, 1994. Approximately 184.5 gallons of crude oil has been recovered from the on-site monitoring wells and abandoned water well through May 1994.

- The analytical results, the presence of PSH, and direction of groundwater flow indicate that hydrocarbon impact may extend off-site along the site's east boundary.

- The analytical results for monitoring wells MW-8 (upgradient) and MW-9 (downgradient) and boring B-12 indicate that no off site migration has occurred across the north, south, and west property boundaries.

- Excavations (trenching) near potential source areas by Shell in March 1994 indicated that the sump, abandoned pipelines, active pipelines, and associated subsurface pipeline components were not sources of PSH observed on site. Based on the findings of this subsurface investigation, the source of the hydrocarbon-impacted groundwater appears to be from the former tank battery location (Tanks 1979 and 1980) adjacent to MW-5.

- Groundwater samples from monitoring well MW-8 (upgradient from potential on-site sources) and MW-9 (downgradient) recorded BTEX and TPH concentrations below method detection limits and represent background water quality conditions.

RECOMMENDATIONS

CURA recommends the installation of an automated PSH only recovery system to actively recover free-floating crude oil, while minimizing the amount of associated water recovered. PSH recovery by manual bailing on a bi-monthly schedule should be continued until an automated recovery system has been installed.

CURA is currently working on a preliminary system design and will present a formal workplan upon completion. CURA appreciates the opportunity to provide you with our professional consulting services. If you have any questions, please do not hesitate to contact us.

Respectively,
CURA, Inc.

F. Wesley Root
Environmental Geologist

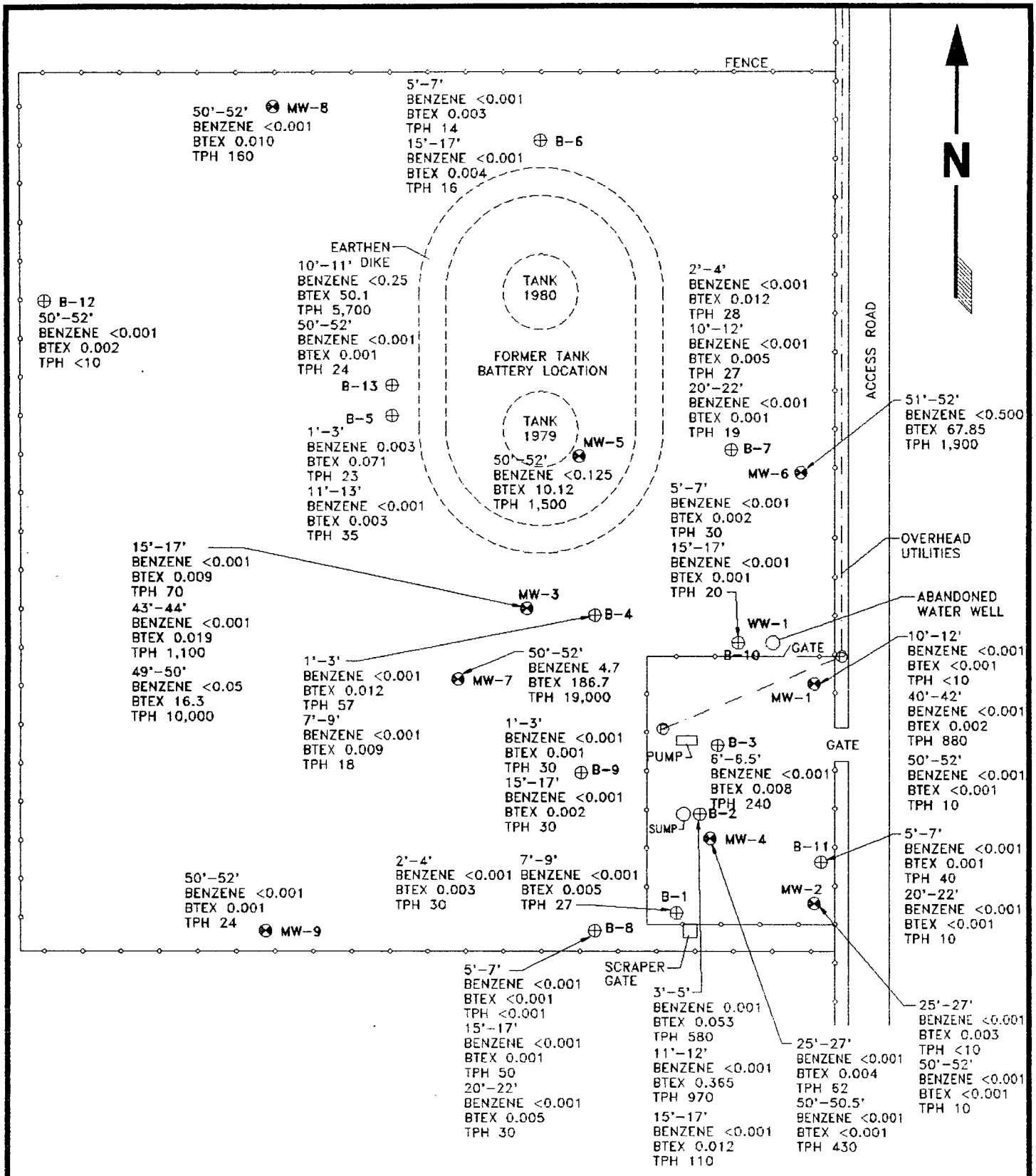
for Michael A. Clark, P.E.
Vice President/Operations

FWR/chs

Attachments

APPENDIX A

FIGURES



SOIL HYDROCARBON CONCENTRATION MAP

-BENZENE, BTEX AND TPH CONCENTRATIONS LISTED IN mg/kg (ppm)

0 100'

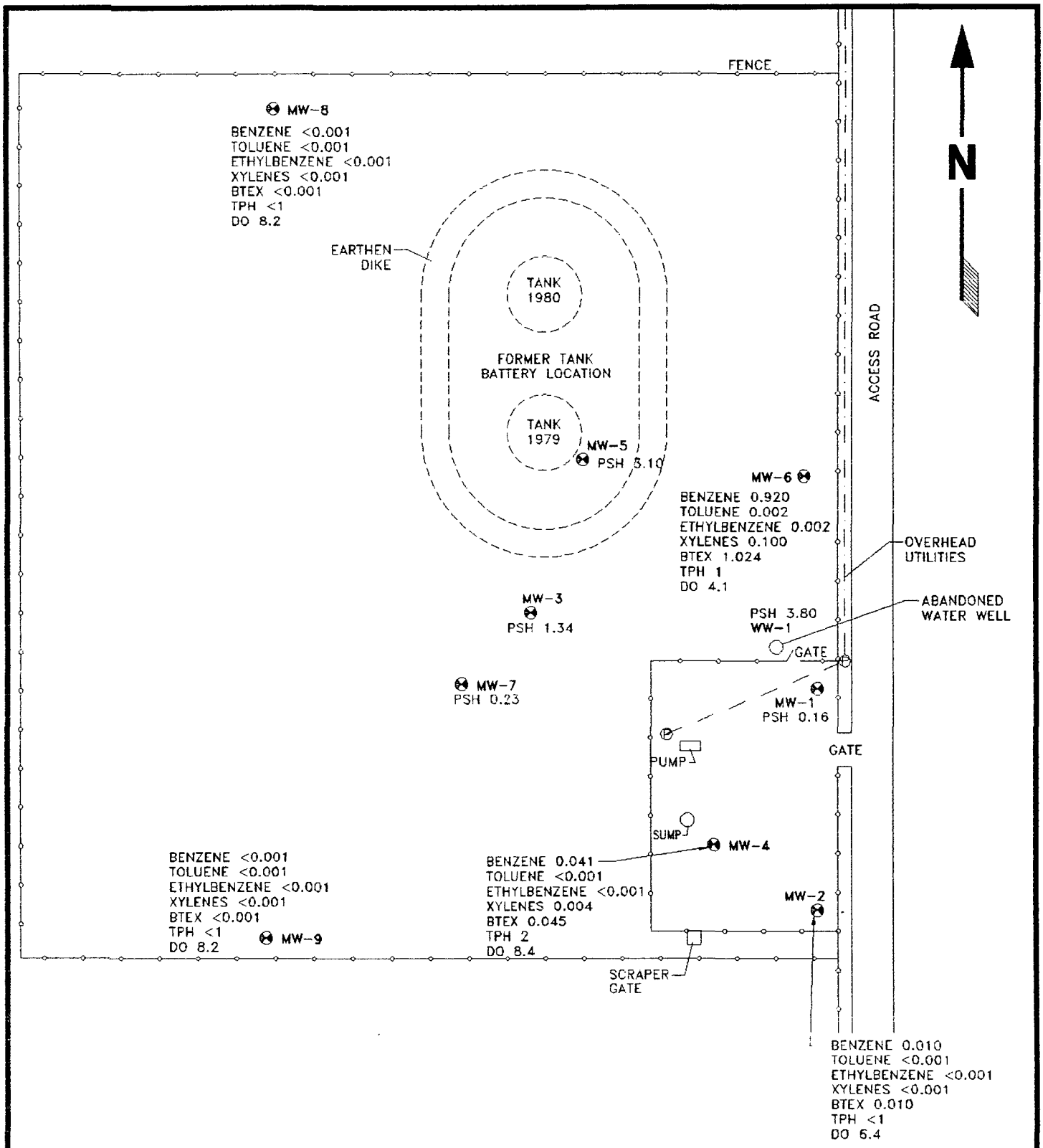
APPROXIMATE SCALE

CURA INC.

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

DENTON STATION
SHELL PIPE LINE CORPORATION
LEA COUNTY, NEW MEXICO

DATE:	SCALE:
MAY 1994	SEE ABOVE
PROJECT NO.	FIGURE NO.
15-93678	1



DISSOLVED HYDROCARBON CONCENTRATION MAP

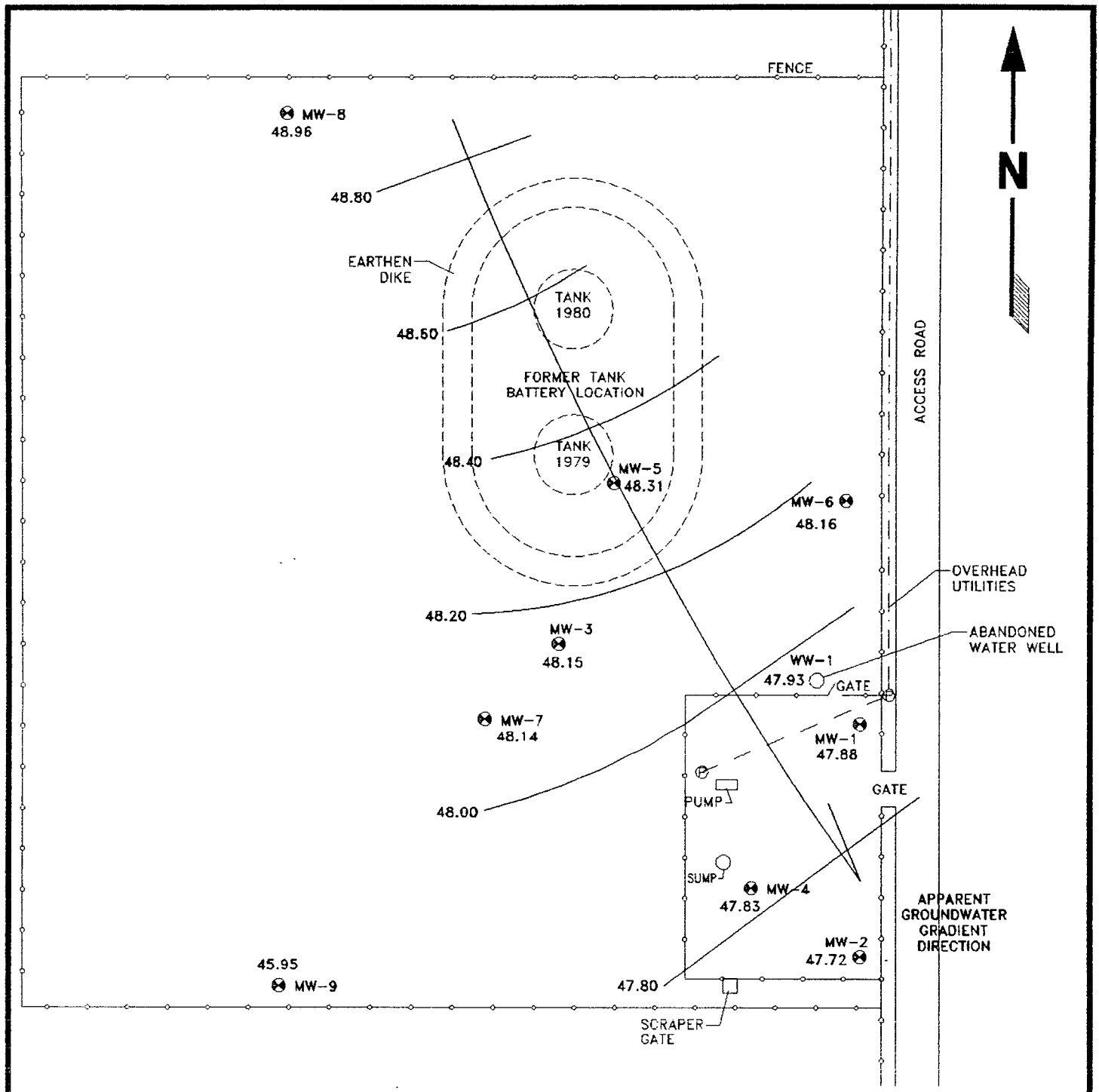
-SAMPLES OBTAINED 05/10/94 AND 05/11/94
-BTEX, TPH AND DO CONCENTRATIONS LISTED IN mg/l (ppm)
-PSH THICKNESS LISTED IN FEET

0 100'
APPROXIMATE SCALE

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

DENTON STATION
SHELL PIPE LINE CORPORATION
LEA COUNTY, NEW MEXICO

DATE:	SCALE:
MAY 1994	SEE ABOVE
PROJECT NO.	FIGURE NO.
15-93678	2



GROUNDWATER GRADIENT MAP

-WATER LEVELS OBTAINED 05/10/94
-CONTOUR INTERVAL = 0.20 FEET
-MW-9 NOT USED IN CONTOURS DUE TO INCONSISTENT DATA.

0 100'
APPROXIMATE SCALE

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

DENTON STATION
SHELL PIPE LINE CORPORATION
LEA COUNTY, NEW MEXICO

DATE:	SCALE:
MAY 1994	SEE ABOVE
PROJECT NO.	FIGURE NO.
15-93678	3

APPENDIX B

SOIL BORING LOGS

CRA INC.
2735 VILLA CREEK DRIVE - TWO METRO SQUARE
BLDG. C - SUITE 250 - DALLAS, TEXAS
(214) 620 - 7117

RECORD OF SUBSURFACE EXPLORATION

Project No.: 15-93678	**Well/Boring #:** B-12	**Date Drilled:** 05/04/94
Project: DENTON STATION LEA COUNTY, NEW MEXICO	**Drilling Co.:** HI-PLAINS DRILLING CO.	**Drilling Method:** AIR ROTARY
	Driller: VAUGHN APPLETON	**Logged By:** G.J.V.

DEPTH FEET	SOIL DESCRIPTION	SAMPLE NUMBER	SAMPLE TYPE	OVA (PPM)	REMARKS
0	Buff-white and tan calcareous fine-grained SAND (SM)				
2.5					
5.0					
7.5	Buff-white calcareous silty fine-grained SAND (caliche) (SM)				
10.0		1	SS	<1	
12.5					
15.0					
17.5					
20.0		2	SS	<1	
22.5	Pink calcareous fine-grained SAND (SM)				
25.0					
27.5					
30.0		3		<1	
32.5					
35.0					

ABBREVIATIONS AND SYMBOLS

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

■ Sample Submitted to Lab
WATER LEVEL
▽ At Completion
▼ After Hours
● Water on Rods

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

CURA INC.
2735 VILLA CREEK DRIVE - TWO METRO SQUARE
BLDG. C - SUITE 250 - DALLAS, TEXAS
(214) 620 - 7117

RECORD OF SUBSURFACE EXPLORATION

Project No.: 15-93678	**Well/Boring #:** B-12	**Date Drilled:** 05/04/94
Project: DENTON STATION LEA COUNTY, NEW MEXICO	**Drilling Co.:** HI-PLAINS DRILLING CO.	**Drilling Method:** AIR ROTARY
	Driller: VAUGHN APPLETON	**Logged By:** G.J.V.

DEPTH FEET	SOIL DESCRIPTION	SAMPLE NUMBER	SAMPLE TYPE	OVA (PPM)	REMARKS
30.0	Pink calcareous fine-grained SAND (SM)	3	SS	<1	
32.5					
35.0	Pink fine- to medium-grained SAND (SW) with intermittent hard sandstone layers				
37.5					
40.0		4	SS	<1	
42.5					
45.0					
47.5					
50.0		5	RC	<1	■ Benzene - 0.002 mg/kg BTEX - 0.002 mg/kg TPH - <10 mg/kg
52.5					▼ Water at 53.0 feet
55.0				<1	
57.5				<1	
60.0	Bottom of boring at 60 feet			<1	
62.5					
65.0					

ABBREVIATIONS AND SYMBOLS

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

■ Sample Submitted to Lab
WATER LEVEL
▽ At Completion
▼ After Hours
● Water on Rods

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

CURA INC.
2735 VILLA CREEK DRIVE - TWO METRO SQUARE
BLDG. C - SUITE 250 - DALLAS, TEXAS
(214) 620 - 7117

RECORD OF SUBSURFACE EXPLORATION

Project No.: 15-93678	**Well/Boring #:** B-13	**Date Drilled:** 05/04/94
Project: DENTON STATION LEA COUNTY, NEW MEXICO	**Drilling Co.:** HI-PLAINS DRILLING CO.	**Drilling Method:** AIR ROTARY
	Driller: VAUGHN APPLETON	**Logged By:** G.J.V.

DEPTH FEET	SOIL DESCRIPTION	SAMPLE NUMBER	SAMPLE TYPE	OVA (PPM)	REMARKS
0	Buff-white and tan calcareous silty fine-grained SAND (SM)				
2.5					
5.0					
7.5					
10.0		1	SS	>1,000	Hydrocarbon staining ■ Benzene - <0.25 mg/kg BTEX - 50.1 mg/kg TPH - 5,700 mg/kg
12.5					
15.0					
17.5					
20.0		2	SS	600	
22.5	Pink calcareous fine-grained SAND (SW)				
25.0					
27.5					
30.0		3	SS	60	
32.5					
35.0					

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RECORD OF SUBSURFACE EXPLORATION

Project No.: 15-93678	**Well/Boring #:** B-13	**Date Drilled:** 05/04/94
Project: DENTON STATION LEA COUNTY, NEW MEXICO	**Drilling Co.:** HI-PLAINS DRILLING CO.	**Drilling Method:** AIR ROTARY
	Driller: VAUGHN APPLETON	**Logged By:** G.J.V.

DEPTH FEET	SOIL DESCRIPTION	SAMPLE NUMBER	SAMPLE TYPE	OVA (PPM)	REMARKS
30.0	Pink calcareous fine-grained SAND (SW)	3	SS	60	
32.5					
35.0					
37.5					
40.0		4	SS	6	
42.5					
45.0	Pink fine- to medium-grained SAND (SW) with intermittent hard sandstone layers				
47.5					
50.0				<1	■ Benzene - <0.001 mg/kg BTEX - 0.001 mg/kg TPH - 24 mg/kg
52.5					
55.0			RC	<1	▼ Water at 53.1 feet
57.5				<1	
60.0	Bottom of boring at 60 feet			<1	
62.5					
65.0					

ABBREVIATIONS AND SYMBOLS

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BLDG. C - SUITE 250 - DALLAS, TEXAS
(214) 620 - 7117

RECORD OF SUBSURFACE EXPLORATION

Project No.: 15-93678	**Well/Boring #:** MW-4	**Date Drilled:** 05/05/94
Project: DENTON STATION LEA COUNTY, NEW MEXICO	**Drilling Co.:** HI-PLAINS DRILLING CO.	**Drilling Method:** AIR ROTARY
	Driller: VAUGHN APPLETON	**Logged By:** G.J.V.

DEPTH FEET	SOIL DESCRIPTION	SAMPLE NUMBER	SAMPLE TYPE	OVA (PPM)	REMARKS
0	Buff-white and tan calcareous silty fine-grained SAND (SM) (caliche)				
2.5					
5.0					
7.5					
10.0		1	SS	85	
12.5					
15.0					
17.5					
20.0		2	SS	50	■ Benzene - <0.001 mg/kg BTEX - 0.004 mg/kg TPH - 62 mg/kg
22.5	Pink calcareous fine-grained SAND (SW) with intermittent hard caliche layers				
25.0		3	SS	24	
27.5					Hard formation from 29 feet to 39 feet
30.0					
32.5					
35.0					

ABBREVIATIONS AND SYMBOLS

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CT-5' - Continuous Sampler

■ Sample Submitted to Lab

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

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BLDG. C - SUITE 250 - DALLAS, TEXAS
(214) 620 - 7117

RECORD OF SUBSURFACE EXPLORATION

Project No.: 15-93678	**Well/Boring #:** MW-4	**Date Drilled:** 05/05/94	
Project: DENTON STATION LEA COUNTY, NEW MEXICO	**Drilling Co.:** HI-PLAINS DRILLING CO.	**Drilling Method:** AIR ROTARY	
	Driller: VAUGHN APPLETON	**Logged By:** G.J.V.	

DEPTH FEET	SOIL DESCRIPTION	SAMPLE NUMBER	SAMPLE TYPE	OVA (PPM)	REMARKS
30.0	Pink calcareous fine-grained SAND (SM) with intermittent hard caliche layers				
32.5					
35.0					
37.5					
40.0	Pink fine- to medium-grained SAND (SW)	4	SS	<1	
42.5					
45.0	Pink fine-grained SANDSTONE				Hard formation from 44 feet to 60 feet
47.5					
50.0		5	RC	<1	■ Benzene - <0.001 mg/kg BTEX - <0.001 mg/kg TPH - 430 mg/kg ▼ Water at 52.1 feet
52.5					
55.0					
57.5					
60.0	Pink fine- to medium-grained SAND (SW) with intermittent hard sandstone layers				
62.5					
65.0					

ABBREVIATIONS AND SYMBOLS

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■ Sample Submitted to Lab

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

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CURA INC.
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BLDG. C - SUITE 250 - DALLAS, TEXAS
(214) 620 - 7117

RECORD OF SUBSURFACE EXPLORATION

Project No.: 15-93678	**Well/Boring #:** MW-4	**Date Drilled:** 05/05/94
Project: DENTON STATION LEA COUNTY, NEW MEXICO	**Drilling Co.:** HI-PLAINS DRILLING CO.	**Drilling Method:** AIR ROTARY
	Driller: VAUGHN APPLETON	**Logged By:** G.J.V.

DEPTH FEET	SOIL DESCRIPTION	SAMPLE NUMBER	SAMPLE TYPE	OVA (PPM)	REMARKS
60.0	Pink fine- to medium-grained SAND (SW) with intermittent hard (sandstone) layers				
62.5					
65.0					
67.5					
70.0					
72.5					
75.0	Bottom of boring at 74 feet				
77.5					
80.0					
82.5					
85.0					
87.5					
90.0					
92.5					
95.0					

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WATER LEVEL
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▼ After Hours
● Water on Rods

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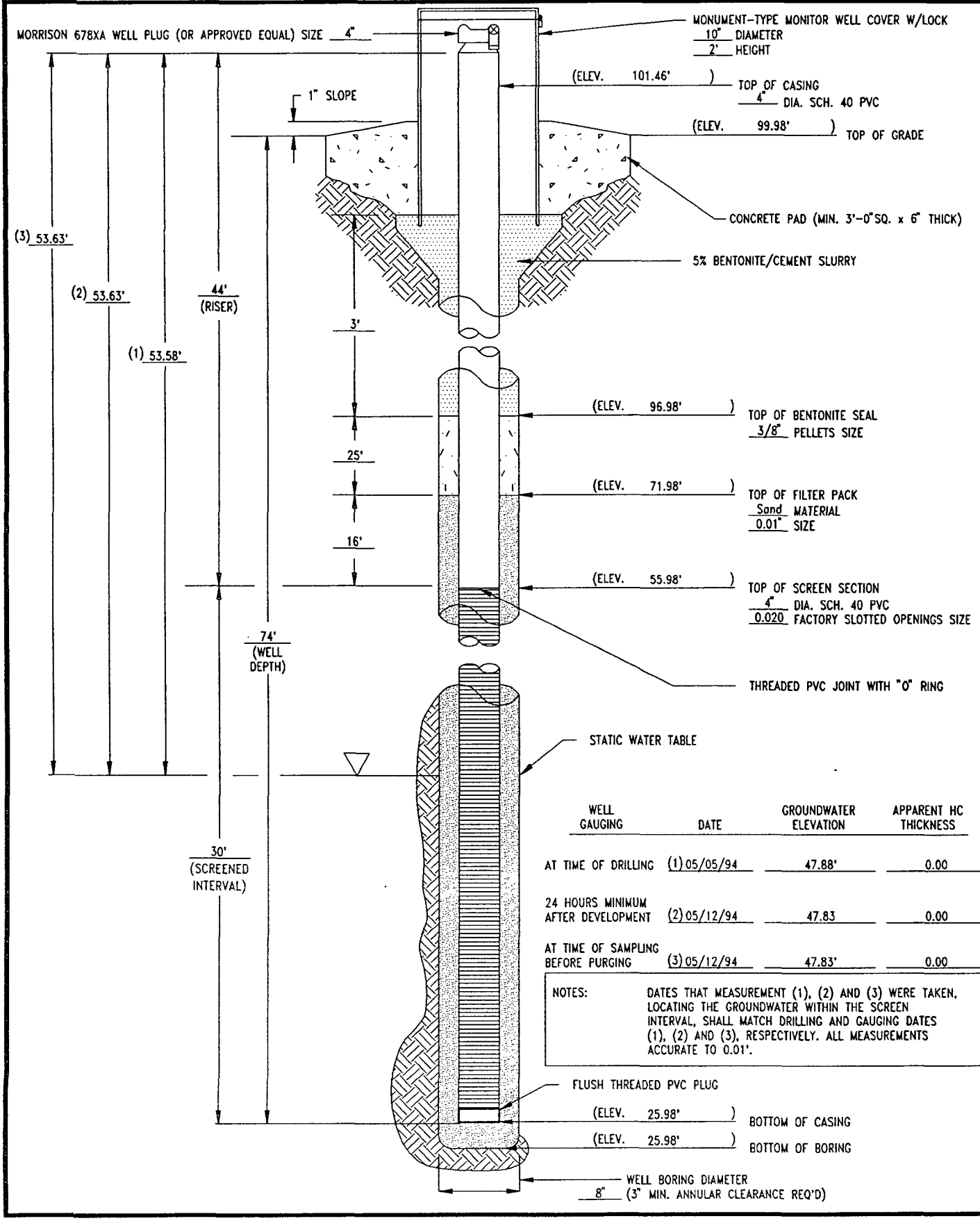
CRA INC.
2735 VILLA CREEK DRIVE - TWO METRO SQUARE
BLDG. C - SUITE 250 - DALLAS, TX 75234
620-7117 FAX - 620-8219

MONITOR WELL INSTALLATION DETAIL

LOCATION:	PROJECT NUMBER:	INSTALLATION DATE:	MONITOR WELL NUMBER:
Denton Station	15-93678	05/05/94	MW-4



WELL GAUGING	DATE	GROUNDWATER ELEVATION	APPARENT HC THICKNESS
AT TIME OF DRILLING	(1) 05/05/94	47.88'	0.00
24 HOURS MINIMUM AFTER DEVELOPMENT	(2) 05/12/94	47.83	0.00
AT TIME OF SAMPLING BEFORE PURGING	(3) 05/12/94	47.83'	0.00

NOTES: DATES THAT MEASUREMENT (1), (2) AND (3) WERE TAKEN, LOCATING THE GROUNDWATER WITHIN THE SCREEN INTERVAL, SHALL MATCH DRILLING AND GAUGING DATES (1), (2) AND (3), RESPECTIVELY. ALL MEASUREMENTS ACCURATE TO 0.01'.

CURA INC.
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(214) 620 - 7117

RECORD OF SUBSURFACE EXPLORATION

Project No.: 15-93678	**Well/Boring #:** MW-5	**Date Drilled:** 05/4 - 5/94
Project: DENTON STATION LEA COUNTY, NEW MEXICO	**Drilling Co.:** HI-PLAINS DRILLING CO.	**Drilling Method:** AIR ROTARY
	Driller: VAUGHN APPLETON	**Logged By:** G.J.V.

DEPTH FEET	SOIL DESCRIPTION	SAMPLE NUMBER	SAMPLE TYPE	OVA (PPM)	REMARKS
0	Buff-white and tan calcareous silty fine-grained SAND (SM) (caliche)				
2.5					
5.0					
7.5					
10.0		1	SS	<1	
12.5					
15.0					
17.5					
20.0		2	SS	<1	
22.5	Pink calcareous fine-grained sandstone (caliche) with tan fine-grained SAND (SM)				Hard formation from 21 feet to 22 feet
25.0					
27.5					
30.0		2	SS	<1	
32.5					
35.0					

ABBREVIATIONS AND SYMBOLS

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■ Sample Submitted to Lab
WATER LEVEL
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▼ After Hours
● Water on Rods

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RECORD OF SUBSURFACE EXPLORATION

Project No.: 15-93678	**Well/Boring #:** MW-5	**Date Drilled:** 05/4 - 5/94
Project: DENTON STATION LEA COUNTY, NEW MEXICO	**Drilling Co.:** HI-PLAINS DRILLING CO.	**Drilling Method:** AIR ROTARY
	Driller: VAUGHN APPLETON	**Logged By:** G.J.V.

DEPTH FEET	SOIL DESCRIPTION	SAMPLE NUMBER	SAMPLE TYPE	OVA (PPM)	REMARKS
30.0	Pink calcareous fine-grained sandstone (caliche) with tan fine-grained SAND (SM)	3	SS	<1	
32.5					
35.0					Hard formation from 34 feet to 37 feet
37.5	Pink fine- to medium-grained SAND (SW) with intermittent hard sandstone layers				
40.0		4	SS	50	
42.5					
45.0				100	
47.5				>1,000	Hydrocarbon staining (greenish) and odors from 49 feet to 55 feet
50.0					■ Benzene - <0.125 mg/kg BTEX - 10.12 mg/kg TPH - 1,500 mg/kg
52.5					▼ Water at 53.1 feet
55.0					
57.5					
60.0					
62.5					
65.0					

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RECORD OF SUBSURFACE EXPLORATION

Project No.: 15-93678	**Well/Boring #:** MW-5	**Date Drilled:** 05/4 - 5/94
Project: DENTON STATION LEA COUNTY, NEW MEXICO	**Drilling Co.:** HI-PLAINS DRILLING CO.	**Drilling Method:** AIR ROTARY
	Driller: VAUGHN APPLETON	**Logged By:** G.J.V.

DEPTH FEET	SOIL DESCRIPTION	SAMPLE NUMBER	SAMPLE TYPE	OVA (PPM)	REMARKS
60.0	Pink fine- to medium-grained SAND (SW) with intermittent hard sandstone layers				
62.5					
65.0					
67.5					
70.0					
72.5					
75.0	Bottom of boring at 74 feet				
77.5					
80.0					
82.5					
85.0					
87.5					
90.0					
92.5					
95.0					

ABBREVIATIONS AND SYMBOLS

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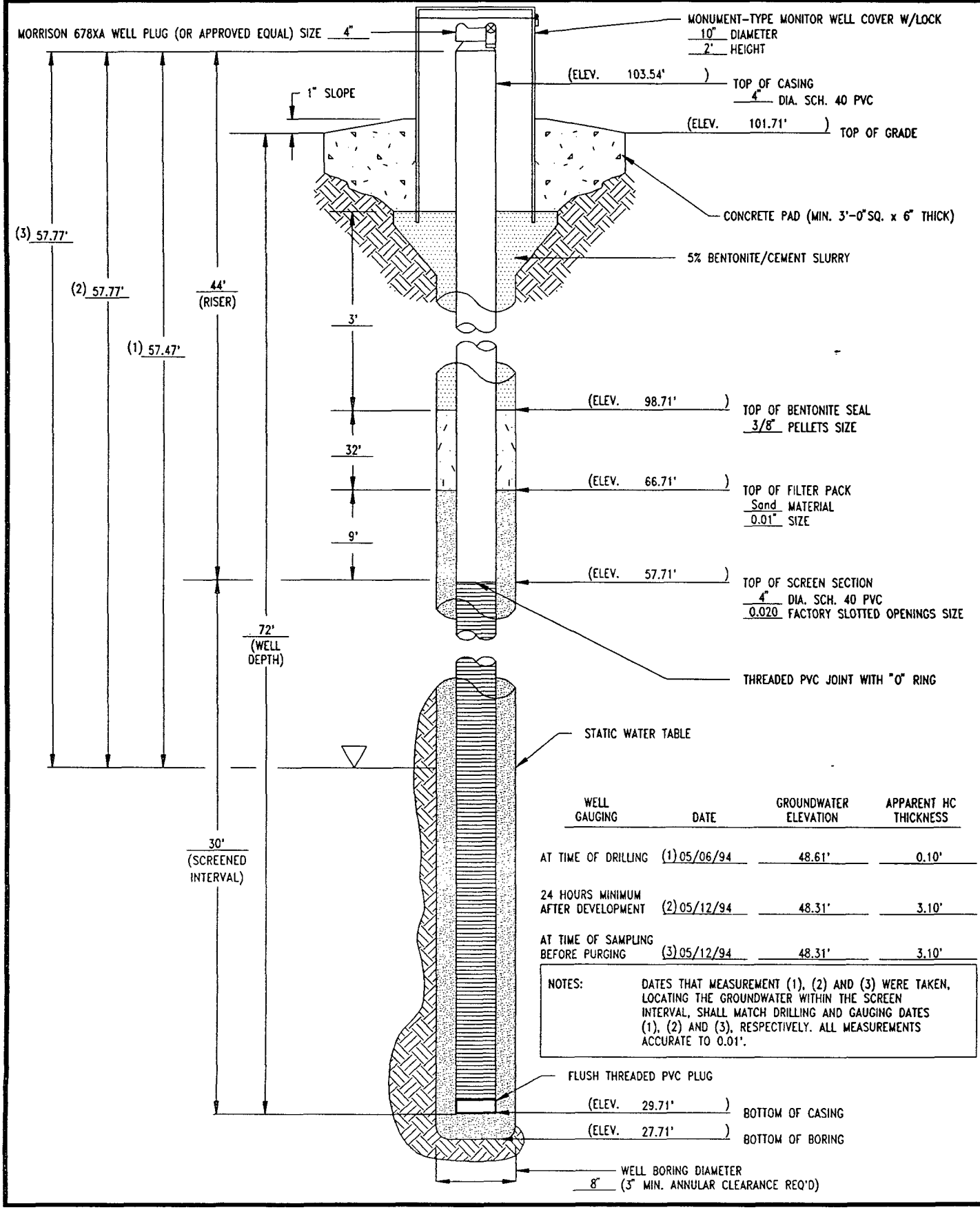
CURA INC.
2735 VILLA CREEK DRIVE - TWO METRO SQUARE
BLDG. C - SUITE 250 - DALLAS, TX 75234
620-7117 FAX - 620-8219

MONITOR WELL INSTALLATION DETAIL

LOCATION:	PROJECT NUMBER:	INSTALLATION DATE:	MONITOR WELL NUMBER:
Denton Station	15-93678	05/06/94	MW-5



WELL GAUGING	DATE	GROUNDWATER ELEVATION	APPARENT HC THICKNESS
AT TIME OF DRILLING	(1) 05/06/94	48.61'	0.10'
24 HOURS MINIMUM AFTER DEVELOPMENT	(2) 05/12/94	48.31'	3.10'
AT TIME OF SAMPLING BEFORE PURGING	(3) 05/12/94	48.31'	3.10'

NOTES: DATES THAT MEASUREMENT (1), (2) AND (3) WERE TAKEN, LOCATING THE GROUNDWATER WITHIN THE SCREEN INTERVAL, SHALL MATCH DRILLING AND GAUGING DATES (1), (2) AND (3), RESPECTIVELY. ALL MEASUREMENTS ACCURATE TO 0.01'.

CURA INC.
2735 VILLA CREEK DRIVE - TWO METRO SQUARE
BLDG. C - SUITE 250 - DALLAS, TEXAS
(214) 620 - 7117

RECORD OF SUBSURFACE EXPLORATION

Project No.: 15-93678	**Well/Boring #:** MW-6	**Date Drilled:** 05/06/94
Project: DENTON STATION LEA COUNTY, NEW MEXICO	**Drilling Co.:** HI-PLAINS DRILLING CO.	**Drilling Method:** AIR ROTARY
	Driller: VAUGHN APPLETON	**Logged By:** G.J.V.

DEPTH FEET	SOIL DESCRIPTION	SAMPLE NUMBER	SAMPLE TYPE	OVA (PPM)	REMARKS
0	Buff-white and tan calcareous silty fine-grained SAND (SM) with intermittent hard caliche layers				5" Concrete & Fill
10.0		1	SS	<1	
20.0		2	SS	<1	
22.5	Pink calcareous fine-grained SAND (SM)				
30.0		3	SS	<1	
35.0					

ABBREVIATIONS AND SYMBOLS

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WATER LEVEL
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CURA INC.
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BLDG. C - SUITE 250 - DALLAS, TEXAS
(214) 620 - 7117

RECORD OF SUBSURFACE EXPLORATION

Project No.: 15-93678	**Well/Boring #:** MW-6	**Date Drilled:** 05/06/94
Project: DENTON STATION LEA COUNTY, NEW MEXICO	**Drilling Co.:** HI-PLAINS DRILLING CO.	**Drilling Method:** AIR ROTARY
	Driller: VAUGHN APPLETON	**Logged By:** G.J.V.

DEPTH FEET	SOIL DESCRIPTION	SAMPLE NUMBER	SAMPLE TYPE	OVA (PPM)	REMARKS
30.0	Pink calcareous fine-grained SAND (SM)	3	SS	<1	
32.5					
35.0					
37.5	Pink fine- to medium grained SAND (SW) with intermittent hard sandstone layers				
40.0		4	SS	90	Slight hydrocarbon odor
42.5					
45.0					
47.5					
50.0				30	Hard formation from 49 feet to 50 feet Hydrocarbon staining and odors from 52 to 53 feet
52.5		5	RC	>1,000 >1,000 5	■ Benzene - <0.500 mg/kg BTEX - 67.85 mg/kg TPH - 1,900 mg/kg ▼ Water at 53.4 feet
55.0					
57.5					
60.0					
62.5					
65.0					

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BLDG. C - SUITE 250 - DALLAS, TEXAS
(214) 620 - 7117

RECORD OF SUBSURFACE EXPLORATION

Project No.: 15-93678	**Well/Boring #:** MW-6	**Date Drilled:** 05/06/94
Project: DENTON STATION LEA COUNTY, NEW MEXICO	**Drilling Co.:** HI-PLAINS DRILLING CO.	**Drilling Method:** AIR ROTARY
	Driller: VAUGHN APPLETON	**Logged By:** G.J.V.

DEPTH FEET	SOIL DESCRIPTION	SAMPLE NUMBER	SAMPLE TYPE	OVA (PPM)	REMARKS
60.0	Pink fine- to medium-grained SAND (SW) with intermittent hard sandstone layers				
62.5					
65.0					
67.5					
70.0					
72.5	Bottom of boring at 72 feet				
75.0					
77.5					
80.0					
82.5					
85.0					
87.5					
90.0					
92.5					
95.0					

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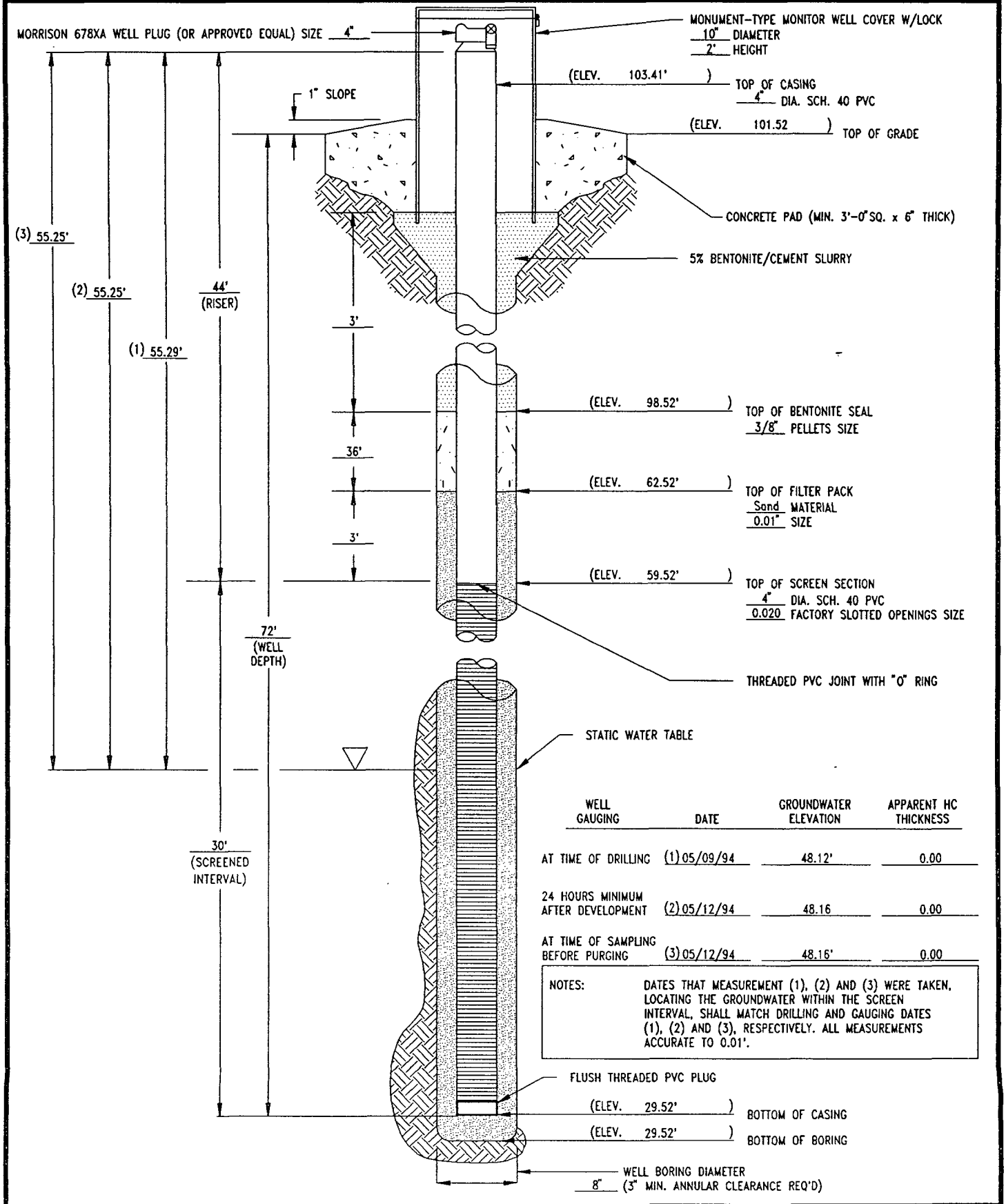
BLDG. C - SUITE 250 - DALLAS, TX 75234
620-7117 FAX - 620-8219

MONITOR WELL INSTALLATION DETAIL

LOCATION:	PROJECT NUMBER:	INSTALLATION DATE:	MONITOR WELL NUMBER:
Denton Station	15-93678	05/09/94	MW-6



WELL GAUGING	DATE	GROUNDWATER ELEVATION	APPARENT HC THICKNESS
AT TIME OF DRILLING	(1) 05/09/94	48.12'	0.00
24 HOURS MINIMUM AFTER DEVELOPMENT	(2) 05/12/94	48.16	0.00
AT TIME OF SAMPLING BEFORE PURGING	(3) 05/12/94	48.16'	0.00

NOTES: DATES THAT MEASUREMENT (1), (2) AND (3) WERE TAKEN, LOCATING THE GROUNDWATER WITHIN THE SCREEN INTERVAL, SHALL MATCH DRILLING AND GAUGING DATES (1), (2) AND (3), RESPECTIVELY. ALL MEASUREMENTS ACCURATE TO 0.01'.

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RECORD OF SUBSURFACE EXPLORATION

Project No.: 15-93678	**Well/Boring #:** MW-7	**Date Drilled:** 05/06/94
Project: DENTON STATION LEA COUNTY, NEW MEXICO	**Drilling Co.:** HI-PLAINS DRILLING CO.	**Drilling Method:** AIR ROTARY
	Driller: VAUGHN APPLETON	**Logged By:** G.J.V.

DEPTH FEET	SOIL DESCRIPTION	SAMPLE NUMBER	SAMPLE TYPE	OVA (PPM)	REMARKS
0	Buff-white and tan calcareous silty fine-grained SAND (SM) with intermittent hard caliche layers				
2.5					
5.0					
7.5					
10.0		1	SS	<1	
12.5					
15.0					
17.5	Pink calcareous fine-grained SAND (SM)				
20.0		2	SS	<1	
22.5					
25.0					
27.5					
30.0		3	SS	<1	
32.5					
35.0					

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▽ At Completion
▼ After Hours
● Water on Rods

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BLDG. C - SUITE 250 - DALLAS, TEXAS
(214) 620 - 7117

RECORD OF SUBSURFACE EXPLORATION

Project No.: 15-93678	**Well/Boring #:** MW-7	**Date Drilled:** 05/06/94
Project: DENTON STATION LEA COUNTY, NEW MEXICO	**Drilling Co.:** HI-PLAINS DRILLING CO.	**Drilling Method:** AIR ROTARY
	Driller: VAUGHN APPLETON	**Logged By:** G.J.V.

DEPTH FEET	SOIL DESCRIPTION	SAMPLE NUMBER	SAMPLE TYPE	OVA (PPM)	REMARKS
30.0	Pink calcareous fine-grained SAND (SM)				
32.5					
35.0					Intermittent hard streaks from 35 feet to 57 feet
37.5	Pink fine- to medium-grained SAND (SW) with intermittent hard sandstone layers				
40.0		4	SS	4	
42.5					Hydrocarbon staining and odors and staining from 43 to 55 feet
45.0					
47.5					
50.0				>1,000	■ Benzene - 4.7 mg/kg BTEX - 186.7 mg/kg TPH - 19,000 mg/kg
52.5		5	RC	>1,000	▼ Water at 53.0 feet
55.0				>1,000	
57.5					
60.0					
62.5					
65.0					

ABBREVIATIONS AND SYMBOLS

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

■ Sample Submitted to Lab

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

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

CURA INC.
2735 VILLA CREEK DRIVE - TWO METRO SQUARE
BLDG. C - SUITE 250 - DALLAS, TEXAS
(214) 620 - 7117

RECORD OF SUBSURFACE EXPLORATION

Project No.: 15-93678	**Well/Boring #:** MW-7	**Date Drilled:** 05/06/94
Project: DENTON STATION LEA COUNTY, NEW MEXICO	**Drilling Co.:** HI-PLAINS DRILLING CO.	**Drilling Method:** AIR ROTARY
	Driller: VAUGHN APPLETON	**Logged By:** G.J.V.

DEPTH FEET	SOIL DESCRIPTION	SAMPLE NUMBER	SAMPLE TYPE	OVA (PPM)	REMARKS
60.0	Pink fine- to medium-grained SAND (SW) with intermittent hard sandstone layers				
62.5					
65.0					
67.5					
70.0					
72.5	Bottom of boring at 72 feet				
75.0					
77.5					
80.0					
82.5					
85.0					
87.5					
90.0					
92.5					
95.0					

ABBREVIATIONS AND SYMBOLS

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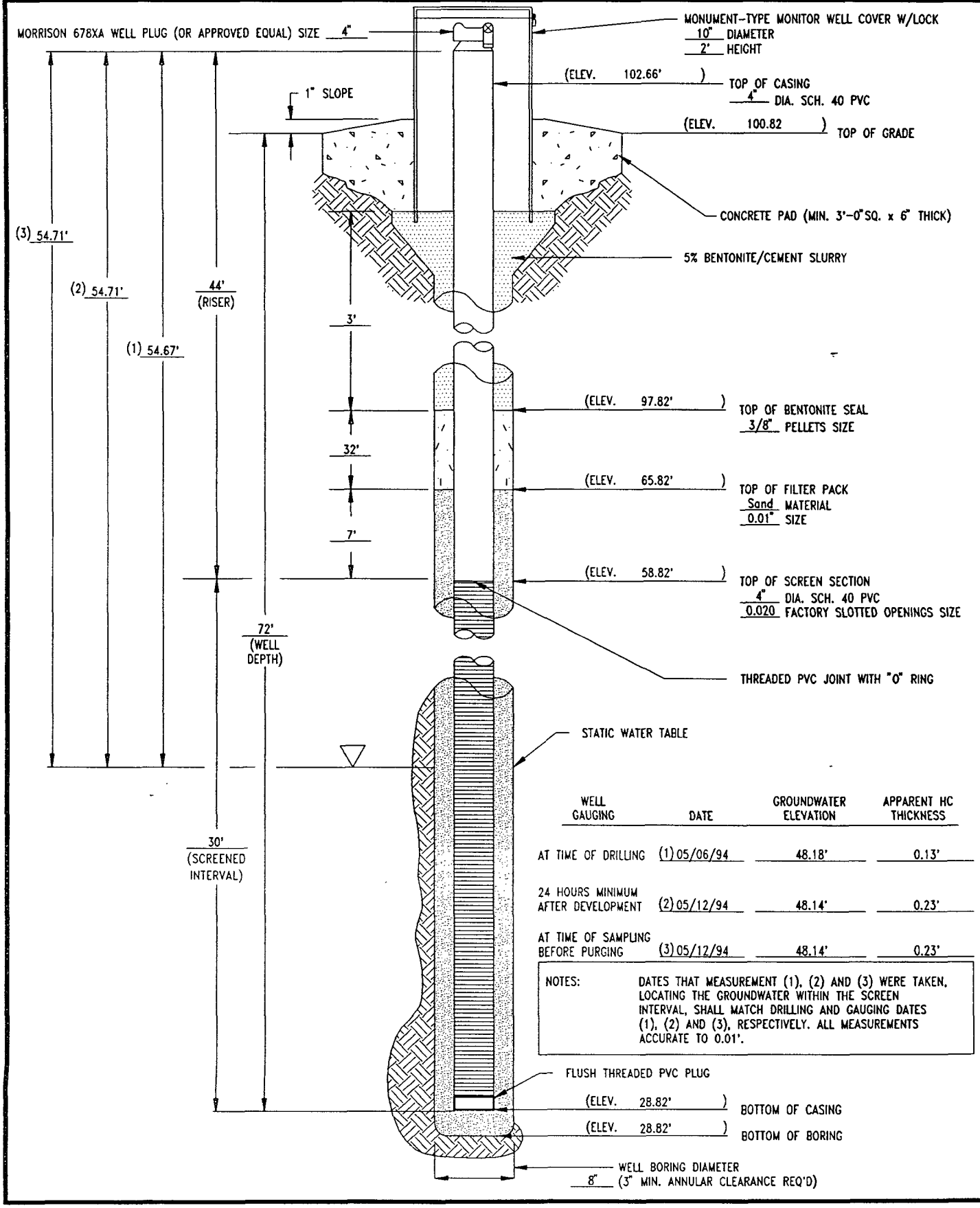
CURA INC.
2735 VILLA CREEK DRIVE - TWO METRO SQUARE
BLDG. C - SUITE 250 - DALLAS, TX 75234
620-7117 FAX - 620-8219

MONITOR WELL INSTALLATION DETAIL

LOCATION:	PROJECT NUMBER:	INSTALLATION DATE:	MONITOR WELL NUMBER:
Denton Station	15-93678	05/09/94	MW-7



WELL GAUGING	DATE	GROUNDWATER ELEVATION	APPARENT HC THICKNESS
AT TIME OF DRILLING	(1) 05/06/94	48.18'	0.13'
24 HOURS MINIMUM AFTER DEVELOPMENT	(2) 05/12/94	48.14'	0.23'
AT TIME OF SAMPLING BEFORE PURGING	(3) 05/12/94	48.14'	0.23'

NOTES: DATES THAT MEASUREMENT (1), (2) AND (3) WERE TAKEN, LOCATING THE GROUNDWATER WITHIN THE SCREEN INTERVAL, SHALL MATCH DRILLING AND GAUGING DATES (1), (2) AND (3), RESPECTIVELY. ALL MEASUREMENTS ACCURATE TO 0.01'.

CURA INC.
2735 VILLA CREEK DRIVE - TWO METRO SQUARE
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(214) 620 - 7117

RECORD OF SUBSURFACE EXPLORATION

Project No.: 15-93678	**Well/Boring #:** MW-8	**Date Drilled:** 05/04/94 & 05/10/94
Project: DENTON STATION LEA COUNTY, NEW MEXICO	**Drilling Co.:** HI-PLAINS DRILLING CO.	**Drilling Method:** AIR ROTARY
	Driller: VAUGHN APPLETON	**Logged By:** G.J.V.

DEPTH FEET	SOIL DESCRIPTION	SAMPLE NUMBER	SAMPLE TYPE	OVA (PPM)	REMARKS
0	Buff-white and tan calcareous silty fine-grained SAND (SM)				
2.5					
5.0	Buff-white calcareous silty fine-grained SAND (SM) (caliche)				
7.5					
10.0		1	SS	<1	
12.5					
15.0					
17.5					
20.0		2	SS	<1	
22.5	Pink calcareous fine- to medium-grained SAND (SM)				
25.0					
27.5					
30.0		3	SS	<1	
32.5					
35.0					

ABBREVIATIONS AND SYMBOLS

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■ Sample Submitted to Lab
WATER LEVEL
▽ At Completion
▼ After Hours
● Water on Rods

HSA - Hollow Stem Augers
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CURA INC.
2735 VILLA CREEK DRIVE - TWO METRO SQUARE
BLDG. C - SUITE 250 - DALLAS, TEXAS
(214) 620 - 7117

RECORD OF SUBSURFACE EXPLORATION

Project No.: 15-93678	**Well/Boring #:** MW-8	**Date Drilled:** 05/04/94 & 05/10/94	
Project: DENTON STATION LEA COUNTY, NEW MEXICO	**Drilling Co.:** HI-PLAINS DRILLING CO.	**Drilling Method:** AIR ROTARY	
	Driller: VAUGHN APPLETON	**Logged By:** G.J.V.	

DEPTH FEET	SOIL DESCRIPTION	SAMPLE NUMBER	SAMPLE TYPE	OVA (PPM)	REMARKS
30.0		3	SS	<1	
32.5					
35.0					
37.5					
40.0		4	SS	<1	
42.5	Pink fine- to medium-grained SAND (SW) with intermittent hard sandstone layers				
45.0					
47.5					
50.0				<1	■ Benzene - 0.003 mg/kg BTEX - 0.010 mg/kg TPH - 160 mg/kg
52.5		5	RC	<1	▼ Water at 53.3 feet
55.0				<1	
57.5					
60.0		6	SS	<1	
62.5					
65.0					

ABBREVIATIONS AND SYMBOLS

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■ Sample Submitted to Lab
WATER LEVEL
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CURA INC.
2735 VILLA CREEK DRIVE - TWO METRO SQUARE
BLDG. C - SUITE 250 - DALLAS, TEXAS
(214) 620 - 7117

RECORD OF SUBSURFACE EXPLORATION

Project No.: 15-93678	**Well/Boring #:** MW-8	**Date Drilled:** 05/04/94 & 05/10/94
Project: DENTON STATION LEA COUNTY, NEW MEXICO	**Drilling Co.:** HI-PLAINS DRILLING CO.	**Drilling Method:** AIR ROTARY
	Driller: VAUGHN APPLETON	**Logged By:** G.J.V.

DEPTH FEET	SOIL DESCRIPTION	SAMPLE NUMBER	SAMPLE TYPE	OVA (PPM)	REMARKS
60.0	Pink fine- to medium-grained SAND (SW) with intermittent hard sandstone layers				
62.5					
65.0					
67.5					
70.0					
72.5	Bottom of boring at 72 feet				
75.0					
77.5					
80.0					
82.5					
85.0					
87.5					
90.0					
92.5					
95.0					

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■ Sample Submitted to Lab

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

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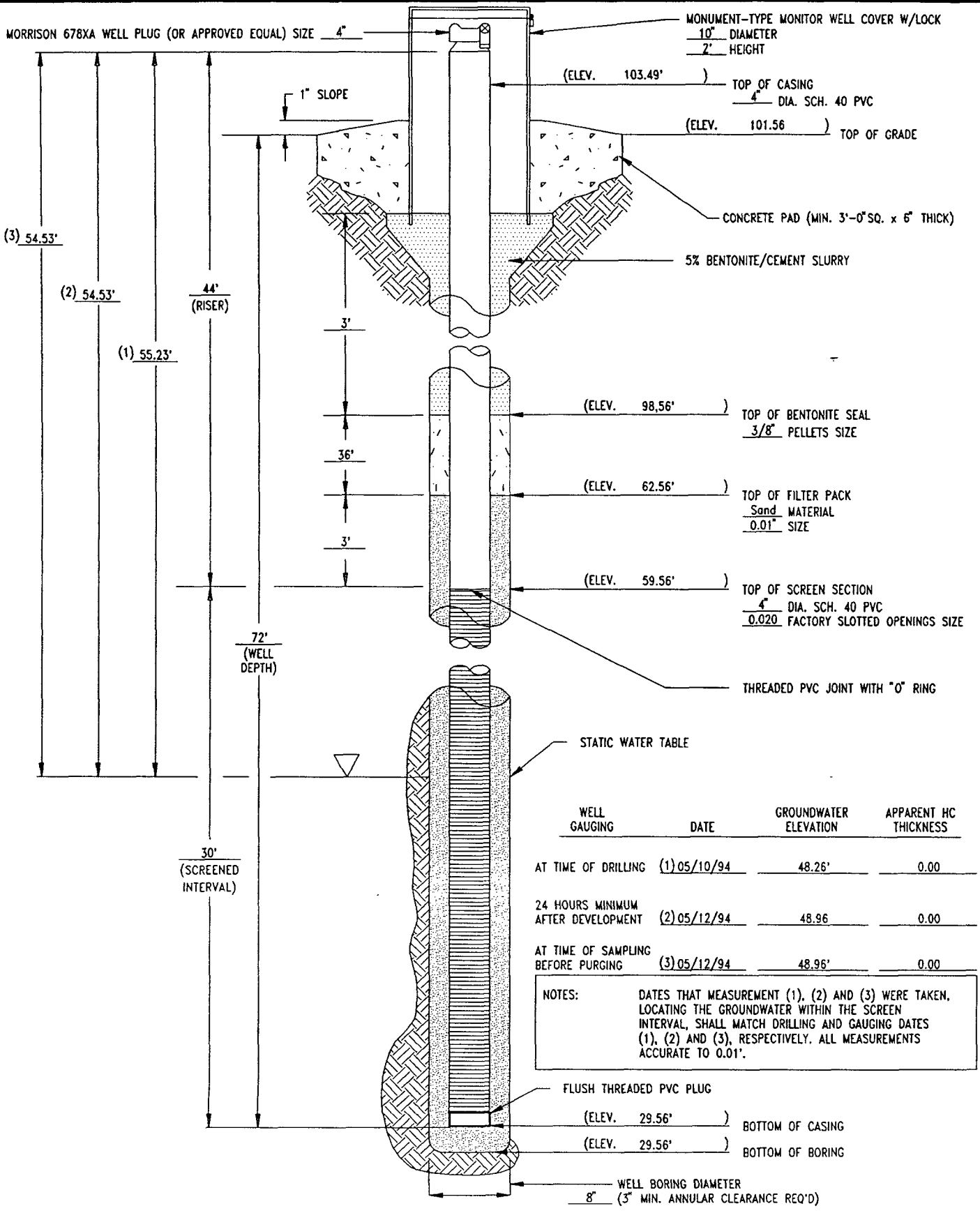
DC - Driving Casing
MD - Mud Drilling

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

MONITOR WELL INSTALLATION DETAIL

LOCATION:	PROJECT NUMBER:	INSTALLATION DATE:	MONITOR WELL NUMBER:
Denton Station	15-93678	05/10/94	MW-8



WELL GAUGING	DATE	GROUNDWATER ELEVATION	APPARENT HC THICKNESS
AT TIME OF DRILLING	(1) 05/10/94	48.26'	0.00
24 HOURS MINIMUM AFTER DEVELOPMENT	(2) 05/12/94	48.96	0.00
AT TIME OF SAMPLING BEFORE PURGING	(3) 05/12/94	48.96'	0.00

NOTES: DATES THAT MEASUREMENT (1), (2) AND (3) WERE TAKEN, LOCATING THE GROUNDWATER WITHIN THE SCREEN INTERVAL, SHALL MATCH DRILLING AND GAUGING DATES (1), (2) AND (3), RESPECTIVELY. ALL MEASUREMENTS ACCURATE TO 0.01'.

CURA INC.
2735 VILLA CREEK DRIVE - TWO METRO SQUARE
BLDG. C - SUITE 250 - DALLAS, TEXAS
(214) 620 - 7117

RECORD OF SUBSURFACE EXPLORATION

Project No.: 15-93678	**Well/Boring #:** MW-9	**Date Drilled:** 05/09/94
Project: DENTON STATION LEA COUNTY, NEW MEXICO	**Drilling Co.:** HI-PLAINS DRILLING CO.	**Drilling Method:** AIR ROTARY
	Driller: VAUGHN APPLETON	**Logged By:** G.J.V.

DEPTH FEET	SOIL DESCRIPTION	SAMPLE NUMBER	SAMPLE TYPE	OVA (PPM)	REMARKS
0	Buff-white and tan calcareous silty fine SAND (SM)				
10.0	Pink calcareous fine-grained SAND (SM)	1	SS	<1	
20.0		2	SS	<1	
30.0		3	SS	<1	
35.0					

ABBREVIATIONS AND SYMBOLS

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RC - Rock Core
THD - Texas Highway Department Cone
CT-5' - Continuous Sampler

■ Sample Submitted to Lab
WATER LEVEL
▽ At Completion
▼ After Hours
● Water on Rods

HSA - Hollow Stem Augers
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CURA INC.
2735 VILLA CREEK DRIVE - TWO METRO SQUARE
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(214) 620 - 7117

RECORD OF SUBSURFACE EXPLORATION

Project No.: 15-93678	**Well/Boring #:** MW-9	**Date Drilled:** 05/09/94	
Project: DENTON STATION LEA COUNTY, NEW MEXICO	**Drilling Co.:** HI-PLAINS DRILLING CO.	**Drilling Method:** AIR ROTARY	
	Driller: VAUGHN APPLETON	**Logged By:** G.J.V.	

DEPTH FEET	SOIL DESCRIPTION	SAMPLE NUMBER	SAMPLE TYPE	OVA (PPM)	REMARKS
30.0	Pink calcareous fine-grained SAND (SM)	3	SS	<1	
32.5					
35.0					
37.5					
40.0		4	SS	<1	
42.5					
45.0					
47.5	Pink fine- to medium-grained SAND (SW) with intermittent hard sandstone layers				
50.0					
52.5		5	RC	<1	■ Benzene - <0.001 mg/kg BTEX - 0.001 mg/kg TPH - 24 mg/kg ▼ Water at 53.7 feet
55.0					
57.5					
60.0					
62.5					
65.0					

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■ Sample Submitted to Lab

WATER LEVEL
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▼ After Hours
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RECORD OF SUBSURFACE EXPLORATION

Project No.: 15-93678	**Well/Boring #:** MW-9	**Date Drilled:** 05/09/94
Project: DENTON STATION LEA COUNTY, NEW MEXICO	**Drilling Co.:** HI-PLAINS DRILLING CO.	**Drilling Method:** AIR ROTARY
	Driller: VAUGHN APPLETON	**Logged By:** G.J.V.

DEPTH FEET	SOIL DESCRIPTION	SAMPLE NUMBER	SAMPLE TYPE	OVA (PPM)	REMARKS
60.0	Pink fine- to medium-grained SAND (SW) with intermittent hard sandstone layers				
62.5					
65.0					
67.5					
70.0					
72.5	Bottom of boring at 72 feet				
75.0					
77.5					
80.0					
82.5					
85.0					
87.5					
90.0					
92.5					
95.0					

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

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APPENDIX C

TABLES

TABLE 1
DENTON STATION
SOIL SAMPLE ANALYTICAL RESULTS

Boring	Date Sampled	Sample Interval (feet)	OVA	Benzene	Toluene	Ethyl-benzene	Xylenes	Total BTEX	TPH
B-1	12-07-92	2 - 4	<1	<0.001	0.003	<0.001	<0.001	0.003	30
		7 - 9	<1	<0.001	0.002	<0.001	0.003	0.005	27
B-2	12-07-92	1 - 3	2						
		3 - 5	9	0.001	0.013	0.007	0.032	0.053	580
		5 - 7	<1						
		10 - 11	20						
		11 - 12	>1000	<0.001	0.025	0.160	0.180	0.365	970
		14 - 15	<1						
		15 - 17	<1	<0.001	0.004	0.002	0.006	0.012	110
B-3	12-07-92	4 - 5	<1						
		6 - 6.5	<1	<0.001	0.003	<0.001	0.005	0.008	240
B-4	12-07-92	1 - 3	2	<0.001	0.004	0.001	0.007	0.012	57
		3 - 5	1						
		5 - 7	1						
		7 - 9	<1	<0.001	0.003	0.001	0.005	0.009	18
B-5	12-07-92	1 - 3	3	0.003	0.019	0.008	0.041	0.071	23
		8 - 9	<1						
		11 - 13	<1	<0.001	0.002	<0.001	0.001	0.003	35
B-6	12-07-92	5 - 7	5	<0.001	0.003	<0.001	<0.001	0.003	14
		10 - 12	<1						
		15 - 17	<1	<0.001	0.004	<0.001	<0.001	0.004	16
B-7	12-07-92	0 - 2	<1						
		2 - 4	4	<0.001	0.004	<0.001	0.008	0.012	28
		5 - 7	3						
		10 - 12	1	<0.001	0.003	<0.001	0.002	0.005	27
		15 - 17	<1						
		20 - 22	<1	<0.001	0.001	<0.001	<0.001	0.001	19
B-8	02-08-93	1 - 3	1						
		5 - 7	2	<0.001	<0.001	<0.001	<0.001	<0.001	10
		10 - 12	<1						
		15 - 17	<1	<0.001	<0.001	<0.001	0.001	0.001	50
		20 - 22	<1	<0.001	<0.001	0.002	0.003	0.005	30

TABLE 1
DENTON STATION
SOIL SAMPLE ANALYTICAL RESULTS

Boring	Date Sampled	Sample Interval (feet)	OVA	Benzene	Toluene	Ethyl-benzene	Xylenes	Total BTEX	TPH
B-9	02-08-93	1 - 3	1	<0.001	<0.001	<0.001	0.001	0.001	30
		5 - 7	2						
		10 - 12	<1						
		15 - 17	<1	<0.001	0.001	<0.001	0.001	0.002	30
B-10	02-08-93	1 - 3	<1						
		5 - 7	1	<0.001	<0.001	<0.001	0.002	0.002	30
		10 - 12	<1						
		15 - 17	<1	<0.001	<0.001	<0.001	0.001	0.001	20
B-11	02-08-93	1 - 3	1						
		5 - 7	1	<0.001	<0.001	<0.001	0.001	0.001	40
		10 - 12	<1						
		15 - 17	<1						
		20 - 22	<1	<0.001	<0.001	<0.001	<0.001	<0.001	10
B-12	05-04-94	10 - 11	<1						
		20 - 20.5	<1						
		30 - 31	<1						
		40 - 41	<1						
		50 - 52	<1	<0.001	<0.001	<0.001	0.002	0.002	<10
B-13	05-04-94	10 - 11	>1,000	<0.25	0.30	4.8	45	50.1	5,700
		20 - 20.5	600						
		30 - 31	60						
		40 - 40.5	6						
		50 - 52	<1	<0.001	<0.001	<0.001	0.001	0.001	24
MW-1	09-20-93	5 - 7	<1						
		10 - 12	<1	<0.001	<0.001	<0.001	<0.001	<0.001	<10
		20 - 22	No Recovery						
		25 - 27	<1						
		30 - 32	2						
		35 - 37	No Recovery						
		40 - 42	200	<0.001					800
		45 - 47	<1						
		50 - 52	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	10
		59 - 60	<1						

TABLE 1
DENTON STATION
SOIL SAMPLE ANALYTICAL RESULTS

Boring	Date Sampled	Sample Interval (feet)	OVA	Benzene	Toluene	Ethyl-benzene	Xylenes	Total BTEX	TPH
MW-2	09-20-93	15 - 17	<1						
		25 - 27	<1	<0.001	0.001	<0.001	0.003	0.003	<10
		25 - 37	<1						
		45 - 47	<1						
		50 - 52	3	<0.001	<0.001	<0.001	<0.001	<0.001	10
MW-3	09-21-93	15 - 17	<1	<0.001	0.002	0.001	0.006	0.009	70
		25 - 27	<1						
		38 - 40	450						
		40 - 41	20						
		43 - 44	700	<0.001	0.004	0.01	0.05	0.064	1,100
		45 - 46	500						
		47 - 48	350						
		49 - 50	>1,000	<0.001	1.1	3.2	12.0	16.3	10,000
MW-4	05-05-94	10 - 11	85						
		20 - 21	50						
		25 - 27	<0.001						
		40 - 41	<1						
		50 - 50.5	<1	<0.001	<0.001	<0.001	<0.001	<0.001	430
MW-5	05-04-94	10 - 11	<1						
		20 - 21	<1						
		30 - 30.5	<1						
		40 - 40.5	50						
		45 - 47	100						
		50 - 52	>1,000	<0.125	0.82	1.5	7.8	10.12	1,500
MW-6	05-06-94	10 - 10.5	<1						
		20 - 20.5	<1						
		30 - 30.5	<1						
		40 - 41	90						
		50 - 51	30						
		51 - 52	>1,000	<0.500	0.85	13	54	67.85	1,900

TABLE 1
DENTON STATION
SOIL SAMPLE ANALYTICAL RESULTS

Boring	Date Sampled	Sample Interval (feet)	OVA	Benzene	Toluene	Ethyl-benzene	Xylenes	Total BTEX	TPH
MW-7	05-06-94	10 - 11	<1						
		20 - 21	<1						
		30 - 31	<1						
		40 - 41	4						
		50 - 52	>1,000	4.7	40	32	110	186.7	19,000
MW-8	05-04-94	10 - 10.5							
		20 - 20.5							
		30 - 30.5							
		40 - 40.5							
		50 - 52	<1	<0.001	0.003	0.001	0.006	0.010	160
MW-9	05-09-94	10 - 12	<1						
		20 - 22	<1						
		30 - 31	<1						
		40 - 41	<1						
		50 - 52	<1	<0.001	<0.001	<0.001	<0.001	0.001	24

OVA results listed in parts per million (ppm) equivalent methane.
BTEX results in mg/kg (parts per million; ppm) with method detection limits listed in Appendix C.
TPH results in mg/kg (parts per million; ppm) with method detection limits listed in Appendix C.
Analyses were conducted using EPA Method 8020 (BTEX) and EPA Method 418.1 (TPH) by SPL Environmental Laboratories.
— Soil sample not submitted for analysis.

TABLE 2
DENTON STATION
WATER SAMPLE ANALYTICAL RESULTS

Monitor Well	Date	Benzene	Toluene	Ethyl-benzene	Xylenes	Total BTEX	TPH	Dissolved Oxygen
MW-1	09-27-93 05-10-94	0.85 PSH	0.067 PSH	0.077 PSH	0.34 PSH	1.334 PSH	3 PSH	--- PSH
MW-2	09-27-93 05-10-94	0.017 0.010	<0.001 <0.001	<0.001 <0.001	<0.001 <0.001	0.017 0.010	<1 <1	--- 6.4
MW-3	09-27-93 05-10-94	1.1 PSH	1.7 PSH	0.44 PSH	0.98 PSH	4.22 PSH	25 PSH	--- PSH
MW-4	05-10-94	0.041	<0.001	<0.001	0.004	0.045	2	8.4
MW-5	05-10-94	PSH	PSH	PSH	PSH	PSH	PSH	PSH
MW-6	05-10-94	0.680	0.001	0.001	0.083	0.765	1	4.1
MW-6 (Duplicate)	05-10-94	0.920	0.002	0.002	0.100	1.024	1	4.1
MW-7	05-10-94	PSH	PSH	PSH	PSH	PSH	PSH	PSH
MW-8	05-11-94	<0.001	<0.001	<0.001	<0.001	<0.001	<1	8.2
MW-9	05-11-94	<0.001	<0.001	<0.001	<0.001	<0.001	<1	8.2

A total dissolved solids (TDS) concentration of 515 ppm was reported for MW-2 on 09-27-93.

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.
--- Not sampled for dissolved oxygen.

TABLE 3
DENTON STATION
SUMMARY OF RELATIVE GROUNDWATER LEVEL ELEVATIONS AND PHASE-SEPARATED HYDROCARBON THICKNESSES

Monitor Well	Date	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	09-27-93	101.07	103.47	55.41	48.06	0.00
	03-29-94	101.07	103.47	55.71	48.02	0.32
	05-10-94	101.07	103.47	55.77	47.83	0.16
MW-2	09-27-93	99.17	101.35	53.48	47.87	0.00
	03-29-94	99.17	101.35	53.64	47.71	0.00
	05-10-94	99.17	101.35	53.70	47.65	0.00
MW-3	09-27-93	101.01	102.68	54.32	48.36	8.20
	03-29-94	101.01	102.68	61.27	48.13	0.00
	05-10-94	101.01	102.68	55.68	48.10	1.34
MW-4	05-10-94	99.98	101.46	53.63	47.83	0.00
MW-5	05-10-94	101.71	103.54	57.77	48.31	3.10
MW-6	05-10-94	101.52	103.41	55.25	48.16	0.00
MW-7	05-10-94	100.82	102.66	54.71	48.14	0.23
MW-8	05-10-94	101.56	103.49	54.53	48.96	0.00
MW-9	05-10-94	99.66	101.71	53.71	48.00	0.00
WW-1	02-26-93	100.55	102.21	60.23	48.52	7.97
	03-05-93	100.55	102.21	56.54	48.50	3.45
	03-12-93	100.55	102.21	55.39	48.39	1.91
	03-17-93	100.55	102.21	55.19	48.46	1.76
	03-29-94	100.55	102.21	60.70	48.03	7.96
	05-10-94	100.55	102.21	57.40	47.93	3.80

* Measured from a relative datum (benchmark = 100.00 feet) located at the northeast corner of the concrete sump 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, 0.82 for crude oil.

TABLE 4
DENTON STATION
PHASE-SEPARATED HYDROCARBON RECOVERY

Date	Monitor Well	PSH Thickness (feet)	PSH Recovery (gallons)	PSH Cumulative Recovery (gallons)	Type of Recovery
02/26/93	WW-1	7.97	35.0	35.0	Hand bailed
03/05/93	WW-1	3.45	25.0	60.0	Hand bailed
03/12/93	WW-1	1.91	20.0	80.0	Hand bailed
03/17/93	WW-1	1.76	4.0	84.0	Hand bailed
03/22/93	WW-1	0.83	3.5	87.5	Hand bailed
03/31/93	WW-1	2.51	8.0	95.5	Hand bailed
04/08/93	WW-1	4.92	13.0	108.5	Hand bailed
04/15/93	WW-1	2.21	8.0	116.5	Hand bailed
04/27/93	WW-1	2.81	9.0	125.5	Hand bailed
05/13/93	WW-1	2.13	6.0	131.5	Hand bailed
05/21/93	WW-1	2.36	6.0	137.5	Hand bailed
03/18/94	WW-1	7.63	20.0	157.5	Hand bailed
05/06/94	WW-1	3.80	12.0	169.5	Hand bailed
05/25/94	WW-1	4.51	15.0	184.5	Hand bailed
03/17/94	MW-1	0.32	0.2	0.2	Hand bailed
05/10/94	MW-1	0.16	<0.01	0.2	Hand bailed
03/17/94	MW-3	8.25	7.5	7.5	Hand bailed
05/10/94	MW-3	1.34	7.0	14.5	Hand bailed
05/25/94	MW-3	3.92	4.5	19.0	Hand bailed
05/25/94	MW-5	6.80	11.0	11.0	Hand bailed
05/25/94	MW-7	1.95	2.5	2.5	Hand bailed

APPENDIX D

ANALYTICAL RESULTS

SPL, INC.

REPORT APPROVAL SHEET

WORK ORDER NUMBER: 94-05-552

Approved for release by:

M. Scott Sample, Laboratory Director Date: 5/20/94

Barbara Martinez, Project Manager Date: 5/20/94

Certificate of Analysis No. 9405552-01

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

P.O.# MESA-CAO-B-131201-PX-4204-NS
DATE: 05/19/94

PROJECT: Denton Station
SITE: Lea County, New Mexico
SAMPLED BY: CURA, Inc.
SAMPLE ID: B-13 (10-11')

PROJECT NO: 15-93678 OOD.3
MATRIX: SOIL
DATE SAMPLED: 05/04/94 13:00:00
DATE RECEIVED: 05/12/94

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	ND	250 P	µg/Kg
TOLUENE	300	250 P	µg/Kg
ETHYLBENZENE	4800	250 P	µg/Kg
TOTAL XYLENE	45000	250 P	µg/Kg
TOTAL VOLATILE AROMATIC HYDROCARBONS	50100		µg/Kg
Surrogate	**% Recovery**		
1,4-Difluorobenzene	87		
4-Bromofluorobenzene	146 «		
METHOD 8020***			
Analyzed by: DAO			
Date: 05/16/94			
Petroleum Extractables	5700	50	mg/Kg
METHOD Mod. 418.1*			
Analyzed by: MF			
Date: 05/13/94			

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.

COMMENTS: («) - Surrogate outside QC Limits

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

Certificate of Analysis No. 9405552-02

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

P.O.# MESA-CAO-B-131201-PX-4204-NS
DATE: 05/19/94

PROJECT: Denton Station
SITE: Lea County, New Mexico
SAMPLED BY: CURA, Inc.
SAMPLE ID: B-13 (50-52')

PROJECT NO: 15-93678 OOD.3
MATRIX: SOIL
DATE SAMPLED: 05/04/94 14:00:00
DATE RECEIVED: 05/12/94

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	ND	1 P	µg/Kg
TOLUENE	ND	1 P	µg/Kg
ETHYLBENZENE	ND	1 P	µg/Kg
TOTAL XYLENE	1	1 P	µg/Kg
TOTAL VOLATILE AROMATIC HYDROCARBONS	1		µg/Kg
Surrogate	**% Recovery**		
1,4-Difluorobenzene	93		
4-Bromofluorobenzene	98		
METHOD 8020***			
Analyzed by: DAO			
Date: 05/17/94			
Petroleum Extractables	24	10	mg/Kg
METHOD Mod. 418.1*			
Analyzed by: MF			
Date: 05/13/94			

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.

Certificate of Analysis No. 9405552-03

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

P.O.# MESA-CAO-B-131201-PX-4204-NS
DATE: 05/19/94

PROJECT: Denton Station
SITE: Lea County, New Mexico
SAMPLED BY: CURA, Inc.
SAMPLE ID: MW-4 (25-27')

PROJECT NO: 15-93678 OOD.3
MATRIX: SOIL
DATE SAMPLED: 05/05/94 10:30:00
DATE RECEIVED: 05/12/94

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	ND	1 P	µg/Kg
TOLUENE	ND	1 P	µg/Kg
ETHYLBENZENE	ND	1 P	µg/Kg
TOTAL XYLENE	4	1 P	µg/Kg
TOTAL VOLATILE AROMATIC HYDROCARBONS	4		µg/Kg
Surrogate	**% Recovery**		
1,4-Difluorobenzene	94		
4-Bromofluorobenzene	97		
METHOD 8020***			
Analyzed by: DAO			
Date: 05/17/94			
Petroleum Extractables	62	10	mg/Kg
METHOD Mod. 418.1*			
Analyzed by: MF			
Date: 05/13/94			

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.

Certificate of Analysis No. 9405552-06

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

P.O.# MESA-CAO-B-131201-PX-4204-NS
DATE: 05/19/94

PROJECT: Denton Station
SITE: Lea County, New Mexico
SAMPLED BY: CURA, Inc.
SAMPLE ID: MW-6 (51-52')

PROJECT NO: 15-93678 OOD.3
MATRIX: SOIL
DATE SAMPLED: 05/06/94 12:00:00
DATE RECEIVED: 05/12/94

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	ND	500 P	µg/Kg
TOLUENE	850	500 P	µg/Kg
ETHYLBENZENE	13000	500 P	µg/Kg
TOTAL XYLENE	54000	500 P	µg/Kg
TOTAL VOLATILE AROMATIC HYDROCARBONS	67850		µg/Kg
Surrogate	**% Recovery**		
1,4-Difluorobenzene	91		
4-Bromofluorobenzene	100		
METHOD 8020***			
Analyzed by: DAO			
Date: 05/16/94			
Petroleum Extractables	1900	10	mg/Kg
METHOD Mod. 418.1*			
Analyzed by: MF			
Date: 05/13/94			

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.

Certificate of Analysis No. 9405552-07

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

P.O.# MESA-CAO-B-131201-PX-4204-NS
DATE: 05/19/94

PROJECT: Denton Station
SITE: Lea County, New Mexico
SAMPLED BY: CURA, Inc.
SAMPLE ID: MW-7 (50-52')

PROJECT NO: 15-93678 OOD.3
MATRIX: SOIL
DATE SAMPLED: 05/06/94 14:30:00
DATE RECEIVED: 05/12/94

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	4700	1000 P	µg/Kg
TOLUENE	40000	1000 P	µg/Kg
ETHYLBENZENE	32000	1000 P	µg/Kg
TOTAL XYLENE	110000	1000 P	µg/Kg
TOTAL VOLATILE AROMATIC HYDROCARBONS	186700		µg/Kg
Surrogate	**% Recovery**		
1,4-Difluorobenzene	89		
4-Bromofluorobenzene	97		
METHOD 8020***			
Analyzed by: DAO			
Date: 05/16/94			
Petroleum Extractables	19000	100	mg/Kg
METHOD Mod. 418.1*			
Analyzed by: MF			
Date: 05/13/94			

(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.

QUALITY CONTROL DOCUMENTATION

Matrix: Soil
Sample ID: 9404A80-12A
Batch ID: VARD940516114700

Reported on: 05/19/94 08:08:16
Analyzed on: 05/16/94 11:47:00
Analyst: DAO

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 - Soil
METHOD 8020***

C O M P O U N D	Sample Value µg/Kg	Spike Added µg/Kg	MS % Recovery #	MSD % Recovery #	Relative % Difference #
BENZENE	ND	20	115	110	4
TOLUENE	1.2	20	112	101	10
ETHYLBENZENE	ND	20	108	100	8
O XYLENE	ND	20	106	97	9
M & P XYLENE	ND	40	111	100	10

NOTES

column to be used to flag recovery and RPD values with an asterisk
* values outside of QC Limits.

Idelis Williams, QC Officer

Matrix: Soil
Sample ID: 9405560-09A
Batch ID: VARD940517073900

Reported on: 05/19/94 08:08:22
Analyzed on: 05/17/94 07:39:00
Analyst: DAO

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 - Soil
METHOD 8020***

COMPOUND	Sample Value µg/Kg	Spike Added µg/Kg	MS % Recovery #	MSD % Recovery #	Relative % Difference #
BENZENE	ND	20	120	114	5
TOLUENE	ND	20	126	119	6
ETHYLBENZENE	ND	20	113	115	2
O XYLENE	ND	20	122	113	8
M & P XYLENE	2.9	40	123	115	7

NOTES

column to be used to flag recovery and RPD values with an asterisk
* values outside of QC Limits.

Idelis Williams, QC Officer

** SPL QUALITY CONTROL REPORT **
TOTAL PETROLEUM HYDROCARBONS [TPH]

SPL sample Id: 9405471-01A **Reported on:** 05/19/94
Matrix: SOIL **Analyzed on:** 05/13/94

This sample was randomly selected for use in the SPL quality control program. One in ten samples is fortified with a known concentration of the substance being analyzed and one in ten samples is analyzed in duplicate. The result are as follows:

-- SPIKE ANALYSIS --

Sample Id	Blank Value	Spike Added mg/L	Original Sample Concentration mg/Kg	MS Concentration mg/Kg	MS % Rec
9405471-01A	ND	382	579	737	77

-- **SPIKE DUPLICATE ANALYSIS** --

Sample Id	Spike Added mg/L	MSD Concentration mg/Kg	MSD % Rec	% RPD
9405471-01A	382	784	82	6

SPL, Incorporated

Idelis Williams, QC Officer

CHAIN OF CUSTODY

AND

SAMPLE RECEIPT CHECKLIST

4405552

SHELL OIL COMPANY
RETAIL ENVIRONMENTAL ENGINEERING

CHAIN OF CUSTODY RECORD NO. 04893

Date: 5-7-94
Page 1 of 1

Denton Station
SITE ADDRESS: Lea County, New Mexico

~~WIC #~~: Proj # 15-93628.00D.3

CONSULTANT NAME & ADDRESS: CURA, Inc,
231 W. Wadley, Ste L-200, Midland, TX 79705

CONSULTANT CONTACT: Wes Root

PHONE: 915-570-9408 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 ☐

ANALYSIS REQUEST: (CHECK APPROPRIATE BOX)

OTHER

REMARKS

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
B-13 (10'-11')	5/4/94	1300		V		V								V	1	4oz	V					V					
B-13 (50-52')	5/4/94	1400		V		V								V	1	4oz	V					V					
MW-4 (25-27')	5/5/94	10:30		V		V								V	1	4oz	V					V					
MW-4 (50-50.5)	5/5/94	11:30		V		V								V	1	4oz	V					V					
MW-5 (50-52')	5/4/94	19:00		V		V								V	1	4oz	V					V					
MW-6 (51'-52')	5/6/94	12:00		V		V								V	1	4oz	V					V					
MW-7 (50-52')	5/6/94	14:30		V		V								V	1	4oz	V					V					

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME
G. Van Deventer	5/7/94	13:00	F. Wesley Root	5/7/94	13:00
F. Wesley Root	5/11/94	16:30		(INTACT 3°C)	
				5/12/94	9:00

BILL NO.:
LABORATORY: SPL - Houston
SHELL CONTACT: Neal Stidham PHONE: 713-241-2061 FAX: 713-241-1124

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

8096041214

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: 5/12 TIME: 9:00 CLIENT NO. _____
LOT NO. _____ CONTRACT NO. _____

CLIENT SAMPLE NOS. _____

SPL SAMPLE NOS.: 9405552

	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#: FedEx: 809604121 4		
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: 5/12/94
DELIVERED FOR RESOLUTION: REC'D _____ DATE: _____
RESOLVED: _____ DATE: _____

SPL, INC.

REPORT APPROVAL SHEET

WORK ORDER NUMBER: 94-05-669

Approved for release by:

M. Scott Sample Date: 5/27/94
S. Sample, Laboratory Director

Barbara Martinez Date: 5/27/94
Barbara Martinez, Project Manager

Certificate of Analysis No. 9405669-01

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

P.O.# MESA-CAO-B-131201-PX-4204-NS
DATE: 05/26/94

PROJECT: Denton Station
SITE: Lea County, New Mexico
SAMPLED BY: CURA, Inc.
SAMPLE ID: MW-2

PROJECT NO: 15-9367800D.3
MATRIX: WATER
DATE SAMPLED: 05/10/94 16:30:00
DATE RECEIVED: 05/13/94

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	10	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	10		µg/L
Surrogate	**% Recovery**		
1,4-Difluorobenzene	92		
4-Bromofluorobenzene	86		
METHOD 8020***			
Analyzed by: MOO			
Date: 05/22/94			
Petroleum extractables	ND	1	mg/L
METHOD 418.1*			
Analyzed by: MF			
Date: 05/18/94			

(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.

Certificate of Analysis No. 9405669-02

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

P.O.# MESA-CAO-B-131201-PX-4204-NS
DATE: 05/26/94

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

PROJECT NO: 15-9367800D.3
MATRIX: WATER
DATE SAMPLED: 05/10/94 15:00:00
DATE RECEIVED: 05/13/94

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	41	1 P	µg/L
TOLUENE	ND	1 P	µg/L
ETHYLBENZENE	ND	1 P	µg/L
TOTAL XYLENE	4	1 P	µg/L
TOTAL VOLATILE AROMATIC HYDROCARBONS	45		µg/L
Surrogate	**% Recovery**		
1,4-Difluorobenzene	98		
4-Bromofluorobenzene	84		
METHOD 8020***			
Analyzed by: MOO			
Date: 05/22/94			
Petroleum extractables	2	1	mg/L
METHOD 418.1*			
Analyzed by: MF			
Date: 05/18/94			

(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.

Certificate of Analysis No. 9405669-03

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

P.O.# MESA-CAO-B-131201-PX-4204-NS
DATE: 05/26/94

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

PROJECT NO: 15-9367800D.3
MATRIX: WATER
DATE SAMPLED: 05/10/94 18:00:00
DATE RECEIVED: 05/13/94

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	680	1 P	µg/L
TOLUENE	1	1 P	µg/L
ETHYLBENZENE	1	1 P	µg/L
TOTAL XYLENE	83	1 P	µg/L
TOTAL VOLATILE AROMATIC HYDROCARBONS	765		µg/L
Surrogate	**% Recovery**		
1,4-Difluorobenzene	98		
4-Bromofluorobenzene	73		
METHOD 8020***			
Analyzed by: MOO			
Date: 05/24/94			
Petroleum extractables	1	1	mg/L
METHOD 418.1*			
Analyzed by: MF			
Date: 05/18/94			

(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.

Certificate of Analysis No. 9405669-04

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

P.O.# MESA-CAO-B-131201-PX-4204-NS
DATE: 05/26/94

PROJECT: Denton Station
SITE: Lea County, New Mexico
SAMPLED BY: CURA, Inc.
SAMPLE ID: MW-8

PROJECT NO: 15-9367800D.3
MATRIX: WATER
DATE SAMPLED: 05/11/94 12:30:00
DATE RECEIVED: 05/13/94

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	86		
4-Bromofluorobenzene	85		
METHOD 8020***			
Analyzed by: MOO			
Date: 05/22/94			
Petroleum extractables	ND	1	mg/L
METHOD 418.1*			
Analyzed by: MF			
Date: 05/18/94			

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.

Certificate of Analysis No. 9405669-05

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

P.O.# MESA-CAO-B-131201-PX-4204-NS
DATE: 05/26/94

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

PROJECT NO: 15-9367800D.3
MATRIX: WATER
DATE SAMPLED: 05/11/94 14:30:00
DATE RECEIVED: 05/13/94

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	88		
4-Bromofluorobenzene	91		
METHOD 8020***			
Analyzed by: MOO			
Date: 05/22/94			
Petroleum extractables	ND	1	mg/L
METHOD 418.1*			
Analyzed by: MF			
Date: 05/18/94			

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.

Certificate of Analysis No. 9405669-06

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

P.O.# MESA-CAO-B-131201-PX-4204-NS
DATE: 05/26/94

PROJECT: Denton Station
SITE: Lea County, New Mexico
SAMPLED BY: CURA, Inc.
SAMPLE ID: Duplicate

PROJECT NO: 15-9367800D.3
MATRIX: WATER
DATE SAMPLED: 05/10/94
DATE RECEIVED: 05/13/94

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	920	1 P	µg/L
TOLUENE	2	1 P	µg/L
ETHYLBENZENE	2	1 P	µg/L
TOTAL XYLENE	100	1 P	µg/L
TOTAL VOLATILE AROMATIC HYDROCARBONS	1024		µg/L
Surrogate	**% Recovery**		
1,4-Difluorobenzene	104		
4-Bromofluorobenzene	69		
METHOD 8020***			
Analyzed by: MOO			
Date: 05/22/94			
Petroleum extractables	1	1	mg/L
METHOD 418.1*			
Analyzed by: MF			
Date: 05/18/94			

(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.

Certificate of Analysis No. 9405669-07

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

P.O.# MESA-CAO-B-131201-PX-4204-NS
DATE: 05/26/94

PROJECT: Denton Station
SITE: Lea County, New Mexico
SAMPLED BY: Provided by SPL
SAMPLE ID: Trip Blank

PROJECT NO: 15-9367800D.3
MATRIX: WATER
DATE SAMPLED: 04/06/94
DATE RECEIVED: 05/13/94

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	1	1 P	µg/L
TOTAL VOLATILE AROMATIC HYDROCARBONS	3		µg/L

Surrogate	% Recovery
1,4-Difluorobenzene	90
4-Bromofluorobenzene	98

METHOD 8020***
Analyzed by: MOO
Date: 05/24/94

(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

Matrix:	Aqueous	**Reported on:**	05/26/94 07:32:15
Sample ID:	9405624-03A	**Analyzed on:**	05/22/94 10:11:00
Batch ID:	VARE940522101100	**Analyst:**	MOO

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***

C O M P O U N D	Sample Value µg/L	Spike Added µg/L	MS % Recovery #	MSD % Recovery #	Relative % Difference #
BENZENE	ND	20	82	86	5
TOLUENE	ND	20	80	84	4
ETHYLBENZENE	ND	20	78	79	2
O XYLENE	ND	20	69	67	2
M & P XYLENE	ND	40	61	57	7

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:**	05/26/94 07:32:19
Sample ID:	9405785-03A	**Analyzed on:**	05/24/94 03:31:00
Batch ID:	VARE940524033100	**Analyst:**	MOO

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***

C O M P O U N D	Sample Value µg/L	Spike Added µg/L	MS % Recovery #	MSD % Recovery #	Relative % Difference #
BENZENE	ND	20	82	91	9
TOLUENE	ND	20	83	92	10
ETHYLBENZENE	ND	20	82	88	7
O XYLENE	ND	20	81	82	2
M & P XYLENE	ND	40	87	91	5

NOTES

column to be used to flag recovery and RPD values with an asterisk
* values outside of QC Limits.

Idelis Williams, QC Officer

** SPL QUALITY CONTROL REPORT **
TOTAL PETROLEUM HYDROCARBONS [TPH]

SPL sample Id: BLANK
Matrix: WATER

Reported on: 05/26/94
Analyzed on: 05/18/94

This sample was randomly selected for use in the SPL quality control program. One in ten samples is fortified with a known concentration of the substance being analyzed and one in ten samples is analyzed in duplicate. The result are as follows:

-- SPIKE ANALYSIS --

Sample Id	Blank Value	Spike Added mg/L	Original Sample Concentration mg/L	MS Concentration mg/L	MS % Rec
BLANK	ND	382	ND	370	97

-- **SPIKE DUPLICATE ANALYSIS** --

Sample Id	Spike Added mg/L	MSD Concentration mg/L	MSD % Rec	% RPD
BLANK	382	389	102	5

SPL, Incorporated

Idelis Williams, QC Officer

CHAIN OF CUSTODY

AND

SAMPLE RECEIPT CHECKLIST

1405669

SHELL OIL COMPANY
~~MIDLAND~~ ENVIRONMENTAL ENGINEERING

CHAIN OF CUSTODY RECORD NO. 04964

Date: 5-12-94
Page 1 of 1

SITE ADDRESS: Denton Station
Lea County, New Mexico
WIO#: Project #15-9367800D.3
CONSULTANT NAME & ADDRESS: CURA, Inc.
731 W. Wadley, Suite 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 ☐

ANALYSIS REQUEST: (CHECK APPROPRIATE BOX)

OTHER

REMARKS: P.O. 5/17

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 (mL)	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			
MW-2	5/10/94	1630		✓	✓									✓	3	40	✓					✓								
MW-4	5/10/94	1500		✓	✓									✓	3	40	✓					✓								
MW-6	5/10/94	1800		✓	✓									✓	3	40	✓					✓								
MW-8	5/11/94	1230		✓	✓									✓	3	40	✓					✓								
MW-9	5/11/94	1430		✓	✓									✓	3	40	✓					✓								
Duplicate	5/10/94	xxxx		✓	✓									✓	2	40	✓													
MW-2	5/10/94	1630		✓	✓									✓	1	1000						✓								
MW-4	5/10/94	1500		✓	✓									✓	1	1000						✓								
MW-6	5/10/94	1800		✓	✓									✓	1	1000						✓								
MW-8	5/11/94	1230		✓	✓									✓	1	1000						✓								
MW-9	5/11/94	1430		✓	✓									✓	1	1000						✓								
Duplicate	5/10/94	xxxx		✓	✓									✓	1	1000						✓								

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME
[signature]	5/12/94	1500			
RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME
RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME
8533601624			[signature]	5/13/94	1000

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

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

Intact 3C

SPL HOUSTON ENVIRONMENTAL LABORATORY

SAMPLE LOGIN CHECKLIST

DATE: 5/13 TIME: 10:00 CLIENT NO. _____
LOT NO. _____ CONTRACT NO. _____

CLIENT SAMPLE NOS. _____

SPL SAMPLE NOS.: 9405669

		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#: FEDERAL 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: 5/13/94
DELIVERED FOR RESOLUTION: REC'D _____ DATE: _____
RESOLVED: _____ DATE: _____

SPL, INC.

REPORT APPROVAL SHEET

WORK ORDER NUMBER: 94-05-668

Approved for release by:

M. Scott Sample, Laboratory Director Date: 5/20/94

Barbara Martinez, Project Manager Date: 5/20/94

Certificate of Analysis No. 9405668-01

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

P.O.# MESA-CAO-B-131201-PX-4204-NS
DATE: 05/19/94

PROJECT: Denton Station
SITE: Lea County, New Mexico
SAMPLED BY: CURA, Inc.
SAMPLE ID: B-12 (50-52')

PROJECT NO: 15-9367800D.3
MATRIX: SOIL
DATE SAMPLED: 05/04/94 12:00:00
DATE RECEIVED: 05/13/94

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	ND	1 P	µg/Kg
TOLUENE	ND	1 P	µg/Kg
ETHYLBENZENE	ND	1 P	µg/Kg
TOTAL XYLENE	2	1 P	µg/Kg
TOTAL VOLATILE AROMATIC HYDROCARBONS	2		µg/Kg
Surrogate	**% Recovery**		
1,4-Difluorobenzene	94		
4-Bromofluorobenzene	95		
METHOD 8020***			
Analyzed by: DAO			
Date: 05/17/94			
Petroleum Extractables	ND	10	mg/Kg
METHOD Mod. 418.1*			
Analyzed by: MF			
Date: 05/17/94			

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.

Certificate of Analysis No. 9405668-02

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

P.O.# MESA-CAO-B-131201-PX-4204-NS
DATE: 05/19/94

PROJECT: Denton Station
SITE: Lea County, New Mexico
SAMPLED BY: CURA, Inc.
SAMPLE ID: MW-8 (50-52')

PROJECT NO: 15-9367800D.3
MATRIX: SOIL
DATE SAMPLED: 05/04/94 16:15:00
DATE RECEIVED: 05/13/94

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	ND	1 P	µg/Kg
TOLUENE	3	1 P	µg/Kg
ETHYLBENZENE	1	1 P	µg/Kg
TOTAL XYLENE	6	1 P	µg/Kg
TOTAL VOLATILE AROMATIC HYDROCARBONS	10		µg/Kg
Surrogate	**% Recovery**		
1,4-Difluorobenzene	94		
4-Bromofluorobenzene	93		
METHOD 8020***			
Analyzed by: DAO			
Date: 05/16/94			
Petroleum Extractables	160	10	mg/Kg
METHOD Mod. 418.1*			
Analyzed by: MF			
Date: 05/17/94			

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.

Certificate of Analysis No. 9405668-03

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

P.O.# MESA-CAO-B-131201-PX-4204-NS
DATE: 05/19/94

PROJECT: Denton Station
SITE: Lea County, New Mexico
SAMPLED BY: CURA, Inc.
SAMPLE ID: MW-9 (50-52')

PROJECT NO: 15-9367800D.3
MATRIX: SOIL
DATE SAMPLED: 05/09/94 14:30:00
DATE RECEIVED: 05/13/94

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	ND	1 P	µg/Kg
TOLUENE	1	1 P	µg/Kg
ETHYLBENZENE	ND	1 P	µg/Kg
TOTAL XYLENE	ND	1 P	µg/Kg
TOTAL VOLATILE AROMATIC HYDROCARBONS	1		µg/Kg
Surrogate	**% Recovery**		
1,4-Difluorobenzene	93		
4-Bromofluorobenzene	99		
METHOD 8020***			
Analyzed by: DAO			
Date: 05/17/94			
Petroleum Extractables	24	10	mg/Kg
METHOD Mod. 418.1*			
Analyzed by: MF			
Date: 05/17/94			

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.

QUALITY CONTROL DOCUMENTATION

Matrix: Soil
Sample ID: 9404A80-12A
Batch ID: VARD940516114700

Reported on: 05/19/94 08:08:54
Analyzed on: 05/16/94 11:47:00
Analyst: DAO

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 - Soil
METHOD 8020***

COMPOUND	Sample Value µg/Kg	Spike Added µg/Kg	MS % Recovery #	MSD % Recovery #	Relative % Difference #
BENZENE	ND	20	115	110	4
TOLUENE	1.2	20	112	101	10
ETHYLBENZENE	ND	20	108	100	8
O XYLENE	ND	20	106	97	9
M & P XYLENE	ND	40	111	100	10

NOTES

column to be used to flag recovery and RPD values with an asterisk
* values outside of QC Limits.

Idelis Williams, QC Officer

Matrix: Soil
Sample ID: 9405560-09A
Batch ID: VARD940517073900

Reported on: 05/19/94 08:08:58
Analyzed on: 05/17/94 07:39:00
Analyst: DAO

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 - Soil
METHOD 8020***

COMPOUND	Sample Value µg/Kg	Spike Added µg/Kg	MS % Recovery #	MSD % Recovery #	Relative % Difference #
BENZENE	ND	20	120	114	5
TOLUENE	ND	20	126	119	6
ETHYLBENZENE	ND	20	113	115	2
O XYLENE	ND	20	122	113	8
M & P XYLENE	2.9	40	123	115	7

NOTES

column to be used to flag recovery and RPD values with an asterisk
* values outside of QC Limits.

Idelis Williams, QC Officer

** SPL QUALITY CONTROL REPORT **
TOTAL PETROLEUM HYDROCARBONS [TPH]

SPL sample Id: 9405457-05B **Reported on:** 05/19/94
Matrix: SOIL **Analyzed on:** 05/17/94

This sample was randomly selected for use in the SPL quality control program. One in ten samples is fortified with a known concentration of the substance being analyzed and one in ten samples is analyzed in duplicate. The result are as follows:

-- SPIKE ANALYSIS --

Sample Id	Blank Value	Spike Added mg/L	Original Sample Concentration mg/Kg	MS Concentration mg/Kg	MS % Rec
9405457-05B	ND	382	9	390	100

-- SPIKE DUPLICATE ANALYSIS --

Sample Id	Spike Added mg/L	MSD Concentration mg/Kg	MSD % Rec	% RPD
9405457-05B	382	388	99	1

SPL, Incorporated

Idelis Williams, QC Officer

CHAIN OF CUSTODY

AND

SAMPLE RECEIPT CHECKLIST

SPL HOUSTON ENVIRONMENTAL LABORATORY

SAMPLE LOGIN CHECKLIST

DATE: 5/13 TIME: 10:00 CLIENT NO. _____
LOT NO. _____ CONTRACT NO. _____

CLIENT SAMPLE NOS. _____

SPL SAMPLE NOS.: 9405668

		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#: FEDEX 8533601624		
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: 5/13/94
DELIVERED FOR RESOLUTION: REC'D _____ DATE: _____
RESOLVED: _____ DATE: _____

1702668

SHELL OIL COMPANY
RETAIL ENVIRONMENTAL ENGINEERING

CHAIN OF CUSTODY RECORD NO. 04963

Date: 5-12-94
Page 1 of 1

SITE ADDRESS: Denton Station
Lea County, New Mexico
~~WIC#~~: Project# 15-93678000.3
CONSULTANT NAME & ADDRESS: CURA, Inc
731 W. Wadley, Suite 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 (ounces)	ANALYSIS REQUEST: 8TEX 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
B-12 (50'-52')	5/4/94	1200		✓		✓								✓	1	4	✓					✓						
MW-8 (50'-52')	5/4/94	1615		✓		✓								✓	1	4	✓					✓						
MW-9 (50'-52')	5/4/94	1430		✓		✓								✓	1	4	✓					✓						

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME
G.D. Van Deventer	5/12/94	1500			
RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME
RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME
			Robin Sinclair	5/13	0800

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

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

Intact 3°C

CURA INC.
Environmental Consultants, Engineers & Scientists
2735 Villa Creek Drive • Building C • Suite 250 • Dallas, Texas 75234 • 214/620-7117 • FAX 620-8219

September 7, 1994

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

RE: SOIL SAMPLING
DENTON STATION
LEA COUNTY, NEW MEXICO

CURA PROJECT NO. 15-93678C.3

Mr. Stidham:

CURA, Inc. has completed soil sampling and crude oil recovery operations at the above-referenced facility as requested by Shell Pipe Line Corporation (SPLC). On March 29, 1994 and May 6 1994, CURA, Inc. performed soil sampling operations at Denton Station. As requested by the New Mexico Oil Conservation Division (OCD) in their letter dated December 1, 1993, the soil samples were analyzed to determine the barium, chromium, and/or lead concentrations using the Toxicity Characteristic Leaching Procedure (TCLP). None of the barium, chromium, and/or lead concentrations determined from TCLP were above the Resource Conservation and Recovery Act's (RCRA) hazardous waste concentration levels.

BACKGROUND

A previous investigation conducted by Weston in June 1993 identified total barium, chromium, and lead levels of 112 ppm, 12.4 ppm, and 13.8 ppm, respectively, in the soils of boring SB-02 and a total lead concentration of 29.1 ppm in sample SS-01. The OCD requested additional soil sampling for confirmatory analysis by TCLP.

SOIL SAMPLING PROCEDURES AND ANALYTICAL RESULTS

On March 29, 1994, soil samples SB-1A and SB-2-1A were collected from the areas previously sampled by Weston (SB-01 and SB-02, respectively) adjacent to the former tank battery at a depth of 2.5 feet to 3.0 feet below ground surface. On May 5, 1994, soil sample SS-1A was obtained from the surface (0 feet to 0.3 feet depth) in the immediate vicinity of Weston sample SS-1 as indicated on the attached site map (Figure 1) in Attachment A. The samples were obtained with a decontaminated sample trowel and placed into 8-ounce jars with a teflon-lined lids. The recorded TCLP levels were below the method detection limits for each constituent. A summary of analytical results for soil samples obtained by CURA is presented in Table 1. The laboratory report and the chain-of-custody are included in Attachment B.

TABLE 1
DENTON STATION
SUMMARY OF SOIL SAMPLE ANALYTICAL RESULTS

Sample Identification	Date	Sampled Interval (feet)	TCLP Barium (mg/kg)	TCLP Lead (mg/l)	TCLP Chromium (mg/l)
SS-1A	05/06/94	0 - 0.3	---	<0.1	---
SB-1A	03/29/94	2.5 - 3.0	---	<0.1	---
SB-2-1A	03/29/94	2.5 - 3.0	<1.0	<0.1	<0.02

Analyses listed in milligrams per kilogram (mg/kg) and milligrams per liter (mg/l) which is equivalent to parts per million (ppm).
Analyses were conducted using EPA Method 3010, EPA Method 6010 and EPA Method 1311 by SPL Environmental Laboratories.

CONCLUSIONS

The analyses of soil samples obtained from the vicinity of the former tank battery indicate leachable concentrations well below the current Toxicity Characteristic (TC) hazardous waste limits of 100 mg/l (ppm) for barium, and 0.5 mg/l (ppm) for lead and chromium as defined by Subtitle C regulations.

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.

F. Wesley Root
Project Manager

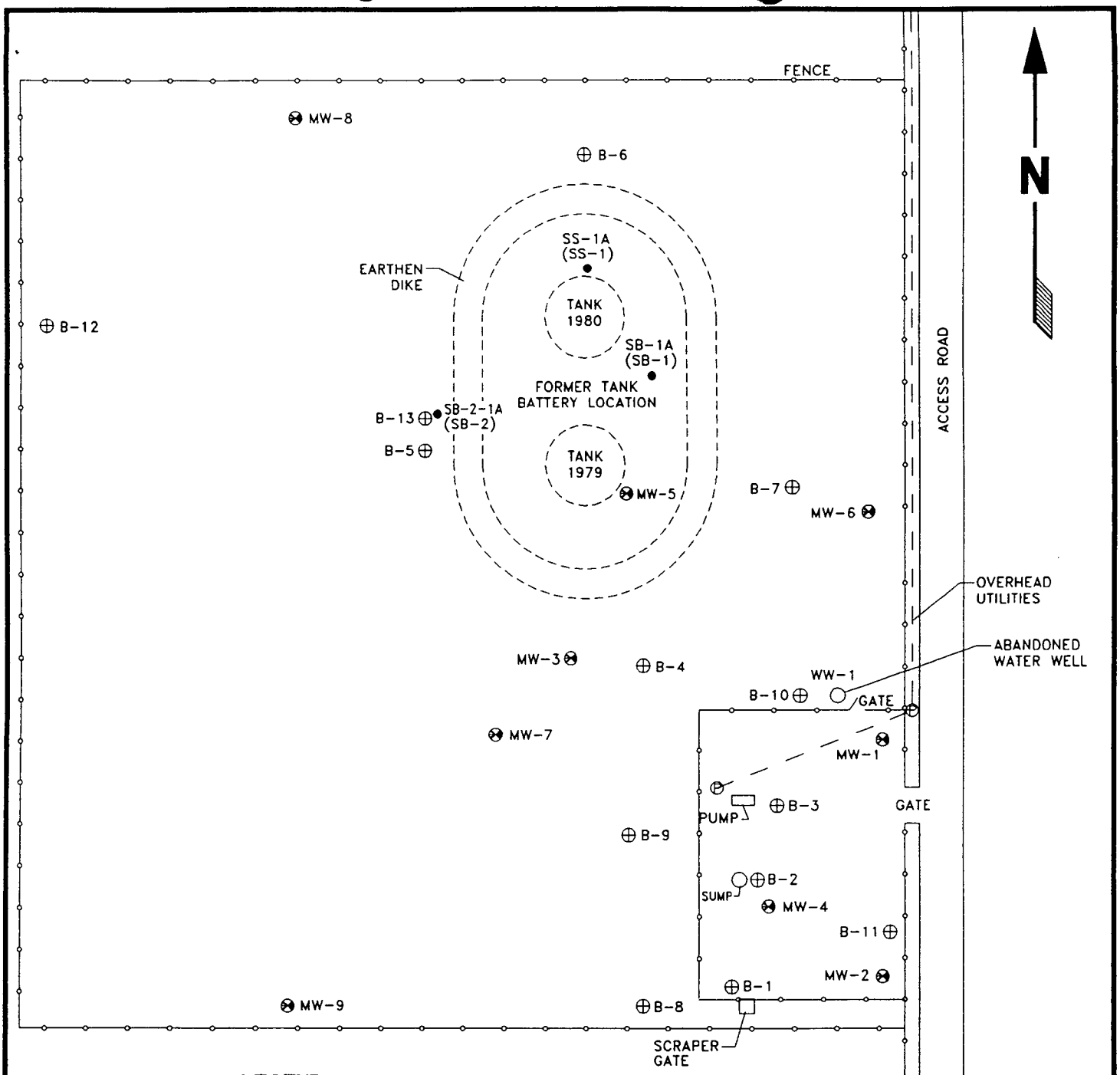
Michael A. Clark, P.E.
Vice President

FWR/chs

Enclosures

ATTACHMENT A

SITE MAP



LEGEND

- ● TCLP SOIL SAMPLE LOCATIONS
- ⊕ BORING LOCATIONS
- ⊗ MONITORING WELL LOCATIONS

SAMPLE LOCATION MAP

0 100'
APPROXIMATE SCALE

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

DENTON STATION
SHELL PIPE LINE CORPORATION
LEA COUNTY, NEW MEXICO

DATE:	SCALE:
AUG 1994	SEE ABOVE
PROJECT NO.	FIGURE NO.
15-93678	1

ATTACHMENT B

LABORATORY REPORT AND

CHAIN-OF-CUSTODY

SPL, INC.

REPORT APPROVAL SHEET

WORK ORDER NUMBER: 94-05-553

Approved for release by:

S. Sample, Laboratory Director Date: 5/20/94

Barbara Martinez, Project Manager Date: 5/20/94

Certificate of Analysis No. 9405553-01

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

P.O.# MESA-CAO-B-131201-PX-4204-NS
DATE: 05/20/94

PROJECT: Denton Station
SITE: Lea County, New Mexico
SAMPLED BY: CURA, Inc.
SAMPLE ID: SS-1A

PROJECT NO: 15-93678 OOC.3
MATRIX: SOIL
DATE SAMPLED: 05/06/94 08:30:00
DATE RECEIVED: 05/12/94

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Acid Digestion - ICP/TCLP METHOD 3010 *** Analyzed by: AM Date: 05/16/94	05/16/94		
Lead, TCLP Leachate METHOD 6010 *** Analyzed by: DQ Date: 05/18/94	ND	0.1	mg/L
TCLP Leachate extraction METHOD 1311 *** Analyzed by: MO Date: 05/13/94	05/13/94		

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.

CLIENT NAME: Shell Pipe Line Corporation SPL #: 9405553-01
CLIENT ID: SS-1A

TCLP SUMMARY

PARAMETER	RESULTS (mg/L)	REGULATORY * LIMIT (mg/L)
LEAD	< 0.1	5.0

* = Reference Federal Register 55, 11862 (3/29/90), RCRA Toxicity Characteristic Final Rule.

ICP SPECTROSCOPY
SUPPLEMENTAL BLANKS AND LCS REPORT

Date of Analysis: 5-18-94 Time: 09:10 AM File #: A051894 Units: mg/L

Instrument: ☑ Thermo-Jarrell Ash 61E ☐ Perkin Elmer Plasma40 Analyst: RR.

Prep. Blank Date: 5-13-94		
Sample Matrix: TCLP - EX-1		
SPL Work Order: 5479 1A		
5481-1B, 5499-2C 5500-1B		
5508 1B-5B 7B 5551 1A,7A		
ELEMENT	METHOD BLANK	LCS % REC.
BA	ND	N/A
AS	↓	↓
SE		
CD		
CR		
PB		
AG	↓	↓

Prep. Blank Date: 5-13-94		
Sample Matrix: TCLP - EX-1		
SPL Work Order: 5553-1A		
5583 1d		
ELEMENT	METHOD BLANK	LCS % REC.
BA	ND	N/A
AS	↓	↓
SE		
CD		
CR		
PB		
AG	↓	↓

Prep. Blank Date: 5-13-94		
Sample Matrix: TCLP - EX-2		
SPL Work Order: 5481-2, -5B		
5478 1A		
ELEMENT	METHOD BLANK	LCS % REC.
BA	ND	N/A
AS	↓	↓
SE		
CD		
CR		
PB		
AG	↓	↓

Flags
☐ See Case Narrative
☐ Blank Conc. < 20 Times Sample Conc.

Analyst

Supervisor Approval

Date Approved 5/19/94

QUALITY CONTROL DOCUMENTATION

HOUSTON ENVIRONMENTAL
ICP SPECTROSCOPY
QUALITY ASSURANCE AND CONTROL REPORT

ICPQAQC.RC REV.4/94

Date of Analysis: 5-18-94 Time: 09:10 AM. Analyst: RR. Units: mg/L.

Inst. ☑ Thermo-Jarrell Ash 61E ☐ Perkin Elmer Plasma 40

File #: A051894 Method: ☐ 200.7 ☑ 6010

Digest: P3010L TCLP: ☐ Water ☑ Soil ☐ Other ☐ Oil

Matrix: ☐ Soil ☐ Water ☑ Leachate

SPL Sample #'s In Batch:

9405479 - 1A	9405508 - 1B	- 5B, 7B	9405679 - 1B
9405481 - 1B	9405551 - 1A, 2A		9405676 - 1B
9405499 - 2A	9405553 - 1A		
9405500 - 1B	9405583 - 1A		

SPL QA/QC Sample ID: #1 9405479 - 1A (EX-1) #2 _____ #3 _____

	Blank and Check Standard			QA/QC	Matrix Spike and Spike Duplicate Data					
Elem.	Method Blank	LCS Theoret.	LCS Rec. (±20%)	Sample Conc.	Spike Added	Spike Conc.	Spk. Dup. Conc.	Spike % Rec.	Spk. Dup. % Rec.	MS-MSD % RPD
BA	ND	2.0	103.4	1.749	2.0	3.869	3.890	106.0	107.1	1
AS	↓	↓	99.0	ND	↓	1.921	1.971	96.1	98.6	3
SE	↓	↓	98.2	↓	↓	2.079	2.072	104.0	103.6	0
CD	↓	↓	100.1	↓	1.0	0.9578	0.9839	95.8	98.4	3
CR	↓	↓	99.2	↓	↓	0.9405	0.9719	94.1	97.2	3
PB	↓	↓	101.0	↓	↓	0.9610	0.9650	96.1	96.5	0
AG	↓	↓	96.4	↓	↓	0.9165	0.9371	91.7	93.7	2

PB-1 5/16

*Flags ☐ MS or MSD Out of QA Limits (±25%)
☐ Spike RPD Out of QA Limits (±20%)
☐ See Case Narrative
☐ Within Soil LCS Limits _____

Analyst _____

Supervisor Approval _____ Date 5/19/94

QA/QC Approval _____ Date 5/19/94

Idelis Williams, QC Officer

CHAIN OF CUSTODY

AND

SAMPLE RECEIPT CHECKLIST

9405553

SHELL OIL COMPANY
RETAIL ENVIRONMENTAL ENGINEERING

CHAIN OF CUSTODY RECORD NO. 04898

Date: 5-7-94
Page 1 of 1

SITE ADDRESS: Denton Station
Lea County, New Mexico
~~WIC #:~~ Proj. # 15-9367800C.3
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: ice	NO. OF CONTAINERS	CONTAINER SIZE (ounces)	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: Lead TCLP			REMARKS
SS-1 A	5/6/94	0830		✓		✓								✓	1	8												✓			

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME
Gil Van Deventer	5/7/94	1300	[illegible]	5/9/94	9:10
[illegible]	5/9/94	1330	[illegible] (INTACT 3°C)		
			[illegible]	5/12/94	9:00

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

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

8096041214

SPL HOUSTON ENVIRONMENTAL LABORATORY

SAMPLE LOGIN CHECKLIST

DATE: 5/12 TIME: 9:00 CLIENT NO. _____
LOT NO. _____ CONTRACT NO. _____

CLIENT SAMPLE NOS. _____

SPL SAMPLE NOS.: 9405553

		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: 809604214		
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: 5/12/94
DELIVERED FOR RESOLUTION: REC'D _____ DATE: _____
RESOLVED: _____ DATE: _____

SPL, INC.

REPORT APPROVAL SHEET

WORK ORDER NUMBER: 94-04-041

Approved for release by:

M. Scott Sample Date: 4/15/94

S. Sample, Laboratory Director

Barbara Martinez Date: 4/14/94

Barbara Martinez, Client Services Representative

Certificate of Analysis No. 9404041-01

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

DATE: 04/12/94

PROJECT: Denton Station
SITE: Lea County, New Mexico
SAMPLED BY: CURA, Inc.
SAMPLE ID: SB-1A

PROJECT NO: 15-9367800C.3
MATRIX: SOIL
DATE SAMPLED: 03/29/94 12:30:00
DATE RECEIVED: 04/01/94

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Acid Digestion - ICP/TCLP METHOD 3010 *** Analyzed by: PB Date: 04/07/94	04/07/94		
Lead, TCLP Leachate METHOD 6010 *** Analyzed by: DQ Date: 04/11/94	ND	0.1	mg/L
TCLP Leachate extraction METHOD 1311 *** Analyzed by: MO Date: 04/04/94	04/04/94		

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.

Certificate of Analysis No. 9404041-02

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

DATE: 04/12/94

PROJECT: Denton Station
SITE: Lea County, New Mexico
SAMPLED BY: CURA, Inc.
SAMPLE ID: SB-2-1A

PROJECT NO: 15-9367800C.3
MATRIX: SOIL
DATE SAMPLED: 03/29/94 12:40:00
DATE RECEIVED: 04/01/94

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Barium, TCLP Leachate METHOD 6010 *** Analyzed by: DQ Date: 04/11/94	ND	1	mg/L
Chromium, TCLP Leachate METHOD 6010 *** Analyzed by: DQ Date: 04/11/94	ND	0.02	mg/L
Acid Digestion - ICP/TCLP METHOD 3010 *** Analyzed by: PB Date: 04/07/94	04/07/94		
Lead, TCLP Leachate METHOD 6010 *** Analyzed by: DQ Date: 04/11/94	ND	0.1	mg/L
TCLP Leachate extraction METHOD 1311 *** Analyzed by: MO Date: 04/04/94	04/04/94		

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.

CLIENT NAME: Shell Pipe Line Corporation SPL #: 9404041-01
CLIENT ID: SB-1A

TCLP SUMMARY

PARAMETER	RESULTS (mg/L)	REGULATORY * LIMIT (mg/L)
LEAD	< 0.1	5.0

* = Reference Federal Register 55, 11862 (3/29/90), RCRA Toxicity Characteristic Final Rule.
** = These two compounds are quantitated together.

4/14

CLIENT NAME: Shell Pipe Line Corporation SPL #: 9404041-02
CLIENT ID: SB-2-1A

TCLP SUMMARY

PARAMETER	RESULTS (mg/L)	REGULATORY * LIMIT (mg/L)
BARIUM	< 1	100.0
CHROMIUM	< 0.02	5.0
LEAD	< 0.1	5.0

* = Reference Federal Register 55, 11862 (3/29/90), RCRA Toxicity Characteristic Final Rule.
** = These two compounds are quantitated together.

4/14

ICP SPECTROSCOPY
QUALITY ASSURANCE AND CONTROL REPORT

Date of Analysis: 4-11-94 Time: 09:38 AM Analyst: RR. Matrix: TCLP

Inst. ☑ Thermo-Jarrell Ash 61E File #: A041194 Method: P3010L Units: mg/L

☐ Perkin Elmer Plasma40

SPL Work Order Identification #:				
	9404004 1C	9404041 2A	94052 RR.	9404041 1A
	9404002 1B-3B, 4A	9404042 1A, 2A	9404052 1C-4C	-
	9403A82 1A-3A	9404047 2B		
	9403A96 1C, 2C	9404050 1E, 2E		

QA\QC Sample ID: #1 9404004 1C (Soil Ex-1) #2 9404041 1A (Soil Ex-1) #3 _____

	Blank and Check Standard			Duplicate Analysis			Spike and Spike Duplicate Analysis			
	ELEMENT PBLK-2 4/7/94	METHOD BLANK	LCS ± 2 % REC.	ORIGINAL CONC.	DUPLICATE CONC.	RPD %	SPIKE ADDED	MS % REC.	MSD % REC.	RPD %
1.	BA	NP	98.8	1.926	1.954	1	2.0	98.5	100.9	2
	AS	↓	99.0	NP	NP	N/A	↓	99.9	101.7	2
	SE	↓	103.4	↓	↓	↓	↓	109.9	107.0	3
	Cd	↓	101.4	↓	↓	↓	1.0	98.3	98.6	0
	CR	↓	101.7	↓	↓	↓	↓	99.2	98.6	1
	PB	↓	102.8	0.1022	↓	↓	↓	95.2	97.4	2
	AG	↓	100.9	NP	↓	↓	↓	95.9	95.6	0
2.	PB	NP	102.8	NP	NP	N/A	1.0	100.4	100.7	0

Flags

☐ Duplicate RPD Out of QA Limits
☐ MS or MSD Out of QA Limits
☐ MS-MSD RPD Out of QA Limits
☐ See Case Narrative

Analyst _____

Supervisor Approval _____

Date Approved 4/11/94

9404041

SHELL OIL COMPANY
RETAIL ENVIRONMENTAL ENGINEERING

CHAIN OF CUSTODY RECORD NO. 04890

Date: _____
Page 1 of 1

SITE ADDRESS: Denton Station
Lea County, New Mexico
~~WIC #:~~ Project # 15-9367800C.3
CONSULTANT NAME & ADDRESS: CURA, Inc.
731 W. Wadley, Suite L-200 Midland, Tx 79705
CONSULTANT CONTACT: F. 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: ice	NO. OF CONTAINERS	CONTAINER SIZE (ounces)	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	REMARKS
SB-1A	3/29/94	1230		✓		✓								✓	2	8											TCLP Ba, Cr, & Pb	P44
SB-2-1A	3/29/94	1240		✓		✓								✓	2	8											TCLP Pb (lead) ✓	

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME
L D Van Deventer	3/29/94	1800	F. Wesley Root	3/29/94	18:00
F. Wesley Root	3/31/94	18:00	(INTACT 3°C)		
RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME
				4/1/94	9:30

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

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: 4/1 TIME: 9:00 CLIENT NO.
LOT NO. CONTRACT NO.

CLIENT SAMPLE NOS.

SPL SAMPLE NOS.: 9404041

		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: 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: 4/1/94
DELIVERED FOR RESOLUTION: REC'D DATE:
RESOLVED: DATE:

Shell Pipe Line Corporation

Two Shell Plaza
P. O. Box 2648
Houston, Texas 77252-2648

April 19, 1994

Mr. William C. Olson
State of New Mexico Oil Conservation Division
Environmental Bureau
P.O. Box 2088
Santa Fe, New Mexico 87504-2088

SUBJECT: DENTON STATION

Dear Mr. Olson,

I would like to take this opportunity to update you on Shell Pipe Line Corporation's activities at Denton Station to locate the source of the Phase Separated Hydrocarbon (PSH) on the groundwater.

On March 16, Shell Pipe Line personnel collected a PSH sample from the station water well for analyses. On the same day, PSH was also discovered on MW-3 and MW-1. The levels of PSH on the water well, MW-3 and MW-1 was 8', 8' and .4', respectively. The PSH level on the water well is the same amount found on the well in February 1993. PSH was not previously encountered on MW-3 or MW-1. The crew began excavating all known lines on the station as well as the sump. The lines were left exposed for 48 hours to see if any leaks would be come evident. Neither the lines nor the sump were found to be leaking or affected. All excavations were backfilled. The accompanying map shows the location and extent of the excavation. Employees utilizing line-locators traversed the station looking for any unknown lines. No additional lines were located.

The tanks have been out of service since the early 1970's and were removed in 1993. The piping between the pump and the tanks was probably removed when the tanks were taken out of service. This piping was not located with either line-locators or cross-trenching. Cross-trenching across this area did not encounter contaminated soil.

The PSH was removed from the wells and a recharge test was conducted on the water well. The PSH recovered to 0.71' in 100 minutes, 0.98' in 11.5 hours and 3.29' on March 29.

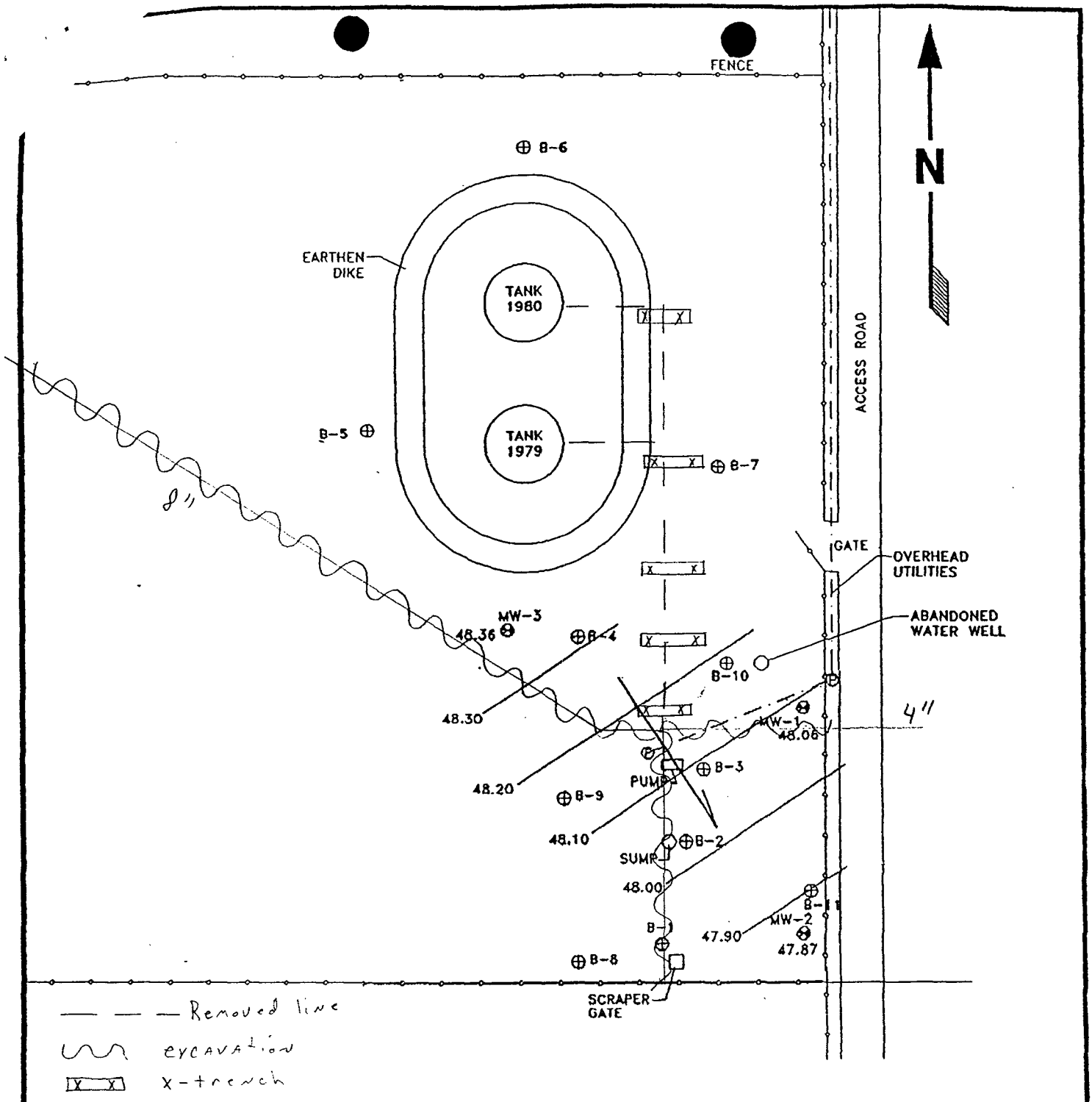
We plan to drill four borings, hydrologically upgradient, along the north and west side of the property to help delineate the extent and source of the contamination. These borings should determine if the source is from off-site. Should these borings prove clean, we will then begin detailed delineation within the station. Based upon findings during drilling, the boring(s) may be completed as monitoring wells. Developmental water will be drummed and tested for benzene. If the developmental water exceeds .5mg/l benzene it will be disposed of in accordance with the State hazardous waste regulations.

I will keep you informed of our findings and progress. If you have any questions please call me at 713-241-2961.

Sincerely,

Neal Stidham
Staff Engineer

cc: Mr. Paul Newman
EOTT Energy Corporation



GROUNDWATER GRADIENT MAP

-WATER LEVELS OBTAINED 09/27/93
-CONTOUR INTERVAL = 0.01 FEET

0 100'
APPROXIMATE SCALE

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

DENTON STATION
SHELL PIPE LINE CORPORATION
LEA COUNTY, NEW MEXICO

DATE:	SCALE:
MAR 1993	SEE ABOVE
PROJECT NO.	FIGURE NO.
15-92567	3

bc: G. H. Sherwin
J. R. Richardson

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 1420	Date 4/29/94
Originating Party		**Other Parties**
Neal Stidham - Shell Pipe Line Corp.		Bill Olson - Envir. Bureau

Subject

Shell Denton Crude Station

Discussion

Shell will install 4 borings next week (Wednesday 5/4/94) for additional plume definition

Conclusions or Agreements

I will inform Wayne Price of OCD Hobbs Office

Distribution
Shell Denton Station file
Wayne Price - OCD Hobbs

Signed Bill Olson

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 fir., 3/16)

Signed Bill Olson

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

STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

DRUG FREE

December 1, 1993

BRUCE KING
GOVERNOR

ANITA LOCKWOOD
CABINET SECRETARY

POST OFFICE BOX 2088
STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO 87504
(505) 827-5800

CERTIFIED MAIL
RETURN RECEIPT NO. P-667-242-415

Mr. John B. Hite
Engineering Advisor
General Engineering
Shell Oil Company
Two Shell Plaza
P.O. Box 2099
Houston, Texas 77252

RE: SITE ASSESSMENT AND CLOSURE PLAN
SHELL DENTON CRUDE STATION
LEA COUNTY, NEW MEXICO

Dear Mr. Hite:

The New Mexico Oil Conservation Division (OCD) is in the process of reviewing the following documents submitted by the Shell Oil Company on November 15, 1993:

a. November 11, 1993 "GENERAL LANDFARMING PROCEDURES FOR LOCATIONS REQUIRING ACTION".

b. November 10, 1993 "SITE ASSESSMENT, DENTON CRUDE OIL GATHERING AND PUMP STATION, LEA COUNTY, NEW MEXICO".

c. October 26, 1993 "PHASE III SUBSURFACE INVESTIGATION, DENTON STATION, LEA COUNTY NEW MEXICO, CURA PROJECT NO. 15-93678.3".

d. September 10, 1993 "SITE ASSESSMENT, DENTON CRUDE OIL GATHERING AND PUMP STATION, LEA COUNTY, NEW MEXICO".

e. August 1993 "FINAL REPORT ENVIRONMENTAL DUE DILIGENCE ASSESSMENT, NEW MEXICO SWEET SYSTEM AND NEW MEXICO SOUR SYSTEM".

f. March 12, 1993 "PHASE II ENVIRONMENTAL SITE ASSESSMENT, DENTON STATION, LEA COUNTY, NEW MEXICO, CURA PROJECT NO.15-92567001.3".

The OCD has the following comments, questions and requests for information regarding the above referenced documents:

1. The August 1993 Due Diligence Assessment documented total barium, cadmium, chrome and lead present in the soils of boring SB-02 and total lead in the soils of sample SS-01 in excess of Toxic Characteristic (TC) hazardous waste limits as defined under federal RCRA Subtitle C regulations. Since crude oil pump stations are not exempt from these regulations, the OCD requires that Shell provide the OCD with a Toxic Characteristic Leaching Procedure (TCLP) barium, cadmium, chrome and lead analysis of the soils from the SB-02 area and a TCLP lead analysis of the soils from the SS-01 area.

2. The November 10, 1993 closure plan proposes excavation and landfarming of contaminated soils in the sump area. However, the plan does not contain a method for documenting the final contaminant level upon completion of excavation. Please supply the OCD with a method for confirming that this remedial action will meet the OCD's recommended soil remediation levels or an approved alternate risk based remediation level.

3. The October 26, 1993 and November 10, 1993 documents contain recommendations for installation of a ground water recovery system. However, these documents contain no information on the type of system proposed to be used or how the system will be monitored. Please provide the OCD with a construction design and monitoring proposal for the ground water remediation system.

4. The ground water assessment did not completely define the extent of ground water contamination at the site. Please provide the OCD with a work plan for delineating the full extent of ground water contamination related to Shell's activities.

5. Please be advised that the concentration of benzene in ground water in monitor wells MW-1 and MW-3 is in excess of Toxic Characteristic (TC) hazardous waste limits as defined under federal RCRA Subtitle C regulations. Although the OCD is responsible for the enforcement of state water quality regulations, removal and treatment of this ground water may also require a RCRA permit. The OCD suggests that you contact the New Mexico Environment Department's Hazardous and Radioactive Materials Bureau to determine the applicability of RCRA regulations.

Receipt of the above information will allow the OCD to complete a review of the above referenced documents.

If you have any questions, please contact me at (505) 827-5885.

Sincerely,

William C. Olson
Hydrogeologist
Environmental Bureau

xc: OCD Hobbs District Office
Ed Horst, NMED Hazardous & Radioactive Materials Bureau

P 667 242 415

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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.

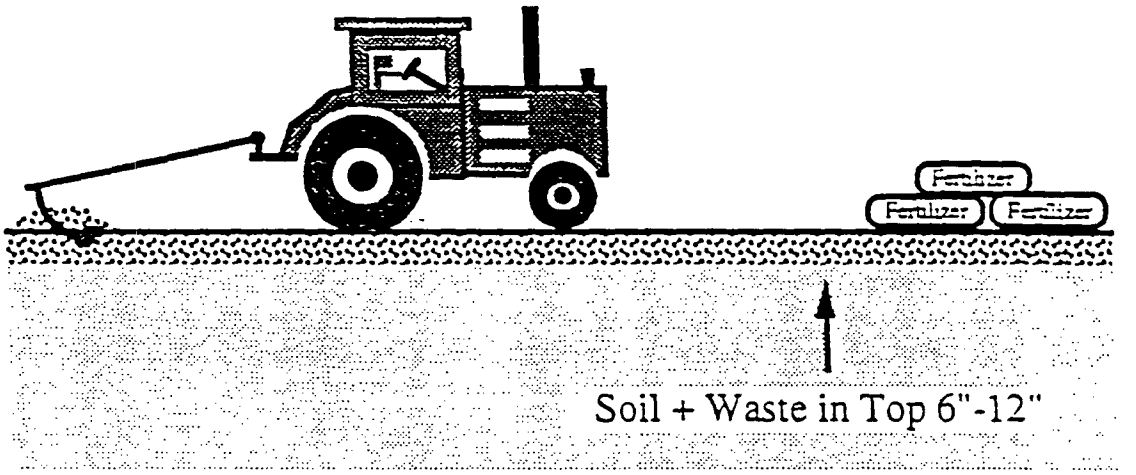
Sincerely,

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.

Shell Oil Company

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

November 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
DENTON CRUDE OIL GATHERING AND PUMP STATION
LEA COUNTY, NEW MEXICO

Please find enclosed a copy of Shell Pipe Line Corporation environmental contractor's (CURA, Inc.) site assessment report and EOTT Energy Corp. environmental contractor's (Roy F. Weston, Inc.) due diligence assessment for Denton Station.

CURA advanced 11 soil borings in areas where crude oil impact to the environment was likely to occur. A minimum of two samples per boring was analyzed for BTEX and TPH. Monitoring wells were to be installed in borings where groundwater was encountered. No groundwater was encountered in any of the borings.

Denton Station is located approximately 13 miles northeast of Lovington in Lea County, New Mexico. The station is surrounded by a barbed wire fence and has a locked gate. The site is located in a rural area within the Denton oil field. No residences or surface bodies of water were observed within a 1,000 foot radius of the facility. An abandoned water well is on site and four water wells are located between 2,000 to 2,500 feet from the site to the northwest. The current status of these wells is unknown. The abandoned water well on site has a 10 inch steel casing near the surface and is currently open to a depth of 97 feet. Currently, the groundwater in the site area is used for industrial and livestock purposes.

The highest TPH values were 5,800 ppm TPH at 3- 5 feet and 970 ppm TPH at 11 - 12 feet in boring B-2. Boring B-3 had a TPH value of 240 ppm at 6 to 6.5 feet. The rest of the samples had values less than 58 ppm TPH. All of the benzene levels were below 0.003 ppm.

DentonSt.jbh

The water well on site had 7.97 feet of crude oil in it. The crude oil has been bailed and approximately 35 gallons of crude oil were recovered. Subsequent measurements recorded 3.45 feet of crude in the well. We reported the crude oil in the well to Mr. Jerry Sexton of your Hobbs, New Mexico office on February 25, 1993.

On September 20 and 21, 1993, CURA, Inc. installed three monitoring wells around the existing water well. No separate phase crude oil was found in the three wells. The water sample results indicate that the wells are impacted by BTEX (benzene levels ranged between 0.017 and 0.85 ppm) (TPH ranged from < 1 to 25 ppm).

Shell proposes to install an oil recovery system and pump and treat the water. We will provide the OCD a copy of our proposed system.

The soil is impacted above 500 ppm TPH in two areas (the sump and an area outside the western side of the tank dike). Shell proposes to excavate the soil around the sump to a depth of 5 to 7 feet and land farm the soil on site. The area west of the tank dike (30 feet by 60 feet) will be tilled or disked and 200 lbs/acre of fertilizer added. The soil excavated from around the sump will be land farmed in that same area.

Shell believes that this site is a low to moderate risk area and that the proposed plans will remove or limit the impact to the water, public health and the environment.

Please advise if these proposed plans are acceptable to the New Mexico Oil Conservation Division. Upon receiving your approval, we will implement the work.

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

Sincerely,

John B. Hite
Engineering Advisor
General Engineering

Attachment

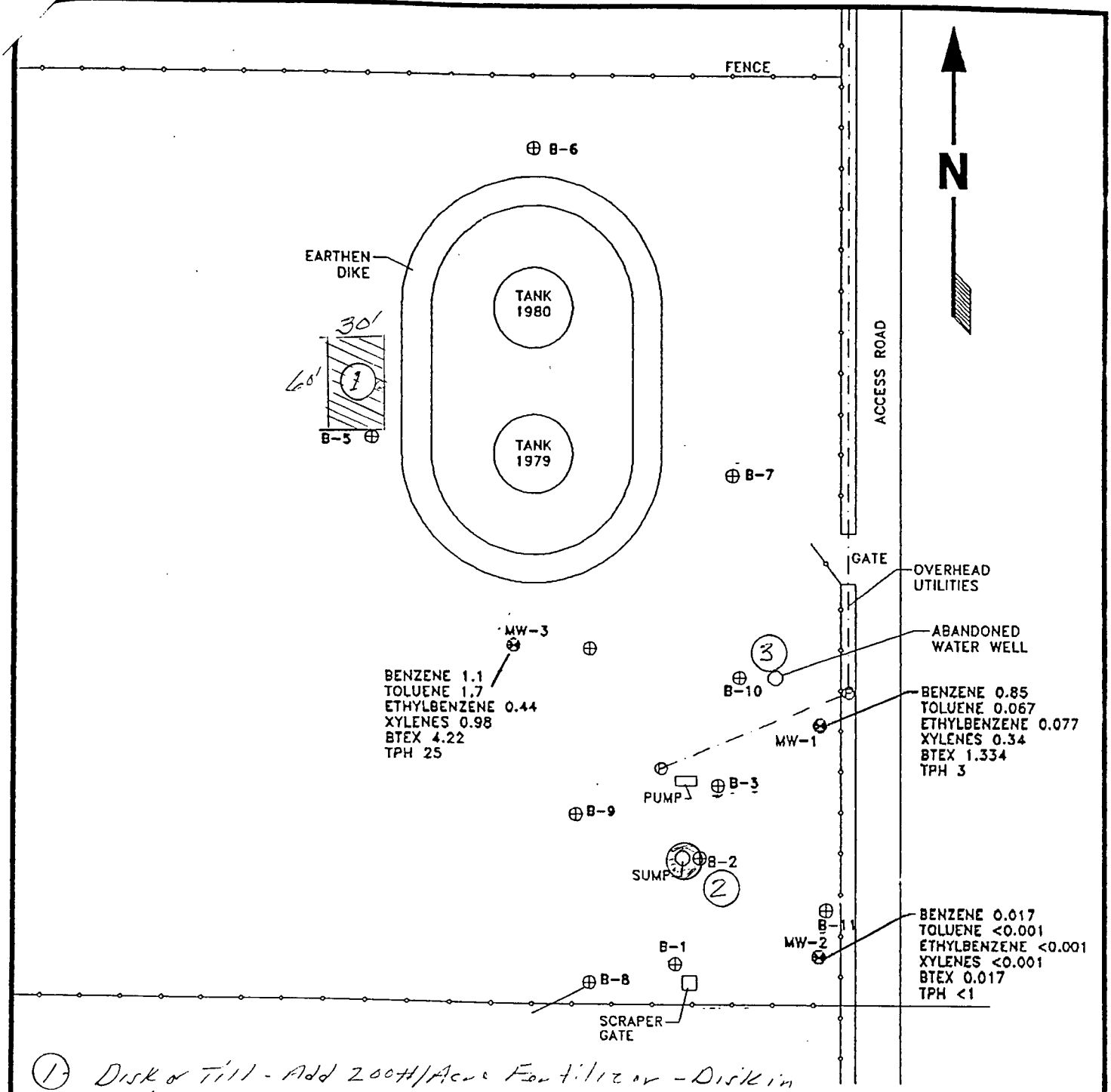
DentonSt.jbh

Denton Station

RANKING CRITERIA

	Ranking Score	Score
Depth to Groundwater		
< 50 feet or unknown	20	
50 - 99	10	10
100 - 200	5	
> 200	0	
Wellhead Protection Area		
< 1000 feet from a water source or,		
< 200 feet from domestic water source		
Yes	20	
No	0	0
Distance to Surface Water Body		
< 500 horizontal feet	20	
500 - 1000 horizontal feet	10	
> 1000 horizontal feet	0	0
Native Soil Type		
Low permeability	0	
Moderate permeability	5	5
High permeability	10	
Total		15

DG330101.JBH



(1) Disk or Till - Add 200#/Acre Fertilizer - Disk in

(2) Excavate around Sump 5'to7' deep - 2'to3' wide
Land Farm soil with (1) - Fill with soil from site

(3) Install recovery System - Treat Benzene in water

DISSOLVED HYDROCARBON MAP

-SAMPLES OBTAINED 09/30/93
-RED NUMBERS INDICATE CONCENTRATIONS IN mg/l (ppm)

0 100'
APPROXIMATE SCALE

CURA INC.
2735 VILLA CREEK DRIVE - TWO METRO SQUARE
BLDG C - SUITE 250 - DALLAS, TX 75234
620-7117 FAX - 620-6219

DENTON STATION
SHELL PIPE LINE CORPORATION
LEA COUNTY, NEW MEXICO

DATE:	SCALE:
MAR 1993	SEE ABOVE
PROJECT NO.	FIGURE NO.
15-92567	2

CURA INC.
Environmental Consultants, Engineers & Scientists
3001 North Big Spring, Suite 101 • Midland, Texas 79705 • 915/570-8408 • FAX 570-8409

October 26, 1993

Mr. John Hite
Shell Pipe Line Company
Two Shell Plaza
P.O. Box 2099
Houston, Texas 77252-2099

RE: PHASE III SUBSURFACE INVESTIGATION
DENTON STATION
LEA COUNTY, NEW MEXICO

CURA PROJECT NO. 15-93678.3

Mr. Hite:

CURA, Inc. has completed the Phase III Subsurface Investigation at the above-referenced facility. As outlined in Shell Pipe Line Corporation's Scope of Work dated August 10, 1993, the field investigation included the drilling and sampling of three soil borings to an estimated depth of 60 feet and subsequent conversion to monitor wells. The borings were completed to delineate the hydrocarbon-impacted soils and phase separated hydrocarbons (PSH) previously identified at the site in soil borings and the on-site water well.

The sump and pump equipment were previously identified as probable source areas by elevated total petroleum hydrocarbon (TPH) concentrations in borings B-2 and B-3. The extent or source of groundwater impact, if any, from crude oil overlying groundwater in an abandoned on-site water well was not determined during the previous investigation.

SOIL BORING OPERATIONS AND ANALYTICAL RESULTS

On September 20 and 21, 1993, three monitor wells (MW-1, MW-2, and MW-3) were each drilled to a depth of 60 feet using an air rotary drilling rig. Monitor well MW-1 was placed in the apparent downgradient direction (based on surface topography) to the abandoned water well containing crude oil. Monitor well MW-2 was placed downgradient to the sump and associated piping (possible source area). Monitor well MW-3 was located upgradient of both the abandoned water well and the sump area (Appendix A, Figure 1).

The soils encountered during the boring operations consisted of 25 feet of buff-white calcareous sand (caliche) which is overlain in areas by a 1 foot to 2 foot brown slightly calcareous sand (SM). The buff-white caliche grades into a pink calcareous sandstone at approximately 25 feet. This sandstone contained intermittent red medium-grained sand (SM) streaks and extended from 25 feet to a depth of 60 feet (maximum boring depth).

During this assessment no significant hydrocarbon concentrations (>10 ppm benzene, >50 ppm total benzene, toluene, ethylbenzene, and xylenes (BTEX), and >100 ppm TPH) were observed in monitor well MW-2 or the upper 38 feet of monitor wells MW-1 and MW-2. However, the soil sample analytical results indicate a hydrocarbon-impacted interval at 40 feet in monitor wells MW-1 and MW-2 that recorded TPH levels of 800 ppm and 1,100 ppm, respectively. A 10 foot conventional core of the sandstone from 40 feet to 50 feet in monitor well MW-3 exhibited intermittent streaks of higher permeability containing hydrocarbons. Hydrocarbon concentrations increased toward the base of the cored interval near the groundwater table from a TPH level of 1,100 ppm at 42 feet to 10,000 ppm at 50 feet.

Groundwater containing no PSH was encountered at approximately 51 feet during drilling operations. The boring logs are included in Appendix B and provide a more detailed description of the subsurface conditions encountered at the site. Soil samples were collected intermittently using a split spoon sampling device and a conventional core barrel. The samples were field screened with a Century 128 organic vapor analyzer (OVA). The soil samples which registered the highest OVA reading, had the greatest hydrocarbon odors or staining, and the samples from the greatest depth above groundwater were submitted to the laboratory to be analyzed for TPH and BTEX.

A complete listing of the OVA readings and the soil sample analytical results is provided in Table 1 (Appendix C). Hydrocarbon concentrations of the subsurface soils are illustrated on the site map (Appendix A, Figure 1). The laboratory reports and chain-of-custodies are included in Appendix D.

MONITOR WELL OPERATIONS AND ANALYTICAL RESULTS

Borings MW-1 through MW-3 were each drilled to a depth of 60 feet and completed as monitor wells to characterize groundwater conditions. Monitor wells MW-1 and MW-2 were located immediately downgradient, and MW-3 was placed upgradient of the probable source areas. Monitor well MW-1 was located approximately 38 feet downgradient to the abandoned water well to delineate previously identified hydrocarbon impacted groundwater. Approximately 2 feet of crude oil has consistently been gauged and bailed out of the abandoned water well during 12 separate gauging events since February 26, 1993. Depth to groundwater in the water well ranged from approximately 52 feet to 53 feet and corresponds with the groundwater elevations measured in the monitor wells indicating that all wells are completed in the same water zone.

The monitor wells were constructed of 4 inch diameter schedule 40 PVC well casing and screen. The screened portion of the monitor wells were surrounded by a sandpack which was capped with a bentonite seal (minimum thickness of 4 feet). The annular space above the bentonite seal was then grouted to surface. A 3-foot by 3-foot concrete pad and an above grade steel monument pipe well cover were then installed at the surface. The boring logs in Appendix B provide a more detailed description of the screened intervals and well construction materials used.

The monitor wells were gauged on September 27, 1993 to determine the presence of PSH, groundwater elevation and gradient. Depth to groundwater on site ranged from 51.3 feet to 53.0 feet below ground surface with the apparent groundwater gradient toward the southeast. No PSH was observed in the monitor wells during gauging operations. The source of the crude oil in the abandoned water well is unknown, however the lack of PSH in the monitor wells (both upgradient and downgradient) does not indicate that crude oil is being transported along the groundwater. A summary of groundwater elevation measurements is listed in Table 2 (Appendix C).

On September 27, 1993, groundwater samples obtained from monitor wells MW-1 through MW-3 recorded BTEX and TPH levels ranging from 0.017 mg/l (parts per million; ppm) and less than 1 mg/l, respectively in MW-1 to a BTEX level of 4.22 ppm and a TPH level of 25 ppm in MW-3.

CONCLUSIONS

- The extent of hydrocarbon-impacted soils (> 100 ppm TPH) near the sump and pump equipment (probable source) appears limited to an area approximately 100 feet by 50 feet located east of the equipment and south of the abandoned water well with a maximum depth of 20 feet.

- The vertical extent of the hydrocarbon-impacted soils identified in monitor wells MW-1 and MW-3 appear limited to the more permeable sand streaks within the 40 foot to 50 foot deep interval of sandstone. The horizontal extent and probable source of the impacted soils is unknown.

- No PSH was observed in monitor wells MW-1, MW-2, or MW-3 indicating that the crude oil previously identified in the abandoned water well is confined to an area near the well and is not migrating along the groundwater table. The probable source of the crude is unknown.

- The greatest dissolved BTEX and TPH concentrations in the groundwater was recorded in monitor well MW-3 indicating a possible source area located upgradient to the sump and associated piping in the southeast corner of the site.

RECOMMENDATIONS

Active crude oil recovery through the installation of an automated on-site recovery system should be initiated. This system would also be utilized for groundwater treatment in the associated monitor wells.

Shallow impacted soils near the sump, pump and water well should be addressed by excavation and treatment. During those operations additional information regarding the crude oil source may be obtained during the trenching and excavation.

CURA will present a formal workplan upon request. CURA appreciates the opportunity to provide you with our professional consulting services. If you have any questions, please do not hesitate to contact us.

Respectively,
CURA, Inc.

F. Wesley Root
Environmental Geologist

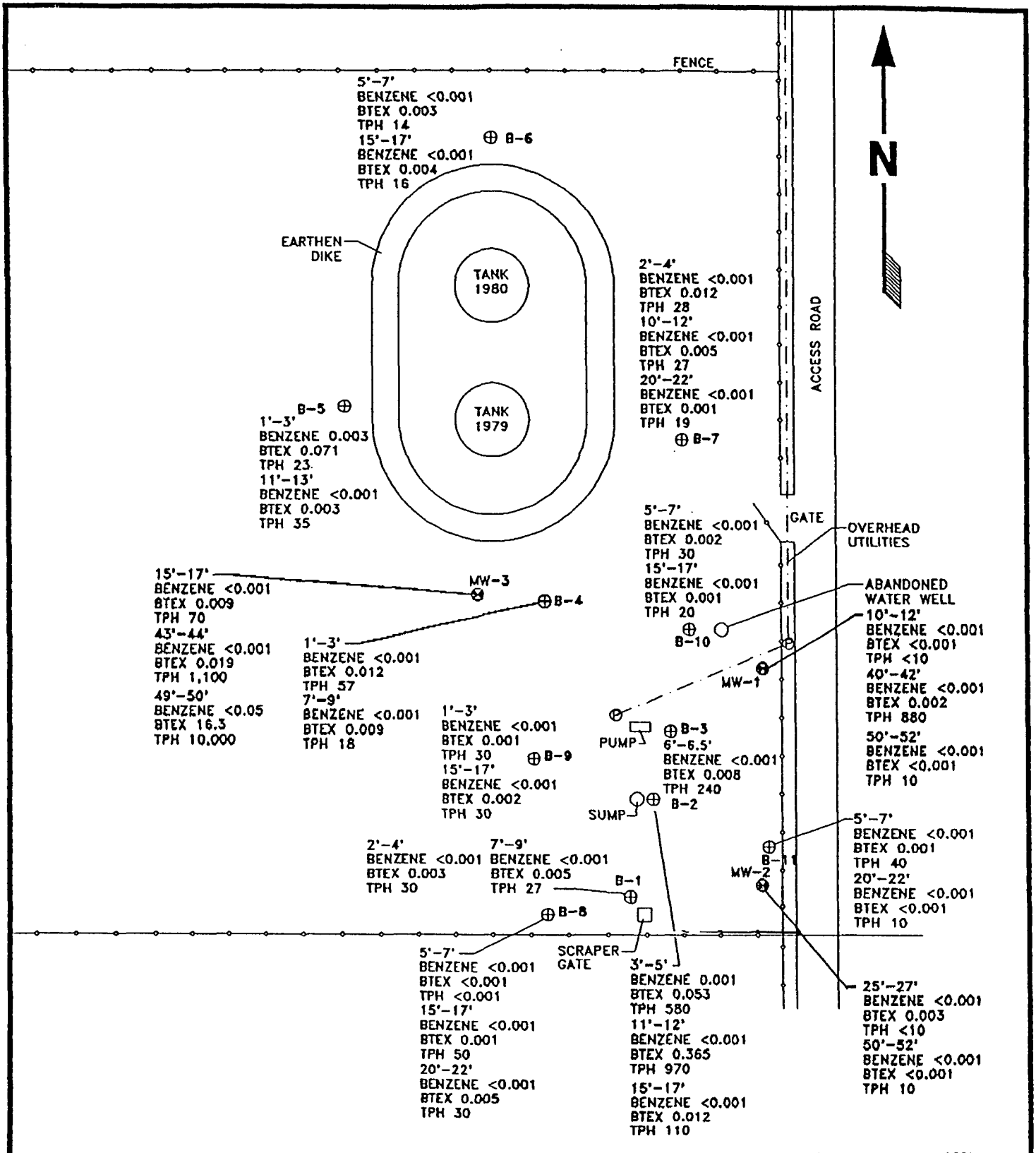
for Greg C. Walterscheid, R.E.M., C.P.G.
Branch Manager - Midland

FWR/chs

Attachments

APPENDIX A

FIGURES



SOIL HYDROCARBON CONCENTRATION MAP

BTEX AND TPH CONCENTRATIONS IN mg/kg (ppm)

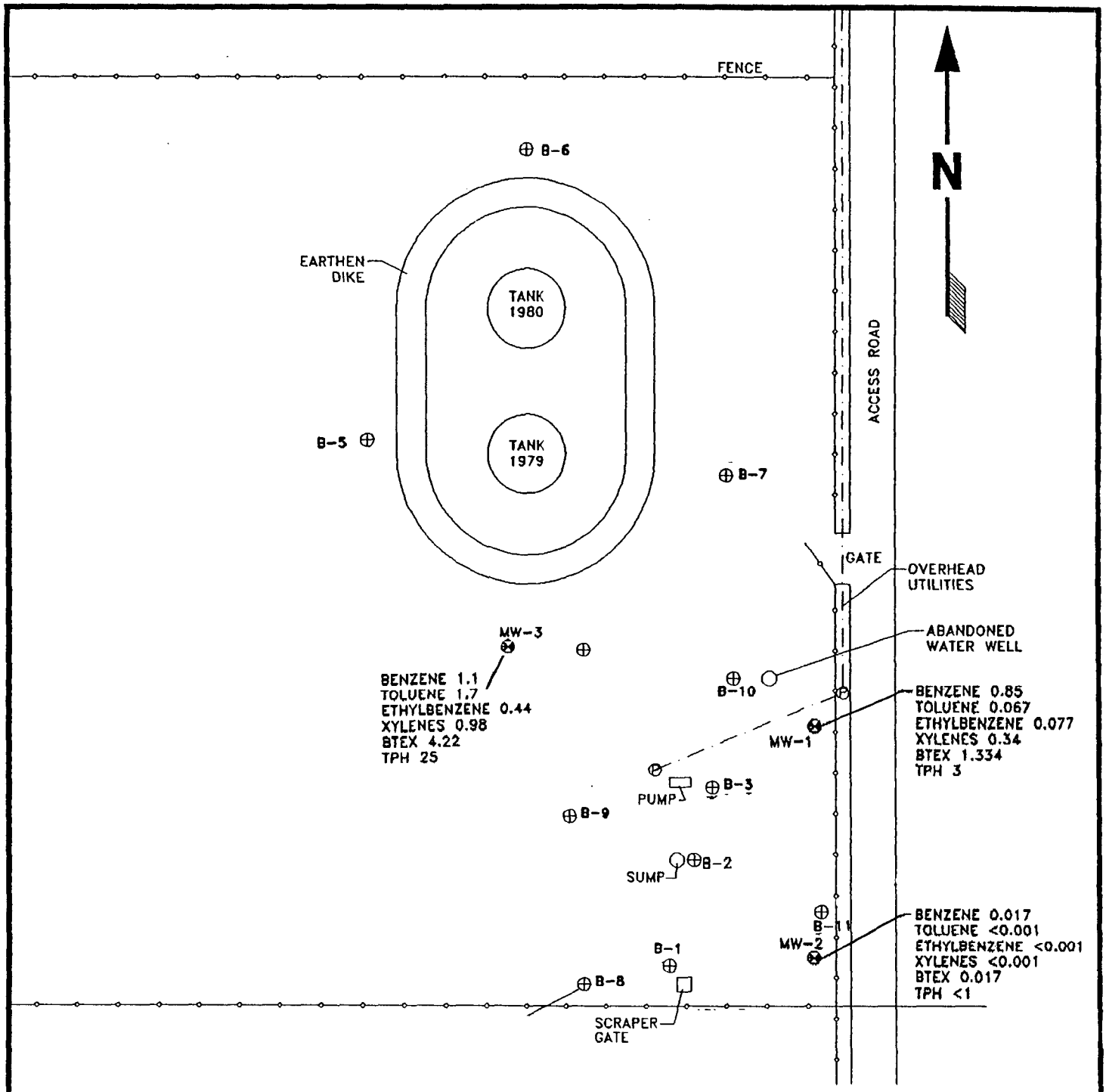
0 100'

APPROXIMATE SCALE

CURA INC.
2735 VILLA CREEK DRIVE - TWO METRO SQUARE
BLDG. C - SUITE 250 - DALLAS, TX 75234
620-7117 FAX - 620-6219

DENTON STATION
SHELL PIPE LINE CORPORATION
LEA COUNTY, NEW MEXICO

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



DISSOLVED HYDROCARBON MAP

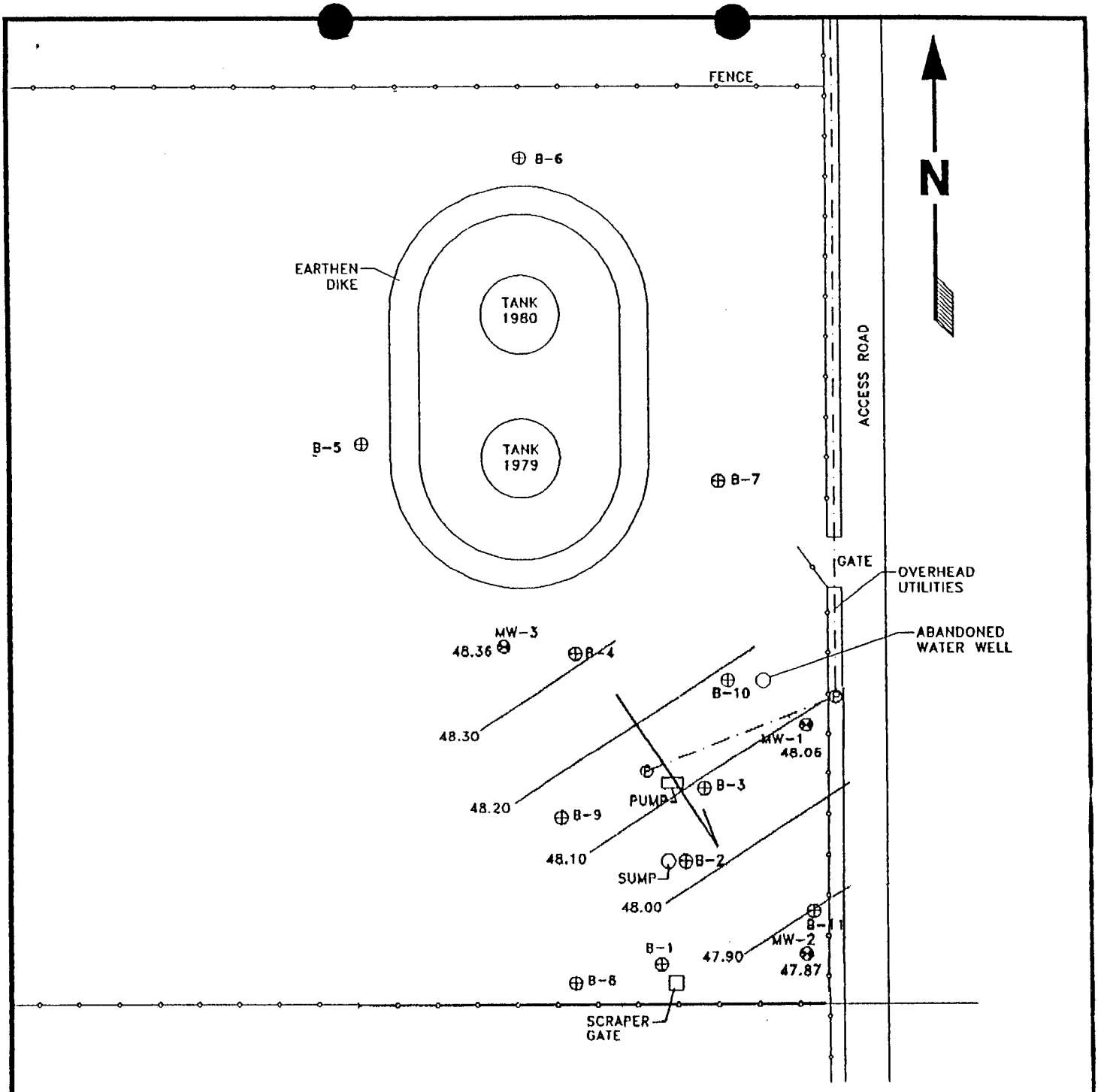
-SAMPLES OBTAINED 09/30/93
-RED NUMBERS INDICATE CONCENTRATIONS IN mg/l (ppm)

0 100'
APPROXIMATE SCALE

CRA INC.
2735 VILLA CREEK DRIVE - TWO METRO SQUARE
BLDG. C - SUITE 250 - DALLAS, TX 75234
620-7117 FAX - 620-6219

DENTON STATION
SHELL PIPE LINE CORPORATION
LEA COUNTY, NEW MEXICO

DATE:	SCALE:
MAR 1993	SEE ABOVE
PROJECT NO.	FIGURE NO.
15-92567	2



GROUNDWATER GRADIENT MAP

-WATER LEVELS OBTAINED 09/27/93
-CONTOUR INTERVAL = 0.01 FEET

0 100'
APPROXIMATE SCALE

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

DENTON STATION
SHELL PIPE LINE CORPORATION
LEA COUNTY, NEW MEXICO

DATE:	SCALE:
MAR 1993	SEE ABOVE
PROJECT NO.	FIGURE NO.
15-92567	3

APPENDIX B

SOIL BORING LOGS

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

RECORD OF SUBSURFACE EXPLORATION

Project No.: 15-93678	Well/Boring #: MW-1	Date Drilled: 09/20/93
Project: DENTON STATION, LEA COUNTY, NEW MEXICO	Depth of Boring: 60 FEET	Diameter of Boring: 8 INCHES
	Depth of Well: 60 FEET	Diameter of Screen: 4 INCHES
Drilling Co: HI PLAINS DRILLING	Length of Screen: 15 FEET	Diameter of Casing: 4 INCHES
Driller: B.S.	Length of Casing: 45 FEET	Slot Size: 0.02 INCH
Drilling Method: AIR ROTARY	Logged By: F.W.R.	Well Material: SCH 40 PVC

DEPTH FEET	SOIL DESCRIPTION	SAMPLE NUMBER	SAMPLE TYPE	OVA (PPM)	WELL DESIGN	REMARKS
0	Buff-white calcareous SAND (caliche)					
5.0		1	SS	<1		
10.0		2	SS	<1	■	Benzene <0.001 mg/kg BTEX <0.001 mg/kg TPH <10 mg/kg
15.0		3	SS	NR		
20.0	Buff-white with pink mottling calcareous SAND (caliche)	4	SS	NR		
25.0		5	SS	<1		
30.0						

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

ABBREVIATIONS AND SYMBOLS

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

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

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

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

RECORD OF SUBSURFACE EXPLORATION

Project No.: 15-93678	Well/Boring #: MW-1	Date Drilled: 09/20/93
Project: DENTON STATION LEA COUNTY, NEW MEXICO	Depth of Boring: 60 FEET	Diameter of Boring: 8 INCHES
	Depth of Well: 60 FEET	Diameter of Screen: 4 INCHES
Drilling Co: HI PLAINS DRILLING	Length of Screen: 15 FEET	Diameter of Casing: 4 INCHES
Driller: B.S.	Length of Casing: 45 FEET	Slot Size: 0.02 INCH
Drilling Method: AIR ROTARY	Logged By: F.W.R.	Well Material: SCH 40 PVC

DEPTH FEET	SOIL DESCRIPTION	SAMPLE NUMBER	SAMPLE TYPE	OVA (PPM)	WELL DESIGN	REMARKS
30.0	Pink calcareous SANDSTONE (caliche) containing red medium-grained SAND (SM) streaks	6	SS	2		
32.5						
35.0		7	SS	NR		
37.5						
40.0	Slight hydrocarbon odor	8	SS	200		Benzene <0.001 mg/kg BTEX=0.002 mg/kg TPH=880 mg/kg
42.5						
45.0		9	SS	<1		
47.5						
50.0	Pink calcareous SANDSTONE (caliche)	10	SS	<1		▽Water @ 50.9' Benzene <0.001 mg/kg BTEX <0.001 mg/kg TPH=10 mg/kg
52.5						
55.0	Pink calcareous SANDSTONE containing red medium-grained SAND (SM) streaks					
57.5						
60.0		11	SS	<1		
	Bottom of boring @ 60.0 feet					

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

ABBREVIATIONS AND SYMBOLS

HSA-Hollow Stem Augers
CFA-Continuous Flight Augers
DC-Driving Casing
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WATER LEVEL
▽ At Completion
▼ After Hours
● Water on Rods

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

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

RECORD OF SUBSURFACE EXPLORATION

Project No.: 15-93678	Well/Boring #: MW-2	Date Drilled: 09/20/93
Project: DENTON STATION, LEA COUNTY, NEW MEXICO	Depth of Boring: 60 FEET	Diameter of Boring: 8 INCHES
	Depth of Well: 60 FEET	Diameter of Screen: 4 INCHES
Drilling Co: HI PLAINS DRILLING	Length of Screen: 15 FEET	Diameter of Casing: 4 INCHES
Driller: B.S.	Length of Casing: 45 FEET	Slot Size: 0.02 INCH
Drilling Method: AIR ROTARY	Logged By: F.W.R.	Well Material: SCH 40 PVC

DEPTH FEET	SOIL DESCRIPTION	SAMPLE NUMBER	SAMPLE TYPE	OVA (PPM)	WELL DESIGN	REMARKS
0	Buff-white calcareous SAND (caliche)					
10.0	Pink-white calcareous SAND (caliche)					
15.0		1	SS	<1		
20.0	Pink medium-grained SAND (SM)					
25.0		2	SS	<1		Benzene <0.001 mg/kg BTEX=0.003 mg/kg TPH <10 mg/kg
27.5	Pink calcareous sandstone (caliche) containing tan medium-grained SAND (SM) streaks					
30.0						

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

ABBREVIATIONS AND SYMBOLS

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CFA-Continuous Flight Augers
DC-Driving Casing
MD-Mud Drilling

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

■ Sample submitted to lab

Bottom Cap
Sand Pack
Bentonite Seal
Factory-Slotted Well Screen
Well Casing
Volclay Grout Seal

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

RECORD OF SUBSURFACE EXPLORATION

Project No.: 15-93678	Well/Boring #: MW-2	Date Drilled: 09/20/93
Project: DENTON STATION, LEA COUNTY, NEW MEXICO	Depth of Boring: 60 FEET	Diameter of Boring: 8 INCHES
	Depth of Well: 60 FEET	Diameter of Screen: 4 INCHES
Drilling Co: HI PLAINS DRILLING	Length of Screen: 15 FEET	Diameter of Casing: 4 INCHES
Driller: B.S.	Length of Casing: 45 FEET	Slot Size: 0.02 INCH
Drilling Method: AIR ROTARY	Logged By: F.W.R.	Well Material: SCH 40 PVC

DEPTH FEET	SOIL DESCRIPTION	SAMPLE NUMBER	SAMPLE TYPE	OVA (PPM)	WELL DESIGN	REMARKS
30.0						
32.5	Tan calcareous SANDSTONE containing red-brown medium grained SAND (SM) streaks					
35.0		3	SS	<1		
37.5						
40.0						
42.5						
45.0		4	SS	<1		
47.5						
50.0		5	SS	3		Benzene <0.001 mg/kg BTEX <0.001 mg/kg TPH=10 mg/kg ▽Water @ 51.2'
52.5						
55.0						
57.5						
60.0	Bottom of boring @ 60.0 feet					

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

ABBREVIATIONS AND SYMBOLS

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WATER LEVEL
▽ At Completion
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● Water on Rods

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

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

RECORD OF SUBSURFACE EXPLORATION

Project No.: 15-93678	Well/Boring #: MW-3	Date Drilled: 09/20/93
Project: DENTON STATION LEA COUNTY, NEW MEXICO	Depth of Boring: 60 FEET	Diameter of Boring: 8 INCHES
	Depth of Well: 60 FEET	Diameter of Screen: 4 INCHES
Drilling Co: HI PLAINS DRILLING	Length of Screen: 15 FEET	Diameter of Casing: 4 INCHES
Driller: B.S.	Length of Casing: 45 FEET	Slot Size: 0.02 INCH
Drilling Method: AIR ROTARY	Logged By: F.W.R.	Well Material: SCH 40 PVC

DEPTH FEET	SOIL DESCRIPTION	SAMPLE NUMBER	SAMPLE TYPE	OVA (PPM)	WELL DESIGN	REMARKS
0	Brown SAND (SM)					
2.5	Buff-white fine-grained calcareous SAND (caliche)					
15.0		1	SS	<1		Benzene <0.001 mg/kg BTEX=0.009 mg/kg TPH=70 mg/kg
25.0		2	SS	<1		
27.5	Pink calcareous SANDSTONE containing tan medium-grained SAND (SM) streaks					
30.0						

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

ABBREVIATIONS AND SYMBOLS

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

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

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

RECORD OF SUBSURFACE EXPLORATION

Project No.: 15-93678	Well/Boring #: MW-3	Date Drilled: 09/20/93
Project: DENTON STATION, LEA COUNTY, NEW MEXICO	Depth of Boring: 60 FEET	Diameter of Boring: 8 INCHES
	Depth of Well: 60 FEET	Diameter of Screen: 4 INCHES
Drilling Co: HI PLAINS DRILLING	Length of Screen: 15 FEET	Diameter of Casing: 4 INCHES
Driller: B.S.	Length of Casing: 45 FEET	Slot Size: 0.02 INCH
Drilling Method: AIR ROTARY	Logged By: F.W.R.	Well Material: SCH 40 PVC

DEPTH FEET	SOIL DESCRIPTION	SAMPLE NUMBER	SAMPLE TYPE	OVA (PPM)	WELL DESIGN	REMARKS
30.0	Pink calcareous SANDSTONE containing tan medium-grained SAND (SM) streaks					
32.5						
35.0						
37.5						
40.0		3	SS	<1		
42.5		4	CORED 10' W/ CORE BARREL	20		
				700		Benzene <0.001 mg/kg BTEX <0.001 mg/kg TPH=0.019 mg/kg
45.0				500		
47.5				350		
50.0				>1000		Benzene <0.001 mg/kg BTEX=16.3 mg/kg TPH=10,000 mg/kg
52.5						▽Water @ 51.6'
55.0						
57.5						
60.0	Bottom of boring @ 60.0 feet					

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CT-5' Continuous Sampler

ABBREVIATIONS AND SYMBOLS

HSA-Hollow Stem Augers
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WATER LEVEL
▽ At Completion
▼ After Hours
● Water on Rods

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

APPENDIX C

TABLES

TABLE 1
SOIL SAMPLE ANALYTICAL RESULTS

Boring	Date Sampled	Sample Interval (feet)	OVA	Benzene	Toluene	Ethyl-benzene	Xylenes	Total BTEX	TPH
B-1	12-07-92	2 - 4	<1	<0.001	0.003	<0.001	<0.001	0.003	30
		7 - 9	<1	<0.001	0.002	<0.001	0.003	0.005	27
B-2	12-07-92	1 - 3	2						
		3 - 5	9	0.001	0.013	0.007	0.032	0.053	580
		5 - 7	<1						
		10 - 11	20						
		11 - 12	>1000	<0.001	0.025	0.160	0.180	0.365	970
		14 - 15	<1						
		15 - 17	<1	<0.001	0.004	0.002	0.006	0.012	110
B-3	12-07-92	4 - 5	<1						
		6 - 6.5	<1	<0.001	0.003	<0.001	0.005	0.008	240
B-4	12-07-92	1 - 3	2	<0.001	0.004	0.001	0.007	0.012	57
		3 - 5	1						
		5 - 7	1						
		7 - 9	<1	<0.001	0.003	0.001	0.005	0.009	18
B-5	12-07-92	1 - 3	3	0.003	0.019	0.008	0.041	0.071	23
		8 - 9	<1						
		11 - 13	<1	<0.001	0.002	<0.001	0.001	0.003	35
B-6	12-07-92	5 - 7	5	<0.001	0.003	<0.001	<0.001	0.003	14
		10 - 12	<1						
		15 - 17	<1	<0.001	0.004	<0.001	<0.001	0.004	16
B-7	12-07-92	0 - 2	<1						
		2 - 4	4	<0.001	0.004	<0.001	0.008	0.012	28
		5 - 7	3						
		10 - 12	1	<0.001	0.003	<0.001	0.002	0.005	27
		15 - 17	<1						
		20 - 22	<1	<0.001	0.001	<0.001	<0.001	0.001	19
B-8	02-08-93	1 - 3	1						
		5 - 7	2	<0.001	<0.001	<0.001	<0.001	<0.001	10
		10 - 12	<1						
		15 - 17	<1	<0.001	<0.001	<0.001	0.001	0.001	50
		20 - 22	<1	<0.001	<0.001	0.002	0.003	0.005	30

TABLE 1
SOIL SAMPLE ANALYTICAL RESULTS

Boring	Date Sampled	Sample Interval (feet)	OVA	Benzene	Toluene	Ethyl-benzene	Xylenes	Total BTEX	TPH
B-9	02-08-93	1 - 3	1	<0.001	<0.001	<0.001	0.001	0.001	30
		5 - 7	2						
		10 - 12	<1						
		15 - 17	<1	<0.001	0.001	<0.001	0.001	0.002	30
B-10	02-08-93	1 - 3	<1						
		5 - 7	1	<0.001	<0.001	<0.001	0.002	0.002	30
		10 - 12	<1						
		15 - 17	<1	<0.001	<0.001	<0.001	0.001	0.001	20
B-11	02-08-93	1 - 3	1						
		5 - 7	1	<0.001	<0.001	<0.001	0.001	0.001	40
		10 - 12	<1						
		15 - 17	<1						
		20 - 22	<1	<0.001	<0.001	<0.001	<0.001	<0.001	10
MW-1	09-20-93	5 - 7	<1						
		10 - 12	<1	<0.001	<0.001	<0.001	<0.001	<0.001	<10
		20 - 22	No Recovery						
		25 - 27	<1						
		30 - 32	2						
		35 - 37	No Recovery						
		40 - 42	200	<0.001					800
		45 - 47	<1						
		50 - 52	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	10
		59 - 60	<1						
MW-2	09-20-93	15 - 17	<1						
		25 - 27	<1	<0.001	0.001	<0.001	0.003	0.003	<10
		25 - 37	<1						
		45 - 47	<1						
		50 - 52	3	<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
MW-3	09-21-93	15 - 17	<1	<0.001	0.002	0.001	0.006	0.009	70
		25 - 27	<1						
		38 - 40	450						
		40 - 41	20						
		43 - 44	700	<0.001	0.004	0.01	0.05	0.064	1,100
		45 - 46	500						
		47 - 48	350						
		49 - 50	<1,000	<0.001	1.1	3.2	12.0	16.3	10,000

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

TABLE 2
SUMMARY OF RELATIVE GROUNDWATER LEVEL ELEVATIONS AND PHASE-SEPARATED HYDROCARBON THICKNESSES
Groundwater Elevations Obtained September 27, 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	101.07	103.47	55.41	48.06	0.00
MW-2	99.17	101.35	53.48	47.87	0.00
MW-3	101.01	102.68	54.32	48.36	0.00

* Measured from a relative datum (benchmark = 100.00 feet) located at the northeast corner of the concrete sump 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.

TABLE 3
WATER SAMPLE ANALYTICAL RESULTS

Monitor Well	Date	Benzene	Toluene	Ethyl-benzene	Xylenes	Total BTEX	TPH	TDS
MW-1	09-27-93	0.85	0.067	0.077	0.34	1.334	3	
MW-2	09-27-93	0.017	<0.001	<0.001	<0.001	0.017	<1	515
MW-3	09-27-93	1.1	1.7	0.44	0.98	4.22	25	

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.

APPENDIX D

ANALYTICAL RESULTS

SPL, INC.

REPORT APPROVAL SHEET

WORK ORDER NUMBER: 9309-961

Approved for release by:

S. Sample, Laboratory Director Date: 10/5/93

Ed Fry, Project Manager Date: 10/4/93

****SUMMARY REPORT*****

10/04/93

Company: Shell Pipe Line Corporation
Site: Lea County, New Mexico
Project No: 15-93678.3
Project: Denton Station

ANALYTICAL DATA
NOTE: ND - Not Detected

SPL ID MATRIX	CLIENT ID DATE SAMPLED	BENZENE PQL	TOLUENE PQL	ETHYLBENZ. PQL	XYLENE PQL	TPH-IR	TPH-GC	LEAD	MTBE
9309961-01 SOIL	MW-1 (10-12) 09/20/93 10:34:00	ND 0.0010mg/kg	0.0010 0.0010mg/kg	ND 0.0010mg/kg	0.0030 0.0010mg/kg	ND 10mg/Kg			
9309961-02 SOIL	MW-1 (40-42) 09/20/93 12:10:00	ND 0.0010mg/kg	ND 0.0010mg/kg	ND 0.0010mg/kg	0.0020 0.0010mg/kg	880 10mg/Kg			
9309961-03 SOIL	MW-1 (50-52) 09/20/93 12:35:00	ND 0.0010mg/kg	ND 0.0010mg/kg	ND 0.0010mg/kg	ND 0.0010mg/kg	10 10mg/Kg			
9309961-04 SOIL	MW-2 (25-27) 09/20/93 14:25:00	ND 0.0010mg/kg	0.0010 0.0010mg/kg	ND 0.0010mg/kg	0.0030 0.0010mg/kg	ND 10mg/Kg			
9309961-05 SOIL	MW-2 (50-52) 09/20/93 16:45:00	ND 0.0010mg/kg	ND 0.0010mg/kg	ND 0.0010mg/kg	ND 0.0010mg/kg	10 10mg/Kg			
9309961-06 SOIL	MW-3 (15-17) 09/21/93 09:50:00	ND 0.0010mg/kg	0.0020 0.0010mg/kg	0.0010 0.0010mg/kg	0.0060 0.0010mg/kg	70 10mg/Kg			
9309961-07 SOIL	MW-3 (43-44) 09/21/93 11:05:00	ND 0.0010mg/kg	0.0040 0.0010mg/kg	0.010 0.0010mg/kg	0.050 0.0010mg/kg	1100 10mg/Kg			
9309961-08 SOIL	MW-3 (49-50) 09/21/93 11:30:00	ND 0.050mg/kg	1.1 0.050mg/kg	3.2 0.050mg/kg	12 0.050mg/kg	10000 50mg/Kg			

BTEX - METHOD 5030/8020 ***
TPH-IR - METHOD Mod. 418.1*

Shari L. Grice

SPL, Inc., - Shari L. Grice

Certificate of Analysis No. 9309961-01

Shell Pipe Line Corporation
P.O. Box 2099
Houston, TX 77252-2099
ATTN: John Hite

P.O.# PX-9103-JBH
DATE: 10/04/93

PROJECT: Denton Station
SITE: Lea County, New Mexico
SAMPLED BY: CURA, Inc.
SAMPLE ID: MW-1 (10-12)

PROJECT NO: 15-93678.3
MATRIX: SOIL
DATE SAMPLED: 09/20/93 10:34:00
DATE RECEIVED: 09/29/93

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	ND	0.0010 P	mg/kg
TOLUENE	0.0010	0.0010 P	mg/kg
ETHYLBENZENE	ND	0.0010 P	mg/kg
TOTAL XYLENE	0.0030	0.0010 P	mg/kg
TOTAL BTEX	0.004		mg/kg
METHOD 5030/8020 ***			
Analyzed by: KA			
Date: 10/01/93			
Petroleum Extractables	ND	10	mg/Kg
METHOD Mod. 418.1*			
Analyzed by: AR			
Date: 09/30/93			

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.

Certificate of Analysis No. 9309961-02

Shell Pipe Line Corporation
P.O. Box 2099
Houston, TX 77252-2099
ATTN: John Hite

P.O.# PX-9103-JBH
DATE: 10/04/93

PROJECT: Denton Station
SITE: Lea County, New Mexico
SAMPLED BY: CURA, Inc.
SAMPLE ID: MW-1 (40-42)

PROJECT NO: 15-93678.3
MATRIX: SOIL
DATE SAMPLED: 09/20/93 12:10:00
DATE RECEIVED: 09/29/93

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	ND	0.0010 P	mg/kg
TOLUENE	ND	0.0010 P	mg/kg
ETHYLBENZENE	ND	0.0010 P	mg/kg
TOTAL XYLENE	0.0020	0.0010 P	mg/kg
TOTAL BTEX	0.002		mg/kg
METHOD 5030/8020 ***			
Analyzed by: KA			
Date: 10/01/93			
Petroleum Extractables	880	10	mg/Kg
METHOD Mod. 418.1*			
Analyzed by: AR			
Date: 09/30/93			

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.

Certificate of Analysis No. 9309961-03

Shell Pipe Line Corporation
P.O. Box 2099
Houston, TX 77252-2099
ATTN: John Hite

P.O.# PX-9103-JBH
DATE: 10/04/93

PROJECT: Denton Station
SITE: Lea County, New Mexico
SAMPLED BY: CURA, Inc.
SAMPLE ID: MW-1 (50-52)

PROJECT NO: 15-93678.3
MATRIX: SOIL
DATE SAMPLED: 09/20/93 12:35:00
DATE RECEIVED: 09/29/93

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	ND	0.0010 P	mg/kg
TOLUENE	ND	0.0010 P	mg/kg
ETHYLBENZENE	ND	0.0010 P	mg/kg
TOTAL XYLENE	ND	0.0010 P	mg/kg
TOTAL BTEX	ND		mg/kg
METHOD 5030/8020 ***			
Analyzed by: KA			
Date: 10/01/93			
Petroleum Extractables	10	10	mg/Kg
METHOD Mod. 418.1*			
Analyzed by: AR			
Date: 09/30/93			

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.

Certificate of Analysis No. 9309961-04

Shell Pipe Line Corporation
P.O. Box 2099
Houston, TX 77252-2099
ATTN: John Hite

P.O.# PX-9103-JBH
DATE: 10/04/93

PROJECT: Denton Station
SITE: Lea County, New Mexico
SAMPLED BY: CURA, Inc.
SAMPLE ID: MW-2 (25-27)

PROJECT NO: 15-93678.3
MATRIX: SOIL
DATE SAMPLED: 09/20/93 14:25:00
DATE RECEIVED: 09/29/93

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	ND	0.0010 P	mg/kg
TOLUENE	0.0010	0.0010 P	mg/kg
ETHYLBENZENE	ND	0.0010 P	mg/kg
TOTAL XYLENE	0.0030	0.0010 P	mg/kg
TOTAL BTEX	0.004		mg/kg
METHOD 5030/8020 ***			
Analyzed by: KA			
Date: 10/02/93			
Petroleum Extractables	ND	10	mg/Kg
METHOD Mod. 418.1*			
Analyzed by: AR			
Date: 09/30/93			

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.

Certificate of Analysis No. 9309961-05

Shell Pipe Line Corporation
P.O. Box 2099
Houston, TX 77252-2099
ATTN: John Hite

P.O.# PX-9103-JBH
DATE: 10/04/93

PROJECT: Denton Station
SITE: Lea County, New Mexico
SAMPLED BY: CURA, Inc.
SAMPLE ID: MW-2 (50-52)

PROJECT NO: 15-93678.3
MATRIX: SOIL
DATE SAMPLED: 09/20/93 16:45:00
DATE RECEIVED: 09/29/93

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	ND	0.0010 P	mg/kg
TOLUENE	ND	0.0010 P	mg/kg
ETHYLBENZENE	ND	0.0010 P	mg/kg
TOTAL XYLENE	ND	0.0010 P	mg/kg
TOTAL BTEX	ND		mg/kg
METHOD 5030/8020 ***			
Analyzed by: KA			
Date: 10/01/93			
Petroleum Extractables	10	10	mg/Kg
METHOD Mod. 418.1*			
Analyzed by: AR			
Date: 09/30/93			

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.

Certificate of Analysis No. 9309961-06

Shell Pipe Line Corporation
P.O. Box 2099
Houston, TX 77252-2099
ATTN: John Hite

P.O.# PX-9103-JBH
DATE: 10/04/93

PROJECT: Denton Station
SITE: Lea County, New Mexico
SAMPLED BY: CURA, Inc.
SAMPLE ID: MW-3 (15-17)

PROJECT NO: 15-93678.3
MATRIX: SOIL
DATE SAMPLED: 09/21/93 09:50:00
DATE RECEIVED: 09/29/93

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT		UNITS
BENZENE	ND	0.0010	P	mg/kg
TOLUENE	0.0020	0.0010	P	mg/kg
ETHYLBENZENE	0.0010	0.0010	P	mg/kg
TOTAL XYLENE	0.0060	0.0010	P	mg/kg
TOTAL BTEX	0.009			mg/kg
METHOD 5030/8020 ***				
Analyzed by: KA				
Date: 10/02/93				
Petroleum Extractables	70	10		mg/Kg
METHOD Mod. 418.1*				
Analyzed by: AR				
Date: 09/30/93				

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.

Certificate of Analysis No. 9309961-07

Shell Pipe Line Corporation
P.O. Box 2099
Houston, TX 77252-2099
ATTN: John Hite

P.O.# PX-9103-JBH
DATE: 10/04/93

PROJECT: Denton Station
SITE: Lea County, New Mexico
SAMPLED BY: CURA, Inc.
SAMPLE ID: MW-3 (43-44)

PROJECT NO: 15-93678.3
MATRIX: SOIL
DATE SAMPLED: 09/21/93 11:05:00
DATE RECEIVED: 09/29/93

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	ND	0.0010 P	mg/kg
TOLUENE	0.0040	0.0010 P	mg/kg
ETHYLBENZENE	0.010	0.0010 P	mg/kg
TOTAL XYLENE	0.050	0.0010 P	mg/kg
TOTAL BTEX	0.064		mg/kg
METHOD 5030/8020 ***			
Analyzed by: KA			
Date: 10/02/93			
Petroleum Extractables	1100	10	mg/Kg
METHOD Mod. 418.1*			
Analyzed by: AR			
Date: 09/30/93			

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.

Certificate of Analysis No. 9309961-08

Shell Pipe Line Corporation
P.O. Box 2099
Houston, TX 77252-2099
ATTN: John Hite

P.O.# PX-9103-JBH
DATE: 10/04/93

PROJECT: Denton Station
SITE: Lea County, New Mexico
SAMPLED BY: CURA, Inc.
SAMPLE ID: MW-3 (49-50)

PROJECT NO: 15-93678.3
MATRIX: SOIL
DATE SAMPLED: 09/21/93 11:30:00
DATE RECEIVED: 09/29/93

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	ND	0.050 P	mg/kg
TOLUENE	1.1	0.050 P	mg/kg
ETHYLBENZENE	3.2	0.050 P	mg/kg
TOTAL XYLENE	12	0.050 P	mg/kg
TOTAL BTEX	16.3		mg/kg
METHOD 5030/8020 ***			
Analyzed by: KA			
Date: 10/01/93			
Petroleum Extractables	10000	50	mg/Kg
METHOD Mod. 418.1*			
Analyzed by: AR			
Date: 09/30/93			

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 Quality Control Report **
BTEX MATRIX SPIKE/MATRIX SPIKE DUPLICATE
Method 8020/602

SPL Sample ID: 9309731-06A **Reported on:** 10/04/93
Matrix: Soil **Analyzed on:** 10/01/93

This sample was randomly selected for use in the SPL quality control program. One in twenty samples is fortified, in duplicate, with a known concentration of the substance being analyzed.
The results are as follows:

---- SPIKE ANALYSIS -----

Compound	Blank Value	Spike Added µg/Kg	Original Sample Concentration µg/Kg	MS Concentration µg/Kg	MS % Rec#	QC Limits Range
BENZENE	ND	20	ND	19	95	39 - 150 %
TOLUENE	ND	20	ND	18	90	46 - 148 %
ETHYL_BENZENE	ND	20	ND	16	80	32 - 160 %
O XYLENE	ND	20	1	17	80	32 - 160 %
M AND P XYLENE	ND	40	2	32	75	32 - 160 %

---- SPIKE DUPLICATE ANALYSIS -----

Compound	Spike Added µg/Kg	MSD Concentration µg/Kg	MSD % Rec#	% RPD	RPD Limit	QC Rec Range
BENZENE	20	19	95	0	20	39 - 150 %
TOLUENE	20	17	85	6	20	46 - 148 %
ETHYL_BENZENE	20	14	70	13	20	32 - 160 %
O XYLENE	20	15	70	13	20	32 - 160 %
M AND P XYLENE	40	28	65	14	20	32 - 160 %

VARJ931001072800

Q.J. Williams
for Cynthia Schreiner, QC Officer

** SPL Quality Control Report **
BTEX MATRIX SPIKE/MATRIX SPIKE DUPLICATE
Method 8020/602

SPL Sample ID: 9309513-01A Reported on: 10/04/93
Matrix: Soil Analyzed on: 10/02/93

This sample was randomly selected for use in the SPL quality control program. One in twenty samples is fortified, in duplicate, with a known concentration of the substance being analyzed.
The results are as follows:

---- SPIKE ANALYSIS -----

Compound	Blank Value	Spike Added µg/Kg	Original Sample Concentration µg/Kg	MS Concentration µg/Kg	MS % Rec#	QC Limits Range
BENZENE	ND	20	ND	17	85	39 - 150 %
TOLUENE	ND	20	ND	17	85	46 - 148 %
ETHYL_BENZENE	ND	20	ND	16	80	32 - 160 %
O XYLENE	ND	20	ND	16	80	32 - 160 %
M AND P XYLENE	ND	40	1	32	77	32 - 160 %

---- SPIKE DUPLICATE ANALYSIS -----

Compound	Spike Added µg/Kg	MSD Concentration µg/Kg	MSD % Rec#	% RPD	RPD Limit	QC Rec Range
BENZENE	20	19	95	11	20	39 - 150 %
TOLUENE	20	18	90	6	20	46 - 148 %
ETHYL_BENZENE	20	16	80	0	20	32 - 160 %
O XYLENE	20	17	85	6	20	32 - 160 %
M AND P XYLENE	40	32	77	0	20	32 - 160 %

VARJ931002050600

for Cynthia Schreiner, QC Officer

** SPL QUALITY CONTROL REPORT **
TOTAL PETROLEUM HYDROCARBONS [TPH]

SPL sample Id: 9309968-1B
Matrix: SOIL

Reported on: 10/04/93
Analyzed on: 09/30/93

This sample was randomly selected for use in the SPL quality control program. One in ten samples is fortified with a known concentration of the substance being analyzed and one in ten samples is analyzed in duplicate. The result are as follows:

-- SPIKE ANALYSIS --

Sample Id	Blank Value	Spike Added mg/L	Original Sample Concentration mg/Kg	MS Concentration mg/Kg	MS % Rec
9309968-1B	ND	384	7	329	84

-- SPIKE DUPLICATE ANALYSIS --

Sample Id	Spike Added mg/L	MSD Concentration mg/Kg	MSD % Rec	% RPD
9309968-1B	384	351	90	6

SPL, Incorporated

Cynthia Schreiner, QC Officer

4309961 7/30/93

SHELL OIL COMPANY
RETAIL ENVIRONMENTAL ENGINEERING

CHAIN OF CUSTODY RECORD NO. H 10276

Date: 9-27-93
Page 1 of 1

Shell Pipe Line Corp
SITE ADDRESS: Denton Station
Lea County, New Mexico
WIC #: Proj # 15-93678.3
CONSULTANT NAME & ADDRESS: CURA Inc.
3001 N. Big Spring, Ste 101, Midland, TX 79705
CONSULTANT CONTACT: F. Wesley Root
PHONE: 915-570-8408 FAX: 915-570-8409
SAMPLED BY: F. Wesley Root

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-1 (10-12)	9-20-93	10:34		V		V								ICE	1	4oz	V					V						
MW-1 (40-42)	9-20-93	12:10		V		V								ICE	1	4oz	V					V						
MW-1 (50-52)	9-20-93	12:35		V		V								ICE	1	4oz	V					V						
MW-2 (25-27)	9-20-93	14:25		V		V								ICE	1	4oz	V					V						
MW-2 (50-52)	9-20-93	16:45		V		V								ICE	1	4oz	V					V						
MW-3 (15-17)	9-21-93	9:50		V		V								ICE	1	4oz	V					V						
MW-3 (43-44)	9-21-93	11:05		V		V								ICE	1	4oz	V					V						
MW-3 (49-50)	9-21-93	11:30		V		V								ICE	1	4oz	V					V						

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME
F. Wesley Root	9-27-93	10:30			
RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME
			INTACT 3°C		
RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME
			Jim Adams	9/29/93	14:00

BILL NO.:
LABORATORY:
SHELL CONTACT: John Hite PHONE: 713-241-1001 FAX:

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

SPL HOUSTON ENVIRONMENTAL LABORATORY

SAMPLE LOGIN CHECKLIST

DATE: 9/29 TIME: 14:00 CLIENT NO.
LOT NO. 1 CONTRACT NO.

CLIENT SAMPLE NOS.

SPL SAMPLE NOS.: 9309961

		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#: UPS Blue		
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: Jim Adams DATE: 9/29/93
DELIVERED FOR RESOLUTION: REC'D DATE:
RESOLVED: DATE:

SPL, INC.

REPORT APPROVAL SHEET

WORK ORDER NUMBER: 93-09-978

Approved for release by:

M. Scott Sample Date: 10/8/93
S. Sample, Laboratory Director

Ed Fry Date: 10/7/93
Ed Fry, Project Manager

Certificate of Analysis No. 9309978-01

Shell Pipe Line Corporation
P.O. Box 2099
Houston, TX 77252-2099
ATTN: John Hite

P.O.# PX-9103-JBH
DATE: 10/07/93

PROJECT: Denton Station
SITE: Lea County, New Mexico
SAMPLED BY: CURA, Inc.
SAMPLE ID: MW-1

PROJECT NO: 15-93678.3
MATRIX: WATER
DATE SAMPLED: 09/27/93 17:30:00
DATE RECEIVED: 09/30/93

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT		UNITS
BENZENE	0.85	0.0010	P	mg/L
TOLUENE	0.067	0.0010	P	mg/L
ETHYLBENZENE	0.077	0.0010	P	mg/L
TOTAL XYLENE	0.34	0.0010	P	mg/L
TOTAL BTEX	1.334			mg/L
METHOD 5030/8020 ***				
Analyzed by: MOO				
Date: 10/05/93				
Petroleum extractables	3	1		mg/L
METHOD 418.1*				
Analyzed by: MF				
Date: 09/30/93				

(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.

Shari L. Grice

SPL, Inc., - Shari L. Grice

Certificate of Analysis No. 9309978-02

Shell Pipe Line Corporation
P.O. Box 2099
Houston, TX 77252-2099
ATTN: John Hite

P.O.# PX-9103-JBH
DATE: 10/07/93

PROJECT: Denton Station
SITE: Lea County, New Mexico
SAMPLED BY: CURA, Inc.
SAMPLE ID: MW-2

PROJECT NO: 15-93678.3
MATRIX: WATER
DATE SAMPLED: 09/27/93 17:20:00
DATE RECEIVED: 09/30/93

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT		UNITS
BENZENE	0.017	0.0010	P	mg/L
TOLUENE	ND	0.0010	P	mg/L
ETHYLBENZENE	ND	0.0010	P	mg/L
TOTAL XYLENE	ND	0.0010	P	mg/L
TOTAL BTEX	0.017			mg/L
METHOD 5030/8020 ***				
Analyzed by: MOO				
Date: 10/05/93				
Petroleum extractables	ND	1		mg/L
METHOD 418.1*				
Analyzed by: MF				
Date: 09/30/93				
Total Dissolved Solids	515	5		mg/L
METHOD 160.1 *				
Analyzed by: DSE				
Date: 10/04/93				

(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.

Shari L. Grice

SPL, Inc., - Shari L. Grice

Certificate of Analysis No. 9309978-03

Shell Pipe Line Corporation
P.O. Box 2099
Houston, TX 77252-2099
ATTN: John Hite

P.O.# PX-9103-JBH
DATE: 10/07/93

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

PROJECT NO: 15-93678.3
MATRIX: WATER
DATE SAMPLED: 09/27/93 17:00:00
DATE RECEIVED: 09/30/93

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT		UNITS
BENZENE	1.1	0.0050	P	mg/L
TOLUENE	1.7	0.0050	P	mg/L
ETHYLBENZENE	0.44	0.0050	P	mg/L
TOTAL XYLENE	0.98	0.0050	P	mg/L
TOTAL BTEX	4.22			mg/L
METHOD 5030/8020 ***				
Analyzed by: MOO				
Date: 10/05/93				
Petroleum extractables	25	2		mg/L
METHOD 418.1*				
Analyzed by: MF				
Date: 09/30/93				

(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.

Shari L. Grice

SPL, Inc., - Shari L. Grice

** SPL Quality Control Report **
BTEX MATRIX SPIKE/MATRIX SPIKE DUPLICATE
Method 8020

SPL Sample ID: 9310015-05A **Reported on:** 10/07/93
Matrix: Water **Analyzed on:** 10/05/93

This sample was randomly selected for use in the SPL quality control program. One in twenty samples is fortified, in duplicate, with a known concentration of the substance being analyzed.
The results are as follows:

---- **SPIKE ANALYSIS** -----

Compound	Blank Value	Spike Added µg/L	Original Sample Concentration µg/L	MS Concentration µg/L	MS % Rec#	QC Limits Range
BENZENE	ND	20	ND	20	100	39 - 150 %
TOLUENE	ND	20	ND	20	100	46 - 148 %
ETHYL_BENZENE	ND	20	ND	20	100	32 - 160 %
O XYLENE	ND	20	ND	21	105	32 - 160 %
M AND P XYLENE	ND	40	ND	47	117	32 - 160 %

---- **SPIKE DUPLICATE ANALYSIS** -----

Compound	Spike Added µg/L	MSD Concentration µg/L	MSD % Rec#	% RPD	RPD Limit	QC Rec Range
BENZENE	20	20	100	0	20	39 - 150 %
TOLUENE	20	19	95	5	20	46 - 148 %
ETHYL_BENZENE	20	20	100	0	20	32 - 160 %
O XYLENE	20	21	105	0	20	32 - 160 %
M AND P XYLENE	40	46	115	2	20	32 - 160 %

HP_N931005133600

Idelis Williams, QC Officer

** SPL QUALITY CONTROL REPORT **
TOTAL PETROLEUM HYDROCARBONS [TPH]

SPL sample Id: BLANK
Matrix: WATER

Reported on: 10/07/93
Analyzed on: 09/30/93

This sample was randomly selected for use in the SPL quality control program. One in ten samples is fortified with a known concentration of the substance being analyzed and one in ten samples is analyzed in duplicate. The result are as follows:

-- SPIKE ANALYSIS --

Sample Id	Blank Value	Spike Added mg/L	Original Sample Concentration mg/L	MS Concentration mg/L	MS % Rec
BLANK	ND	384	ND	323	84

-- SPIKE DUPLICATE ANALYSIS --

Sample Id	Spike Added mg/L	MSD Concentration mg/L	MSD % Rec	% RPD
BLANK	384	329	86	2

SPL, Incorporated

D. J. Williams

Cynthia Schreiner, QC Officer

8880 Interchange Drive, Houston, Texas 77054 713/660-0901

Wet Chemistry QA/QC Validation Report

Test Code TDS | Date 10-4-93 | Analyst DSE
Method 160.1 | Time 1:00PM | Matrix LIQUID
Of Samples in Set 9 | Detection Limit 1

Sample #'s in Set					Units Mg/L
	309978-2C	309966-1F→3F			
	309979-1C	309A10-1F→3F	-		
	309891-3A				

Standards	EM, %T, ABS.	Actual Concentration	Theoretical Concentration	% Recovery	Upper Limit	Lower Limit
Blank		ND	< 1	ND	NA	NA
#1						
#2						
#3						
#4						
Check Std.		279	289	96.5	336	248

Duplicate	#1	#2	RPD (%)	Upper Limit	Lower Limit	Dilution
309966-3F	2705	2710	0.18	7.6	5.6	

Spike Sample	Concentration Before Spike	Amount Added	Concentration After Spike	After - Before	% Recovery	Upper Limit	Lower Limit

Spike Recovery Calculation

$$\% \text{ Recovery} = \frac{(\text{Actual} - \text{Original})}{\text{Amount Added}} \times 100$$

Relative Percent Difference Calculation

$$\text{RPD} = \frac{(\#1 - \#2)}{(\#1 + \#2)(0.5)} \times 100$$

Reviewed By [signature] Date 10/5/93

Approved By Maria G Macias Date 10/5/93

750978 · 9/20/93

SHELL OIL COMPANY
RETAIL ENVIRONMENTAL ENGINEERING

CHAIN OF CUSTODY RECORD NO. H 10282

Date: 9-29-93
Page 1 of 1

SITE ADDRESS: Shell Pipe LINE Corp.
Denton Station, LEA County N.M
Proj #: 15-93678.3

CONSULTANT NAME & ADDRESS: CURA INC
3001 N. Big Spring, 101, Midland TX

CONSULTANT CONTACT: Greg Walterscheid

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)

- 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: TDS

CONTAINER SIZE: 1l / 40ml

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	BTEX/GAS HYDROCARBONS	VOL	PNA/PAH	SEMI-VOL	TPH/IR 418.1	TPH/GC	TCLP METALS	EP TOX METALS	REACTIVITY	OTHER: TDS	REMARKS
MW-1	9-27-93	1730		✓	✓					✓				✓	4	1l 40ml	✓					✓						
MW-2	9-27-93	1720		✓	✓					✓				✓	4	1l 40ml	✓					✓					✓	
MW-3	9-27-93	1700		✓	✓					✓				✓	4	1l 40ml	✓					✓						

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME
Bill Smith	9-29-93	1300			

BILL NO.: ~~Ref. No. PX-9103 JBH~~

LABORATORY:

SHELL CONTACT: John Hite PHONE: (713) 241-1001 FAX: (713) 241-3517

TURN AROUND TIME (CHECK ONE)

- 7 DAYS ☐ (NORMAL)
- 14 DAYS ☐
- 48 HOURS ☐
- OTHER ☒ per SPLC 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

SPL HOUSTON ENVIRONMENTAL LABORATORY

SAMPLE LOGIN CHECKLIST

DATE: 9/30 TIME: 09:00 CLIENT NO.
LOT NO. CONTRACT NO.

CLIENT SAMPLE NOS.

SPL SAMPLE NOS.: 9309978

		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: 8014383856		
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: 9/30/93
DELIVERED FOR RESOLUTION: REC'D DATE:
RESOLVED: DATE:

APPENDIX E

PHOTO-DOCUMENTATION

Photograph 1: View of drilling operations on monitor well MW-2 at Denton Station. (Monitor well MW-1 and the abandoned water well are in foreground)

Photograph 2: View of the 10 foot conventional core obtained from the 40 foot to 50 foot interval in monitor well MW-3.

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
DENTON CRUDE OIL GATHERING AND PUMP STATION
LEA COUNTY, NEW MEXICO

Please find enclosed a copy of Shell Pipe Line Corporation environmental contractor's (CURA, Inc.) site assessment report and EOTT Energy Corp. environmental contractor's (Roy F. Weston, Inc.) due diligence assessment for Denton Station.

CURA advanced 11 soil borings in areas where crude oil impact to the environment was likely to occur. A minimum of two samples per boring was analyzed for BTEX and TPH. Monitoring wells were to be installed in borings where groundwater was encountered. No groundwater was encountered in any of the borings.

Denton Station is located approximately 13 miles northeast of Lovington in Lea County, New Mexico. The station is surrounded by a barbed wire fence and has a locked gate. The site is located in a rural area within the Denton oil field. No residences or surface bodies of water were observed within a 1,000 foot radius of the facility. An abandoned water well is on site and four water wells are located between 2,000 to 2,500 feet from the site to the northwest. The current status of these wells is unknown. The abandoned water well on site has a 10 inch steel casing near the surface and is currently open to a depth of 97 feet. Currently, the groundwater in the site area is used for industrial and livestock purposes.

The highest TPH values were 5,800 ppm TPH at 3- 5 feet and 970 ppm TPH at 11 - 12 feet in boring B-2. Boring B-3 had a TPH value of 240 ppm at 6 to 6.5 feet. The rest of the samples had values less than 58 ppm TPH. All of the benzene levels were below 0.003 ppm.

DentonSt.jbh

The water well on site had 7.97 feet of crude oil in it. The crude oil has been bailed and approximately 35 gallons of crude oil were recovered. Subsequent measurements recorded 3.45 feet of crude in the well. We reported the crude oil in the well to Mr. Jerry Sexton of your Hobbs, New Mexico office on February 25, 1993.

Shell will install three monitoring wells in the vicinity of the water well to delineate the extent of the groundwater impact and to determine the gradient. Shell will conduct pilot tests on the impacted soil to determine its treatability.

After we have completed the test and analyzed the data from the monitoring wells, we will submit a proposed remedial action for your review. A complete copy of the site assessment will also be furnished.

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

Sincerely,

John B. Hite
Engineering Advisor
General Engineering

Attachment

DentonSt.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 13

DENTON STATION

13.1 SITE LOCATION AND DESCRIPTION

The Denton Station is located approximately 13 miles northeast of Lovington, Lea County, New Mexico. The site location is shown in Figure 13-1. Denton Station is a crude oil pumping station and storage facility where oil from gathering lines is pumped into a trunk line. The approximately 10-acre Denton site is surrounded by ranch land and oil wells.

The Denton Station layout is shown in Figure 13-2. Above-ground facilities include two 10,000 BBL cone-top crude oil storage tanks (tank numbers 812 and 813, both now idle), pump, scraper trap, and sump. A transformer is attached to a utility pole along the north fence. Areas of thin vegetation inside of the tank dikes may be indications of hydrocarbon-impacted soil. Some hydrocarbon staining is visible around the pump. An abandoned well is located near the pump. SPLC personnel reported that a pile of soil was recently spread out over the ground south of the tank dike. The area is still largely bare.

13.2 PREVIOUS INVESTIGATION RESULTS AND CONCLUSIONS

CURA, Inc. performed a baseline assessment of soil and groundwater conditions at Denton Station in December, 1992 and a Phase II environmental assessment in February, 1993. CURA advanced a total of eleven borings at the site. The CURA boring locations are shown on Figure 13-2. Soil samples collected from the borings were analyzed for BTEX and TPH.

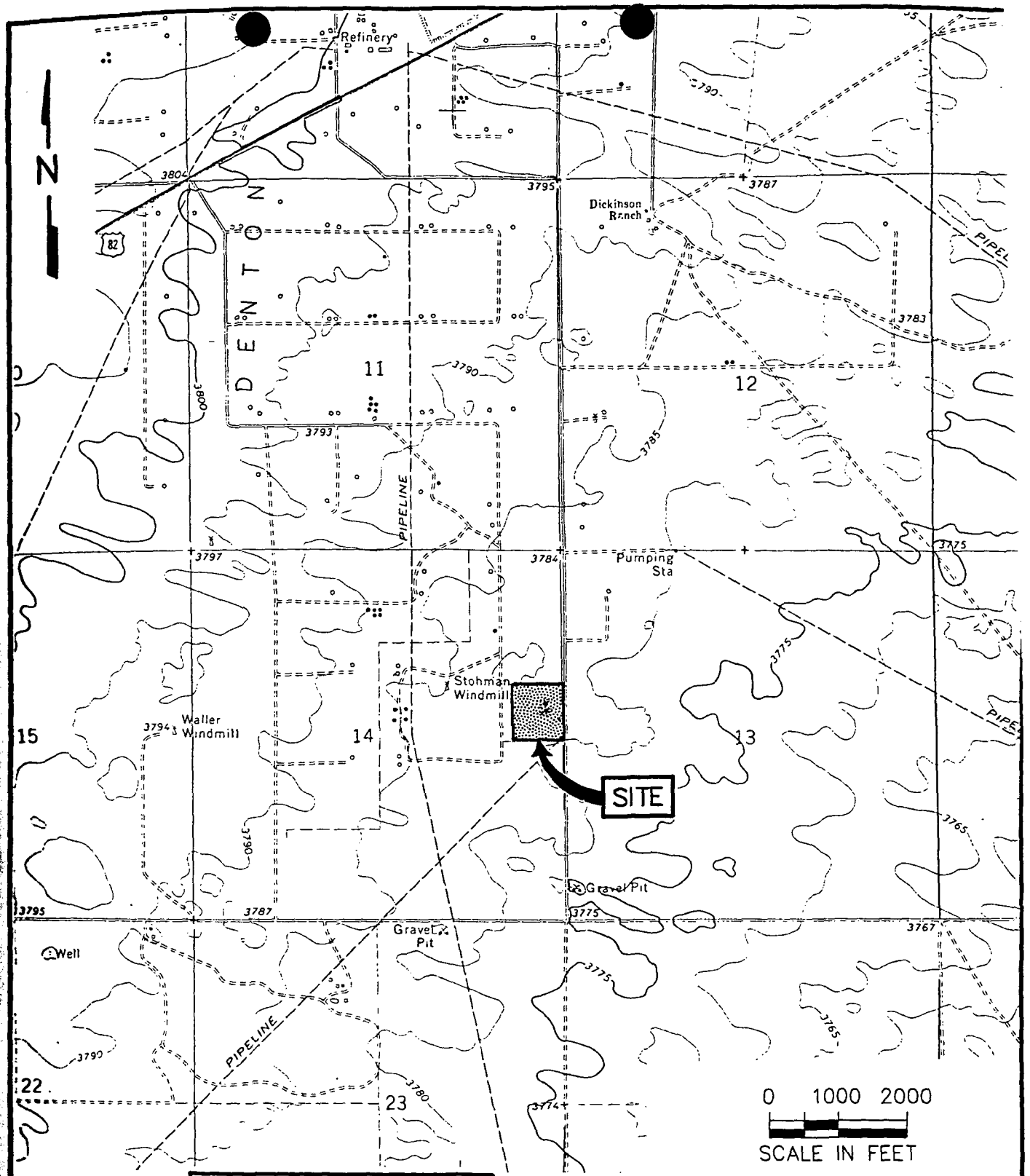
BTEX concentrations ranged from <0.001 mg/kg to 0.365 mg/kg. TPH concentrations ranged from 10 mg/kg to 970 mg/kg. Most of the higher hydrocarbon concentrations occurred in subsurface soils more than 6 feet deep.

Based on these analytical results, CURA estimated that the extent of hydrocarbon-contaminated soils is limited to an area near the sump and pump measuring approximately 5,000 square feet with a maximum depth of 20 feet. CURA also reported that the crude oil was floating on top of the water in the existing water well, and that groundwater contamination is possible.

13.3 SITE SAMPLING

After the records review, site inspection and CURA report review, WESTON recommended sampling at Denton 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, and
- soil staining inside tank dike.



BASE MAP FROM:
U.S. DEPT. OF THE INTERIOR
GEOLOGICAL SURVEY
PRAIRIEVIEW QUADRANGLE
NEW MEXICO
7.5 MINUTE SERIES (TOPOGRAPHIC)
1970 SERIES
SCALE 1:24,000

WESTON
MANAGERS DESIGNERS/CONSULTANTS

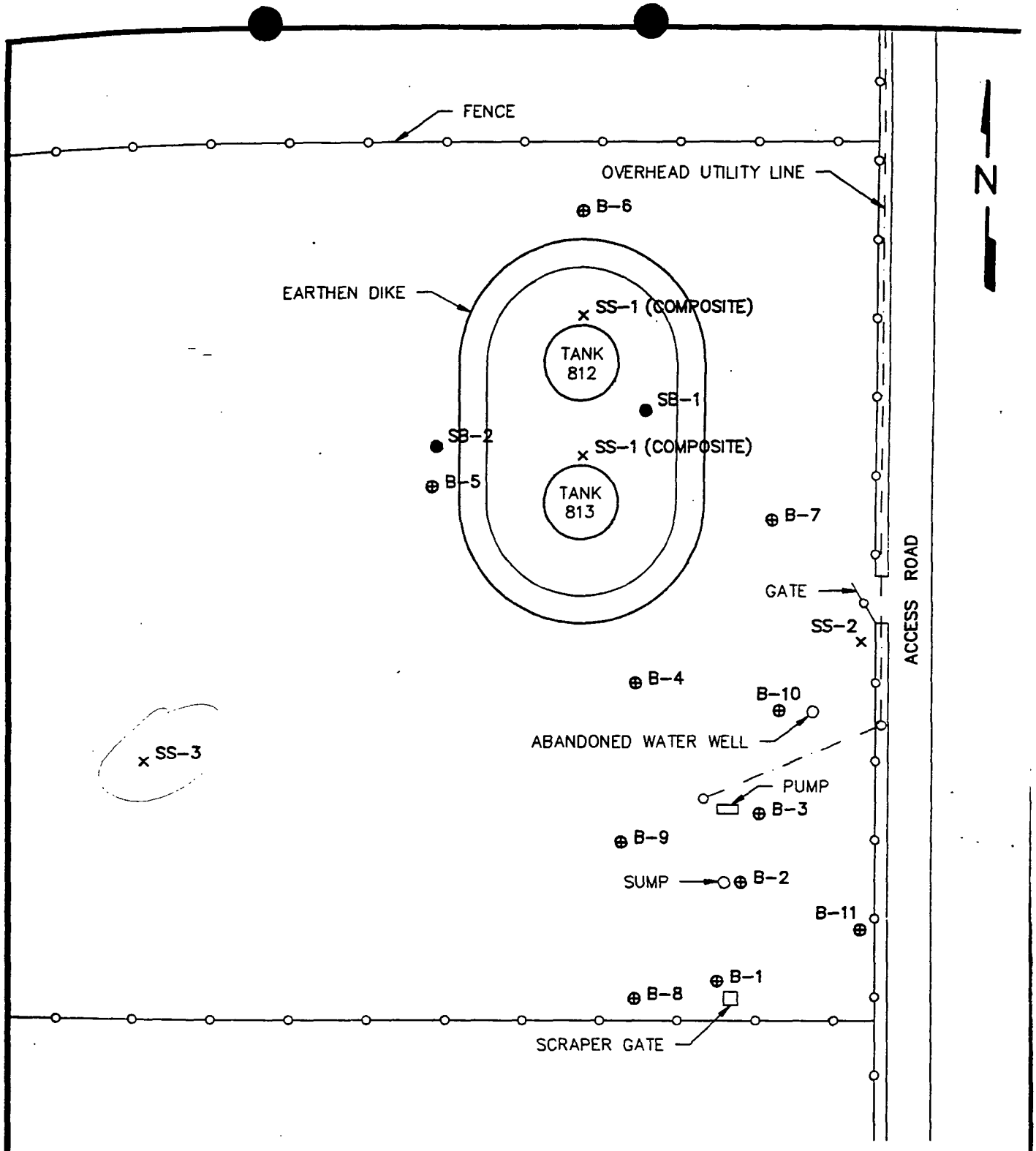
FIGURE 13-1

DENTON 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



NOT TO SCALE

LEGEND

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

WESTON MANAGERS DESIGNERS/CONSULTANTS

FIGURE 13-2

DENTON STATION
SITE PLAN

EOTT ENERGY CORPORATION
SPLC PIPELINE ENVIRONMENTAL ASSESSMENT

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

H:\DWG\EOTT\SP5.PB 1=1 07-21-93

The sample locations are shown on Figure 13-2. Analytical results are provided in Table 13-1.

SS-01, collected from surface soils adjacent to the tank, contained 29.1 mg/kg total lead. Background sample SS-03, collected at a high spot near the center of the station property contained 7.1 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 transformer. No sample could be obtained from the sump.

Boring SB-01 was advanced into potentially hydrocarbon-impacted soils inside the tank dike. A description of the soils encountered in this boring is as follows:

0 in. - 1.8 ft.	Tan sand, possible staining
1.8 ft. - 2.5 ft.	Yellow-gray sand
	Collected SB-01 at 2.5 ft.

SB-01 contained <0.00096 mg/kg BTEX and 504 mg/kg TPH.

Boring SB-02 was advanced into the newly spread soils south of the two tanks. A description of the soils encountered in this boring is as follows:

0 in. - 2.0 ft.	Brown clay, no staining, no odor
	Collected SB-02-01 at 2 in. - 6 in.
2.0 ft. - 3.0 ft.	Light brown sand, no visible staining
	Collected SB-02-02 at 2.8 - 3.2 ft.

SB-02-01 contained <0.00088 mg/kg BTEX and 5,140 mg/kg TPH. SB-02-02 contained <0.0008 mg/kg BTEX and 1,060 mg/kg TPH.

13.4 COMPLIANCE ISSUES

Air Issues for Tanks 812 and 813

These tanks are currently out of service and are probably no longer grandfathered since they have been out of service for longer than five years. Based on the available information, an air permit is not required for these tanks if they are operated at a constant crude oil level. If the tanks are not operated at a constant crude oil level, then an air permit would probably be required if the tanks' throughput is greater than 90,000 BBLs per year. The tanks appear to be in compliance with other New Mexico and federal regulations.

13.5 LIABILITY ISSUES

Hydrocarbon Contaminated Soil

The CURA investigation identified an area of hydrocarbon-contaminated soil at the east end of the site. The WESTON soil borings and site inspection identified additional areas of hydrocarbon-stained soil within the tank dikes and south of the tanks in the newly spread soils. Additional work is needed to identify the horizontal and vertical extent of hydrocarbon-impacted soil and to determine whether or not the hydrocarbon-impacted soils threaten groundwater.

Soil remediation is likely to be required by the OCD if the hydrocarbon-impacted site soils identified by CURA or WESTON are determined to be a source of the groundwater contamination in the existing well.

Groundwater Contamination

The presence of crude oil in the on-site water well suggests that groundwater at the site is contaminated. Since free-phase hydrocarbons appear to be present in the groundwater, the OCD would probably require groundwater remediation as described in Section 2.1.4. Groundwater would have to be remediated until it met the New Mexico water quality criteria.

Regulatory Database Search

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

TABLE 13-1
DENTON STATION ANALYTICAL RESULTS
EOTT ENVIRONMENTAL ASSESSMENT OF THE
SPLC ZONE III PIPELINE

SAMPLE NUMBER: LOCATION: DATE COLLECTED:	SS-01 ADJACENT TO TANK 6/24/93	SS-02 BENEATH TRANSFORMERS 6/24/93	SS-03 BACKGROUND 6/24/93	SB-01 INSIDE YANK DIKES 6/24/93	SB-02-01 SOLID WASTE DISPOSAL AREA 6/24/93	SB-02-02 SOLID WASTE DISPOSAL AREA 6/24/93
ORGANICS (mg/kg):[1]						
Benzene	NA	NA	NA	<0.00096	<0.00088	<0.0008
Toluene	NA	NA	NA	<0.00096	<0.00088	<0.0008
Ethylbenzene	NA	NA	NA	<0.00096	<0.00088	<0.0008
Total Xylenes	NA	NA	NA	<0.00096	<0.00088	<0.0008
TOTAL BTEX[2]	NA	NA	NA	<0.00096	<0.00088	<0.0008
TPH[3]	NA	NA	NA	504	5,140	1,060
TOTAL PCBs[4]	NA	<0.081	NA	NA	NA	NA
METALS (mg/kg) (TOTAL):						
Silver	NA	NA	NA	NA	<2.9	<3.1
Arsenic	NA	NA	NA	NA	1.9	3.0
Barium	NA	NA	NA	NA	112	101
Cadmium	NA	NA	NA	NA	<0.49	0.76
Chromium	NA	NA	NA	NA	12.4	10.1
Mercury	NA	NA	NA	NA	<0.11	<0.094
Lead	29.1	NA	7.1	NA	13.8	7.3
Selenium	NA	NA	NA	NA	<0.22	<0.2

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

Memo

From

JERRY SEXTON
District Supervisor

To: Roger

Shell Oil Company contacted you on this site assessment job and since it was on site you had them go through the District.

They have found problems and I will keep you advised of what is going on.

Attached is Shell's letter for your information and records.

NOTE: I don't think the water well is Shell's problem since it is up dit to natural drainage.

Oil Conservation Division
PO Box 1980, Hobbs, New Mexico 88240

Shell Oil Company

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

February 25, 1993

New Mexico Oil Conservation Commission
ATTN Mr. Jerry Sexton
P. O. Box 1980
Hobbs, NM 88240

Gentlemen:

SUBJECT: SHELL PIPE LINE CORPORATION - SITE ASSESSMENT DENTON STATION

In conducting the site assessment at our Denton crude oil pump station, we found an existing water well that appeared to be plugged. We returned to the location on February 24 and proceeded to remove the plug.

We found an old pump with wooden rods in the well. These were removed. The well is approximately 90 feet deep with 30 feet of water in it. Oil was found on the water. We will measure the thickness of oil on the water, remove the oil and check for any recharge.

This well has been out of service for 30 years.

Denton Station is located approximately 13 miles northeast of Lovington in Lea County, New Mexico. The site is in a rural area within the Denton oil field. No residences, public buildings, or surface bodies of water are within a 1000 foot radius of the facility. Four water wells are located between 2000 to 2500 feet from the site to the northwest.

We will keep you advised of our results and findings.

We would like to plug and abandon this well and will contact you for guidance when we obtain all the data on the well.

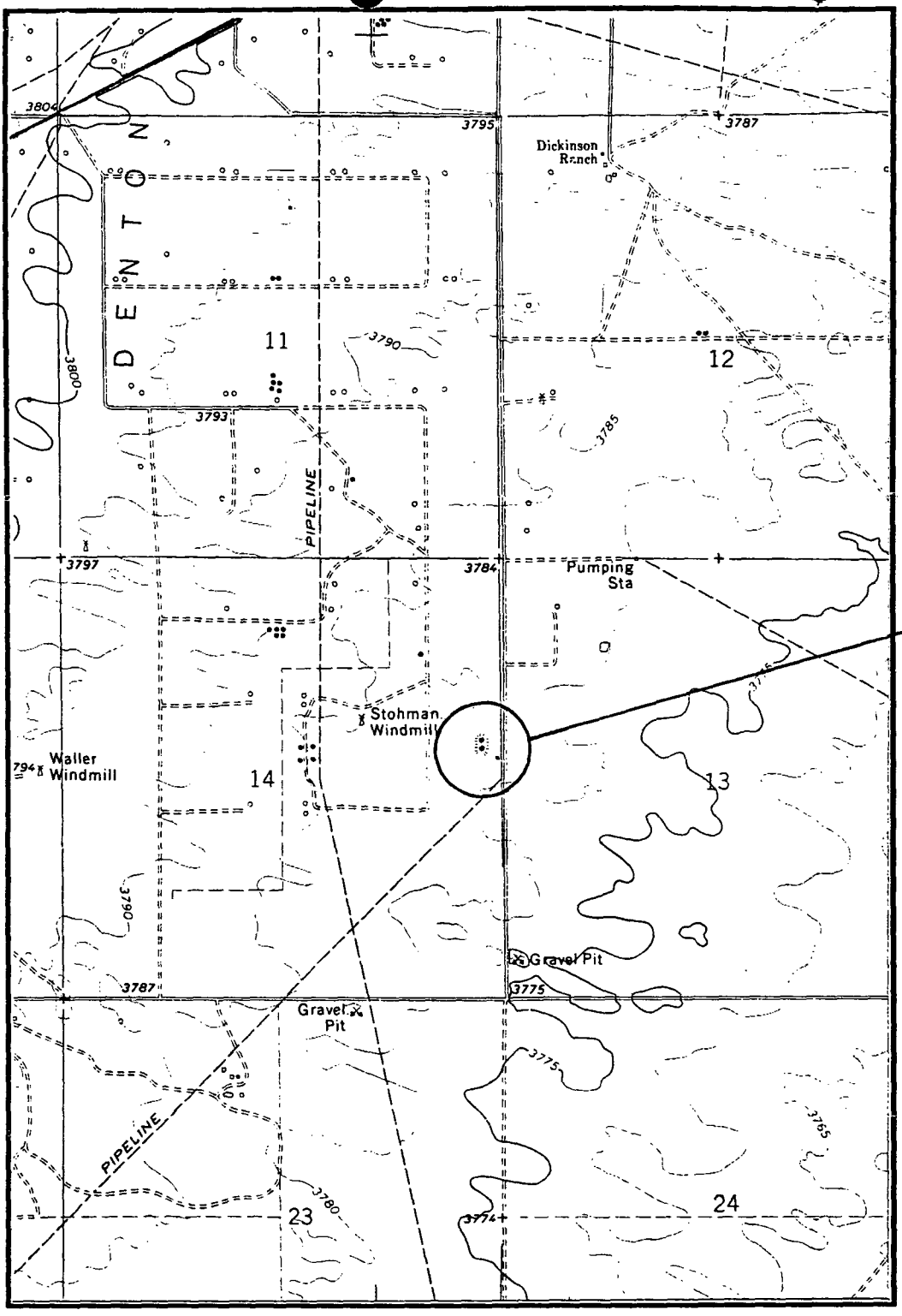
Sincerely,

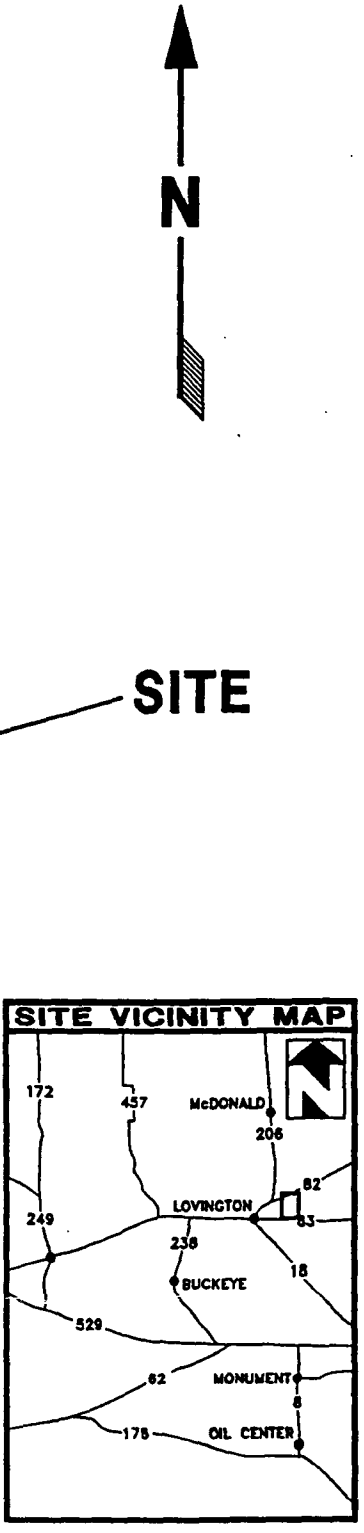
John B. Hite

John B. Hite, Engineering Advisor
General Engineering

Attachment

cc: CURA, Inc.
ATTN Greg C. Walterscheid
3001 North Big Springs, Suite 101
Midland, TX 79705





SITE LOCATION MAP

REF: USGS PRAIRIEVIEW, NEW MEXICO TOPOGRAPHIC QUADRANGLE (1970)

CURA INC.
2735 VILLA CREEK DRIVE - TWO METRO SQUARE
BLDG C - SUITE 250 - DALLAS, TX 75234
620-7117 FAX - 620-6219

DENTON STATION
SHELL PIPE LINE CORPORATION
LEA COUNTY, NEW MEXICO

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

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